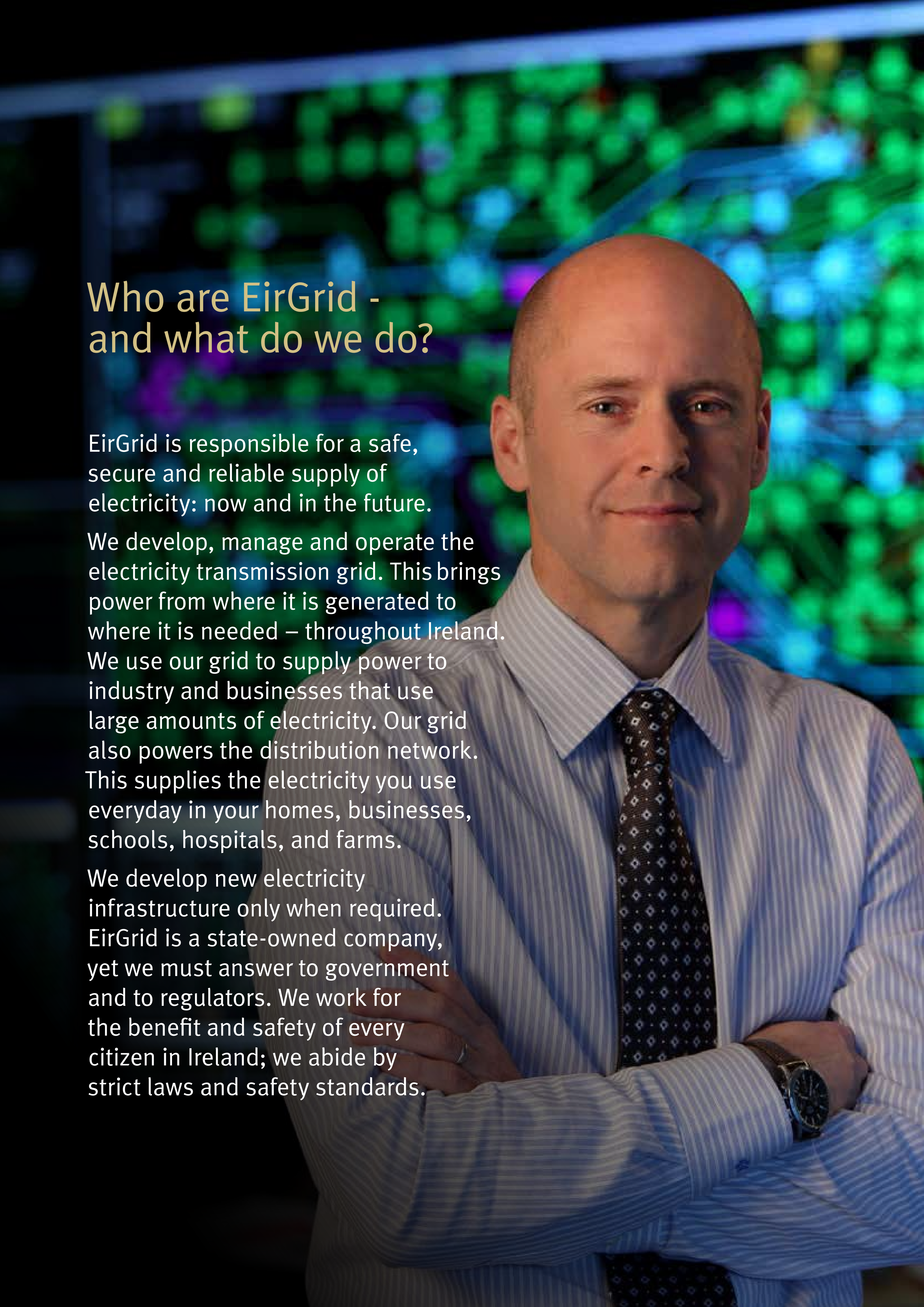
North South Interconnector

Answering Your Questions

EIRGRID

The current. The future.



Who are EirGrid - and what do we do?

EirGrid is responsible for a safe, secure and reliable supply of electricity: now and in the future.

We develop, manage and operate the electricity transmission grid. This brings power from where it is generated to where it is needed – throughout Ireland. We use our grid to supply power to industry and businesses that use large amounts of electricity. Our grid also powers the distribution network. This supplies the electricity you use everyday in your homes, businesses, schools, hospitals, and farms.

We develop new electricity infrastructure only when required. EirGrid is a state-owned company, yet we must answer to government and to regulators. We work for the benefit and safety of every citizen in Ireland; we abide by strict laws and safety standards.

The North South Interconnector

We have now sought planning approval for a new 400 kV overhead line to connect the electricity grids in Northern Ireland and the Republic. The proposed line will run through counties Monaghan, Cavan and Meath in the Republic, and Armagh and Tyrone in Northern Ireland.

This is a significant project for EirGrid, and for everybody on the island of Ireland. If approved, it will improve the reliability and security of your electricity supply.

In our consultation about this project in the Republic of Ireland, we have heard your concerns. They can be grouped into six main topics, which we've summarised in the questions shown on this page.

Our goal is to address every genuine issue from members of the public, particularly in the project area. We're using this publication to answer these six questions, and to explain the basic facts about this project.

Please note that this is not a technical or legal document, and it does not form a part of our planning application. Equally, it does not replace our planning application or Environmental Impact Statement. If you want more detail on the topics we're discussing or to find sources for the information we use, please refer to those documents. You can also contact our project team with your questions.

By working together, we can create a stronger electricity grid - with the least possible inconvenience for you.

Why do we need the North South Interconnector?

For a secure supply of electricity – now and in the future.

The electricity transmission system that EirGrid operates needs to be strong, yet flexible. It is not simply a set of lines or cables that move power from one point to another. It is a mesh or web of interdependent connections that send bulk supply of electricity around the country.

