

TYRONE-CAVAN INTERCONNECTOR & MEATH-CAVAN TRANSMISSION CIRCUIT

CORRIDOR EVALUATION DOCUMENT

Prepared For

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CHAPTER ONE: INTRODUCTION

RPS Planning & Environment has been commissioned by EirGrid to prepare this Corridor Evaluation Document (CED) in respect of that portion of the overall planned 400kV Interconnector and Transmission Circuit Project being developed by EirGrid, which extends from the border with Northern Ireland, in the vicinity of Clontibret, Co. Monaghan, via a planned new sub-station in the vicinity of Kingscourt, Co. Cavan, to the existing Woodland sub-station near Dunshaughlin, Co. Meath. The interconnector project is being developed jointly by EirGrid and Northern Ireland Electricity (NIE).

In summary, the objectives of the joint EirGrid/NIE Interconnector and Transmission Circuit Project are as follows:- to enhance the security of electricity supply to the island of Ireland; to improve the efficiency of the Single Electricity Market (SEM); and to facilitate greater connection of renewable generation on both parts of the island. This is primarily to occur by means of provision of new strategic electricity transmission infrastructure that connects the existing electricity grid network of the Republic of Ireland with the corresponding grid network in Northern Ireland. The wider strategic issues associated with the planned infrastructure development are addressed in greater detail in the Strategic Issues Review document, produced in December 2008, and available on the EirGrid website – www.eirgrid.com

Whilst essentially comprising a single all-island project, the proposed strategic infrastructure development has 3 no. inter-related constituent elements:-

- **The Northern Ireland Project: Co. Tyrone (Turleenan) to the Border**
This element is under the administrative control of NIE, and comprises a 400 kV transmission circuit extending approx. 35 km from a planned 400 kV sub-station at Turleenan, Co. Tyrone, south-westwards to the border with the Republic, at a point north-east of Clontibret, Co. Monaghan.
- **Tyrone-Cavan (Kingscourt) 400 kV Interconnector Project**
An approx. 40 km long 400 kV transmission circuit extending from the border with Northern Ireland to a planned 400/220 kV sub-station in the vicinity of Kingscourt, Co. Cavan. This element of the overall project includes construction of that planned sub-station, and associated 220 kV transmission infrastructure. The existing Flagford – Louth 220 kV east-west transmission circuit will loop into the planned Kingscourt sub-station.
- **Cavan (Kingscourt)–Meath (Woodland) 400 kV Transmission Circuit Project**
An approx. 60km long 400 kV transmission circuit extending from the planned sub-station in the vicinity of Kingscourt, Co. Cavan to the existing sub-station at Woodland, near Batterstown, Dunshaughlin, Co. Meath. Woodland station is the existing eastern terminus of the existing 400 kV transmission line corridor extending from Moneypoint in Co. Clare. It is also proposed as the western terminus of the planned East-West Interconnector.

This CED comprises the second phase of a comprehensive and structured route evaluation process within the Republic of Ireland. The first phase of this evaluation process comprised a multi-disciplinary information gathering exercise, identifying technical, environmental and strategic planning constraints; in addition, a public consultation and communications process was, and continues to be undertaken, in order to obtain the views, recommendations, and concerns of stakeholders, Statutory bodies, and general public regarding the overall transmission infrastructure project.

The primary deliverables of the Phase 1 process comprise as follows:-

- **Meath - Cavan 400 kV Transmission Circuit; Cavan - Tyrone 400 kV Interconnector: Strategic Planning Context Report, April 2008**
- **Cavan - Tyrone 400 kV Interconnector Project: Route Constraints Report, September 2007 (including Addendum Report, May 2008)**
- **Kingscourt – Woodland: Constraints Report, July 2007 (including Addendum Report, May 2008)**
- **Cavan – Tyrone and Meath - Cavan 400 kV Projects: Preliminary Briefing Note regarding Overhead and Underground Energy Transmission Options, February 2008**
- **Public Consultation Report, April 2008**

These documents are publicly available on the EirGrid website, www.eirgrid.ie. In addition, a Strategic Roadmap was prepared on behalf of EirGrid to set out an envisaged phased approach to the overall and ongoing route evaluation and planning applications process. This Strategic Roadmap is available on the EirGrid website.

As addressed in more detail in the Strategic Issues Review, it is EirGrid's policy for the use of OHL infrastructure in carrying out rural linear transmission projects such as is planned in this instance, in absolute preference to Underground Cable (UGC) systems. This policy is consistent with the conclusions of the Ecofys *Study on the Comparative Merits of Overhead Electricity Transmission Lines Versus Underground Cables*, of May 2008 prepared by order of the Department of Communications, Energy and Natural Resources, which notes that:- *"Until now, 400 kV to 500 kV AC cables for transmission are nearly exclusively used in short sections in urban areas and only rarely in open country"* (p.38), and that *"Up to now, construction and operation of an EHV UGC in Ireland with a length of up to 100 km would not be backed by any experience worldwide"* (p.44). The Study concludes that *"With more than 50 years of experience OHL are state-of-the-art and are the reference technology for transporting large amounts of electric power over distances of several hundreds of kilometres"* (p.53).

EirGrid's policy for use of OHL infrastructure is also consistent with the PB Power report entitled *'Comparison of High Voltage Transmission Options: Alternating Current Overhead and Underground, and Direct Current Underground'*, of February 2009. The report was produced primarily to identify the main alternatives to an overhead connection for this project, and examines the practicalities of placing the proposed 400kV power lines underground, from a project specific perspective. The Non Technical Summary sets out the following key conclusions;

- there is no underground cable circuit, of the kind and length required for these projects, anywhere in the world.
- most faults on an overhead line are caused by the weather. Any damage can be repaired quickly; in comparison, underground cables can be expected to be out of service due to faults for much longer periods..
- it would cost electricity customers over seven times as much for underground cables as compared to overhead line; it would be more expensive to operate an underground cable than an equivalent overhead line. This would again, add to customers costs.
- there are environmental impacts associated with both solutions and that these can be mitigated.

The Strategic Issues Review also gives some summary detail of the process for identification of the Study Area within which the planned Interconnector and Transmission Circuit project is planned to be developed, irrespective of any preferred corridor or final route. In summary, the Study Area comprises a strategic mid-country transmission option; It allows appropriately located strategic linkage between the transmission networks of Northern Ireland and the Republic of Ireland; it allows strategic linkage and connection with other parts of the National high voltage (HV) transmission network; it creates the potential to remove significant load from the existing transmission infrastructure supplying the existing Louth sub-station; it creates the potential to more fully utilise the entire existing Interconnector infrastructure; and it avoids the congested and constrained eastern corridor.

The two Phase 1 technical and environmental Constraints Reports, prepared separately for the two identified portions of the overall EirGrid project within the Republic, each identified 3 no. potential Overhead Line (OHL) corridors within the identified Study Area, which the proposed transmission infrastructure could be feasibly constructed and operated, in the context of existing identified constraints (see Chapter 3 of this Report). This CED presents a multi-criteria evaluation of those identified corridors, in reference to the findings of these Constraints Reports, and other published reports prepared during Phase 1 and up to February 2009. This includes both the *Meath to Cavan 400kV Overhead Powerline Project, Distribution of Whooper Swan Feeding and Roosting Sites*, and the *Cavan to Tyrone 400kV Overhead Powerline Project, Distribution of Whooper Swan Feeding and Roosting Sites*, December 2008.

This evaluation process acknowledges that other reports, or updates of existing reports may be carried out following identification of a candidate preferred corridor, and which may require re-consideration of the merits of that identified preferred corridor. This evaluation process allows for ongoing iteration and review against a comprehensive set of evaluation criteria. This is detailed in Chapter 3 of this Report.

The structure of this Corridor Evaluation Document comprises the following:-

- Summary detail of the potentially feasible route corridors, as identified in the published Constraints Reports;
- Methodology for Corridor Evaluation: an overview of the methodology applied in carrying out the multi-criteria corridor evaluation;
- Multi-Criteria Corridor Evaluation: a comparative evaluation of Technical, Environmental and Community criteria to the identified potential route corridors, to reveal a preferred candidate corridor;

The two portions of the overall project within the Republic of Ireland – the Cavan (Kingscourt)-Tyrone 400 kV Interconnector Project and the Cavan (Kingscourt) – Meath (Woodland) 400 kV Transmission Circuit project will continue to be referenced separately within this Report; however, they should be considered as together comprising that element of the overall planned Interconnector and Transmission Circuit Project which occurs within the Republic of Ireland. The presentation of the overall project in its constituent portions is intended to ensure clarity of understanding of the technical, environmental and community issues arising, both for EirGrid and its consultants, but equally for stakeholders, landowners, Statutory and non-Statutory bodies, and the general public, who will be facilitated by means of more closely identifying the local issues which influence selection of the preferred corridor. This

approach still permits the identification of a preferred route corridor for the overall strategic transmission infrastructure project.

The Corridor Evaluation Document and evaluation methodology is intended to inform EirGrid and all other parties as to the identification of a feasible transmission route corridor which ensures the best balance between identified evaluation criteria. This is intended to form the basis for ongoing dialogue with interested parties, including the general public and landowners, regarding the identification and realisation of a final preferred route. The Phase 2 CED – which comprises a strategic comparative assessment of corridor options - will require to be followed in Phase 3 by more detailed technical and environmental studies, and ongoing Statutory, non-Statutory and public consultation, with the purpose of identifying a preferred route for the overall transmission infrastructure project within the identified preferred corridor.

