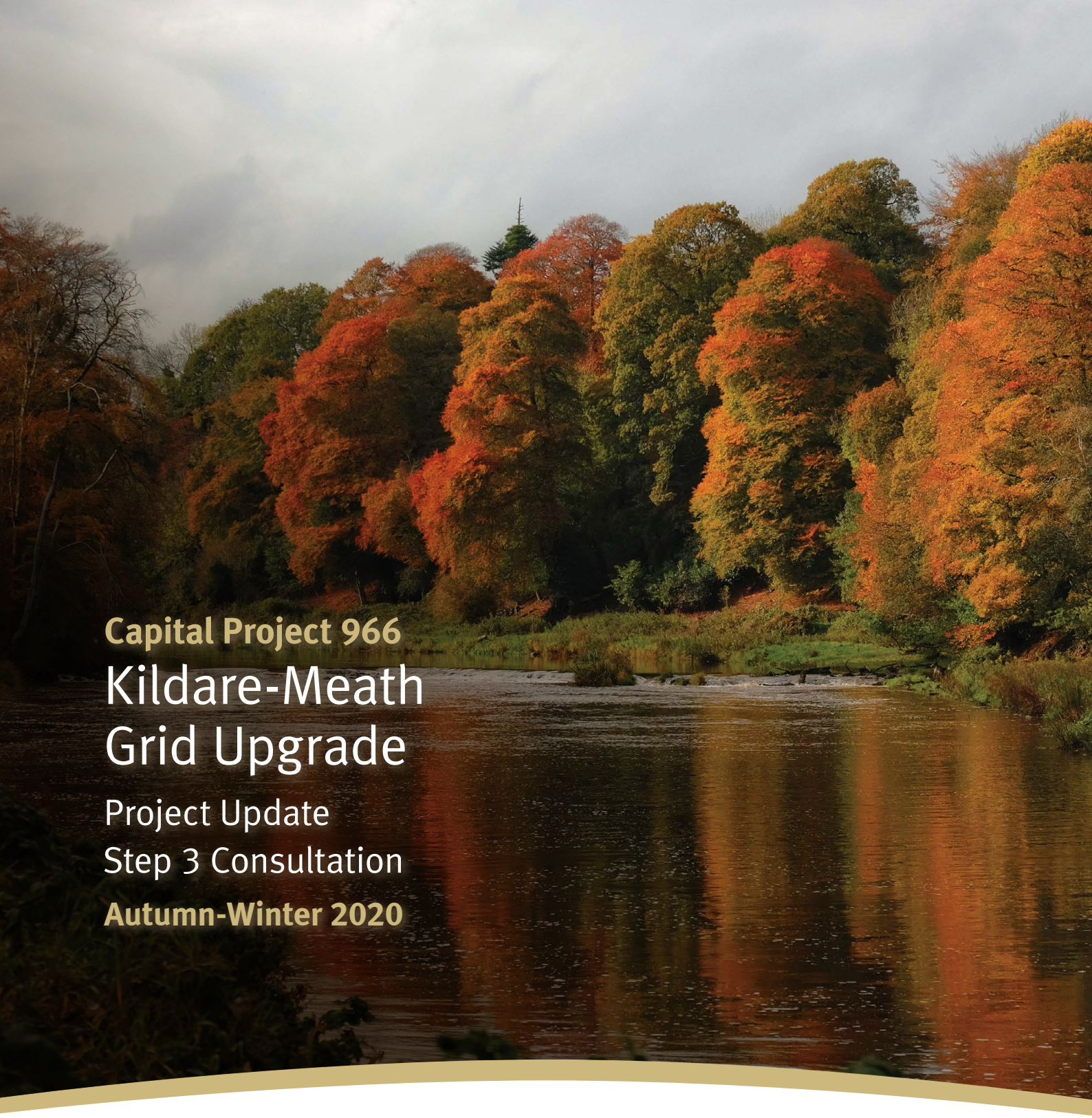


Capital Project 966

Kildare-Meath Grid Upgrade

Project Update
Step 3 Consultation

Autumn-Winter 2020

EIRGRID

The current. The future.

Who are EirGrid – and what do we do?

EirGrid as an organisation 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 grid brings power from where it is generated to where it is needed throughout Ireland. We use the grid to supply power to industry and businesses that use large amounts of electricity. The grid also powers the distribution network and supplies the electricity you use every day in your homes, businesses, schools, hospitals and farms.

About this update

We want to hear what you have to say about the Kildare-Meath Grid Upgrade (also called Capital Project 966). This update is for you as stakeholders, communities, landowners and members of the public interested in finding out more about the Kildare-Meath Grid Upgrade. This document provides information about the project, and we hope it will help you take part in this consultation. We are on Step 3 of a six-step process (see page 3). Please read this document carefully to understand our thinking and how you can give us your feedback.

The consultation is open from 6 October to 14 December 2020. We are consulting on a shortlist of five options (see page 4) for the Kildare-Meath Grid Upgrade. Based on our assessments to date, we have identified **Option 1 as the emerging best performing option (an overhead option)**. Of the remaining options, we have identified **Option 4 as the emerging best performing alternative (an underground option)**. However, please note that we will consider feedback on all five options before making a decision on what the best option is to take into the next step of this project.

This document provides up-to-date information on the project, including:

- what it is,
- its benefits for Ireland,
- our six-step approach to developing the electricity grid,
- what has been learned on the project so far,
- technology involved and studies done,
- the five options being considered, and
- next steps and how you can get involved.