Power usage varies enormously – by user, and over time. A small number of industrial and high tech users need a direct connection to our high-voltage network as they use large amounts of power.

We supply other electricity users though the lower-voltage distribution network. But even on this network, some connections will need more power than others – such as hospitals, factories, or offices.

The demand for power on both networks changes constantly due to the time of day, the seasons, and the weather. We also adjust power from generators in response to their capacity, their location, and where and when electricity is needed most.

Finally, the grid must also be robust enough to cope with unforeseen events. This could include a line being unavailable due to a fault, or for unplanned maintenance.

Our goal is that all customers can be certain of a secure, reliable and economic supply of power at any time. To achieve this, we need a transmission grid that offers a choice of network paths. We then use this network to flow continuously varying amounts of power, along a choice of routes.

We choose the best route based on many factors. The most important are where electricity is generated and where it is needed. But we also must consider the cost of the power, the type of power, and the load that the lines between those two points can carry.

Making these choices is a task that EirGrid must carry out 24 hours a day, 365 days a year.

What is the specific problem that we need to fix?

The transmission network is considerably restricted where electricity transmission lines cross the border.

Due to a lack of connections between the two jurisdictions, we must limit power flows across the border to prevent stress on the power grid.

This creates inefficiencies that lead to extra costs for all electricity users.

The two jurisdictions have just three transmission connections. Only one of these has significant capacity.

- Louth – Tandragee 275 kV double line
- Corraclassy – Enniskillen 110 kV line
- Letterkenny – Strabane 110 kV line.

The Louth – Tandragee 275 kV line is the primary means for power to flow between Ireland and Northern Ireland today. As this is a double circuit line, there are two separate sets of overhead lines carried by the same pylons.

This means that we could lose the entire connection in a single event, such as weather damage.

The two other connections are 110 kV lines from Corraclassy to Enniskillen and from Letterkenny to Strabane. They only provide local support to the network. Because of this, they don't have sufficient capacity to carry the surplus power.

This means that there is no fall-back in place should the Louth – Tandragee line go down. If we lose this connection, safety protocols mean that we must remove the other two cross-border lines from service. Otherwise they would become immediately overloaded.

Such an event will leave no live transmission connections between Ireland and Northern Ireland.

This is called "system separation", and it could have severe consequences. Any such unplanned imbalance between generation and demand would make the transmission system unstable.

This could lead to a cascading loss of electricity until a system blackout occurs across the region, on either or both sides of the border.

To minimise this risk, EirGrid must restrict the quantity and direction of power flows on the Louth – Tandragee line. This minimises the impact on the grid if this line went down unexpectedly.

However, it also creates a limit on power flows. This adds cost to everyone who uses electricity – throughout the island of Ireland.

But apart from this immediate risk and its direct cost, even more significant problems will occur in the future. Over the next five years, we expect some power generators in Northern Ireland will close because of their age and fuel types.

Due to the restriction on the amounts of power that can flow across the border, Northern Ireland will simply not have enough electricity.

This could lead to rolling blackouts when demand exceeds supply.

Is there any other way to fix this problem?

The core problem is a lack of grid connections between Northern Ireland and the Republic. This is a very particular and urgent issue, and creates specific risks that are not directly comparable to any of our other projects.

To explain why, here's a comparison with two other major grid development projects.

Grid West

The purpose of the Grid West project is to allow us to connect new sources of renewable energy to a strong point on the transmission network. It also strengthens the electricity network in the west of Ireland.

There is a significant difference in the amounts of power that each project needs to carry.

The options for Grid West must add a minimum of 500 MW of capacity to meet current needs. This compares to the 1,500 MW needed for the North South Interconnector.

The smaller capacity for Grid West means we can consider smaller scale solutions and lower voltages. Using lower voltages also allows us to suggest the use of short underground sections.

Grid Link

The Grid Link project responds to the need to increase power transfer capacity between the southwest and east of Ireland.

We recently reviewed the need for Grid Link. A fall in projected demand allowed us to propose a solution that flows more power across existing transmission lines.

Even if we used a similar solution to increase the capacity of the existing Louth – Tandragee line, this won't solve the fundamental problem.

There would still only be one line acting as the primary route for power to flow. This creates an unacceptable risk of blackouts if that line were to go down unexpectedly.

Why is EirGrid fixing grid problems in Northern Ireland?

We're not - this is an all-island problem. Without the North South Interconnector, there are consequences across the entire island of Ireland. Under certain operating conditions, there is a real risk of blackouts in either jurisdiction.

Apart from this worst-case scenario, every electricity user on the island pays more for power without this project. This is because of the restrictions caused by the lack of interconnection.

All-island grid development also reflects a move towards integrated grids across Europe.

The EU has responded to climate change and diminishing supply of fossil fuels with binding laws and protocols. These apply to member states like Ireland and the UK.

These initiatives aim to reduce carbon emissions. They also look to increase the efficiency and competitiveness when power flows across borders.

In response, the two governments established a Single Electricity Market for Ireland and Northern Ireland in 2007.

The Single Electricity Market means wholesale prices for electricity are the same in both jurisdictions.

Those who generate or sell electricity now compete to buy and sell power for the most economic wholesale price. This also means that electricity customers - like you - can shop around for cheaper options.

EirGrid, as the operator of the electricity transmission grid, must meet the needs of this Single Electricity Market.

The connection between networks in Northern Ireland and the Republic lacked investment. This is because they had been developed as two separate systems. In contrast, cross-border transmission projects are more common throughout continental Europe.

Finally, it is important to recognise that EirGrid does not set energy policy. This is a function of Governments in Northern Ireland and the Republic. However, EirGrid must plan for the changes needed to implement this policy.

Why does the interconnector need to carry 1,500 MW?

At present, we must usually restrict the Louth – Tandragee line to a maximum of 300 MW of electricity flowing in either direction.

This is a safety limit to protect the grid in case this single point of connection goes down unexpectedly.