CHAPTER TWO: IDENTIFICATION OF POTENTIAL TRANSMISSION INFRASTRUCTURE ROUTE CORRIDORS

Introduction

The identified Study Area of the EirGrid transmission infrastructure project was subject to detailed strategic technical and environmental constraints identification and analysis. This involved assembling all available environmental and physical constraints data into a GIS database, including Ordnance Survey and other mapping, aerial photography, identification of designated habitats, peatlands and other natural and built heritage constraints, and identification of urban areas, rural dwellings and other elements of the existing and planned built environment. Concurrently, on-site and vantage point visual, technical and other surveys of the identified Study Area were undertaken by qualified and experienced professional specialists.

Combined with this, one other parameter was applied to the constraints studies, deriving from established best practice and the professional expertise and experience of EirGrid, as the National electricity Transmission System Operator. This was to seek where possible to provide a 50 metre separation distance of transmission infrastructure from existing occupied dwellings and other buildings. This 50 metre separation distance is not a legal, planning or safety requirement. It is rather EirGrid's own reference distance which, if it cannot be achieved in a particular location, triggers a more detailed analysis of the transmission line design in that particular location. It is applied here as one of a number of 'yardsticks' for comparing route corridors with the objective of arriving at a balanced view as to which is the most appropriate.

The application of this parameter, and the identified physical and environmental constraints, within the Study Area, facilitated the identification of a number of technically and environmentally feasible OHL corridor options. The constraints studies also identified a potentially feasible route for the transmission infrastructure within each of the corridor options, as well as identifying any potential constraints arising within those corridors for delivery of any route.

Identified OHL Corridor Options of the Cavan (Kingscourt) - Tyrone 400 kV Interconnector Project

ESBI, together with AOS Planning, prepared a Route Constraints Report in respect of the Cavan to Tyrone 400 kV Interconnector Project. In summary, this portion of the project in the Republic of Ireland consists of the construction of a new 400 kV OHL transmission circuit from a border crossing point at a location to the north east of Clontibret, Co. Monaghan, southwards to a proposed new 400/220kV station in the environs of Kingscourt, Co. Cavan, located in the vicinity of the existing Louth to Flagford 220 kV electricity line. The planned circuit covers a distance of approx. 40km and also involves the provision of the new electricity sub-station at Kingscourt.

Three potential route corridors have been identified in this Route Constraints Report. Each route corridor is approximately 1 km wide within which the OHL transmission infrastructure will be located. The Report addresses the technical and environmental issues and constraints of the 3 no. route corridor options. The 3 no. corridors are detailed in Fig. 2.1 and their characteristics are summarised below.

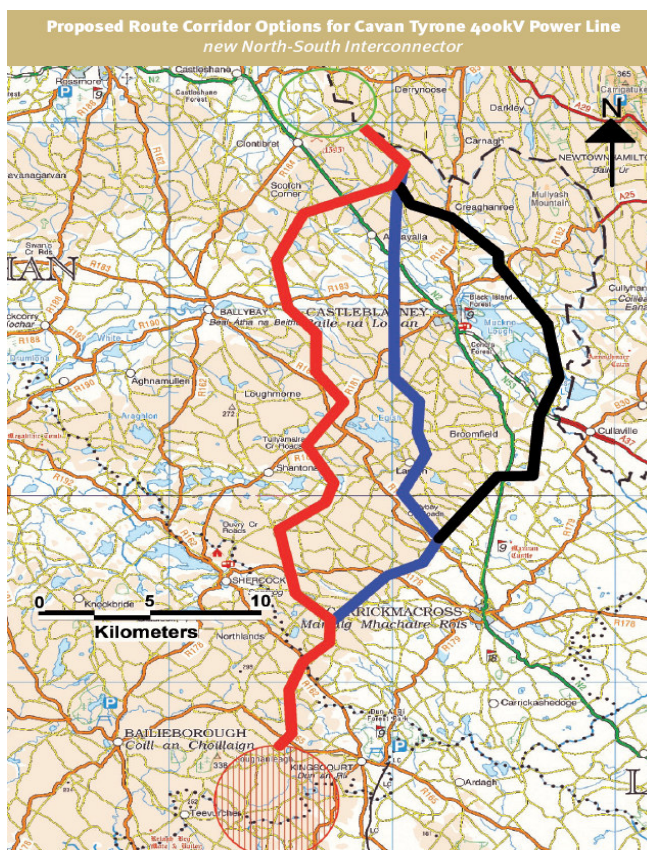


Fig. 2.1 Potential Route Corridors of the Tyrone – Cavan Interconnector Project

Route Corridor A – the Western Corridor

- Route Corridor A connects with the NIE project at a Border crossing area located to the north east of Clontibret, Co. Monaghan;
- From this point it extends south-eastwards, before turning to the south-west and crossing the N2 National Primary Route at a location north of Annayalla;
- The Route Corridor continues to the south-west before turning to the south, and crossing the R183 regional road at a location between the settlements of Doohamlat to the east and Ballybay to the west;
- The Route Corridor continues in a generally southerly and south-easterly direction before turning to the south-west, and crossing the R180 regional road at a location to the west of Lough Egish;
- The Route Corridor continues in a south-westerly direction, before turning back to the south-east in the vicinity of Tullyamalra Cross Roads, and crossing the R181 regional road at a location to the north-east of the settlement of Shantonagh, thereby circumventing Shantonagh Lough;
- The Route Corridor continues south-eastwards, before turning to the south-west and then the south, before crossing the R178 regional road, approximately 3 kilometres east of Shercock, thereby avoiding the lakelands at Northlands;
- The Route Corridor crosses the boundary into Co. Cavan, continuing in a generally southern and south-easterly direction, before turning to the south-west to cross the R162 regional road. Thereafter, it travels in a generally southerly direction, crossing the R165 regional road, and extending south-westwards to the vicinity of the planned 400kV substation located to the west of Kingscourt.

Route Corridor B – the Central Corridor

- Route Corridor B follows the alignment of Route Corridor A as it extends south-eastwards from the border crossing point;
- It then turns to the south, crossing the N2 National Primary Route at a location south-east of the settlement of Annayalla;
- It continues in a southerly direction and crosses the R183 and R181 regional roads, approximately 3km west of the town of Castleblayney;
- It continues in a south-easterly, and then southerly direction, passing to the east of Lough Egish;
- It turns to the south-west, passing to the south-east of the settlement of Laragh;
- It turns to the south-east, running generally parallel to the alignment of the R180 regional road, before turning to the south-west, and crossing the R178 approximately 4km north-west of Carrickmacross;
- Route Corridor B continues in a south-westerly direction to the west of Carrickmacross. It then follows the alignment of Route Corridor A from west of Carrickmacross generally southwards to the planned 400kV substation located to the west of Kingscourt.

Route Corridor C – the Eastern Corridor

- Route Corridor C follows the alignment of Route Corridors A & B as it extends south-eastwards from the border crossing point;
- It extends in a generally south-easterly direction, crossing the R181 regional road at a location to the south of Creaghanroe;
- It continues in a south-easterly direction, crossing the R182 regional road north-east of Castleblayney, and extending to the north-east of Muckno Lough;
- It turns southwards, extending between Muckno Lough to the west and the Border to the east, before turning to the south-west and crossing the N53 National Secondary Route at a location west of Crossmaglen;
- Route Corridor C continues in a generally south-westerly direction, before turning westwards and crossing the N2 National Primary Route at a location to the south-east of the settlement of Laragh;
- It continues in a south-westerly direction, crossing the R180 regional road approximately 4km north-west of Carrickmacross;
- It then follows the alignment of Route Corridor B south-westwards to the planned 400kV substation located to the west of Kingscourt.

Identified OHL Corridor Options of the The Cavan (Kingscourt) – Meath (Woodland) 400 kV Transmission Circuit Project

Soluziona with TOBIN Consulting Engineers prepared a Route Constraints Report in respect of the Cavan-Meath 400 kV Transmission Circuit Project. In summary, this portion of the project in the Republic of Ireland consists of the construction of a new 400 kV OHL transmission circuit from the planned substation near Kingscourt, Co. Cavan – being the southern terminus of the Tyrone - Cavan Interconnector – southwards to connect with the existing Woodland 400kV Station near Batterstown, Dunshaughlin, County Meath. The planned circuit covers a distance of approx. 60km.

Three potential route corridors have been identified in this Route Constraints Report. Again, each route corridor is approximately 1 km wide within which the OHL transmission infrastructure will be located. The 3 no. corridors are detailed in Fig. 2.2 and their characteristics are summarised below.



Fig. 2.2 Potential Route Corridors of the Meath-Cavan Transmission Circuit Project

Route Corridor 1 – the Western Corridor

- Route Corridor 1 extends south-westwards from the area of the planned Kingscourt sub-station, running generally parallel to the north-west of the R164 regional road;
- It crosses the R194 regional road at a location between the settlements of Mullagh to the north-west and Moynalty to the south-east;
- It continues in a generally south-westerly direction, crossing the N3 National Primary Route in the vicinity of the settlement of Carnaross, north-west of Kells;
- It turns to the south, crossing the R163 regional road in the vicinity of Ballinlough, before turning to the south-east and crossing the N52 National Secondary Route north-east of its junction with the R154 regional road;
- It continues in a generally southerly direction, crossing both the R154 regional road, and the N51 National Secondary Route, west of the town of Athboy;
- It turns to the south-east, and extends in the vicinity of the settlement of Kildalkey, before crossing the R161, R160, R159 and R158 regional roads, extending to the south of the town of Trim;
- It continues in a south-easterly and easterly direction, crossing the R125 regional road and extends to the existing Woodland 400kV sub-station, located west of the settlement of Batterstown, south-west of the town of Dunshaughlin.