Please note that the project timeline may change depending on developments relating to COVID-19.

What is the Kildare-Meath Grid Upgrade?

The Kildare-Meath Grid Upgrade will add or upgrade a high-capacity electricity connection between Dunstown substation in Kildare and Woodland substation in Meath.

The upgrade will help to more effectively transfer power to the east of the country and distribute it within the electricity network in Meath, Kildare and surrounding counties.

The project is essential to enable further renewable energy generation in line with Government policy ambitions. This includes transporting electricity from offshore renewable sources. It will also help meet the growing demand for electricity in the East. This growth is due to increased economic activity and the planned connection of new large-scale IT industry infrastructure in the region.

A significant number of Ireland's electricity generators are in the South and South West, where many wind farms and some modern electricity generators are located. The power they generate needs to be transported to where it is needed.

Power is currently transported across the country on two high-voltage power lines from Moneypoint in Clare to the Dunstown substation in Kildare and Woodland substation in Meath.

Transporting more electricity on these lines could cause electricity supply problems throughout Ireland, particularly if one of the lines is lost (where power is out) unexpectedly.

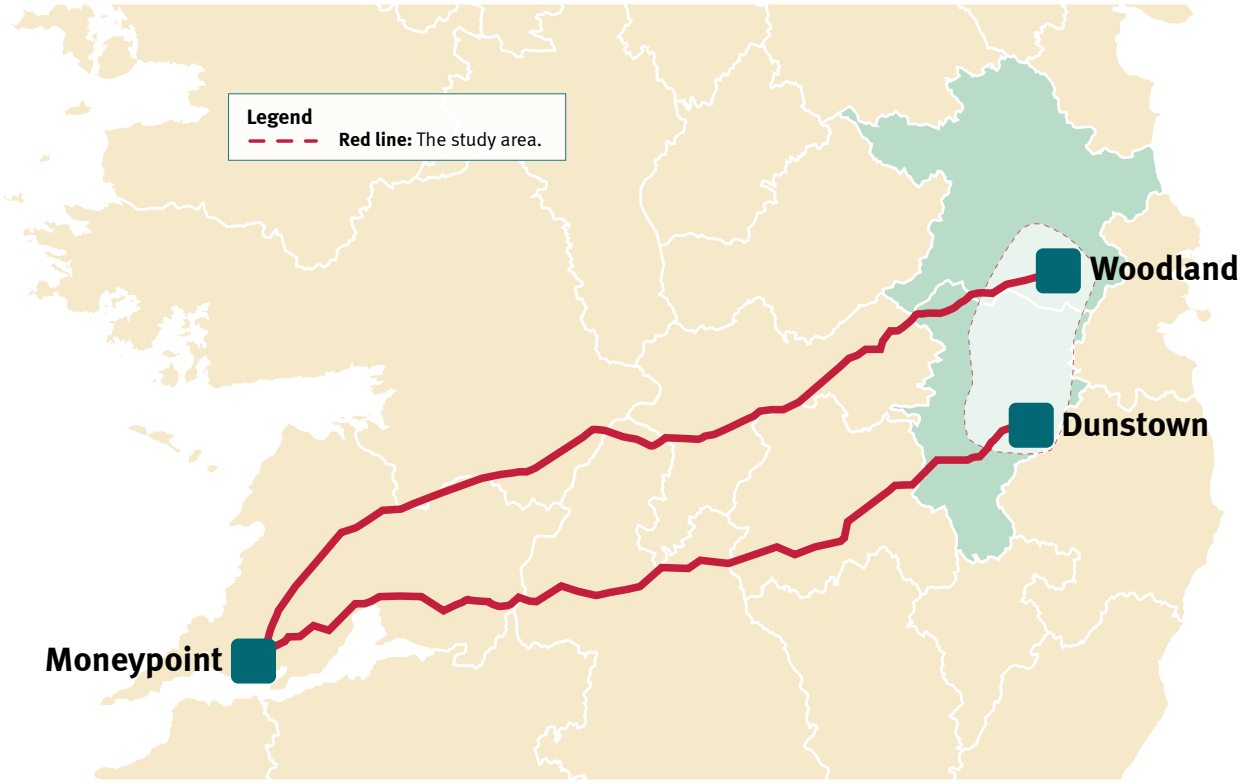


Figure 1: The connections from Moneypoint to Dunstown and Woodland with the study area between Dunstown and Woodland highlighted. We need to add or upgrade a connection between Dunstown and Woodland.

Benefits

Competition
Apply downward pressure on the cost of electricity to consumers

Sustainability
Help facilitate Ireland's transition to a low carbon energy future

Security of Supply
Improve electricity supply for Ireland's electricity consumers

Community
Deliver community benefit in the areas that facilitate the project infrastructure
See page 14

Our six-step approach

We have a six-step approach to gathering and understanding your and other stakeholders' views during this process. You can help us identify any potential issues now by getting involved and sharing your views on the different options when developing the electricity grid in this document.

EirGrid's Have Your Say publication outlines our renewed commitment to engage with, and listen to, stakeholders. It outlines our detailed six-step approach to developing projects, and how you can get involved at every step. You can get a copy of Have Your Say at **www.eirgrid.ie**.