However, due to the Single Electricity Market, we know the actual demand for power on both sides of the border.

We have eight years of trading data since the Single Electricity Market has been in place. Based on this, we know there is a considerable demand for unrestricted flows of power between Northern Ireland and the Republic.

There is a regular demand for cross-border transfers of more than 750 MW, with peak demand reaching 1,100 MW at times.

Due to the current limits of 300 MW, we're barely meeting half this demand.

This creates a bottleneck – which leads to inflated prices for every electricity user on the island of Ireland. More importantly, it also provides clear guidance for the scale of the solution we need to build.

To meet demand today, and to allow for forecasted growth, we have designed the North South Interconnector with a capacity of 1,500 MW.

1,500 MW also matches the potential capacity of the existing interconnector. This would allow for more flexibility in operating both lines.

Finally, high capacity lines on both networks are designed to carry 1,500 MW. Building a new connection using this standard of capacity is the most sustainable, long-term solution. This will prevent future bottlenecks.

What are the benefits of this interconnector?

The main benefit is that the supply of electricity throughout the island of Ireland will be more secure and reliable – for decades to come.

The project will also make it possible to use more renewable energy on the network. This will reduce our production of greenhouse gases and our reliance on imported fossil fuels. There will also be an economic benefit.

With the North South Interconnector in place, we estimate this will create savings of €20m each year by 2020. These savings will rise to €40m - €60m per annum by 2030.

This is for many reasons. At present, restricted power flows on the Louth – Tandragee line create a bottleneck on cross border transfer capacity. This increases the cost of electricity.

Also, the need to work around the limits on cross border power flows has a significant effect on electricity generation.

We cannot supply electricity using newer and cheaper generators elsewhere on the island. Instead, we have to generate more locally produced electricity at a higher cost.

With the North South Interconnector in place, these bottlenecks and inefficiencies will end – and the savings will start to flow.

Why is this project not underground?

How does power flow on a transmission grid?

Since large amounts of energy cannot be stored, electricity must be produced as soon as it is needed. The grid must also be able to respond quickly to shifting demand. EirGrid manages a continuous process to generate and route electricity where and when it's needed.

Like every country in Europe, Ireland uses an Alternating Current (AC) electricity transmission system. This is the standard form of electricity everywhere in the world.

High voltage alternating current makes it easy to generate and move electricity across long distances. It allows us to quickly respond to the changing needs for electricity across the grid, as it happens.

However, most electricity customers can't use the high voltages we carry. That is why we convert the power to lower voltage using transformers, then send it to the distribution network.

As a result, power generating stations can be many miles away, yet still serve a large number of electricity users.

The vast majority of high voltage alternating current is transmitted using overhead lines. An overhead line has a high level of reliability, as we can locate and repair most faults easily and quickly.

It is a flexible technology that can adapt to a variety of topographies. It has a relatively low physical impact on the land it crosses, affecting only pylon locations and land underneath the overhead line. It is also very cost effective.

There are over 27,000 kilometres of high-voltage AC overhead lines planned in the next ten years across Europe. It is the dominant technology for transmitting large amounts of electricity.

This is why new projects typically use high voltage alternating current on overhead lines. This technology integrates seamlessly into existing transmission networks.

What happens when AC is transmitted in an underground cable?

There are underground AC cables in Ireland, but they are generally at lower voltages and for relatively short lengths. Typically you will find these in urban areas, where we only need to move lower-voltage power over short distances.

More importantly, there are fundamental technical obstacles to putting high voltage AC lines underground.

In overhead transmission lines, the air around the line provides all the insulation this technology needs. But if we send high voltage power underground using cables, they need more extensive insulation.

As a result of this extra insulation, underground AC cables hold and store some of the energy they carry. Also, the longer the cable is, the more energy they hold. The term for this situation is “capacitance”.

If a fault occurs - even in a different part of the grid - this stored energy in the cable is then released. When this happens, equipment on the electricity grid may face energy levels beyond their safety limits.

Many people with concerns about overhead lines mention Denmark as a model to follow. In 2009 Denmark published a plan to place some of their transmission grid underground over the next thirty years.

However, this plan relates only to lower voltage lines. It would simply not be possible to place a 400 kV high voltage AC line underground for long distances. The capacitance problem in underground cables - described above - is a fundamental obstacle.

Because of all these factors, there are no underground 400 kV AC cables in the world even close to the length of the North South Interconnector.

The longest operational underground AC cables of this voltage are approximately 40km in length. Yet this project must cover a distance of 140km.

For these reasons, a Government-appointed International Expert Commission agreed that an AC underground cable would not be suitable.

Its report of November 2011 stated: **“The Commission is not recommending any solution as such. However, it recommends against fully undergrounding using an AC cable solution.”**

What about HVDC?

High Voltage Direct Current (HVDC or DC) is an alternative method of transmitting electricity. HVDC technology is mostly used to transmit bulk power from one point to another over long distances. EirGrid’s East-West Interconnector – that runs undersea from Ireland to Wales – is a HVDC cable.

HVDC is mostly used for three purposes:

- Undersea cables over 50km in length
- Connecting two separate transmission systems of different strength, or that operate at different frequencies
- Transmitting large amounts of power over very long distances – typically over 500km

The main limitation of HVDC is the very high cost of converting AC to DC power and back again, so it can connect with AC transmission grids.

HVDC systems are more complex to manage and monitor. They need to be tightly and actively controlled in response to changes in power flow – a must for any transmission grid. They need significant counter-measures to avoid interference with nearby communications networks.

There are also ongoing losses of power when electricity is converted from AC to DC, or back to AC. This makes HVDC a very expensive choice for construction, and for the lifetime of their operation.

A high voltage DC line also does not have the operational flexibility of a high voltage AC line. This is a significant disadvantage in the context of the problems that the North South Interconnector must solve. We need an integrated, seamless and flexible solution.