Route Corridor 2 – the Central Corridor

- Route Corridor 2 generally follows a similar alignment as Route Corridor 1, south-westwards to a location south of the R163 regional road, west of Kells;
- It turns to the south-east and east, and crosses the N52 National Secondary Route to the south-west of Kells, and the R164 regional road, south of the town;
- It continues in a generally south-easterly direction, bisecting the settlements of Fordstown to the west and Cortown to the east, before crossing the N51 in the vicinity of the settlement of Rathmore, north-east of Athboy;
- It continues to the south-east, to the north of the settlements of Rathcarran and Dunderry. It then crosses the R161 regional road at a location south of the settlement of Robinstown, to the north-east of Trim;
- It continues in a generally south-easterly direction, in the vicinity of the settlement of Bective, before turning to the south and crossing the R154 regional road at a location to the south-west of the settlement of Dunsany;
- Route Corridor 2 then turns to the south-east, crossing the R125 regional road and extending to the existing Woodland 400kV sub-station.

Route Corridor 3 – the Eastern Corridor

- Route Corridor 3 extends southwards from the area of the planned Kingscourt sub-station, west of the settlement of Kilmainham Wood;
- Route Corridor Option 3A extends to the south-west and south, west of the settlement of Thomastown, before crossing the N52 National Secondary Route at a location north-east of the settlement of Carlanstown. It then turns to the south-east and extends to a location north of the R163 regional road;
- Route Corridor Option 3B extends to the south-east and south generally parallel to the R162 regional road east of Thomastown, before crossing the N52 National Secondary Route. It then turns to the south-west, north of the R163;
- Route Corridor 3 continues generally southwards and crosses the R163 regional road at a location west of Gibstown, before turning to the south-west and crossing the N3 National Primary Route, north-west of Navan;
- It continues southwards before crossing the N51 National Secondary Route. It follows the alignment of Route Corridor 2 south-eastwards to the existing Woodland 400kV sub-station.

CHAPTER THREE: METHODOLOGY FOR CORRIDOR EVALUATION

Introduction

The previous chapters, and the other documents referenced therein, have identified the process and methodology for selection of the Study Area, and the identification of potential route corridors therein.

In tandem with the identification of technically and environmentally feasible corridor options within the Study Area, EirGrid with its Consultants commenced formal and informal consultation with the residential and business communities of the Study Area and beyond, as well as with other Statutory and non-statutory stakeholders, and the general public. A primary purpose of this consultation process, in addition to providing information to the public and stakeholders regarding the nature, purpose and extent of the project, was to note and to clarify all issues of public concern in respect of the project. Such verbal and written concerns were recorded during workshops and Open Days, and in correspondence to EirGrid.

Separately, public submissions were made in respect of the preparation of the Ecofys Study regarding the comparative merits of OHL versus UGC transmission infrastructure – as noted above, and in the Strategic Issues Review, the content and conclusions of this Study in May 2008 has informed this corridor evaluation process.

This Report extends from this previous analysis and sets out a methodology for, and undertakes a process of, comparative evaluation of the identified corridors. As such, it requires to be considered in conjunction with the other documents and reports, as detailed herein, which inform the initial identification of the Study Area and corridors.

Methodology

The methodology employed in this comparative evaluation process is as follows:-

- **Identification of Evaluation Criteria**

Within a workshop format, EirGrid and its project consultants identified a diverse range of issues which could potentially comprise criteria which would inform a comparative evaluation of the identified OHL corridors. These issues derived from the professional experience of the EirGrid project team and its consultants, from the strategic technical and environmental constraints identified by the consultants in their assessments of the identified Study Area, and from issues and concerns articulated or arising during the public consultation process.

Some 60 no. multi-disciplinary issues were identified during the workshop process; these were synthesised into 22 no. general categories of Technical, Environmental, Community and Other criteria, which in turn included more detailed sub-criteria. In the interests of ensuring consistency and clarity, these agreed criteria were subsequently cross referenced both against generic Techno-Economic and Environmental criteria detailed generally at Chapters 5 and 6 of the Ecofys Study referred to in Chapter 1 above and in the Strategic Issues Review, and against the constraints and criteria that originally identified the route corridors within the Study Area, as detailed in the two Constraints Report. These criteria are considered to be consistent with the conclusions of these documents.

The agreed Corridor Evaluation Criteria, and Sub-Criteria, are as follows:-

- **TECHNICAL CRITERIA:**

- 1 Safety**

- 1.1 Operational Safety Risk:** The risk to the general public, operational personnel, and transmission infrastructure, during operation;
- 1.2 Construction Safety Risk:** The risk to the general public, construction personnel and transmission infrastructure during construction;
- 1.3 Risk of Disturbance by Third Parties:** Potential risk of accidental or intentional disturbance to the transmission infrastructure during operation;

- 2 Construction/Operation**

- 2.1 Road Infrastructure:** The general condition and adequacy of the local road network providing access to the transmission infrastructure;
- 2.2 Availability of Construction Materials:** The assurance of adequate supply of materials to construct the transmission infrastructure;
- 2.3 Maintenance During Operation:** The capability to carry out both routine maintenance and inspection of the transmission infrastructure, as well as specific fault detection and repair during its operation;
- 2.4 Ground Condition/Stability:** The impact of civil works, generally during construction, on the ground stability of the receiving environment;
- 2.5 Extent of Civil Works:** The nature, extent and complexity of works involved in construction of the transmission infrastructure;
- 2.6 Road Closures:** The envisaged requirements for closure of public roads to facilitate construction of the transmission infrastructure;

- 3 Design**

- 3.1 Need for Temporary and Permanent Compounds:** The requirement for temporary and permanent compounds during construction and operation;
- 3.2 Watercourse Crossings:** The number of navigable/non-navigable, streams, lakes etc. to be crossed by the transmission infrastructure;
- 3.3 Road Crossings:** The number of public roads to be crossed by the transmission infrastructure;
- 3.4 Length of Route:** The approximate length of an indicative route of transmission infrastructure within the identified corridor;

- 4 Other Technical Considerations**

- 4.1 Security of Supply:** The assurance of electricity supply;
- 4.2 Reliability:** The assurance of a reliable electricity supply;
- 4.3 Potential for Future Linkage:** The potential capability for planned or future upgraded transmission infrastructure to link with additional transmission infrastructure and/or other energy infrastructure;
- 4.4 Assurance of Adequate Power Transfer (MVA) Capacity:** The capability of the transmission infrastructure to meet the required power transfer capacity of 1,500 MVA (Megavoltamperes)

- **ENVIRONMENTAL CRITERIA:**

- 5 **Human Beings**

- 5.1 **Health Impacts:** The potential impacts of transmission infrastructure on public health, having regard to latest relevant research;

- 5.2 **Noise:** The impact of noise occurring during both during construction & operation of the transmission infrastructure;

- 5.3 **Potential for Negative Economic Impact:** The potential economic constraints of transmission infrastructure on existing and/or potential future expanded commercial activities including mines, quarries and forestry;

- 6 **Electrical & Magnetic Fields (EMF)**

- 6.1 & 6.2 **EMF:** The occurrence of EMF associated with transmission infrastructure;

- 7 **Flora & Fauna**

- 7.1 **Potential Impact on Livestock**

- 7.2 **Potential Impact on Bloodstock**

- 7.3 **Potential Impact on Other Fauna and Flora Including Specific Species**

- 7.4 **Potential Impact on Protected/Designated Habitats**

- 8 **Visual Amenity & Landscape**

- 8.1 **Potential Impact on Protected Views and Prospects**

- 8.2 **Potential Impact on Areas of High Scenic Value**

- 8.3 **Potential Impact on Non-Designated but Scenic Landscapes**

- 9 **Archaeology, Culture & Local Heritage**

- 9.1 **Potential Impact on Protected Structures and Their Settings**

- 9.2 **Potential Impact on Recorded Monuments & Places (RMP), National Monuments and Their Settings**

- 9.3 **Potential for Other Cultural Heritage Constraints**

- 10 **Water**

- 10.1 **Disruption to Groundwater**

- 10.2 **Risk of Pollution of Ground and/or Surface Water**

- 11 **Air Quality**

- 11.1 **Disturbance and/or Creation of Particle Matters (PM10s)**

- **COMMUNITY CRITERIA:**

- 12 **Planning and Land Use**

- 12.1 **Impact on Rural Development and Land Use:** The potential constraints to development potential for rural housing and other activities, including farming and forestry from operation of the transmission infrastructure;

- 12.2 **Impact on Urban Development and Land Use:** The potential constraints to development potential for urban housing and other activities from operation of the transmission infrastructure;

- 13 **Community Severance**

- The potential for transmission infrastructure to create a barrier to community movement, development or interaction;

- 14 **Number of Dwellings within the 1 km wide Corridor**

- A general indication of the density of residential development within the identified route corridor;

15 Number of Dwellings and Other Residential Accommodation within 100 metres of Indicative Routes

A general indication of the density of residential accommodation (primarily within, but not restricted to, private dwellings) within immediate proximity of an indicative route within the identified route corridor;

16 Landowner Consent

The considered likelihood of obtaining partial or total landowner consent to construct and operate the transmission infrastructure;

17 Potential Impact on Public Amenities

17.1 Nearest School (within 500m): The number of schools within a representative radius of 500m from the indicative routes. It should be noted that the 500m radius has no technical or safety basis but was considered as a representative distance during public consultation;

17.2 Nearest Playing Pitches (within 200m): The number of playing pitches within a representative radius of 200m from the indicative routes. It should be noted that the 200m radius has no technical or safety basis but was derived as a representative distance during public consultation;

17.3 Recreational Areas: The potential impact on human beings of transmission infrastructure on areas of existing or potential public amenity;

17.4 Other Public Buildings/Institutions: The existence of buildings and institutions accessible to the public in proximity to the corridor;

17.5 Tourism Facilities: The potential impact on human beings of transmission infrastructure on areas of existing or potential tourism attractions/facilities;

17.6 Airfields: The existence of any airports or airfields, including identified landing and take-off flight paths, in proximity to the corridor;

• **OTHER CRITERIA:**

18 Compliance with Current Planning & Development Policy & Guidelines

19 Project Programme and Deliverability

20 Economic Feasibility

21 Compliance with Best International Practice

22 Adaptability for Future Development

- **The Corridor Evaluation**

No quantitative or weighting system has been applied to the various technical, environmental and community criteria in order to evaluate corridors. Rather, having regard to the high-level corridor identification process that has occurred – based on strategic, though not necessarily intrusive or otherwise detailed surveys along the full extent of each corridor, a qualitative evaluation system, based on professional expertise, is applied for each corridor against the agreed criteria.