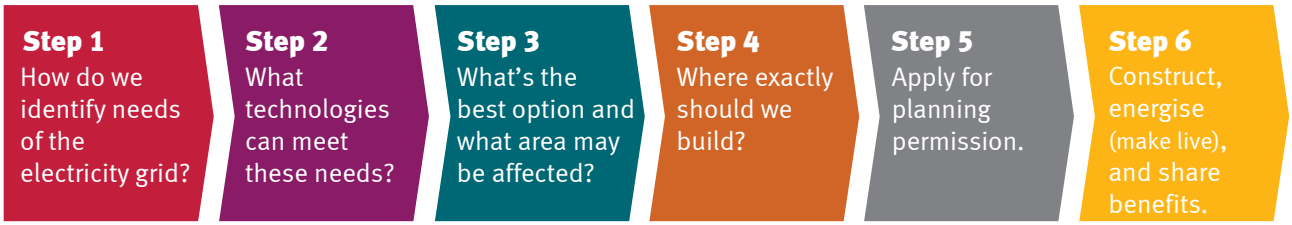


Figure 2: Our six-step approach to developing the electricity grid

This six-step approach to public consultation underpins all communications we have with you on the Kildare-Meath Grid Upgrade. This approach guides how we:

- Engage and consult with stakeholders and communities;
- Explore options fully; and
- Make more informed decisions.

This project is currently in Step 3:

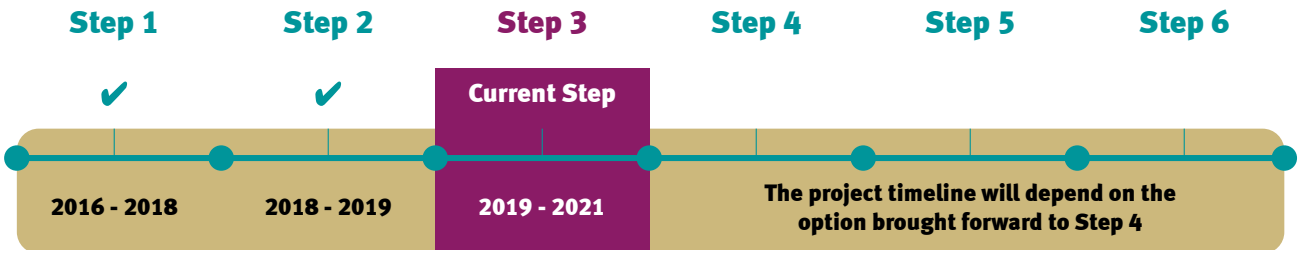


Figure 3: Our six-step timeline for the Kildare-Meath Grid Upgrade

What has happened so far?

In Step 1, we identified the need for the Kildare-Meath Grid Upgrade.

In Step 2, we compiled a shortlist of best-performing technical options, which went out for public consultation between November 2018 and February 2019. Four of those options were taken forward to Step 3 in April 2019.

In Step 3, we have re-confirmed the need for the project. We have also investigated the shortlisted options to strengthen the electricity network between Dunstown and Woodland.

The shortlist we have been working on is as follows:

1. Connect two existing 220 kV overhead lines and up-voltage to 400 kV;
2. Build a 400 kV overhead line;
3. Build a 220 kV underground cable;
4. Build a new single conductor 400 kV underground cable in one route;
5. Build a new 400 kV underground cable using two new conductors in two separate routes.

As we investigated Option 4, we identified that the cable would perform differently depending on its construction (if this option was chosen). So we added this as Option 5. This also provided an underground option that could transfer the same amount of power as a new 400 kV overhead line. (A conductor is the metal that the current travels through.)

Technology that may be used

There are different technology options that we can use to strengthen the electricity network between Dunstown and Woodland. Developing these may mean we have to install more circuits and equipment, or use as much of the existing electricity transmission infrastructure as possible with some necessary upgrades.

The up-voltage option (Option 1) would use a new technology, which would enable the existing 220 kV towers to be modified or replaced. The 220 kV conductors would need to be replaced with a 400 kV conductor to create a new Dunstown – Woodland 400 kV circuit.

The underground cable and overhead line options would create a new circuit between Dunstown and Woodland.

Electricity current

We will use an electricity current called High Voltage Alternating Current (HVAC). This form of electricity transmission is used internationally in electricity networks and in Ireland. This current can travel over long distances and can reduce the amount of electricity that is lost in transmission.

Figure 4: The five categories we use to assess options along with your feedback

Completing of studies

So far in Step 3, we have finished new investigations. These add to those we did in Steps 1 and 2. We have assessed and compared these investigations under five categories:

1. Technical aspects;
2. Economic factors;
3. Environmental factors;
4. Socio-economic factors – such as the local economy and local amenities; and
5. Deliverability factors – such as timeline and potential risks.

Emerging best performing option

Based on our assessments to date, we have identified **Option 1 as the emerging best performing option**. Option 1 is the connecting of two existing 220 kV overhead lines and up-voltaging them to 400 kV.

Of the remaining options, we have identified **Option 4 as the emerging best performing alternative**.

Option 4 is the building of a new single conductor 400 kV underground cable.

However, please note that we will consider feedback on all five options before making a decision on what the best option is to take into the next step of this project.

The Emerging Best Performing Option Report is available on our website: www.eirgrid.ie/KildareMeath.

Outcomes for Step 3

The expected outcomes (results) of Step 3 are to:

- Identify an emerging best performing option;
- Consult with you;
- Publish a consultation report on the feedback we received in Spring 2021; and
- Announce a best performing option to take into Step 4 in Spring 2021.

