

CAVAN - TYRONE 400kV POWERLINE - New North-South Interconnector MEATH - CAVAN 400kV POWERLINE

NEED FOR THE PROJECT & COST

What's happening?

EirGrid is planning two projects to facilitate cross-Border sharing of electricity, promote better competition and to ensure a future secure supply of electricity throughout the North East.

The two projects are:

- The Cavan-Tyrone 400kV Power Line - the new North-South Interconnector, approximately 80km in length.
- The Woodland (Co Meath) to Kingscourt (Co Cavan) 400kV Power Line, approximately 58km in length.

Why are these new Power lines needed?

- To increase the security and reliability of electricity supply to all households, businesses and other customers throughout the island of Ireland. To support growth and boost existing industry in the region and ensure continuing reliability of supply.
- To facilitate the use of even more renewable energy such as from wind farms, wave, tidal and biomass, to connect to the electricity network. The Irish government has set out an ambitious target of 33% renewable generation by 2020.
- The North-South Interconnector (Cavan-Tyrone 400kV line) will allow the new all-island wholesale electricity market to work efficiently. This will allow for increased competition in electricity supply thereby offering consumers choice and competitive prices.
- The Meath-Cavan 400kV Power Line is necessary to strengthen the existing power supply in the North East due to recent increased development in the region, and to ensure there is enough capacity to transmit bulk supplies of power in order to meet energy demand in the coming years. Demand is growing on average 4% per year so if nothing is done in the next number of years there will not be enough high voltage infrastructure to bring power to these areas.

NEED FOR THE PROJECT & COST (Continued)

How much will these projects cost?

- 1) The Cavan-Tyrone Interconnector will cost approximately €180 million.
- 2) The Meath-Cavan Power Line will cost approximately €100 million.

These approximate figures are initial estimates for the total project.

Who pays for the project?

- 1) The European Union Trans-European Network for Energy has funded 50% of the stage 1 phase (i.e. to Planning) for both the Meath-Cavan Power Line and the Cavan-Tyrone Interconnector.
- 2) The remainder of the cost of the stage 1 phase for the Meath-Cavan Power Line will be funded by EirGrid and is ultimately funded by the electricity consumer.
- 3) The remainder of the cost of the stage 1 phase for the Cavan-Tyrone Interconnector will be funded jointly by EirGrid and Northern Ireland Electricity and is ultimately funded by the electricity consumer in both jurisdictions.

ESB is the Transmission Asset Owner (TAO), while EirGrid is responsible for the development of the transmission

system. These activities are funded ultimately by all electricity customers through transmission use of system charges to generators and suppliers. The amount that EirGrid and ESB (TAO) can recover is regulated by the Commission for Energy Regulation (CER) through five yearly price controls that determine appropriate levels of capital and operating expenditure.

What is EirGrid's role?

EirGrid plc, a state owned company, is the independent electricity Transmission System Operator in Ireland and the Market Operator in the wholesale electricity trading system.

- EirGrid's role is to deliver quality connection, transmission and market services to those who generate electricity, suppliers and customers utilising the high voltage electricity system, and to put in place the grid infrastructure required to support the development of Ireland's economy.
- EirGrid develops, maintains and operates a safe, secure, reliable, economic and efficient system to transmit electricity.
- EirGrid is playing a key role in establishing the new All-Island Market for Electricity, as well as developing a second North-South Interconnector.

ROUTE CORRIDOR OPTIONS

How were route corridors decided upon?

Seven key criteria were taken into account when choosing possible route corridors for the power lines:

- *Visual Impact:* An assessment of the visual impact of the proposal on the environment was carried out in order to minimise the impact
- *Community:* an assessment of the local villages and communities was undertaken to reduce the proximity of the power lines to them to ensure minimal impact

on the lifestyles of those living and working in nearby communities

- *Ecology:* A review of conservation designated areas, including Special Areas of Conservation (SACs), Special Protection Areas (SPAs), and Natural Heritage Areas (NHAs) was completed
- *Cultural Heritage:* Architectural and archaeological heritage sites, including recorded archaeological monuments and places, protected structures, and national monuments, were assessed in order to minimise any impact

ROUTE CORRIDOR OPTIONS (Continued)

- *Landscape:* A review of County Development Plans was undertaken in order to assess the numbers of scenic views, scenic routes, and vulnerable landscapes in the area
- *Geology:* Soil, subsoil, and bedrock were used to determine significant types and their benefits and drawbacks
- *Water:* The surface water features were reviewed, as lakes are to be avoided and river crossings minimised

What is the preferred route?