This approach thereby allows a qualitative construction of a profile – albeit at some general level of detail – of each of the corridors, and how they meet the identified criteria. This qualitative approach can thus determine whether in respect of a particular criterion, a corridor is ‘more preferred’ or ‘less preferred’. The approach also means that corridor specific issues can be taken into account and detailed in considering a particular criterion.

As a visual aid, and in order to provide a clear and comparative analysis of the evaluation process, matrices have been prepared for each portion of the overall project – refer to Tables 3.1 and 3.2. In this way key information pertaining to each criterion can be succinctly summarised for each corridor, and compared with other corridors. A simple colour system has been adopted to distinguish between ‘more preferred’ (green) and ‘less preferred’ (blue) criteria as applying to each corridor. Criteria that were considered to be neither ‘more preferred’ or being ‘less preferred’ remain uncoloured on the matrices.

The colour system is essentially intended to constitute a visual indicator of where potential benefits and constraints are considered to occur in respect of the multi-criteria assessment of corridors; they are not intended to comprise a comparative ranking system of the corridors, as there is no suggestion that all criteria have equal importance.

The matrices, and the colour system thereof, should not be considered to comprise an alternative to the comparative evaluation set out at Chapter 4 of this report, or within other documents that have been referenced in this report.

CHAPTER FOUR: COMPARATIVE CORRIDOR EVALUATION

Introduction

The following is a criteria-by-criteria evaluation of the identified OHL corridor options. As previously noted, this evaluation derives from, and has been referenced with relevant information and professional judgement of the EirGrid project team and from its Technical and Environmental consultants – as recorded in the Technical and Environmental Constraint Reports and other reports published up to February 2009 as well as from public consultation. It is not considered necessary nor appropriate for such supporting information to be reproduced in this Report. Rather, this summary comparative evaluation should be read in conjunction with those more detailed assessment documents.

The details of the comparative evaluation are contained in both the Comparative Evaluation text below and the text of the Comparative Evaluation Matrices set out in Tables 3.1 and 3.2. It will be noted that for many criteria, there is little differentiation between the various identified corridors. Where differentiation does occur, it is recorded below and coloured accordingly in the matrices.

The details contained within this evaluation are subject to change as a result of ongoing indepth surveys, their results and subsequent variations to the indicatives routes. It is also important to note that while common criteria were applied to both sections of the project the extent of the details and ranges of survey information collected are not always consistent.

Comparative Evaluation

Technical Criteria Assessment

(1) Safety

Operational Safety Risk

All EirGrid transmission infrastructure will be operated in compliance with national and international safety standards. Operational safety risk is therefore low for all corridor alternatives.

Construction Safety Risk

All construction work will be fully compliant with relevant Health and Safety legislation and guidelines. Construction safety risk is low for all corridor alternatives.

Risk of Disturbance by Third Parties

The risk of disturbance - accidental or intentional - to OHL infrastructure is low. In specific situations where a localised risk is identified, this can be mitigated by the application of appropriate measures - primarily through tower location or design.

(2) Construction/Operation

Road Infrastructure

The existing local and regional road network for each of the identified corridor options is adequate to facilitate construction & operation of OHL transmission infrastructure.

Availability of Construction Materials

Materials and components for the construction of OHL transmission infrastructure are normally readily available.

Maintenance During Operation

OHL infrastructure can be easily accessed for general maintenance and repair. The faults can generally be easily detected and quickly repaired. Maintenance works are frequent due to the continual exposure to adverse weather conditions.

Ground Conditions/Stability

A lattice tower is required approximately every 350 – 400m. Where ground conditions are good, the civil works required for the pylon foundations are relatively minor. More extensive works, such as piling, may be required when ground conditions are poor. All civil works will be localised to the pylon positions and on average approximately 200 m³ of excavated spoil per km can be expected¹.

Extent of Civil Works

A lattice tower is required approximately every 350 - 400m. The civil works are associated only with the foundations for the tower, as described in respect of Ground Conditions/Stability above, so therefore site disturbance is low.

Road Closures

Generally the construction, operation and maintenance of OHL infrastructure does not require the closure of roads.

(3) Design**Need for Temporary & Permanent Compounds**

OHL infrastructure requires only temporary construction compounds for storage of materials, machinery etc. Where appropriate existing sub-station compounds along, or in proximity to, an alignment can be used for this purpose.

Watercourse Crossings

Watercourse crossings are typically manageable through site specific tower location. Once the lattice base is appropriately located, and in consideration of the fact that a tower is required only approximately every 350 - 400m, the impact of an OHL crossing of a river or lake is low.

Each of the various identified corridors include some 5 - 8 watercourse crossings. This variation is not considered significant such as to merit differentiation or preference between these corridor options, particularly having regard to the flexibility for OHL construction detailed above.

Road Crossings

Road crossings are typically manageable through tower location. Once the lattice base is appropriately located, and in consideration of the fact that a tower is required only approximately every 350 - 400m, the impact of an OHL road crossing is low.

Each of the various identified corridors include some 30 - 60 road crossings. This variation is not considered significant such as to merit differentiation or preference between these corridor options, particularly having regard to the flexibility for OHL construction detailed above.

¹ Ecofys Study, May 2008, pg. 95

Length of Route

An indicative route within each corridor has been identified in the Constraints Reports. Lengths of these indicative routes range between approx. 39 km and 44km for the Tyrone - Cavan Interconnector (corridors A, B & C), and approx. 53.4 km and 63.0 km for the Cavan – Meath Transmission Circuit (corridors 1, 2, 3a & 3b).

The variation between approx. 39km and 44km for Corridors A, B & C is not considered significant such as to merit preference between these corridor options. **However, the variation between approx. 53.2km and 63.0km for corridors 1, 2, 3a & 3b is considered significant to differentiate between the other corridor options. In this regard, the shortest corridors 3a and 3b are preferred.**

(4) Other Technical Considerations

Security of Supply

OHL is the internationally proven and preferred method of electricity transmission for the nature and extent of this project with regard to assurance of electricity supply.

Reliability

OHL is the internationally proven and preferred method of power transmission for the nature and extent of this project with regard to reliability of electricity supply.

Potential for Future Linkage

As the OHL transmission infrastructure is designed to operate as part of an AC network, there arises no differentiation or preference between the corridor options.

Assurance of adequate power transfer (MVA) capacity

OHL infrastructure will ensure 1,500 MVA capacity.

Environmental Criteria Assessment

(5) Human Beings

Health Impacts

As the project will operate within accepted International guidelines, it is considered that there are no health impacts associated with OHL infrastructure. It is however acknowledged that there can arise a public perception concerning adverse health impact of OHL transmission infrastructure.

Noise

The noise during construction will be low and temporary as only minor civil works are required along a linear corridor.

Noise during operation is typically manageable through site specific tower location. The noise during operation is low – generally 60dB directly below the centreline of a pylon. The impact of this noise diminishes with distance from the individual pylons.

Potential for Negative Economic Impacts

Mines: There are no mines within any of the identified corridors. Corridors 3a & 3b are located approximately 2km from Tara Mines. While this is a distinction from Corridors 1 and 2, it is not sufficient to differentiate between these corridor options.

Quarries: There is low potential for negative economic impact on existing quarries for the entire project. Corridor 1 is located approx. 800 m from Roadstone Trim Quarry and approx. 300m from Keegan Quarries (Trammon). While this characteristic has a low impact, its proximity is considered sufficient to differentiate between it and the other corridor options. **Corridor Option 1 therefore is considered as less preferred.**

There are 8 - 12 quarries located within Corridors A, B & C. This is regarded as a low impact for each of the corridor options. There is no differentiation between the corridor options with regard to the significance of the impact.

Forestry: The potential for negative economic impacts on existing forestry ranges from low to medium along the entire project. Corridor 1 is within 300m of Moyrath/ Kildalkey, Causetown/ Athboy and Dirlagh/ Mullagh forests. In comparison, Corridor 2 has no forests within 300m, while Corridor 3a & 3b have one forest, Clongill located within 300m. While the impact on Corridor 1 is considered to be low, it is sufficient to differentiate between it and the other corridor options. **Having regard to these details Corridor 1 is considered as less preferred and Corridor 2 is considered more preferred.**

There are 10 - 11 areas of forest located within Corridors A, B & C. This is regarded as a medium impact for each of the corridor options. There is no differentiation between the corridor options with regard to the significance of the impact.

(6) Electric and Magnetic Fields

Impact of Electric fields

OHL transmission infrastructure is designed and operated in accordance with accepted international & EU standards and recommendations (1999/519 EC).