This step will **not** identify where we will build electricity infrastructure. This will be done in Step 4.

The study area

This is the proposed area within which the electricity infrastructure for The Kildare-Meath Grid Upgrade will be built. The option taken forward at the end of the six-step process will happen within the study area shown in Figure 5 by the red dashed line.

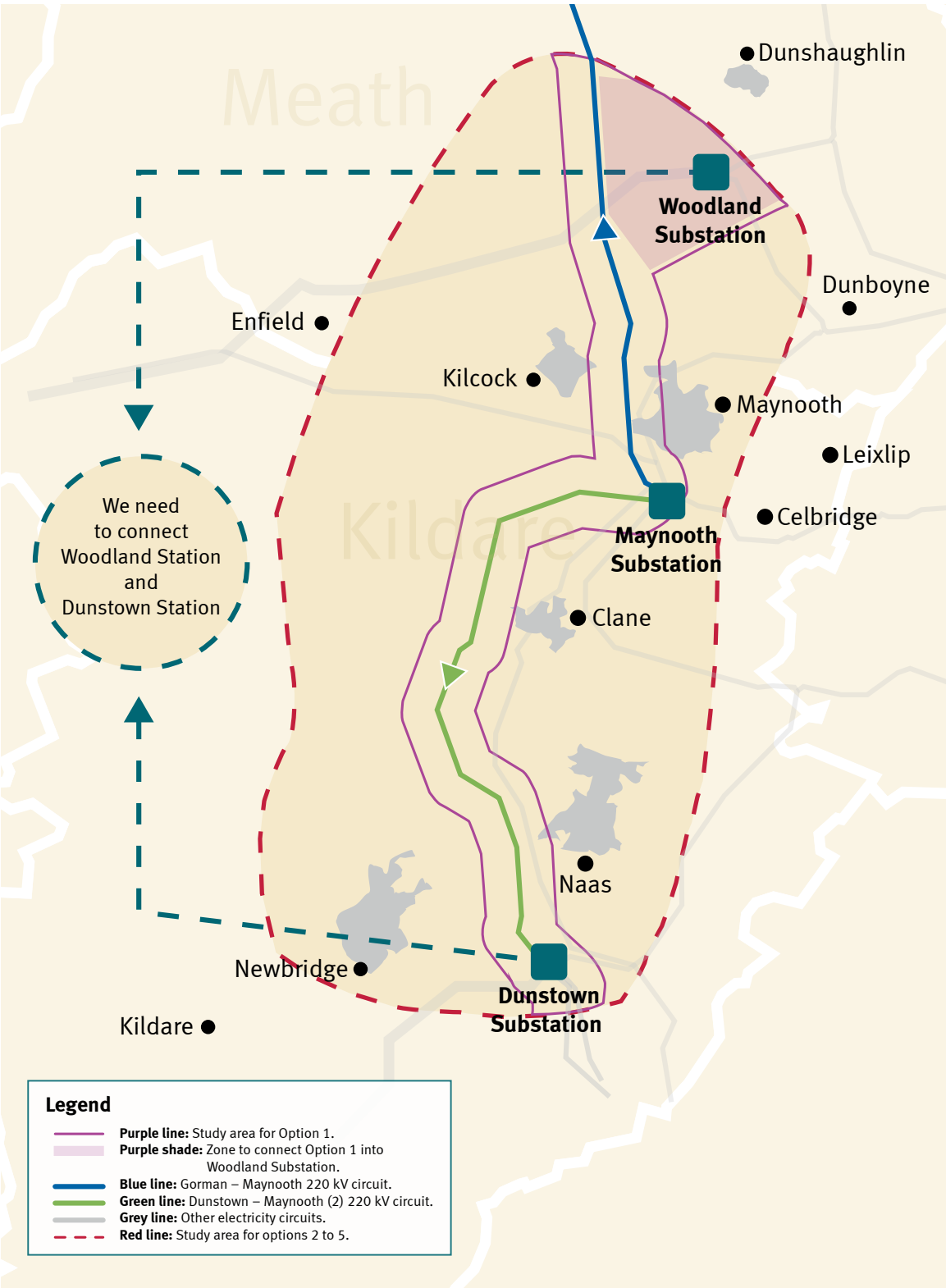


Figure 5: The Kildare-Meath Grid Upgrade Study Area

A comparison of the options being considered for this project

Consideration	Outcome of multi-criteria assessments to date	Capital cost	Environmental impact	Potential disruption during construction	Visual difference when construction completed	Meets technical requirements	Other notable points
Option 1 Connect two existing 220 kV overhead lines and up-voltage to 400 kV	Emerging best performing option	€239m	Least risk	Possible road closures, traffic and land access disruption	There will be changes to existing overhead infrastructure with minimal new infrastructure on the existing route. New infrastructure into Woodland station	Yes	Uses route along existing overhead lines and maximises use of existing infrastructure
Option 2 Build a 400 kV overhead line	Not emerging as a preferred option	€168m	Moderate risk	Possible road closures, traffic and land access disruption	New overhead infrastructure	Yes	
Option 3 Build a 220 kV underground cable	Not emerging as a preferred option	€372m	Moderate risk	Possible road closures, traffic and land access disruption	New underground infrastructure, mainly under existing roads. No new overhead infrastructure	Not to the same level as other options	
Option 4 Build a single conductor 400 kV underground cable in one route	Emerging best performing alternative	€356m	Moderate risk	Possible road closures, traffic and land access disruption	New underground infrastructure, mainly under existing roads. No new overhead infrastructure	Yes	Requires a 4 metre wide cable trench and overall work space of up to 12 metres in places
Option 5 Build a 400 kV underground cable using two conductors in two separate routes	Not emerging as a preferred option	€679m	Most risk	Possible road closures, traffic and land access disruption	New underground infrastructure, mainly under existing roads. No new overhead infrastructure	Yes	Requires the same as option 4 but along 2 routes

(A conductor is the metal that the current travels through.)