All of the route corridors that have been prepared are possibilities. EirGrid will announce the preferred routes early in 2008 and the public will have further opportunities to consider and comment on them.

What is the length of the Meath-Cavan 400kV Powerline?

The route from Kingscourt to Woodland is approximately 58km; the line connects an existing substation at Woodland to a proposed new substation at Kingscourt.

What will happen at the new substation in Kingscourt?

The main purpose of a substation is to connect together various transmission lines. This includes converting (transforming) voltage from the powerlines into a lower voltage that ultimately is supplied, via other substations, to customers' homes, businesses, etc.

What is the length of the North-South Interconnector?

The route length from Kingscourt to the Border crossing point near Clontibret, Co. Monaghan, is approximately 45km in the Republic of Ireland.

Where will the substation be located?

A substation will be located near Kingscourt, Co. Cavan close to the existing Flagford-Louth 220kV line. EirGrid is presently trying to acquire a site in this area. The station size will be approximately 240m x 220m (approximately 13 acres) in size and additional lands will be used for access and landscaping purposes.

What impact will these projects have on the environment?

An Environmental Impact Assessment will be undertaken by EirGrid and this is an essential requirement of planning law and must accompany the application for planning permission.

There will be some impact on the environment but EirGrid will keep this to a minimum through a careful route selection process which takes into account all of the environmental and technical constraints.

HIGH VOLTAGE TRANSMISSION LINES

What is the function of the overhead powerlines?

The power lines carry electricity from the generators (such as Moneypoint, Poolbeg, Huntstown, wind farms etc.) into a substation where the electricity is transformed into a lower voltage that ultimately is supplied to customers' homes, businesses, etc. The power lines are supported by pylons.

How were route corridors decided upon?

- The high voltage transmission system in Ireland is composed of 110kV, 220kV and 400kV lines, cables and substations.
- There are approximately 6,000km of high voltage lines in Ireland at present.
- It is proposed that the new transmission lines for these projects in the North East will be operated at a voltage of 400kV.
- There are currently 439km of 400kV lines in Ireland, running from Moneypoint in Co. Clare to Woodland in Co Meath and Dunstown in Co. Kildare.
- There are four existing 400kV substations - Moneypoint, Oldstreet, Dunstown and Woodland.

Why use 400kV transmission lines?

These projects will link into the existing 400kV system. Demand for electricity is growing at 4% per annum and so significant additional electricity transmission capacity is needed to meet this demand. Given the required volume of power transfer required, a 400kV line was chosen because it:

- Can carry large quantities of power and so is more efficient than lower voltage lines
- Has strategic benefits and the ability to best meet technical and economic criteria
- Provides additional capacity that can be exploited at a later date by other users, thus avoiding the need for further expansion in future planning horizons

- Shows potential developers and industrialists that there is room for generator capacity in this area, which will enable and encourage further local development
- Will maximise power transfer in the Dublin to Louth corridor and therefore fully leverage interconnection with Northern Ireland, increasing the amount of power that can be accessed by either system operator on both sides of the border
- Opens up the network to competition, allowing producers in Northern Ireland and the UK to access to the Irish electricity supply market

Where will the power come from?

The power ultimately comes from the generators i.e. the power generation stations and renewable energy sources such as wind, wave, biomass, etc. Generators are located throughout the island of Ireland such as in Poolbeg and Moneypoint.

Will powerlines and pylons be built over my house?

No, power lines will not be built over houses. The pylons will be kept as far as possible from houses for amenity reasons i.e

- Visual Impact
- Community
- Ecology
- Cultural Heritage
- Landscape
- Geology
- Water.

What are the standards for pylon/line distances from towns, villages, schools, etc?

One of the main constraints in route selection of overhead lines is avoiding existing residential developments such as houses, schools and hospitals, especially in light of extensive recent development. EirGrid aims to build the powerlines a minimum distance of 50 to 60 metres from existing dwellings to the centre of the line. In the vast majority of cases a much greater distance than 50-60 metres is achieved.