A live OHL emits an electrical field. The strength of the electric field is directly proportional to the strength of the applied voltage - that is, the higher the voltage the stronger the field. The strength of this field decreases rapidly with growing distance from the live wires. Therefore a person or animal standing at ground level will experience the strongest field at those points where the live wires hang lowest, typically this will be at the mid point between a pair of pylons. For the voltage level and pylon design proposed for this project, the electric field strength experienced at ground level will be lower than the limits specified in EU Guidelines.

Impact of Magnetic fields

OHL transmission infrastructure is designed and operated in accordance with accepted international & EU standards and recommendations (1999/519 EC).

Passing an AC electric current (measured in Amps) through a wire causes a magnetic field around that wire. The greater the current flowing in the wire the stronger the magnetic field. The strength of the field experienced by a person or animal standing at ground level is directly proportional to proximity to the current carrying wire. However, the strength of the magnetic field decreases rapidly with growing distance from the current carrying wire. A current carrying AC OHL will always emit a magnetic field. By appropriate design it is possible to ensure that the permanent exposure levels to such magnetic fields are kept well within specified EU Guidelines levels.

(7) Flora & Fauna

Potential Impact on Livestock

Construction of the transmission infrastructure may affect the movement and grazing of livestock. However it is likely in any case that livestock would be temporarily relocated to alternative grazing areas during the construction phase. It is considered that any impact would be temporary and negligible.

Potential Impact on Bloodstock

Construction of the transmission infrastructure may affect the movement and grazing of bloodstock. Whilst it is likely that bloodstock would be relocated to alternative areas during construction, it is acknowledged that the bloodstock industry has more sensitive requirements than livestock, in particular stud farming. It is considered that any impact would be temporary and negligible.

Potential Impact on Other Fauna and Flora Including Specific Species

Whooper Swans: Corridor 1 does not cross any regular flightlines, also there are no sites on this corridor option where Whooper Swans regularly spend the entire winter, though Whooper Swans utilise an area close to Carnaross at least late in the season in small numbers. **In this regard Corridor 1 has a minor impact and is considered a more preferred route option.**

A flightline was noted crossing route corridor option 2. The area appears to be an important foraging area for a number of Whooper Swans that can exceed nationally important levels. **In this regard Corridor 2 has a potential impact and is considered as less preferred.**

Corridor option 3 is crossed by two confirmed and one probable flightline. Two of these flightlines (one confirmed) crosses corridor option 3b and not 3a. It has been concluded that given the importance of the Tara Mines tailing ponds roosting site and the regular flightlines along the Blackwater Valley and the probable importance of the

Whitewood Lough and the Cruicetown area to Whooper Swan numbers, Corridor 3 is likely to have the greatest level of potential impact on wintering Whooper Swans. **In this regard both Corridors 3a and 3b are also considered as less preferred.**

The published Whooper Swan Report for the study area from Cavan to Tyrone does not contain finalised findings or assessments of impacts. The study is ongoing to coincide with the season when Whooper Swans are present and will continue until April 2009. In this regard, while identified and potential sites are located close to and within Corridors the findings are not yet finalised and therefore the Corridors have not been differentiated between.

Potential Impact on Designated/Protected Habitats

Corridors 3a & 3b cross the River Boyne SAC and River Blackwater SAC at two separate locations. These Corridors lie within 2km of two NHAs. Corridor 1 crosses the River Boyne SAC and River Blackwater SAC at three separate locations. This Corridor lies within 5km of 2 other NHAs and one SAC. Corridor 2 crosses the River Boyne SAC and River Blackwater SAC at two separate locations. This corridor option also lies within 2km of two NHAs. All Corridors will have a similar level of impact and therefore are not differentiated.

Corridors A and B have low impacts. Tassan Lough is located some 300m and 450m respectively from these Corridors. **While there is no differentiation between Corridors A and B with regard to the significance of the impact both corridors are considered as more preferred.** Corridor C occurs in proximity to a relatively large cluster of hydrologically linked pNHAs, and approx. 350 metres from Muckno lake. **This corridor has a medium impact and is therefore less preferred.**

(8) Visual Amenity & Landscape

Potential Impact on Protected Views & Prospects

Corridors 1 and 2 run through medium sensitivity viewsheds of 2.3km and 6.2km respectively. **Both have medium impacts and are less preferred.**

Corridor Options 3a and 3b are more preferred as both avoid sensitive views and prospects.

Corridor Options 1, 2, 3a & 3b traverse between 20.5km and 25.8km of area of high sensitivity to power lines².

Corridors B and C both have medium impacts as they cross scenic route views SV 21 and SV 16 respectively. **Corridor A is more preferred as it avoids transecting any scenic route.**

Corridor Options B and C are both less preferred as they cross scenic routes for 3km and 1.5km respectively.

Potential Impact on Areas of High Scenic Value

None of the identified corridors transect any areas categorised as areas of high scenic value. There is no differentiation between these corridors with regard to this criterion.

Potential Impact on Non Designated But Scenic Landscapes

² The Landscape Capacity Map of the Meath Landscape Character Assessment (Meath County Development Plan) rates the capacity of each Landscape Character area in County Meath to accommodate power lines.

Corridors 1, 2, 3a and 3b all cross a number of existing driving routes, waymarked paths and cycle routes, as designated in the local development plan. The difference between these corridors is not considered significant.

Corridors A, B and C all have low impacts; whilst no cycle ways are crossed, the corridor does transect the Monaghan Walkway close to the border.

(9) Archaeology, Culture & Local Heritage

Potential Impact on Protected Structures and Their Setting

The potential impact of OHL infrastructure on Protected Structures and their settings is typically manageable through site specific tower location.

Corridors 1, 2, 3a & 3b have between 6 and 9 protected structures located within 250m. The potential impact for each of these options is low.

Corridors A, B and C are located away from protected structures and in this regard there is no differentiation in the significance of the impact.

Potential Impact on Recorded Monuments & Places (RMP) and National Monuments and Their Setting

The potential impact of OHL infrastructure on RMPs, National monuments and their settings is typically manageable through site specific tower location.

All identified corridor options are considered as having a low impact on the sites of RMPs and National Monuments, and their settings. **However, while identified as having a low impact, Corridor A and Corridor 2 both contain the highest number of RMPs and are considered as less preferred.**

Potential for Other Cultural Heritage Constraints

It is considered that there is a low impact associated with all identified corridors. Excavation work is only required at tower bases, so the impact in any case would be low. Also the potential to uncover unrecorded cultural heritage is considered as low. There is also flexibility to reposition a tower base if an unrecorded find of significant value is located at the initial proposed location.

(10) Water

Disruption to Groundwater

The potential disruption to groundwater for all corridors is low.

Risk of Pollution of Ground & Surface water

The potential risk of pollution of ground and surface water with OHL infrastructure for all corridors is low. A tower is required approximately every 350-400m. This requires minor civil works with little disturbance to ground and surface water regimes.

(11) Air Quality

Disturbance and /or Creation of Particle Matters (PM10s)

The potential disturbance and/or creation of particle matters with OHL infrastructure, for all options on both portions of this project is low.

Community Criteria Assessment

(12) Planning and Land use

Impact on Rural Development and Land Uses

The potential negative impact on rural development and land uses with OHL infrastructure, for all corridor options is low. The Electricity Supply Act requires that any person intending to construct a building within 25 yards (approximately 23 metres) of an OHL must notify ESB in advance. This is required so that ESB can ensure that the works can be carried out safely and that the future safe operation and maintenance of the OHL is ensured. Outside this, rural development, particularly rural housing is currently subject to other Statutory and development control policies and guidelines, but is not otherwise constrained by the transmission infrastructure.

Impact on Urban Development and Land Uses

The impact of OHL infrastructure is low. None of the proposed corridor options impinge upon urban areas, or envisaged areas of future urban expansion.

(13) Community Severance

There is no community severance as a result of any of the identified OHL corridors as unrestricted access occurs between the towers.

(14) No. of Dwellings within the 1km wide Route Corridor

The following number of dwellings have been identified within each 1km corridor:-

Corridor 1: 569; Corridor 2: 533; Corridor 3a: 640; Corridor 3b: 611; Corridor A: 317; Corridor B: 352; and Corridor C 418. **Corridor 2 with the least number of dwellings is considered more preferred, whilst Corridor 3a with the greatest number of dwellings is considered less preferred. Corridor A is also considered more preferred, while Corridor C is considered less preferred.**

(15) No. of Dwellings and Other Occupied Buildings within 100m of Indicative Route

The following number of dwellings, and other occupied buildings, have been identified within approx. 100m of the indicative route within each corridor option:-

Corridor 1: 24; Corridor 2: 23; Corridor 3a: 23; Corridor 3B: 16; Corridor A: 36; Corridor B: 46; and Corridor C: 63. **Corridor 3b, with the least number of dwellings and other occupied buildings within 100m of the indicative routes is considered more preferred. Corridor A is also considered more preferred, while Corridor C is less preferred.**

(16) Landowner Consent

With each of the proposed route corridor options there is a significant potential for objections from landowners.

(17) Potential Impact on Public Amenities

Nearest School (within approx. 500m)

There are schools located approx. 380m and approx. 420m from the indicative route within Corridor 1, while there are schools located approx. 220m and 500m from the indicative route on Corridor 2. **There are no schools within 500m of the route in Corridors 3a and 3b. These corridors are therefore more preferred options.**

There are no schools within 500m of the indicative routes in Corridors A, B or C. The impact is therefore considered to be low for all options.

Nearest Playing Pitches (within approx. 200m)

There are no playing pitches within approx.200m of any of the indicative routes in the identified corridors. The impact is therefore considered to be low for all options.

