

July 2024



Reaching a net zero grid: our position

Magnus Gallie explains how the UK's electricity grid must change to avoid the worst landscape and nature harms while still decarbonising to meet climate targets.

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Summary

The UK's electricity grid – including transmission/ distribution lines, associated infrastructure and storage – needs to radically change to reach binding net zero targets by 2050.¹

In our view, the overriding benefits of building substantially more electricity power lines (such as climate change mitigation, lower energy bills, greater energy security and improved ability to adapt) will nearly always outweigh the negatives (such as the loss of private views from homes, impacts on heritage and other harms).

In this article, we focus on the potential for landscape/ visual and nature harms. In this context, we've taken a pragmatic policy position on achieving a net zero grid, while still preserving our stance that timely grid decarbonisation is essential to meet the UK's climate targets.

Policy summary 1: Net zero grid and landscape/ visual impact

- Outside of National Landscapes, Friends of the Earth is likely to support applications for pylon-based transmission/ distribution lines and associated infrastructures, unless they result in significant cumulative landscape effects² that can't be mitigated.
- Friends of the Earth doesn't support applications for pylon-based transmission/ distribution lines and associated infrastructures in National Landscapes (eg National Parks, Areas of Outstanding Natural Beauty (AONBs), the Broads or heritage coasts). Assuming no other option for re-routing or undergrounding is available, small-scale distribution lines could be considered appropriate in exceptional circumstances, but only where the benefits of doing so clearly outweigh the impact on the physical landscape and other harms³
- Friends of the Earth is highly unlikely to support objections to new pylon-based transmission/ distribution lines and associated infrastructures based on aesthetics or the loss of private views, because these reasons are unlikely to outweigh the overriding need for and societal benefits of rapidly achieving grid decarbonisation.

Policy summary 2: Net zero grid and biodiversity

- Friends of the Earth doesn't support pylon-based transmission/ distribution lines and associated infrastructures within internationally (eg Special Protection Areas, Special Areas of Conservation or Ramsar) and nationally (eg Sites of Special Scientific Interest, Marine Conservation Zones or National Nature Reserves) protected nature designations, especially where alternative solutions (eg re-routing) are possible. In the wholly exceptional event that no other option is available besides locating new grid in such areas, applicants would have to clearly demonstrate⁴ no adverse effects on the integrity of any international site (and its species) and/ or ensure no unmitigable significant effect in Environmental Impact Assessment (EIA) terms.⁵
- Outside of the above designations, Friends of the Earth would support pylon-based transmission/ distribution lines and associated infrastructures that avoid and don't undermine nature restoration objectives of non-statutory nature sites/ designations.⁶
- Where harm is unavoidable, the approach to grid siting should embrace the mitigation hierarchy (avoid, mitigate or compensate) for significant harm to biodiversity. Where this can't be achieved, applications should be refused.

Setting the scene

As the UK progresses towards its international climate commitments and domestic carbon budgets, heating, transport and electricity demand and supply need to substantially decarbonise – pivoting much more towards renewables and other low-carbon sources like green hydrogen. At the same time, to ensure we can adequately heat our schools, homes, hospitals, town centres and places of work, power our appliances and get around more sustainably, the grid will also have to produce and deliver much more decarbonised energy capacity.

The Climate Change Committee (CCC) estimates reaching the [Sixth Carbon Budget pathway to net zero](#) will require the grid to accommodate twice the UK's existing electricity demand: from around 300 TWh today to 610 TWh by 2050 (including 360 TWh by 2030 and 460 TWh by 2035). At the same time, the carbon intensity of this increased capacity also needs to dramatically fall: from 220 gCO₂/kWh in 2019 to 2 gCO₂/kWh by 2050 (including around 50 gCO₂/kWh by 2030 and 10 gCO₂/kWh by 2035).

Such figures demonstrate the monumental action needed by government to both decarbonise the grid (by 2035) and double its capacity (by 2050) to meet our binding carbon budgets. While such targets may seem daunting, Friends of the Earth is pushing for grid decarbonisation and capacity increases to happen even faster: the former by 2030, and the latter more quickly to accommodate demand from more electric vehicles and heat pumps.

To hit our Nationally Determined Contribution (NDC) by 2030, a decarbonised grid by 2030/35 and overall net zero targets by 2050, a much greater magnitude of onshore (and offshore) renewable energy capacity as well as grid interconnectivity and distribution is needed – and at pace.

The need for an expanded net zero grid

Clearly, much more electricity grid infrastructure will be required – including new pylon-based transmission lines and associated infrastructures across newer and wider geographies beyond those we've become accustomed to in our UK landscape. This is because the physical infrastructure of the transmission network was [originally designed](#) and built to distribute electricity generated from a series of centralised, large-scale coal, gas and (coastal) nuclear power stations to our cities, towns and wider rural areas.