There are no examples anywhere in the world of a DC line or cable working as an integral part of an AC transmission network of our size. However, there are DC interconnectors used to link separate grids that operate independently. The East-West Interconnector is one example.

There are also new interconnectors planned between France and Spain, and between Norway and Sweden. However, their primary purpose is to add more cross-border capacity to large systems with many existing connections.

The Government Commission estimated that the cost of the DC underground option would be three times higher than an overhead line.

EirGrid also commissioned an independent study on the project by international consultants Parsons Brinckerhoff. It concluded an underground DC option would cost at least five times or €670 million more than an overhead line.

EirGrid cannot make a technology choice that would lead to such substantial extra costs. This would be contrary to our statutory obligations to run a power grid that is both effective and cost-efficient.

Taking on this level of additional cost is a decision that only Government and the Energy Regulator could make. It would also add to the cost of electricity for every user in Ireland for decades.

HVDC cable reel

What would a high-voltage underground cable look like?

People often presume that underground cables create less of an environmental impact than overhead lines. However, when we bury a high voltage electricity cable, it's a big undertaking.

Unlike lines for telephone, broadband or low-voltage electricity, we're not placing a small cable in a simple trench.

Constructing an underground cable of the type and size needed for this project would create significant impacts. We would need a 20-25 metre wide strip of land cleared along the entire length of the route during construction.

HVDC converter station

Even when completed, there will be restrictions near the cable along the entire route. These will limit tree planting, certain types of agriculture, and future development.

If the underground cable was to use HVDC power, it would also need converter stations. We would need at least two stations at either end of the cable, and more stations at any future point of connection to the cable. These stations are major projects and would have environmental consequences. This would include a visible impact on the landscape.

The cumulative effect of these measures makes underground high-voltage cables a relatively intrusive solution. Although there is no overhead line, an underground solution still has a considerable impact on the environment.

Did EirGrid consider underground as an option for this project?

Yes, we did. We have a duty to apply our technical and engineering expertise to these kinds of decisions. That means we consider all options comprehensively and in great detail.

Many people feel that EirGrid did not seriously consider underground to meet the needs of the North South Interconnector. However, we carefully considered underground solutions for this project.

Apart from our own internal expertise, in the past seven years we also commissioned studies from three independent consultants. In addition, the Government commissioned a further two independent studies on this issue.

Together, these five studies examined every aspect of undergrounding technology. They considered technical application, viability, availability, reliability, longevity, maturity, cost and suitable routes. As years passed, these reviews also looked at new technologies or changing forecasts for electricity use.

In summary, all these independent reports and oversight processes have consistently validated EirGrid's decision. Overhead lines are the best solution for this project.

The final choice of an overhead line was an informed and carefully considered decision. It was not made lightly, or without consideration of the impact on communities and individuals along the final line route.

Are there health risks from this project – particularly due to EMFs?

Electricity is an indispensable and everyday part of our modern life. It is also a very safe form of energy - but we need to move a lot of it around the island. To achieve this, we put our lines on pylons, or bury them underground. We do this to protect the general public and those who work the land from accidental electrocution.

That's the main health and safety issue for electricity lines, and we take it very seriously.

Electricity is also a source of electric and magnetic fields, or EMFs. They are present in both natural and man-made environments.

People everywhere are exposed to EMFs wherever they live. Natural sources of EMFs include the earth's geomagnetic field, and electric fields in storm clouds.

When electric power flows, both electric and magnetic fields are produced. This occurs in the home, in the workplace, or anywhere we use electricity.

EirGrid operates the transmission grid to stringent safety standards set by national and European regulators.

This includes independent oversight on this issue from the Department of Environment, Community and Local Government.

EirGrid abides by the recommendations made by these external, independent authorities. They set guidelines on the maximum amount of EMFs that our infrastructure can emit, and we work well within these limits.

The issue of EMFs is an emotive and contentious one, powered by fears about health that are strongly held by some people. In this section, we have summarised the current scientific consensus on this topic.

If you want to explore this topic further, we would encourage you to consult the relevant authorities at a National and European level. EirGrid is willing and open to respond to any concerns that the public may have.

It is useful to understand the role of scientific research about EMFs and health. In general, science cannot prove the absence of harm. It can only demonstrate that, despite repeated testing, harmful effects are not observed at particular levels of exposure.

There is a large amount of evidence accumulated after almost 40 years of intensive scientific research. This research has not confirmed the existence of any adverse health impact from low level EMF exposure.

Many scientific and health organisations, including the World Health Organisation, have considered this topic. They have reviewed scientific studies to find any potential health risks from the widespread exposure we all have to EMF.

Following its most recent review of scientific literature on EMF, the World Health Organisation said:

"Based on recent in-depth review of the scientific literature, the WHO concluded that current evidence does not confirm the existence of any health consequences from exposure to low level electromagnetic fields."

The HSE, in their submission to An Bord Pleanála on the North South Interconnector, also said:

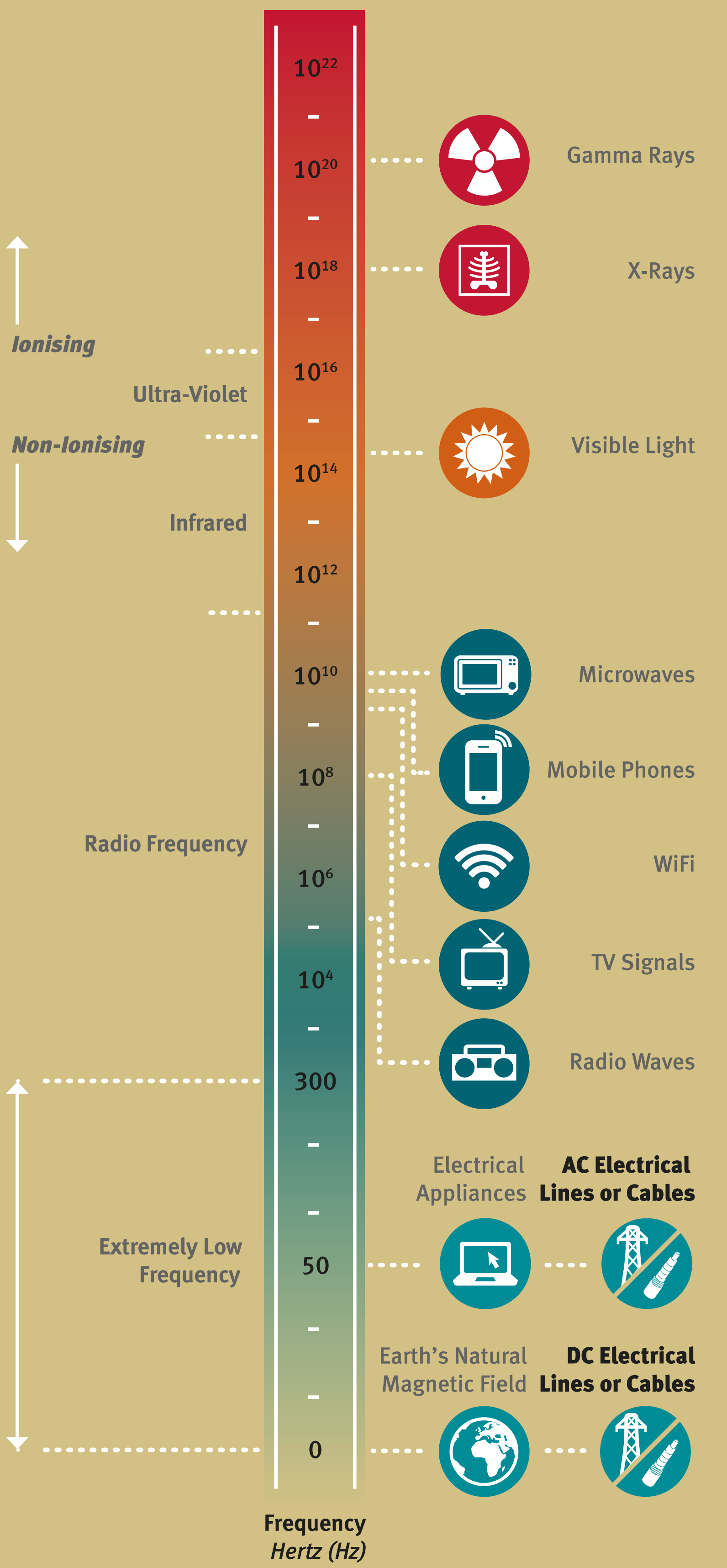
"Based on the weight of research, we are satisfied that as long as the development complies at all times with the international exposure limit guidelines as established by the International Commission on Non-Ionising Radiation Protection (ICNIRP), there will be adequate protection for the public from any Electromagnetic Field Sources."

Research on this topic will continue, given our widespread exposure to EMFs from many sources.

So far, the scientific consensus is that there is no credible way to explain how electromagnetic fields could cause cancer.

If there were reliable scientific evidence of harm due to EMFs, it is likely this would have already emerged. This is particularly the case given the considerable amounts of research already completed.

Electromagnetic Spectrum



Are EMFs associated with electricity the same as ionising radiation?

No. The fields resulting from electricity are fundamentally different from x-ray and gamma ray radiation.

Whilst these are all forms of electromagnetic energy, there are important and fundamental differences.

The term radiation usually refers to electromagnetic energy that falls at the ionising end of the spectrum. This kind of energy is capable of breaking bonds in molecules. This damages our basic biological building blocks - the DNA of our cells.

Only the high-frequency portion of the electromagnetic spectrum is ionising. This includes x-rays and gamma rays.

The energy at electricity's 50Hz frequency is non-ionising. This term means that they don't have enough energy to cause damage to human or animal cells.

Other sources of non-ionising energy include EMF from the earth. It also includes radio waves, TV signals, and visible light.

Some people fear that EMFs cause cancer. However, the overall results of scientific research on this issue do not confirm this fear, or explain how it could happen.

The concern that electric power lines may cause childhood cancer arose in 1979. It started with a single epidemiological study.

Since then, many large-scale studies have investigated this initial finding. These studies have not convinced health authorities that EMFs are a cause of cancer.

In addition, laboratory studies that health authorities reviewed did not confirm that EMF causes damage to cells.

New research has not confirmed associations of EMF with childhood cancer. For instance, the largest and most comprehensive epidemiological study on this issue was published in a UK report in 2014.

This new study looked at the period 1962 to 2008. It found that children with leukaemia, brain cancer and other solid tumours were no more likely to live near overhead transmission lines than children without cancer.

This report was from the Childhood Cancer Research Group at the University of Oxford. They studied 53,515 children with cancer and a similar number of healthy children in the UK.

Overall, their research found there was no statistical association between living near a transmission line in early childhood and childhood leukaemia or other cancers.

What is an epidemiological study?

Epidemiology involves the study of patterns of disease in populations. For instance, an epidemiological study might look for similar circumstances in the lives of people with the same disease. It would then contrast these to circumstances in the lives of people without that disease. However, patterns and associations observed in these studies do not prove that any of these similarities are the cause of the disease. Yet the findings are often misinterpreted in this way.

For example, the WHO reports that Europe's leading cause of premature adult death is conditions like cardiovascular disease.

Yet Europe also has the world's highest proportion of doctors per capita. Does this mean that doctors are a cause of cardiovascular disease?

Common sense says no, but it is this kind of misinterpretation of statistical associations that drives much of the fear about EMFs.

Epidemiological studies reveal patterns that require further scientific investigation. But they cannot, in isolation, prove cause and effect.

Are we taking risks by building electric transmission lines?

No, we are not. The scientific evidence does not show that EMF from electricity lines present any health risk.