Recreational Areas

Corridors 1, 2, 3a and 3b all have a low impact on recreational areas. In addition, there is no impact on recreational areas for both Corridors A and C. Within approx. 200m of the indicative route in Corridor B there is a Car Park and picnic area. **Corridor B is therefore considered less preferred.**

Other Public Buildings/Institutions

Dunderry House (a Shamanism Healing centre) is located proximate to the indicative routes in Corridors 2, 3a and 3b. **Corridor 1 is considered more preferred as there are no public buildings or institutions in proximity.**

There are no public buildings or other institutions in proximity to Corridors A and B. There is a Celestial/Jehova hall within some 150m of the indicative route in Corridor C. Whilst this is considered to have a low impact, **Corridor C is less preferred.**

Tourism Facilities

There are no designated tourism facilities within close proximity of the indicative route in any of the corridor options. The impact on the tourism facilities of the three counties is therefore considered to be low.

Airfields

The indicative routes in Corridors 2, 3a and 3b are located approx. 1.3km from Trim Airfield. **The indicative route in Corridor Option 1 is located approx. 300m from Summerhill Airstrip. While this a low impact it is a the less preferred corridor.** However, it has been verified that the height of the proposed OHL will not impinge on any height restriction zone specified by the Irish Aviation Authority. If required, aerial warning spheres can be installed on the upper OHL wires to improve their visibility to pilots of low flying aircraft. An OHL in these corridors will have a low potential impact.

Other Criteria Assessment

(18) Compliance with Current Planning & Development Policy and Guidelines

All of the alternative corridors are in compliance with current planning and development policy and guidelines.

(19) Project Programme & Deliverability

All identified corridors have the potential to impact on the project programme and deliverability due to possible landowner consent issues.

(20) Economic feasibility

Costs in respect of construction methodology, and the infrastructure and materials involved, will not differentiate significantly between OHL corridor options.

(21) Compliance with Best International Practice

OHL is the internationally proven and preferred method of power transmission for a project of the specific nature and extent proposed in this instance. This conclusion is supported by the findings of the Ecofys Study.

(22) Adaptability for future development

OHL generally can be upgraded and or modified easily.

CHAPTER FIVE: CONCLUSIONS

As is particularly evident from the Corridor Evaluation Matrices, all identified OHL route corridors emerged from the corridor evaluation process as having both preferred and less preferred criteria responses. This is to be expected, and confirms the benefit of such a multi-criteria evaluation.

The emerging preferred route corridors present what is considered to constitute the most appropriate balance between the various technical, environmental and community evaluation criteria, notwithstanding the fact that potential constraints are identified for all corridors. It must be noted that this comprises a strategic comparative evaluation process; any potential constraints in respect of the emerging preferred corridors will be identified and addressed in detail in the Phase Three, the Preferred Route Evaluation process. There is clearly scope that careful siting of a line route, based on site specific detailed survey and analysis, can overcome any potential concerns with a corridor that are identified in the comparative evaluation process. Whilst this logic might be applied to any line route, within any corridor, it can be reasonably considered that an acceptable line route is likely to emerge from the identified preferred route corridors.

This multi-criteria comparative corridor evaluation process identifies as the emerging preferred route corridors, **CORRIDOR A** on the Cavan (Kingscourt)-Tyrone 400 kV Interconnector Project, and **CORRIDOR 3b** on the Cavan (Kingscourt) – Meath (Woodland) 400 kV Transmission Circuit Project.

The comparative corridor evaluation process does not in any way eliminate the other route corridor options from any future evaluation, should more detailed assessment of emerging candidate Corridors A (Cavan-Tyrone) and 3b (Meath-Cavan) confirm that either of these is not appropriate or acceptable as a route for the planned strategic transmission infrastructure project. In this regard, it is clear that nothing arises from this comparative evaluation which would conclude that a particular identified OHL corridor is inherently unacceptable to the accommodation of the planned infrastructural development. It is important to note that both of the emerging preferred route corridors are indicative and subject to variations subsequent to more detailed surveys and assessments. Additional feasibility work has been undertaken on the preferred corridors, that is Corridors A (Cavan-Tyrone) and 3b (Meath-Cavan), to confirm a viable line route within each corridor.

It is prudent to refer to the parallel process occurring whereby consultants have been carrying out ongoing work on the emerging indicative line routes, identified in their technical and environmental reports. The ongoing surveys, using both vantage points and aerial photography, are testing the feasibility of the indicative line routes and the results and findings of the surveys will feed back into the ongoing route selection process. However, it must be acknowledged that the line routes are only indicative and thus clearly require more detailed technical and environmental assessment, as well as appropriate and ongoing landowner dialogue and liaison.

In conclusion, the emerging indicative line routes will comprise the basis for Phase Three – Preferred Route Evaluation - of this overall project route selection process. Overall, the entire route selection process, covering initial identification of the route Study Area, technological alternatives, corridor identification, corridor evaluation and ultimately line route identification will most likely be set out in detail within an Environmental Impact Statement (EIS) which will be prepared in respect of the proposed development.

Tyrone - Cavan Interconnector

More Preferred Neutral Less Preferred

Table 3.1 Tyrone to Cavan Corridor Evaluation Matrix

Technical Criteria		Corridor Option A	Corridor Option B	Corridor Option C
1 Safety				
1.1	Operational Safety Risk	Low All EirGrid plant will be operated in compliance with national & international safety standards	Low All EirGrid plant will be operated in compliance with national & international safety standards	Low All EirGrid plant will be operated in compliance with national & international safety standards
1.2	Construction Safety Risk	Low Construction site will be fully compliant with HSA guidelines	Low Construction site will be fully compliant with HSA guidelines	Low Construction site will be fully compliant with HSA guidelines
1.3	Risk of Disturbance by Third parties	Low Manageable through tower location &/design	Low Manageable through tower location &/design	Low Manageable through tower location &/design
2 Construction/Operation				
2.1	Road Infrastructure	Road network adequate for construction & operation of OHL	Road network adequate for construction & operation of OHL	Road network adequate for construction & operation of OHL
2.2	Availability of Construction Materials	OHL materials are normally readily available	OHL materials are normally readily available	OHL materials are normally readily available
2.3	Maintenance During Operation	Routine maintenance can occur easily and quickly	Routine maintenance can occur easily and quickly	Routine maintenance can occur easily and quickly
2.4	Ground Conditions/Stability	Lattice tower every 350 - 400m approx. Minor civil works required hence only minor disturbance	Lattice tower every 350 - 400m approx. Minor civil works required hence only minor disturbance	Lattice tower every 350 - 400m approx. Minor civil works required hence only minor disturbance
2.5	Extent of Civil Works	Tower every 350 - 400m approx. Minor civil works required hence only minor disturbance	Tower every 350 - 400m approx. Minor civil works required hence only minor disturbance	Tower every 350 - 400m approx. Minor civil works required hence only minor disturbance
2.6	Road Closures	Not required	Not required	Not required
3 Design				
3.1	Need for Temporary & Permanent Compounds	Temporary construction compounds required	Temporary construction compounds required	Temporary construction compounds required
3.2	Watercourse Crossings	6 no. Crossings. Manageable through tower location	5 no. crossings. Manageable through tower location	8 no. crossings. Manageable through tower location
3.3	Road Crossings	41 no. Crossings. Manageable through tower location	46 no. Crossings. Manageable through tower location	58 no. Crossings. Manageable through tower location
3.4	Length of Route	approx. 42km	approx. 39km	approx. 44km
4 Other Technical Considerations				
4.1	Security of Supply	OHL is the internationally proven and preferred method of power transmission.	OHL is the internationally proven and preferred method of power transmission.	OHL is the internationally proven and preferred method of power transmission.
4.2	Reliability	OHL is the internationally proven and preferred method of power transmission.	OHL is the internationally proven and preferred method of power transmission.	OHL is the internationally proven and preferred method of power transmission.
4.3	Potential for Future Linkage	Good	Good	Good
4.4	Assurance of Adequate Power Transfer (MVA) Capacity	Good	Good	Good
5 Environmental Criteria				
5 Human Beings				
5.1	Health Impacts	None It is acknowledged that the public perceive health impacts with OHL infrastructure.	None It is acknowledged that the public perceive health impacts with OHL infrastructure.	None It is acknowledged that the public perceive health impacts with OHL infrastructure.
5.2	Noise	Noise during construction	Low & Temporary Minor civil works along linear corridor	Low & Temporary Minor civil works along linear corridor
		Noise during operation	Low 60dB below centreline. Manageable through Pylon location away from settlements	Low 60dB below centreline. Manageable through Pylon location away from settlements
5.3	Potential for Negative Economic Impacts	Existing Mines	Low No mine within the proposed indicative corridor	Low No mine within the proposed indicative corridor
		Existing Quarries	Low 12 quarries within 6km of indicative route.	Low 12 quarries within 6km of indicative route.
		Existing Forestry	Medium 10 forests within 300m of indicative route	Medium 11 forests within 300m of indicative route
6 Electric and Magnetic Fields				
6.1	Impacts of Electric fields	Negligible Electric Field generated but within EU guidelines. The strength of this field decreases rapidly with growing distance from the live wires.	Negligible Electric Field generated but within EU guidelines. The strength of this field decreases rapidly with growing distance from the live wires.	Negligible Electric Field generated but within EU guidelines. The strength of this field decreases rapidly with growing distance from the live wires.
6.2	Impacts if Magnetic fields	Negligible Magnetic field generated but within EU guidelines. The strength of this field decreases rapidly with growing distance from the live wires.	Negligible Magnetic field generated but within EU guidelines. The strength of this field decreases rapidly with growing distance from the live wires.	Negligible Magnetic field generated but within EU guidelines. The strength of this field decreases rapidly with growing distance from the live wires.