Although this has worked for a while, it's clear that to try and avoid catastrophic climate change, the physical grid's design and functionality must radically change. Only by expanding transmission (larger pylons over longer distances) and distribution (smaller scale lines and pylons) will we be able to accommodate and transmit the increased proportion of renewable energy needed to hit not only net zero by 2050 but also our 2030 NDC (see more below), as well as help secure our domestic energy and heating needs for years to come. Some of these will need to be buried or avoid sensitive areas, but not all can at an affordable price – particularly when there are other pressing calls for investment, like insulation. And putting additional costs on bills could exacerbate fuel poverty and so must be avoided wherever possible.

We're not just talking about the need for more wind turbines (both on- and offshore) and solar panels, but also the cables, pylon towers, interconnectors, substations and associated infrastructures needed to better distribute the cheap, bountiful, clean renewable electricity (already being produced and

sometimes wasted) needed to heat and power our homes, schools, businesses, hospitals and industries. The National Energy Supply Operator estimates it'll cost £58 billion to do this, including [5,000-6,000 new pylons and 1,000 miles of new transmission lines](#). There'll be some opposition to such major change across many impacted communities where grid lines are required. But as the CCC's ex-Chair Lord Deben keeps reiterating, the cost of not doing so is far greater.

More onshore renewables needed to meet the UK's NDC

To date, the government's plan to achieve grid decarbonisation has been in part to rapidly expand the UK's offshore windfarm capacity, setting itself an [offshore target of 50 GW by 2030](#) as this has been deemed more politically acceptable. Of course, more offshore wind is fundamental to the UK decarbonising energy and increasing capacity. But to hit our 2030 NDC – to reduce UK carbon emissions by [68% compared with 1990 levels](#) – we'll need much more onshore renewable capacity in the short term. This is in addition to delivering a fully decarbonised grid by 2030.

How can the UK change the grid?

Strategic grid planning

In recognition of the challenges we face, a newly formed [National Energy System Operator \(NESO\)](#) has been established (following the passing of the Energy Act 2023). NESO should ensure that future planning for the grid also has a key focus on net zero and decarbonisation. It aims to implement a [Strategic Spatial Energy Plan](#) to help facilitate this process and identify key grid and energy generation priority measures. This plan will be supported by an "authoritative evidence base for the key clean energy projects that are needed to deliver our 2035 targets and beyond, and be endorsed in national and local planning policy".

Better connectivity

A decarbonised grid means a much better connected grid so that, for example, wind energy in Scotland isn't wasted due to no capacity in the grid to carry it further afield. This happens now and means that windfarm operators are sometimes paid to switch off turbines (resulting in more costs to consumers) to avoid overloading the local grid – even when demand for such cheap, clean energy is evident just across the border in England. The [National Grid plc is acutely aware of the situation:](#)

“Investment in renewable energy generation has exceeded investment in transmission capacity over the past decade, resulting in bottlenecks on the electricity network. Currently, energy is being wasted as the grid cannot transport it to where it can be used. Because of these bottlenecks, as the system operator, we sometimes have to ask wind farms to switch off to prevent the grid becoming overloaded – wasting cheap, sustainable, homegrown wind power.”

Getting rid of power wastage/ bottlenecks

You don't need to look far to see how badly prepared for net zero grid planning has been. Newspapers are awash with stories of District Network Operators (DNOs) giving prospective solar and wind farm operators ridiculously long connection timeframes (ie for connecting renewable energy generators to the grid) due to capacity constraints and backlogs arising from the lack of a strategic approach. Essentially this means that, while a plethora of new large-scale onshore renewable energy

schemes across the UK are either seeking or have received planning permission, many face substantial grid [delays of up to 10-15 years](#) before they can start exporting their clean energy.

The cumulative effect of such bottlenecks and delays means that it'll take much longer to connect newly consented and future onshore solar and wind farms to help decarbonise the grid's supply. [Philip Dunne, the former Environmental Audit Committee's Chair, concluded:](#) "The ability for low-carbon energy sources, including solar, to be able to connect to the grid could seriously jeopardise Net Zero Britain."

The remedy will require more strategic grid planning, including the Strategic Spatial Energy Plan, and at pace, as well as new grid connections between the north and the south, both onshore and offshore: such as the newly proposed [Eastern Green Links \(EGLs\)](#) from Scotland to Lincolnshire.

Increasing storage

Future grid expansion planning must ensure that [more energy storage capacity is available](#) to allow the grid to "flex" and meet its peak demands without reverting to short-term fossil fuel top-ups (such as the previous option of firing up Ratcliffe-on-Soar coal power station, now scheduled for demolition in late 2024). While the grid needs to be bigger in scale and connectivity to deliver more renewables to where demand is high, it also needs agility to offset peak demand, encouraging people to switch off at peak times but also allowing charged energy from the offpeak grid to be pumped back into it to satisfy peak users. Nighttime wind energy can replenish both large (eg [battery storage farms](#)) and small-scale (eg residential energy batteries like Sunsync/ Tesla/ GivEnergy) storage, which can then be sold back to the grid at peak times.