Health agencies around the world have evaluated decades of research on EMF and health. No agency has found any demonstrable harm caused by exposure to EMFs from transmission and distribution lines. This is also the case for household wiring and electric appliances.

As a precaution, there are scientifically established guidelines to limit EMF exposure – and EirGrid stays well within these limits. We are answerable to Irish authorities responsible for the protection of health. They all agree that these guidelines protect those who live and work near electricity lines.

We can't individually choose where electricity transmission infrastructure is built. Yet the vast majority of us want the benefits and convenience of the reliable electricity supply that they deliver.

So in the absence of any proven harm from EMF, it does not make sense to halt the building of electricity infrastructure that we rely on so much in our lives.

How will this project affect land and property?

Will this project devalue my home or land?

When we start to define a new line route, there are understandable concerns about the potential effect on land and property.

In particular, people who own land or a home near the route worry that the project will devalue their property, or limit how they can develop it in future.

Property and land values may drop during the planning and construction stages on this kind of project. However, in the long-term,the scale and age of our existing grid can provide reassurance.

The proposed North South Interconnector will be a 400 kV overhead line, if built as planned. There are two other existing 400 kV overhead lines in Ireland that have a total length of 440 km.

Both lines start at the generation station at Moneypoint in Clare. One runs to Woodland in County Meath, and the other to Dunstown in County Kildare.

They have been in place since the 1980s, and are part of our transmission grid network. This network also includes over 1,800 km of 220 kV line that use similar-looking pylons.

There is no evidence across these 2,200 km of existing lines and pylons of any long-term devaluation to land or property.

If high voltage overhead lines reduce property values, there would have been little or no development near these lines. This is not the case.

This pattern is also repeated in the case of home values or new residential developments. There is no evidence of devaluation that differs from national, regional and local patterns.

In fact, there have been a number of applications for new residential developments near the proposed route for this project.

Building overhead lines and pylons is a noticeable change for any community, as the initial visual impact of new pylons is significant.

In particular, this is the case when compared to long-held memories of the landscape before new pylons were built.

But like all major infrastructure, such as motorways, research proves that they soon become familiar. Particularly for new arrivals in a community, the presence of pylons and overhead lines is taken for granted.

This explains why the perception of long-term property devaluation is not supported by actual figures.

What can we learn from international experience?

We can also look to research in North America on this topic. They have a much longer history of using pylons and lines, and a far larger grid network.

Studies have shown that in many cases the only time devaluation occurs is during the late planning and construction phases. Also, this devaluation was only found along narrow bands in the immediate vicinity of new overhead lines. These drops in value were low, and they tended to diminish in the following years.

Some of this research also looked at the effect of pylons and overhead lines on how property values increase. It found that property values near infrastructure increased in value at the same rate as those located farther away. By ten years after construction, there was no recorded difference in values at all.

This could be explained by two reasons. Firstly, the maturing landscape around the pylons.

Secondly, media coverage of public objections may cause some devaluation during planning and construction. When the line is built, the media coverage tends to fade, as does any short-term property devaluation.

There are two details from North American studies that are worth noting:

- Where a devaluation occurred during construction, it was near pylons, and not along the entire route;
- Examples of construction-related devaluation faded with distance from pylons. Beyond 150-200 metres from a new pylon, there was no devaluation at all.

EirGrid recognises the initial visual impact of new pylons. In response to this, we created our Proximity Payment scheme.

This makes a sliding scale of payments to homeowners that live within 200 m of new transmission infrastructure.

How will this project affect farm values, or future use of land on a farm?

There is no clear evidence in international research to suggest that pylons and lines could affect the value of typical Irish farms.

As noted above, house prices may see a small dip during the planning and construction stages. But this difference with nearby valuations tends to balance out over time.

Similarly, new pylons will not limit your ability to develop land for other uses, except in the immediate vicinity of the pylon itself. It is possible to develop land underneath and beside an overhead line, once you maintain safe clearances.

However, EirGrid is aware of the inconvenience and interruption to farm activity due to the construction of new pylons on a farm. Equally, we acknowledge that there are some restrictions on land use at the site of individual pylons.

That's why the owner or occupier of any lands with new pylons can make a claim for compensation under a statutory scheme.

There is a system in place between the IFA and ESB Networks – who construct the line. This compensates farmers for financial loss caused by the construction of new electricity infrastructure.

Finally, it is important to look at the relative impacts on future land use of overhead lines compared to underground cables.

Those who object to overhead lines often have a preference for underground cables, as they believe there is a lesser impact on the land.

However, burying the high voltage cables would actually affect a much larger area of valuable agricultural land. It would also restrict certain farming or development activities. This would occur along the entire length of the route, particularly during construction.

How will this project affect landscape and tourism?

Will this project have a negative visual impact on the landscape?

EirGrid recognises the inevitable visual impact of overhead infrastructure like pylons. This is a topic we take very seriously. We work throughout the design and planning stages to reduce the impact as much as we can.

Our goal is to minimise the visual impact of new pylons. We do so through careful route selection, and in the details of how and where we site each pylon.

Also, there is a considerable amount of international research on this topic. The consensus is that the visual impact is significant at first, but fades with time. Also, this does not happen for the entire length of a route, but only near certain, more visible, pylons.

We have carefully designed the route to minimise the negative visual impact as much as possible. Unfortunately, some individual pylons can have a significant visual effect on the landscape. However, the impact of this at any location will depend on planting and natural features between the viewer and the pylon.

They will be more noticeable where the transmission line crosses roads or where hedgerows and other plant growth is low. Beyond 1km away, pylons are much less or not at all visible. As before, this depends on the landscape between the viewer and the pylon.

However, the experience in Ireland and in other countries is that the visual impact of pylons diminishes over time.

This project is linear, using the least possible number of pylons. They will not alter the character of the wider rural landscape. The essence of the environment near this proposed project will stay rural. Fields, hedgerows, and the ribbon development of homes and farms will still dominate the views.