7	Flora & Fauna			
7.1	Potential Impact on Livestock	negligible	negligible	negligible
7.2	Potential Impact on Bloodstock	negligible	negligible	negligible
7.3	Potential Impact on Other Fauna/Flora Including Specific Species/Birds	Whooper Swans Impact not yet concluded Potential flightline crossing. Potential roosting site close.	Impact not yet concluded Does not cross flightlines. Potential impact at 1 frequently used site which is located within the corridor	Impact not yet concluded Does not cross flightlines. 1 known & 1 potential site within this corridor.
7.4	Potential Impact on Designated/Protected Habitats	Low Tassan Lough is located 300m away from indicative route	Low Tassan Lough is located 450m away from indicative route	Medium Proximity to a relatively large cluster of hydrologically linked pHAs. Also Muckno's lake is c. 350 m from this indicative route
8	Visual Amenity & Landscape			
8.1	Potential Impact on Protected Views & Prospects	Low Avoids transecting scenic route. (SV 22 is a view from a scenic route on option A. Scenic route is 1km in length)	Medium Crosses scenic route. (SV 21 is a view from a scenic route on this option, scenic route is approximately 3km in length)	Medium Crosses scenic route. (SV 16 is a view from a scenic route on line route C. Scenic route is approximately 1.5km in length)
8.2	Potential Impact on Areas of High Scenic Value	Low No designated high scenic areas within Monaghan Development plan. 2.5km from County Cavan designation	Low No designated high scenic areas within Monaghan Development plan. 2.5km from County Cavan designation	Low No designated high scenic areas within Monaghan Development plan. 2.5km from County Cavan designation
8.3	Potential for impacts on non designated but scenic landscapes	low No cycle ways crossed. The indicative corridor does transect the Monaghan Walkway close to the border.	low No cycle ways crossed. The indicative corridor does transect the Monaghan Walkway close to the border.	low No cycle ways crossed. The indicative corridor does transect the Monaghan Walkway close to the border.
9	Archaeology, Culture & Local Heritage			
9.1	Potential Impact on Protected Structures and Their Settings	No Impact No Protected structures in proximity of the proposed indicative route	No Impact No Protected structures in proximity of the proposed indicative route	No Impact No Protected structures in proximity of the proposed indicative route
9.2	Potential Impact on Recorded Monuments & Places (RMP), National Monuments and Their Settings	Low 5 recorded archaeological sites on route.	Low 2 recorded archaeological sites on route.	Low 1 recorded archaeological site on route.
9.3	Potential for Other Cultural Heritage Constraints	Low Only minor civil works required. Flexibility to reposition if unrecorded find	Low Only minor civil works required. Flexibility to reposition if unrecorded find	Low Only minor civil works required. Flexibility to reposition if unrecorded find
10	Water			
10.1	Disruption to Groundwater	Low	low	low
10.2	Risk of Pollution of Ground and or Surface Water	Low Lattice tower every 350-400m approx. Minor civil works required hence only minor disturbance.	Low Lattice tower every 350-400m approx. Minor civil works required hence only minor disturbance.	Low Lattice tower every 350-400m approx. Minor civil works required hence only minor disturbance.
11	Air Quality			
11.1	Disturbance and or Creation of Particle Matters (PM10s)	low	low	low
12	Community Criteria			
12.1	Planning and Land Use Impact on Rural Development & Land Uses	Low Limited exclusion wayleave. Rural housing is currently constrained by rural housing policies	Low Limited exclusion wayleave. Rural housing is currently constrained by rural housing policies	Low Limited exclusion wayleave. Rural housing is currently constrained by rural housing policies
12.2	Impact on Urban Development & Land Use	Low Avoidance of urban areas	Low Avoidance of urban areas	Low Avoidance of urban areas
13	Community Severance	no impact	no impact	no impact
14	No. of Dwellings within the 1km wide Corridor	317	352	418
15	No. of Dwellings and Other Occupied Buildings within 100m of Indicative Route	36	46	63
16	Landowner Consent	Significant potential for objections	Significant potential for objections	Significant potential for objections
17	Potential Impact on Public Amenities			
17.1	Nearest School (within approx. 500m)	low Nearest school is 500m away	low Nearest school is 500m away	low Nearest school is 500m away
17.2	Nearest Playing Pitches (within approx. 200m)	low No playing pitches within 200m	low No playing pitches within 200m	low No playing pitches within 200m
17.3	Recreational Areas	low	low Car Park/Picnic area within 200m of this indicative route	low
17.4	Other Public Buildings/Institutions	low	low	Low Celestial / Johova hall within 150m of this indicative route
17.5	Tourism Facilities	low	low	low
17.6	Airfields	low No known airfields in study area	low No known airfields in study area	low No known airfields in study area
18	Other Criteria Compliance with Current Planning & Development Policy & Guidelines	In compliance	In compliance	In compliance
19	Project Programme & Deliverability	Potential impact due to land owner consent issues	Potential impact due to land owner consent issues	Potential impact due to land owner consent issues
20	Economic Feasibility	High feasibility	High feasibility	High feasibility
21	Compliance with Best International Practice	OHL are the internationally proven and preferred method of power transmission.	OHL are the internationally proven and preferred method of power transmission.	OHL are the internationally proven and preferred method of power transmission.
22	Adaptability for Future Development	OHL can be upgraded/ modified	OHL can be upgraded/ modified	OHL can be upgraded/ modified

Meath - Cavan Transmission Line

More Preferred	Neutral	Less Preferred
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Table 3.2 Meath to Cavan Corridor Evaluation Matrix

Technical Criteria		Corridor Option 1	Corridor Option 2	Corridor Option 3(a)	Corridor Option 3(b)
1 Safety					
1.1	Operational Safety risk	Low All EirGrid plant will be operated in compliance with national & international safety standards	Low All EirGrid plant will be operated in compliance with national & international safety standards	Low All EirGrid plant will be operated in compliance with national & international safety standards	Low All EirGrid plant will be operated in compliance with national & international safety standards
1.2	Construction Safety Risk	Low Construction site will be fully compliant with HSA guidelines	Low Construction site will be fully compliant with HSA guidelines	Low Construction site will be fully compliant with HSA guidelines	Low Construction site will be fully compliant with HSA guidelines
1.3	Risk of Disturbance by Third Parties	Low Manageable through tower location &/ design	Low Manageable through tower location &/ design	Low Manageable through tower location &/ design	Low Manageable through tower location &/ design
2 Construction/Operation					
2.1	Road Infrastructure	Road network adequate for construction & operation of OHL	Road network adequate for construction & operation of OHL	Road network adequate for construction & operation of OHL	Road network adequate for construction & operation of OHL
2.2	Availability of Construction Materials	OHL materials are normally readily available.	OHL materials are normally readily available.	OHL materials are normally readily available.	OHL materials are normally readily available.
2.3	Maintenance During Operation	Routine maintenance can occur easily and quickly	Routine maintenance can occur easily and quickly	Routine maintenance can occur easily and quickly	Routine maintenance can occur easily and quickly
2.4	Ground Conditions/Stability	Lattice tower every 350 - 400m approx. Minor civil works required hence only minor disturbance to ground.	Lattice tower every 350 - 400m approx. Minor civil works required hence only minor disturbance to ground.	Lattice tower every 350 - 400m approx. Minor civil works required hence only minor disturbance to ground.	Lattice tower every 350 - 400m approx. Minor civil works required hence only minor disturbance to ground.
2.5	Extent of Civil Works	Lattice tower every 350 - 400m approx. Minor civil works required hence only minor disturbance.	Lattice tower every 350 - 400m approx. Minor civil works required hence only minor disturbance.	Lattice tower every 350 - 400m approx. Minor civil works required hence only minor disturbance.	Lattice tower every 350 - 400m approx. Minor civil works required hence only minor disturbance.
2.6	Road Closures	Not required.	Not required.	Not required.	Not required.
3 Design					
3.1	Need for Temporary & Permanent Compounds	Temporary construction compounds required	Temporary construction compounds required	Temporary construction compounds required	Temporary construction compounds required
3.2	Watercourse Crossings	6 no. crossings. Manageable through lower location	7 no. crossings. Manageable through lower location	8 no. crossings. Manageable through lower location	8 no. crossings. Manageable through lower location
3.3	Road Crossings	39 no. Crossings Manageable through lower location	39 no. Crossings Manageable through lower location	35 no. Crossings Manageable through lower location	33 no. Crossings Manageable through lower location
3.4	Length of Route	63.03km	58.87km	53.56km	53.42km
4 Other Technical Considerations					
4.1	Security of Supply	OHL is the internationally proven and preferred method of power transmission..	OHL is the internationally proven and preferred method of power transmission..	OHL is the internationally proven and preferred method of power transmission..	OHL is the internationally proven and preferred method of power transmission..
4.2	Reliability	OHL are the internationally proven and preferred method of power transmission..	OHL are the internationally proven and preferred method of power transmission..	OHL are the internationally proven and preferred method of power transmission..	OHL are the internationally proven and preferred method of power transmission..
4.3	Potential for Future Linkage	Good	Good	Good	Good
4.4	Assurance of Adequate Power Transfer (MVA) Capacity	Good	Good	Good	Good
Environmental Criteria					
5 Human Beings					
5.1	Health impacts	None It is acknowledged that the public perceive health impacts with OHL infrastructure	None It is acknowledged that the public perceive health impacts with OHL infrastructure.	None It is acknowledged that the public perceive health impacts with OHL infrastructure.	None It is acknowledged that the public perceive health impacts with OHL infrastructure.
5.2	Noise	Noise during construction	Low & Temporary Minor civil works along linear corridor	Low & Temporary Minor civil works along linear corridor	Low & Temporary Minor civil works along linear corridor
		Noise during operation	Low 60dB below centreline. Manageable through Pylon location away from settlements	Low 60dB below centreline. Manageable through Pylon location away from settlements	Low 60dB below centreline. Manageable through Pylon location away from settlements
5.3	Potential for Negative Economic Impacts	Existing mines	No impact No mine within the indicative corridor	No impact No mine within the indicative corridor	low Approximately 2 km from Tara Mines
		Existing quarries	Low Roadstone Trim quarry located c.0.8km and Keegan Quarries (Trammon) located c.3km of this indicative route	Low No quarries within 1km. Roadstone trim Quarry is located 5.2km from this indicative route	Low No quarries within 1km. Tullykane Quarry 4.2km and Roadstone Trim quarry located c.5.2km of this indicative route
		Existing forestry	Low Moyrath/ Kildalkey, Causetown/ Athboy, Diralagh/ Mullagh present within 300m	Low No forests within 300m	Low Clongill located within 300m
6 Electric & Magnetic Fields					
6.1	Impact of Electric Fields	Negligible Electric Field generated but within EU guidelines. The strength of this field decreases rapidly with growing distance from the live wires.	Negligible Electric Field generated but within EU guidelines. The strength of this field decreases rapidly with growing distance from the live wires.	Negligible Electric Field generated but within EU guidelines. The strength of this field decreases rapidly with growing distance from the live wires.	Negligible Electric Field generated but within EU guidelines. The strength of this field decreases rapidly with growing distance from the live wires.
6.2	Impact of Magnetic Fields	Negligible Magnetic field generated but within EU guidelines. The strength of this field decreases rapidly with growing distance from the live wires.	Negligible Magnetic field generated but within EU guidelines. The strength of this field decreases rapidly with growing distance from the live wires.	Negligible Magnetic field generated but within EU guidelines. The strength of this field decreases rapidly with growing distance from the live wires.	Negligible Magnetic field generated but within EU guidelines. The strength of this field decreases rapidly with growing distance from the live wires.