Option 1: Connect two existing 220 kV overhead lines and increase voltage to 400 kV

Description

This option would use existing route corridors and infrastructure (like lines and towers) as much as possible to create a 400 kV overhead line (OHL) between Dunstown substation and Woodland substation. A route corridor is a 'path' through the land that is approved and used to transfer energy.

Two existing 220 kV circuits would be used for this option. They are:

- Gorman – Maynooth 220 kV circuit; (blue line in Figure 5)
- Dunstown – Maynooth (2) 220 kV circuit. (green line in Figure 5)

The towers and conductors on the existing circuits would be replaced or modified so they could handle a higher capacity and voltage (400 kV). This option will also need new towers at some points along the route. Figure 6 illustrates the difference between the current towers and the towers they could be replaced with.

At the moment, the Gorman and Dunstown circuits connect into Maynooth. If we were to create a new circuit from Dunstown to Woodland, we would need to connect the two existing circuits outside the Maynooth station.

We would also need to modify the Gorman-Maynooth 220 kV overhead line circuit to add a 'turn in' to the Woodland station.

This would create two new circuits into the Woodland station:

- a Gorman-Woodland circuit connected at 220 kV;
- a circuit heading towards Maynooth from Woodland at 400 kV.

This new section going south from Woodland to Maynooth would be used for the 220 kV to 400 kV increased voltage option.

The Dunstown-Maynooth (2) circuit is currently connected at 220 kV in Dunstown station. We would need to modify it to connect to the 400 kV busbar at Dunstown station. A busbar is a common connection point for several power lines.

This option is illustrated in Figure 5 (see page 6).

Assessment

Based on our assessments to date, we have identified Option 1 as the emerging best performing option.

This option has a very good technical performance. However, it would use two existing circuits to achieve the required upgrade. This means it does not perform as well as an additional new circuit, which would give more operational flexibility. This option's economic performance is good in comparison with the other options.

This option has the overall best performance in relation to environmental and socio-economic factors compared with the other options. This option's environmental impact is mainly related to its construction. Once operational, this option would not be significantly different from the current baseline.