HIGH VOLTAGE TRANSMISSION LINES (Continued)

What type of support structures are being used to carry the power lines?

EirGrid is looking at using a variety of new steel lattice pylons with a view of choosing one which has a low visual impact on the environment. They will range from 28-43 metres high.

What size is a pylon?

The pylons have a foot print (ground area) of about 10m x 10m up to 16m x 16m and range from 28 - 43 metres high.

How far apart are the pylons spaced?

The maximum distance between 400kV pylons is 500 metres. On average 400kV lines are spaced an average of 350 metres from each other.

What is the clearance above ground of the lines?

- Generally speaking the clearance (smallest distance) between the line and the ground is more than 11 metres.
- In the very worst case the clearance between the line and the ground is no more than 9 metres, and no more than 10 metres over major roads/railways, based on the maximum line operating temperature of 80 degrees Celsius coinciding with the least favourable weather case.

Is there any noise from the lines?

There will be some noise from the line; however for the most part the noise will be below the existing level of background noise even in houses near the line. Projected noise levels will be included in the Environmental Impact Statement (EIS) being prepared for the planning application.

OVERHEAD V UNDERGROUND

Why not build underground lines for these projects?

Undergrounding all or part of a Transmission Network presents problems for the secure and reliable operation of that network. The location and repair of faults on underground cables can take a number of weeks, depending on the type of fault and its location. For such an integral part of the transmission system, such a compromise to the security of supply would be unacceptable.

Industries are attracted to a region for many reasons, one of them being a dependable supply of electricity. New industries locating in Ireland discuss with EirGrid the terms, conditions, security of supply and the quality of the power being delivered. A Transmission System based

on circuits of underground cable would not provide the continuity or quality of supply necessary to attract the high quality type of industry being sought by the local development agencies such as the IDA.

Are there any underground lines in Ireland?

In line with utilities worldwide, Ireland's transmission system is predominantly based on overhead lines. At present, the transmission system in Ireland is an AC (alternating current) system and comprises about 6,000km of overhead line and 100km of underground cable (of short individual lengths).

OVERHEAD V UNDERGROUND (Continued)

Why are the majority of powerlines in Ireland overhead?

There are a number of reasons why the transmission system is predominantly based on overhead lines. These include:

- An overhead line has several advantages compared with an underground cable, as an overhead line is faster and easier to maintain and repair plus it is not subject to damage from digging activities.
- Underground cable circuits are also more vulnerable to outside construction activities such as local building/road works and farming activities, which can result in excavation damage.
- An underground cable fault can take significantly longer to repair. Firstly, if the fault is not caused by a third party - or the third party has left the scene - the location of the fault has to be identified. An underground cable fault can therefore take weeks to repair as it can be difficult to locate the position of the fault and the repair process itself is slow. Such a situation could not be tolerated on major high voltage systems.
- If cables are laid under agricultural land or cross-country, the trench for the cables has an environmental and agricultural impact. Farming activities would be impeded and habitats across which the cable was laid would be disrupted. It would also be necessary to maintain permanent year round access for the heavy machinery needed to facilitate emergency fault repair. Even so access would be difficult when cables are under waterlogged fields in wintertime and this would further increase the repair time.
- There are two methods of connecting an overhead line section to an underground AC (alternating current) cable section - interface compounds or direct mounting on special interface towers.

Interface compounds would consist of large fenced compounds, with a ground-mounted electrical plant, such as cable sealing ends, surge arresters, high-frequency line traps and communications coupling equipment. Large portal structures would also be

required to take the connections from the overhead line end masts. These compounds would be far more visually intrusive than an overhead line mast.

- In certain cases it is possible to mount all of the cable interface hardware as described above on the overhead line pylon itself. Nonetheless, this still leads to a greater visual impact than the normal overhead line structures.
- If underground cables are laid along existing roadways instead of cross-country, traffic delays can occur due to construction during the trenching process and afterwards if repairs are required. After installation, high voltage underground cables cannot be disturbed and this could make it more difficult for road widening or other works.
- Underground high voltage AC (alternating current) cables are typically many times more expensive than the equivalent overhead line and electrically they present many technical difficulties. Maintenance costs are higher for an underground cable than an overhead line. Large amounts of AC underground cable would require reactive compensation to be installed to prevent excessive system voltages.