Together, such measures can help offset peak demands, limiting the need for fossil fuel back-ups. Longer duration energy storage options are also developing fast, including for capturing excess electricity generation in the summer to use in winter (as happens in reverse for water).

Balancing nature and landscape needs with the grid

Much more grid infrastructure is needed already. Large-scale grid projects are being proposed across the UK: some at formal pre-application consultation, others soon to be at the more advanced "acceptance" and "examination" stages (see [our guide](#) for more details on the Development Consent Order process).

While there's potential for accommodating some offshore north-south interconnection, and although other transmission and distribution infrastructures can be buried where really needed, a large number of land-based grid upgrades will also be needed to ensure the internal network can accommodate and link up to increased onshore renewables and offshore renewables brought in from our seas.

This will mean more visible pylons, transmission lines, substations and other associated infrastructures, which could impact on our landscapes and potentially upset some members of local communities.

So, what's Friends of the Earth's position on all this?

Before we can get into that, it's useful to understand the role of the planning regimes in all this. Only by having some grounding in and understanding of these technocratic systems can we have informed thinking, especially around the potential impacts of a new net zero grid on nature and landscapes. An understanding of the planning system helps identify how we can best balance competing demands.

Planning: consenting net zero grid lines

Planning aims to regulate land use within competing demands and needs to balance nature, social, climate and economic objectives. Unfortunately, the planning system is more complicated than it was when renewables began appearing across the UK in the 1990s and 2000s, with 2 different but related systems now consenting new infrastructure development.

Development Consent Orders and Nationally Significant Infrastructure Projects

Despite the government's inception of a "new" Nationally Significant Infrastructure Projects (NSIPs) regime in 2008⁷ to both reduce the timescales of and centralise decision making⁸ for key infrastructures (eg power stations, new motorways etc)⁹ Development Consent Order (DCO) timescales have dramatically slowed, with processing times increasing by 65% since 2008. In 2014 the government found that most DCOs now [take around an average of 4 years](#) from inception to final decision.

With judicial review rates for DCOs also [jumping from 10% to 58%](#) (according to the Institute of Chartered Engineers), it's obvious that litigation could also have an impact¹⁰ on the number of new grid consents able to enter the construction phase. To put such system delay into context, National Grid estimates that to achieve just the government's 50 GW offshore wind target by 2030 will require [17 new DCO applications](#) over the next 4 years. That's a lot of strain on a creaking system.

Radically speeding up DCO processing timeframes to meet our 2030 NDC (and other targets) must be done properly and fairly, especially with local communities in mind. It's also worth pointing out that, despite the delay caused by the legal process, it was actually recent climate judicial review judgments that forced the government to review some National Policy Statements (NPSs) that guide decision making for NSIPs/DCOs, which the new Labour government has also promised to review. A summary of recent key NSIP policy changes relevant to grid lines is provided below:

Key energy policy updates: EN-1, -3 and -5

The government updated the [Energy NPSs](#) (Overriding Energy Statement (EN-1); Renewables (EN-3); Electricity Networks (EN-5)) which took effect in 2024, including:

- A new [Critical National Priority \(CNP\)](#) for offshore wind generation and low-carbon energy infrastructures, including "**all power lines** [...] network reinforcement and upgrade works, and associated infrastructure such as substations" [our emphasis].
- A "strong starting presumption" for overhead power lines outside of protected landscapes (eg National Landscapes such as AONBs, National Parks and the Broads) that have the highest level of policy protection afforded to them.
- NPS EN-5 also states that the "strong starting presumption" is reversed for developments crossing part of a nationally designated landscape. In such areas, "where harm to the landscape, visual amenity and natural beauty of these areas cannot feasibly be avoided by re-routing overhead lines, the strong starting presumption will be that the applicant should underground the relevant section of the line".
- However, even in nationally designated landscapes, undergrounding isn't compulsory: "undergrounding will not be required where it is infeasible in engineering terms or where the harm it causes is not outweighed by its corresponding landscape, visual amenity and natural beauty benefits".

Overall, despite some warranted hesitation,¹¹ the CNP and "strong starting presumption" in favour of overhead infrastructures outside of protected landscapes does bring some useful policy clarity. While not everyone agrees on these new policy positions, such clarity, together with other government announcements of an expedited DCO route for CNP developments, should mean NSIP processing timeframes for the grid will improve.

Bearing in mind National Grid's own estimates as to how many DCO applications will be needed to deliver the UK's 2030 offshore wind target, recent NPS EN-5 updates should be seen as a positive overall for net zero grid delivery, although we accept that local stakeholders may take a different point of view.