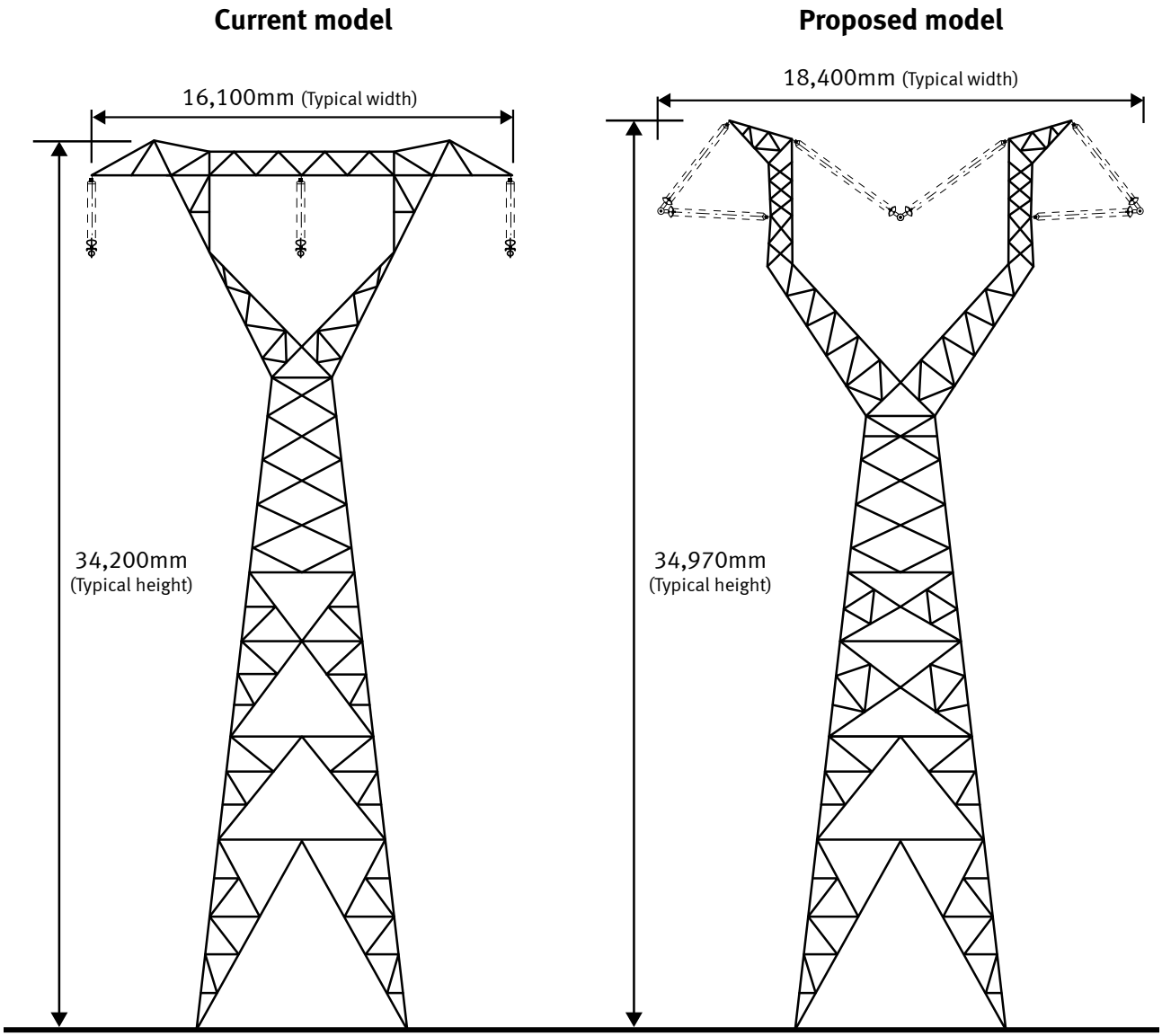


Figure 6: The tower on the left is the current model used on the existing route. These would be replaced by the model on the right.

Option 2: Build a 400 kV overhead line

Description

Option 2 would involve building a new 400 kV overhead line to link the Dunstown substation and Woodland substation.

This new 400 kV line would use towers (pylons) for the whole route. The tower type would be the same, or they would look the same, as the towers used on the existing 400 kV circuits.

For this option, we would also need to work on the Dunstown and Woodland stations, so we could connect the overhead line.

Assessment

Based on our assessments to date, Option 2 is not emerging as a preferred option.

This option is the best performing option from a technical and economic performance perspective. This option has the same overall impact on the environmental factors as Option 3 and Option 4 and this impact is considered to be of moderate significance. This option has the longest delivery timeline based on similar projects undertaken by EirGrid. It is also anticipated that it will be very challenging to achieve societal acceptance. This option is considered to be a high risk from a deliverability and socio-economic perspectives.

Option 3: Build a 220 kV underground cable

Description

For Option 3, we would build a 220 kV underground cable to link the Dunstown substation and Woodland substation.

Previously in Step 2 of this project, we were unsure if a cable option would be technically feasible due to the length of the cable involved. During Step 3, we have investigated this and found that we could address any issues that would arise.

We prefer to install underground cables in the road network (as opposed to through green fields or similar). This allows for easy access if the cable needs repair or maintenance. To achieve electricity transmission using alternating current (AC), three cables would be required for each circuit. We call these phases. This is the same for both overhead line and underground cables. One cable per phase (AC cable) would be needed. This means that three cables would make up one circuit.

These cables would be laid in the same 4-metre wide trench in a road. The trench may be up to 4 metres wide to meet the required power carrying capacity (rating) of the circuit.

We would also need a temporary working area to carry out the installation. The cable would be laid in sections. While we were laying the cables, there would be local traffic restrictions.

For Option 3, we would also need to work on the Dunstown and Woodland stations, so we could connect underground cables.

Assessment

Based on our assessments to date, Option 3 is not emerging as a preferred option.

This option is the worst performing option from a technical perspective. Connecting the Woodland and Dunstown stations using a 220 kV voltage level will not support the network as effectively as the other options in transferring the electricity to where it is needed. It will not provide enough improvements and will not provide for future growth in energy. This option has a similar delivery timeline to Option 4. This option has the same overall impact on the environmental considerations as Option 2 and Option 4 and this impact is considered to be of moderate significance.

This option carries the lowest amount of power out of all options. Our experience is that 220 kV underground cables are less challenging to manage than 400 kV underground cables. That is why we included this option while we assessed the feasibility of the 400 kV underground cable options.

The working area required to install this option may impact deliverability because no roads within the study area could accommodate the width required for construction without temporary or permanent alteration. Road closures and potentially significant implications for traffic movements for both local access and commuter traffic would be a factor for all the underground cable options during construction. This option does not have a good economic performance compared to the options.

Overall, this option has the same deliverability, environmental and socio-economic performance as Option 4, but with a lower technical performance and a higher cost.

Option 4: Build a new single conductor 400 kV underground cable in one route

Description

For Option 4, we would build a new 400 kV underground cable to link the Dunstown substation and Woodland substation.

Previously in Step 2 of this project, we were unsure if a cable option would be technically feasible due to the length of the cable involved. During Step 3, we have investigated this further and found that we could address any issues that would arise.

Like the other underground options, we would install Option 4 in the existing road network. The 400 kV cable has the same diameter as the 220 kV cable (Option 3) and has the same installation needs.

The trench may be up to 4 metres wide to meet the required power carrying capacity (rating) of the circuit.

We would also need a temporary working area to carry out the installation. The cable would be laid in sections. While we were laying the cables, there would be local traffic restrictions.

For Option 4, we would also need to work on the Dunstown and Woodland stations, so we could connect underground cables.

Assessment

Based on our assessments to date, we have identified Option 4 as the emerging best performing alternative option.

This option has the same overall impact on the environmental considerations as Option 2 and Option 3 and this impact is considered to be of moderate significance. This option has some technical performance advantages that other options do not. The amount of cable required for this option is a challenge and a risk, but not to the same level as Option 5.