What are the implications for the system of using underground cables?

Industrial and domestic customers require that the transmission system operates to very high levels of availability. One of the ways that EirGrid achieves this on our overhead line networks is by High Speed Auto Reclosing.

What is High Speed Auto Re-closing?

- In case of overhead lines, the majority of faults (over 90%) are of a transient nature usually caused by lightning. In the event of a lightning strike, protection schemes at both ends of the line detect the fault and open the switches (breakers) to clear the fault. The breakers are then re-closed and the circuit switched back into service. All of this takes place in less than half a second and is called High Speed Auto Re-closing.

OVERHEAD V UNDERGROUND (Continued)

- If the fault remains when the circuit is re-closed then the switches open again and stay open until the line is patrolled and the cause of the fault is identified and repaired.
- With underground cables all faults are permanent and the majority of faults are caused by third party activity usually somebody digging into the cable.
- Therefore when a fault is detected on an underground cable, the breakers open the circuit as in the case of overhead lines but do not re-close i.e. no attempt is made to return the cable to service. This is to prevent further damage and for safety reasons - EirGrid do not want to apply full voltage to somebody who may be in contact with the cable.
- Therefore in the case of any underground cable fault, EirGrid switch out the circuit and do not switch it back again until the circuit has been patrolled, the cause of the fault identified and repairs carried out.

In Dublin there are a number of 220kV underground transmission cables connecting the generation stations on the Poolbeg peninsula to the rest of the system. Reclosing as described above is not allowed on these circuits and if a fault does occur the circuit stays out of service until the fault has been found and repaired. Repairs to underground transmission system cables are highly specialised work and it is not uncommon for faulted circuits to be unavailable for several weeks. Similar situations apply in Cork.

When and why are underground cables installed?

EirGrid uses underground cables where there is no other option e.g. in built-up areas or where it is the only practical option, for example on the proposed East-West (Ireland-Wales) undersea connection.

Under certain conditions EirGrid permit short underground cable sections at the end of an overhead transmission line, such as when one end of the underground cable must terminate in a transmission station. While this does have an impact on the circuit availability, the impact is limited because if the underground cable is at one end and a fault occurs on the circuit (the connection between transmission substations), modern protection equipment can be

programmed to discriminate whether the fault is on the line or on the underground cable section. For a fault on the overhead line section reclosing is permitted while if it is on the underground cable section reclosing is blocked.

Is there an EU Directive banning overhead lines of this nature due for introduction in 2008?

No plans for any EU Directive banning overhead line construction have been announced or proposed by the European Commission. The reason why an overhead line is proposed here is because it will deliver the most reliable and economic method of transporting power for electricity customers. Overhead lines are the method used for 97 per cent of on-shore high voltage electricity transmission lines in Europe.

What is the Ireland-Wales East-West project?

It is a link between two separate power systems, from Ireland to Wales under the Irish Sea using DC (direct current) technology. This will involve very expensive pieces of infrastructure, called converter stations, at both ends as well as the use of submarine cables.

Why is EirGrid planning AC Overhead lines for the North East projects?

The proposed Meath-Cavan and Cavan-Tyrone 400kV projects will be integral to the All Ireland transmission system. Overhead line AC technology is used everywhere in the world. AC underground is not technically feasible for the length of 400kV line proposed for these projects and would cost many times more.

Direct Current technology would not be appropriate for these projects because it doesn't fulfil the function required; DC technology is not suitable for future system development and is expensive.

Given that the costs of completing these projects is ultimately borne by the consumers, EirGrid is responsible for ensuring that these projects are implemented in the most technical, economical, and reliable means possible taking into account the criteria mentioned detailed elsewhere in this document (see Route Corridors Options section).

HEALTH & EMF

What is EirGrid's position on health and power lines?

A debate about the possible effect on human and animal health of electric and magnetic fields (EMF) has continued since the 1970s. Since then, many thousands of studies have been undertaken all over the world to assess any potentially harmful effects from power lines, electrical appliances and domestic wiring.