Will this project have a negative impact on tourism?

Irish tourism is linked to the quality of our environment. In particular, Ireland trades on the perception that it is green and natural. Because of this, there are concerns that new overhead lines and pylons will damage our tourism industry.

EirGrid is aware of these concerns, and has designed the project to minimise the impact where possible. Also, we are reassured by the history of visitor perceptions of Ireland. Tourism bodies take careful measurement of visitor perceptions every year.

Despite the presence of 6,500km of overhead lines for over 30 years, tourists still praise our green and natural landscape.

This project will add just 2% to the amount of pylons and overhead lines in Ireland. Given this, we don't believe it will create a long-term change to visitor perceptions.

During our route selection process, there is a list of places we make every effort to avoid. This includes: historic landscapes, protected views, landmarks, and sites of cultural or heritage significance.

Where possible, we carefully sited this proposed development away from key tourism destinations. We were conscious of the Boyne Valley – both the heritage attractions and the driving route.

We also responded to outline plans for Ireland's Ancient East. This is a new tourism plan, intended to repeat the success of Wild Atlantic Way. It will focus on heritage destinations in the eastern part of the country.

Throughout the proposed route, we worked hard to avoid scenic routes where we could. When designing the line and locating pylons, we tried as much as we could to use natural features to visually absorb pylons. We also aimed to avoid higher ground, to minimise changes of direction, and to avoid visibility along the skyline where possible.

EirGrid has taken every reasonable measure to protect the views of Ireland's natural landscape – for both locals and tourists.

Has EirGrid consulted with the public about this project?

We aim to continuously improve the way we engage with the public, and we will always consult with those affected by our projects. We reviewed our approach to consultation in 2014. We believe this enhanced approach will further improve our engagement, and make it as accessible and inclusive as possible.

A background to our consultation on this project

EirGrid started our process of public consultation on the North South Interconnector in 2007. It was carried out across many different media and using many methods over the next seven years.

In the early years of this project, it was called the Meath Tyrone 400 kV Interconnection Development. As part of ongoing efforts to improve engagement, we regularly assessed the effectiveness of our public consultation.

In response to one of these reviews, we devised and implemented a new programme of public and landowner consultation. We then rolled out this approach when we re-evaluated the project in 2011.

These efforts at improvement show our ongoing commitment to better our public consultation. They also reflect the lengthy process involved when developing this scale of major infrastructure.

We apply improved methods of engagement to the ongoing stages of each project. However, we can't restart our consultation process every time we improve it. All stages of our consultation on this project were thorough and extensive, and met all legal requirements.

Throughout this process, we also commissioned independent expertise to confirm or challenge our thinking.

EirGrid commissioned three independent consultants to report on using underground cables on this project. Also, our decision-making was assessed twice by a government appointed panel of independent experts.

Main public consultation steps on this project

October 2007 – May 2008

- Public consultation on the route corridors for the first application of this project.

June 2008 – March 2009

- Public consultation on the evaluation of these route corridors.

April 2009 – September 2010

- Public consultation on a line route within a preferred route corridor. This ended in a planning application.

- This planning application was then withdrawn. This was due to an error in a Public Notice that misstated the heights of pylons on one section of the line.

May 2011 – May 2013

- Public consultation on a re-evaluation of the project.
- Landowner engagement commences with Phase 1 contacts.
- The Minister for Communications, Energy and Natural Resources establishes an International Expert Commission. They are asked to investigate the possibility of undergrounding all or part of the North South Interconnector. They recommended against using a fully underground AC cable. They also indicated that underground options were significantly more expensive and potentially less capable.

July 2013 – December 2013

- Public consultation happens on the preferred project solution report. It then continues on the proposed line route.
- Landowner engagement continues to Phase 2 and Phase 3.

January 2014 – to date

- Government sets up a new Independent Expert Panel. They are asked to review the methodologies of the Grid Link and Grid West projects. Their task is to compare our methods on these projects to our work on the North South Interconnector. They concluded that work so far on the North South Interconnector matched the standards of other projects.
- Proposed Line Design is updated. Some pylons are repositioned along the line route and further public engagement takes place.
- EirGrid appears before the Joint Oireachtas Committee in April 2015.
- Full planning application submitted to An Bord Pleanála in June 2015.

Methods used for public consultation on this project

Throughout this process, EirGrid has done a lot to communicate with the public and stakeholders.

Our goal was to establish a two-way flow of information. We wanted to engage with communities, landowners and residents potentially affected by the project:

- **Project website.** This included the announcement of each stage of the project development process. We also used the site to publish key project reports, route maps, Frequently Asked Questions and brochures.

The website also informed the public of all methods they could use to contact EirGrid. This included details of the project information service, information offices and open days.

- **Printed, hard-copy information.** This was available to the public through a number of sources.
- **Dedicated lo-call phone number.** This allowed the public to talk to a member of the project team. They could discuss concerns, or request specific information like a map of the project in their location.
- **Dedicated postal address.** This allowed the public to request information, or send feedback.
- **Dedicated email address.** Along with the postal address, this was widely publicised.
- **Three information centres.** These were in Navan, Carrickmacross and Kingscourt – and then in Cootehill. Members of the project team were available here to meet with members of the public. They could discuss their concerns or collect information material.
- **Meetings with representatives of community groups.** These were arranged by request.
- **Open days and information evenings.** EirGrid hosted these. People could meet face-to-face with the EirGrid team and specialists on specific topics. These included agriculture, EMF and archaeology. Hard copies of project information were available to the public at each of these events.
- **Personal meetings.** These were arranged on request for individuals or small representative groups. This meant they could have their questions answered in a more individual manner.
- **Community update brochures.** These were published at key stages of the project. They highlighted key project developments and milestones, and summarised key reports and documents. They also answered questions raised during the consultation process.
- **Specific booklets on key issues.** We identified some key issues of concern in the earlier stages of our consultation. These covered topics such as health, construction of the project and EMF. In response, we created and distributed our response to these issues in some specific publications.
- **Advertising and PR Campaigns:** We recognised that we had a duty to create awareness of the project. This was to ensure the public continued to take part in the development and consultation process. For this reason, we carried out media and advertising campaigns to support the public consultation process.
- **Briefings to Public Representatives:** We also carried out individual and group briefings. These were with individual public representatives, to County Councils and to the Dáil.