7 Flora & Fauna					
7.1	Potential Impact on Livestock	negligible	negligible	negligible	negligible
7.2	Potential Impact on Bloodstock	negligible	negligible	negligible	negligible
7.3	Potential Impact on Other Fauna/Flora Including Specific Species/Birds	Whooper Swans Minor Does not cross any flightlines. Also there are no sites on this corridor option where significant numbers of Whooper Swans regularly spend the entire winter.	Potential Impact A flightline was noted crossing this option. The area appears to be an important foraging area for a number of Whooper Swans that can exceed nationally important levels.	Potential Impact Crosses 1 flightline. Potential impact on wintering due to proximity of Tara Mines tailing ponds roasting site & regular flightlines along Blackwater Valley & probable importance of Whitewood Lough & Cruicetown area to Whooper Swans	Potential Impact Crosses 2 flightlines. Potential impact on wintering due to proximity of Tara Mines tailing ponds roasting site & regular flightlines along Blackwater Valley & probable importance of Whitewood Lough & Cruicetown area to Whooper Swans
7.4	Potential Impact on Designated/Protected Habitats	Low Crosses the River Boyne (cSAC) & Blackwater (cSAC) at three separate locations. Lies within 5 km of 2 other NHAs & 1 cSAC	Low Crosses river Boyne (cSAC) and river Blackwater (cSAC) at two separate locations. Lies within 3km of other NHAs & 1 cSAC.	Low Crosses river Boyne (cSAC) and river Blackwater (cSAC) at two separate locations. Lies within 2km of two NHAs.	Low Crosses river Boyne (cSAC) and river Blackwater (cSAC) at two separate locations. Lies within 2km of two NHAs.
8 Visual Amenity & Landscape					
8.1	Potential Impact on Protected Views & Prospects	Medium 2.3km of line crossing medium sensitive viewsheds. Traverses an area of high sensitivity to power lines for 25.8km	Medium 6.2km of line crossing medium sensitive viewsheds. Traverses an area of high sensitivity to power lines for 21km	No Impact Avoids sensitive view. Traverses an area of high sensitivity to power lines for 20.5km	No Impact Avoids sensitive view. Traverses an area of high sensitivity to power lines for 20.6km
8.2	Potential Impact on Areas of High Scenic Value	No Impact Does not transect areas of high scenic value.	No Impact Does not transect areas of high scenic value.	No Impact Does not transect areas of high scenic value.	No Impact Does not transect areas of high scenic value.
8.3	Potential Impact on Non Designated but Scenic Landscapes	Low 3 no crossings of existing driving routes, waymarked paths and cycle route	Low 4 no crossings of existing driving routes, waymarked paths and cycle route	Low 4 no crossings of existing driving routes and cycle route	Low 4 no crossings of existing driving routes, waymarked paths and cycle route
9 Archaeology, Culture & Local Heritage					
9.1	Potential Impact on Protected Structures and Their Settings	Low 6 protected structures located within 250m	Low 6 protected structures located within 250	Low 9 protected structures located within 250	Low 9 protected structures located within 250
9.2	Potential Impact on Recorded Monuments & Places (RMP) and National Monuments and Their Settings	Low 19 RMPs within 250m	Low 23 RMPs within 250m	Low 18 RMPs within 250m	Low 17 RMPs within 250m
9.3	Potential for Other Cultural Heritage Constraints	Low Minor civil works required. Flexibility to reposition if unrecorded find located	Low Minor civil works required. Flexibility to reposition if unrecorded find located	Low Minor civil works required. Flexibility to reposition if unrecorded find located	Low Minor civil works required. Flexibility to reposition if unrecorded find located
10 Water					
10.1	Disruption to Groundwater	low	low	low	low
10.3	Risk of Pollution of Ground and or Surface Water	Low Lattice Tower every 350-400m approx. Minor civil works required hence only minor disturbance.	Low Lattice Tower every 350-400m approx. Minor civil works required hence only minor disturbance.	Low Lattice Tower every 350-400m approx. Minor civil works required hence only minor disturbance.	Low Lattice Tower every 350-400m approx. Minor civil works required hence only minor disturbance.
11 Air Quality					
11.1	Disturbance and or Creation of Particle matters (PM10s)	low	low	low	low
Community Criteria					
12 Planning and Land use					
12.1	Impact on Rural Development and Land Uses	Low Limited exclusion wayleave. Rural housing is currently constrained by rural housing policies	Low Limited exclusion wayleave. Rural housing is currently constrained by rural housing policies	Low Limited exclusion wayleave. Rural housing is currently constrained by rural housing policies	Low Limited exclusion wayleave. Rural housing is currently constrained by rural housing policies
12.2	Impact on Urban Development and Land Uses	Low Avoidance of urban areas	Low Avoidance of urban areas	Low Avoidance of urban areas	Low Avoidance of urban areas
13	Community Severance	no impact	no impact	no impact	no impact
14	No. of Dwellings within the 1km wide Corridor	569	533	640	611
15	No. of Dwellings and Other Occupied Buildings within 100m of Indicative Rout	24	23	23	16
16	Landowner Consent	Significant potential for objections	Significant potential for objections	Significant potential for objections	Significant potential for objections
17 Potential Impact on Public Amenities					
17.1	Nearest School (within 500m)	Low Schools located at c.380m & c.420m from indicative route	Low Schools located at c.220m & c.500m from indicative route	Low No schools within 500m	Low No schools within 500m
17.2	Nearest Playing Pitches (within 200m)	Low Impact No playing pitches within 200m	Low Impact No playing pitches within 200m	Low Impact No playing pitches within 200m	Low Impact No playing pitches within 200m
17.3	Recreational Areas	low	low	low	low
17.4	Other Public Buildings/Institutions	Low No other public building/institutions proximate to indicative route	Low Dunderry House - Shamanism Healing is located proximate to route	Low Dunderry House - Shamanism Healing is located proximate to route	Low Dunderry House - Shamanism Healing is located proximate to route
17.5	Tourism Facilities	Low No impact on the main tourism facilities of the area (i.e. Trim Castle, Bective Abbey & Hill of Tara)	Low No impact on the main tourism facilities of the area (i.e. Trim Castle, Bective Abbey & Hill of Tara)	Low No impact on the main tourism facilities of the area (i.e. Trim Castle, Bective Abbey & Hill of Tara)	Low No impact on the main tourism facilities of the area (i.e. Trim Castle, Bective Abbey & Hill of Tara)
17.6	Airfields	Low Summerhill Airstrip 300m from indicative route	low Trim Airfield located approximately 1.3km from indicative route	low Trim Airfield located approximately 1.3km from indicative route	low Trim Airfield located approximately 1.3km from indicative route
Other Criteria					
18	Compliance with Current Planning & Development Policy & Guideline:	In compliance	In compliance	In compliance	In compliance
19	Project Programme & Deliverability	Potential impact due to land owner consent issues	Potential impact due to land owner consent issues	Potential impact due to land owner consent issues	Potential impact due to land owner consent issues
20	Economic Feasibility	High feasibility	High feasibility	High feasibility	High feasibility
21	Compliance with Best International Practice	OHL are the internationally proven and preferred method of power transmission. OHL can be upgraded/ modified	OHL are the internationally proven and preferred method of power transmission. OHL can be upgraded/ modified	OHL are the internationally proven and preferred method of power transmission. OHL can be upgraded/ modified	OHL are the internationally proven and preferred method of power transmission. OHL can be upgraded/ modified
22	Adaptability for Future Development	OHL can be upgraded/ modified	OHL can be upgraded/ modified	OHL can be upgraded/ modified	OHL can be upgraded/ modified