The operation of underground cables needs more management than overhead lines to make sure they are safe and secure. This can be challenging and is something we consider in our assessments. The deliverability of this option is similar to Option 3. The option's economic performance is good in comparison with the other options.

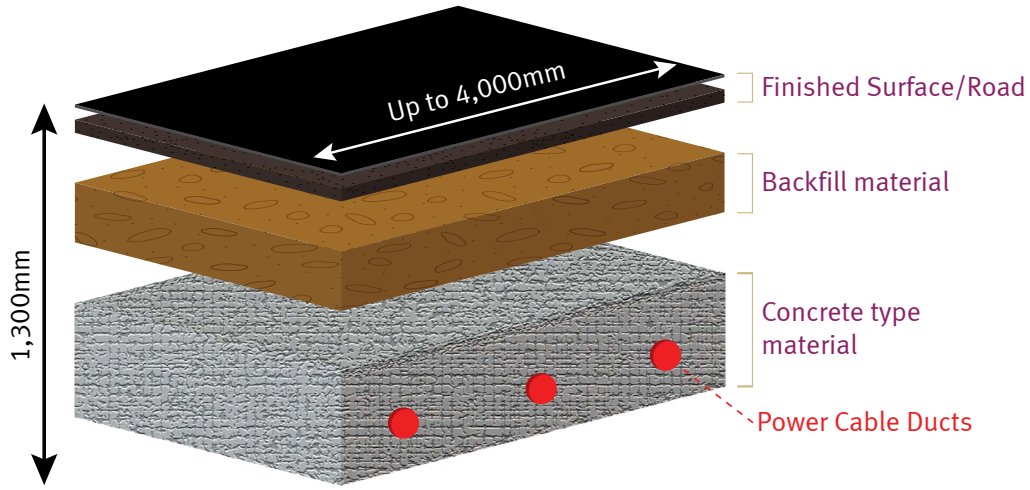


Figure 7: Indicative HVAC underground cable duct arrangement

Option 5: Build a new 400 kV underground cable using two new conductors in two separate routes

Description

For Option 5, we would build a 400 kV underground cable to link the Dunstown and Woodland substations.

Previously in Step 2 of this project, we were unsure if a cable option would be technically feasible due to the length of the cable involved. During Step 3, we have investigated this and found that we could address any issues that would arise.

Like other underground options, we would install Option 5 in the road network.

We would use two separate routes between the stations – keeping the road network in mind. We would install one circuit on each route.

The trench may be up to 4 metres wide to meet the required power carrying capacity (rating) of the circuit.

We would also need a temporary working area to carry out the installation. The cable would be laid in sections. While we were laying the cables, there would be local traffic restrictions.

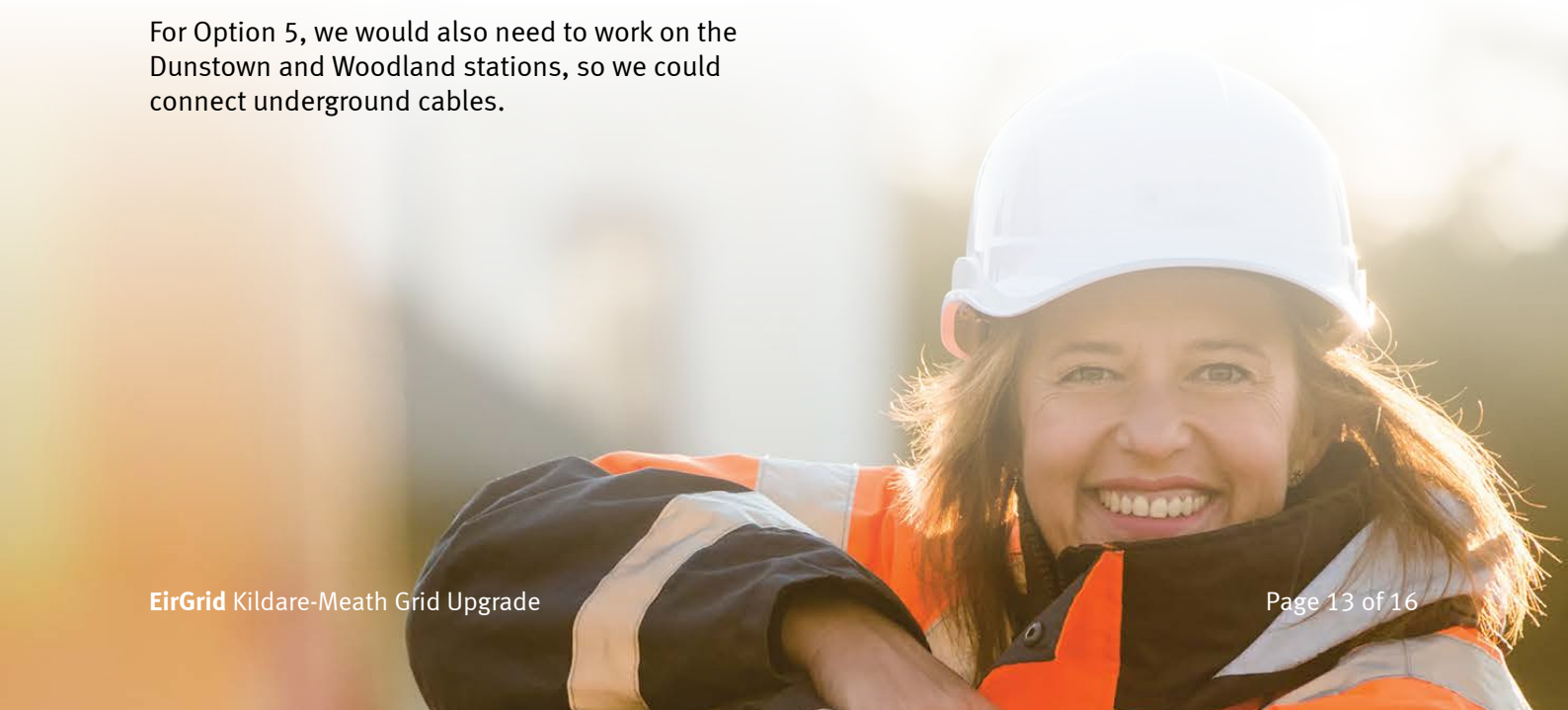
For Option 5, we would also need to work on the Dunstown and Woodland stations, so we could connect underground cables.