Engaging with landowners

Apart from communications with the general public, EirGrid also directly engaged with individual landowners. This was first carried out in April 2009 for the first application of this project. We also focused on landowners on the indicative line route identified in the re-evaluation process, from May and June of 2011.

As part of this round of engagement, all landowners were issued with letters and maps showing the indicative route.

We also included the Landowner Terms of Reference publication. This set out a specific phased approach to landowner engagement. It aimed to clearly set out the opportunities for landowners to participate in each phase, and to explain how they could influence the proposal.

Our new Agricultural Liaison Officers

This was the first of two letters issued to landowners during Phase 1 of landowner engagement. An important function of the initial letter was to engage with as many landowners as possible.

We wanted to hear their inputs at the earliest point in the design process, so they could have as much influence as possible.

In July 2013, as part of Phase 2 of landowner engagement, each landowner was sent:

- Maps of the preferred route and proposed tower locations;
- Maps of indicative access routes;
- A Landowner Information Brochure.

This brochure included comprehensive detail on the project. It also contained information on applying for a change to the proposal. This explained how the landowner could influence the line design and pylon positions.

In December 2013, we contacted landowners in Phase 3 of this process. We published the design of the proposed line route, and sent them updated detailed maps showing construction access points.

These updates reflected over 30 changes we made in response to landowner submissions. We also sent comprehensive responses to landowners who had requested changes that we were unable to accommodate.

Working together for a better grid

Although we develop the grid for everyone's benefit, concern about our projects can create opposition.

This leads to a sense of "them" and "us" that prevents constructive dialogue, and makes it harder to reach an agreed compromise.

We have worked throughout this project to reach out to anybody who has concerns, or who would be directly affected.

Our goal is to build a working relationship, built on mutual trust and respect.

This is because we value your local knowledge. Equally, we know that our projects will ultimately benefit the local community. We hope that our process of consultation achieves this goal, but we will continuously work to improve it.

If you still have concerns or questions about any of the topics raised in this publication, please get in touch. We want to hear from you, and we're here to help.

Glossary

AC electricity
A type of power used to deliver electrical power to businesses and residences and where the electric charge reverses direction at regular intervals.

Capacity
The amount of electricity that can be safely transferred on the system or a circuit.

Circuit
The overhead line or underground cable linking two substations.

Converter station
A special type of station that converts direct current to alternating current or the reverse. Direct current is used in undersea or underground cables or long stretches of overhead lines that connect electricity between two points. Converting direct current into alternating current means the electricity can be used in the local electricity networks.

Corridor
The strip of land of a particular width where the electricity line or cable will be routed.

DC electricity
Direct current (DC) is used at high voltages for sending electricity long distances. It is mainly used for underground or undersea projects, and to send electricity between two countries. Direct current is also the same type of electricity you will find stored in a household battery, although at a very low voltage.

Demand
The amount of electrical power that consumers take from the network. This is often expressed as 'peak demand', which is the largest amount of power used in a given period.

Demand forecasts
The amount of electricity that is predicted to be drawn from the network by energy users. The forecast is updated every year.

Distribution Network
Our high-voltage transmission network supplies power to the distribution network. This lower voltage network delivers power to households and businesses. In Ireland, the ESB owns and ESB Networks Ltd operates the distribution network.

Electric and magnetic fields (EMFs)
These are invisible areas of energy which occur naturally – the earth itself has natural electric and magnetic fields. EMFs can also be created artificially – an example would be electricity power lines. EMFs can create electrical currents in nearby materials that can conduct electricity.

Energy security
This is the uninterrupted availability of energy sources at an affordable price.

Generator
A facility that produces electricity. Generators use a variety of sources to generate power. This can include coal-fired power plants, gas fired power plants and wind farms.

Grid
A network or 'energy motorway' made up of high-voltage overhead lines and underground cables, as well as transmission stations. The network links energy users with energy creators. It is designed to ensure that power can flow freely to where it is needed.

Grid infrastructure
The physical structures which make up the transmission grid. These include the cables and lines used to transmit electricity, the pylons which hold the lines, and the substations used to convert the electrical current and raise or lower the voltage of that current.

Infrastructure
This refers to the structures and facilities of a region or country, such as buildings, roads, bridges and the electrical grid.

Interconnector
A high voltage transmission line connecting the national electricity networks of two countries.

kV
Kilovolt, or one thousand volts.

MW
Megawatt, or one million watts.

Renewable generation
The generation of electricity using renewable energy, such as wind, solar, tidal and biomass.

Stakeholder
A person, interest group or organisation that has an interest or concern in something.

Substation
A set of electrical equipment typically used to step high-voltage electricity down to a lower voltage. We use substations to create lower voltages to safely deliver power to small businesses and homes.

Transmission line
A high-voltage power line running at 400kV, 275kv, 220kV or 110kV on the Irish transmission system, or grid. The high-voltage allows delivery of bulk power over long distances with minimal power loss.

Transmission Network or Grid
In Ireland, this is a network of around 6,500 km high-voltage power lines, cables and substations. It links generators of electricity to the distribution network. EirGrid operates Ireland's transmission network.

Voltage, Volts
Voltage is a measure of 'electric potential'. It is like 'pressure' in a water system. It is measured in units called volts.

Watt
This is a measure of electrical power. We use this term to describe the capacity, or amount of power, that can be delivered by our transmission infrastructure.

EIRGRID

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