EirGrid is satisfied from the totality of studies and the views of international authoritative agencies that the balance of evidence is that extremely low frequency (ELF) electromagnetic fields (EMF) do not have any adverse effect on health. The Irish network is in full compliance with the most up-to-date international and EU guidelines and recommendations relating to public and staff EMF exposure. The proposed new lines will also be in full compliance.

What independent research has been carried out about EMF?

- Extensive worldwide research (at a cost of over €440m) has found no conclusive evidence to date proving that electric and magnetic fields from power lines [i.e. extremely low frequency (ELF) EMF] are harmful.
- A study carried out by the World Health Organisation (WHO) EMF Task Group concluded in 2007 that there are no substantive health issues related to Extremely Low Frequency (ELF) Electro Magnetic Fields (EMFs) at levels generally encountered by members of the public.
- The Irish Department of Communications reported independently on this issue and its conclusions were consistent with the above independent bodies.

Are the guidelines used by WHO ten years old and therefore out of date?

The guidelines by WHO are reviewed regularly by that organisation's International Committee on Non-Ionising Radiation and no change has been made to the guidelines. See www.who.int for further information. All Irish power lines comply with the WHO levels and, in fact,

the levels of EMF from power lines in Ireland are far lower than those levels from appliances commonly used in homes throughout the country.

The Draper Report is being quoted as conclusive proof that electromagnetic fields cause serious health risk. Is this true?

International research reviewed by the World Health Organisation, EU and Irish Government has shown that the levels of EMF which anyone in Ireland could be exposed to are safe. The researchers who produced the Draper Study in England and Wales stated that their results indicating a higher risk of childhood leukaemia were not supported by convincing laboratory data or any accepted biological mechanisms. No change in international EMF limits has been implemented as a result of the Draper Report.

What is EirGrid doing about EMF?

EirGrid recognises that some individuals are genuinely concerned about issues regarding EMF and health and we are committed to addressing these concerns by continuing to:

- Design and operate the transmission system in accordance with the most up-to-date recommendations and guidelines of the various expert and independent international bodies.
- Closely monitor engineering and scientific research in this area.
- Provide advice and information to staff and the general public on this issue.

Where can I find out more about EMF?

For more information you can download our brochure 'Information on Electric and Magnetic Fields' from www.eirgrid.com.

THE PLANNING PROCESS

Who will EirGrid apply to for planning permission for these projects?

Applications for planning approval for both projects with accompanying Environmental Impact Statements will be made directly to An Bord Pleanála in 2008, under the Strategic Infrastructure Act 2006.

Everybody, including state and semi-state bodies, seeking permission for strategic infrastructure projects of national importance must first apply to the Strategic Infrastructure Division of An Bord Pleanála for a decision on whether the particular project is of strategic importance. EirGrid has already held pre-application consultations with the Strategic Infrastructure Division of An Bord Pleanála in respect of these projects and they have confirmed that they are of strategic importance and fall under the remit of the Strategic Infrastructure Act. Therefore EirGrid will apply to An Bord Pleanála for this approval.

Will the public be consulted before a planning application is made?

The public, the local authorities and interested stakeholders are being consulted and their views will be taken into account in respect of the application that is submitted.

A preferred route for each project will be chosen in early 2008. Public consultation will continue on these projects until planning applications are made later in 2008 to the independent planning authorities who will in turn examine all issues.

Has EirGrid already applied for planning permission to build these overhead lines?

We will not be applying for planning permission until later in 2008, so all concerned people will have information to enable them to make submissions or objections as a part of the independent planning permission process.

Can the public make submissions to the planning authorities?

Members of the public have seven weeks to make submissions to the planning authority from the date of the application. More information on the planning process is available on www.pleanala.ie or at www.eirgrid.com.

What is the Strategic Infrastructure Act?

The Strategic Infrastructure Act 2006 amended the Planning and Development Act 2000 to provide for the introduction of a 'strategic consent process' for strategic infrastructure of national importance provided by statutory bodies and private promoters. The Act provides a service for all stakeholders, infrastructure providers, state bodies and general public through:

- a single stage process of approval of projects
- a rigorous assessment of all projects including their environmental input
- full public consultation

The application must be made by way of the full completion of the application form to An Bord Pleanála. The sequencing of the application process and the content of the public notice as set out at section 182A of the Planning and Development Act 2000 and article 214 of the Planning and Development Regulations, 2006.