Assessment

Based on our assessments to date, Option 5 is not emerging as a preferred option.

For three out of the five categories we assess our options against, this option is considered to be high risk or have a significant impact and is therefore not preferred. The two routes required double the impact on environmental and socio-economic factors. Therefore this option performs the worst in comparison to all other options in these categories.

This option can carry the same amount of power as Options 1 and 2. This option has similar advantages to Option 4, but also has increased risks and challenges due to the amount of cable required. The operation of underground cables needs more management than overhead lines to make sure they are safe and secure. This can be challenging and is something we consider in our assessments. This option's economic performance is the worst of all options.



Community Benefit

We recognise electricity infrastructure projects impact on local residents and businesses. While the Kildare-Meath Grid Upgrade is being built, we will work to benefit communities as part of our community benefit policy.

The focus is often on projects to help the community. Examples include:

- Community walkways like the one we sponsored in Moyvane, Co. Kerry;
- Education initiatives like IT equipment for local schools;
- Environmental initiatives like installing beehives;
- Youth facilities like a playground;
- Sports facilities like a play pitch.

We will seek your views on how to use the community funds we have for projects that would benefit your community. We encourage you to think about how your area could benefit from a Kildare-Meath Grid Upgrade community fund.

We will work in partnership with the community and grant-making specialists to decide how to manage and spend this fund.

Next steps and how you can get involved

We are inviting you to give feedback on the five options for the Kildare-Meath Grid Upgrade. We want to know what option you prefer. The consultation period is from 6 October to 14 December 2020.

We encourage you to engage with us and have your say as early as possible during the consultation period.

In Step 4 (the next step) we will consult about where exactly the new infrastructure will be built. We expect this to be in 2021.

Where can I find our more?

You can find out more in different ways. All information relating to this project is available on our website: **www.eirgrid.ie/KildareMeath**.

View project information and documents online

View our interactive maps

Take a virtual tour of our exhibition

Sign up for webinar

Arrange to speak to a team member directly

If you need further guidance or copies of any of our documents, please contact us. Our details are available in the opposite column.

How can I get involved?

You can get involved in different ways. We are engaging and consulting at local level with members of the public, landowners, and local representatives from the study area. We are also speaking directly to elected representatives, specialist representative groups, environmental and planning agencies.

There are many ways you can give feedback. These include:

Complete the questionnaire online

Email your submission to us at KildareMeath@eirgrid.com

Write your own submission and freepost it back to us

Our freepost address is: **Kildare-Meath Grid Upgrade Consultation, EirGrid plc, Freepost FDN 5312, 160 Shelbourne Road, Ballsbridge, D04 FW28**.

Who can I contact?

If you would like to find out more information or give feedback on this project, you can email **KildareMeath@eirgrid.com** or contact your local Community Liaison Officers:

Gráinne Duffy on
+353 (0)85 887 4798
and
Eoghan O'Sullivan on
+353 (0)87 247 7732

Step 3 at a glance

Step 1 Completed identifying needs of the grid.

Step 2 Completed identifying the technologies that can meet these needs.

Step 3 What's the best option and what area may be affected?

Step 4 Where exactly should we build?

Step 5 Apply for planning permission.

Step 6 Construct, energise (make live), and share benefits.

Step 3 At a glance

What's happening?

We have assessed the five options to upgrade the electricity grid between Kildare and Meath. We have identified an emerging best performing option and we are consulting with you about this.

How long will this take?

Step 3 will take us into the Spring of 2021.

What can I influence?

You can influence which of the five options we decide to bring into Step 4. We want your feedback on which option you prefer.

How can I get involved?

You can get involved in different ways. We are engaging and consulting at local level with members of the public, landowners, and local representatives from the study area. We are also speaking directly to elected representatives, specialist representative groups, environmental and planning agencies.

You can share your views from 6 October to 14 December 2020. Find out more at: **www.eirgrid.ie/KildareMeath**.

Who can I contact?

If you would like to find out more information or give feedback on this project, you can email **KildareMeath@eirgrid.com** or contact your local Community Liaison Officers:

Gráinne Duffy on +353 (0)85 887 4798
and
Eoghan O'Sullivan on +353 (0)87 247 7732.

EIRGRID

The Oval, 160 Shelbourne Road, Ballsbridge, Dublin D04 FW28 • Telephone: 01 677 1700 • www.eirgrid.com

Printed on recycled paper