Will the public be able to make submissions to An Bord Pleanála?

- An Bord Pleanála requires as a minimum that the public notice of the application would be in two newspapers circulating in the area to which the proposed development relates.
- The documentation relating to the application is to be available for public inspection at the offices of the relevant public authority, the offices of An Bord Pleanála and the offices of the applicant.

THE PLANNING PROCESS (Continued)

- An Bord Pleanála also requires the prospective applicant (EirGrid) to provide a stand alone website containing all of the application documentation. The documentation on the website should be in a read only format whereby members of the public can download/view information in relation to the application.
- The time period for making submissions by the public is to be at least seven weeks from the date the documents become available for inspection. An Bord Pleanála requires that the public notice must indicate the time and date deadline for making submissions to them

Where can I find out more information about the planning process?

More information on the planning process is available on www.pleanala.ie

What permission does EirGrid need to enter land?

As agreed for transmission system reinforcements, ESB carries out the construction works in accordance with the planning approval obtained by EirGrid. ESB's entry onto lands is covered by the Irish Electricity Supply Acts (1927 and subsequent amendments). These acts contain a legal right for ESB to enter onto lands to erect overhead lines subject to a requirement to inform the landowner in advance of construction by a statutory wayleave notice giving ESB's intention to erect an overhead line across their lands. The right of landowners for compensation and access to the Property Arbitration Court was confirmed in the 1985 amendment.

What process will be followed if the proposed route goes through my land?

- In practice, landowners are made aware of the proposed line during the consultative/planning process and the survey/design stage.
- Wayleave notices and a six inch map of the area showing structure locations are formally issued to landowners following receipt of a final grant of planning approval for the overhead line project.
- The wayleave notice must be served on every landowner and on every occupier of land crossed by the proposed line, even if there is no structure on their land.

What compensation will I receive?

Compensation is paid to landowners on whose property the overhead line is erected. This is done in accordance with long established agreements with the Irish Farmers Association.

All agreements with landowners are negotiated individually since the effect of the transmission line on each landowners' property will vary from landowner to landowner. EirGrid will endeavour to complete negotiations with each landowner prior to construction.

PUBLIC CONSULTATION PROCESS

EirGrid would not be making an overhead line proposal for these projects if it was not convinced that this method was the best way to ensure supplies of safe, reliable, secure and economic power for many years ahead in the North East. The proposal is subject to public consultation and the final decision on the project will be made - not by EirGrid - but by independent planning authorities who will examine all issues.

There are many ways for any interested individual or group to raise their concerns and EirGrid is committed to ensuring that all members of the public are fully aware of the project. We encourage everyone to participate in public consultation. There are a number of methods available:

Website

Up-to-date information on both projects is available on EirGrid's website, www.eirgrid.com. This site will be updated regularly to keep everyone informed of the progress of the project.

Email & Phone

Dedicated email addresses (meathcavanpower@eirgrid.com and cavantyroneinterconnector@eirgrid.com) and a phone line (1890.25.26.90) have been set up to deal with any queries or issues people may have.

Feedback Form

Fill out the feedback form (available at the Open Days or at www.eirgrid.com) and return it, highlighting your queries / concerns.

Meetings

If you would like to talk directly to the project team regarding either project, we would be happy to arrange such a meeting. Please use any of the above communication methods to make such an appointment.

Elected Members Meetings

EirGrid has made a series of presentations with the elected members of Meath, Cavan, and Monaghan. This was an opportunity for the local representatives to be made fully aware of the project, after which they were able to advise their local stakeholders on the benefits and drawbacks of the projects.

We are keeping in regular contact with Elected Members are providing briefings and information/materials to them as required.

Planning Process

A preferred route for each project will be chosen in early 2008. Public consultation will continue on these projects until planning applications are made later in 2008 to the independent planning authorities who will in turn examine all issues. Subject to planning permission, construction would not take place until 2009. Members of the public have seven weeks to make submissions to the planning authority from the date of the application. More information of the planning process is available on page 9 of this leaflet or visit www.pleanala.ie