Town and Country Planning Act and Electricity Act

Not all new grid infrastructure is subject to the DCO process. Smaller scale transmission developments (eg less than 2 km of high voltage lines) can be decided by Ministerial Electricity Act 1989 powers, while proposals for compressor stations, block valves, drainage works culverting or new temporary accesses from such sites to the road network etc may also require permission from a local planning authority (LPA). In such instances, LPAs will need to consider formal planning application(s) made to them, or at least cast their eye over any submission submitted for prior approval under permitted development.

In terms of policy, the key consideration for Town and Country Planning Act (TCPA) applications is the National Planning Policy Framework (NPPF), which includes the presumption of sustainable development. While the presumption doesn't specify grid lines, it infers that development in

accordance with an up-to-date local plan should be granted without delay. This would require planning officers to check whether applications for net zero grid accord with relevant local policies, or alternatively, where [material considerations](#)² “indicate otherwise,” whether an application needs to be refused.

While not traditionally a barrier to new grid infrastructure, TCPA processing times have also slowed despite being subject to statutory limits. This is due to a mix of reduced central government funding¹³ since 2010 – [by 40% in some instances](#); constant legislative and policy tinkering by central government; and a brain drain of well-trained and experienced planning officers to the private sector where pay is generally higher.

Overall, where local planning permission is needed for associated grid infrastructure, it's likely more funding will be needed to ensure LPAs can process applications in a timely manner, otherwise planning departments could become additional bottlenecks to the delivery of the net zero grid we all need.

Balancing community impacts with faster grid delivery

Decision makers for new grid infrastructure need to balance a range of competing objectives – contributing to net zero, scheme design, landscape/ visual impacts, heritage and local amenity, and other considerations.

The National Grid already operates under its own [“Schedule 9” parameters](#) when undertaking, designing and submitting applications for new grid works. In addition, protocols (and guidance) in the Planning Act for NSIPs, especially NPSs EN-1, -3 and -5, also ensure that local community concern will be considered by law at a statutory pre-application stage (although a shorter time period for this was being considered under the last government's proposed NSIP reforms).

Despite these and other safeguards, both the Examining Authority (which makes a recommendation) and the relevant secretary of state need to ensure that, when consenting new gridlines, genuine community concerns aren't ignored (such as in the highly unlikely situation of health concerns, where residential amenity is so diminished as to make somewhere unliveable, or where potential significant cumulative landscape effects can't be mitigated).

However, there will be instances where landscape, visual or other impacts aren't as severe but at the same time can't be mitigated, perhaps because no practical alternative engineering solution exists. So trade-offs and a level of pragmatism will be required by both developers and communities in such circumstances.

Our position: landscape and visual impact

Objections to new major pylon-based transmission lines and associated grid enhancements are inevitable. In the [government's response to its 2023 NPS consultation](#), it said that, while most industry respondents favoured the "strong starting presumption" of overhead lines outside of protected landscapes (specifically in terms of cost and time efficiencies, as well as the added clarity for applicants and decision makers), "the views expressed in individual and community responses were largely against the starting presumption citing the visual and landscape impact as the most common reasons".

Such concerns are understandable, although more likely to be justified in landscape terms where overhead transmission lines are proposed within National Landscapes. While unprotected landscapes could be proposed as having more capacity to accommodate further grid lines (and associated infrastructures), landscape and visual impact assessments would still need to be undertaken by professional landscape architects and assessed robustly by decision makers to ensure this is indeed the case (reducing instances of significant cumulative effects which can't be mitigated against).

As to the visual impact of pylons, the assessment and weighting of this as a consideration is less straightforward. While visual impacts on public receptors (such as public rights of way, roads, parks etc) are taken into account as material considerations, as are impacts on the amenity of residential properties, no one has a right to a private view from their residence. Simply seeing new transmission or distribution grid lines from your property won't usually be enough to count as a material consideration for a decision maker. However, detrimental impacts on the outlook of a property, to the extent that the living conditions of it become unacceptable, could give residential amenity more weight as a consideration,¹⁴ although it's likely this would only occur in the rarest of instances.

Industry approach

The [National Grid's approach](#) is to avoid key landscape designations first:

"If we need to build new infrastructure, we will seek to avoid the following areas which are nationally or internationally designated for their landscape, wildlife or cultural significance: National Parks; Areas of Outstanding Natural Beauty; National Scenic Areas; Heritage Coasts; Preferred Conservation Zones; World Heritage Sites; Sites of Special Scientific Interest; Marine Conservation Zones; Special Protection Areas; Special Areas of Conservation; Ramsar sites; National Nature Reserves; Registered Battlefields; Scheduled Monuments and Registered Parks or Gardens."

In addition, the Holford Rules (as endorsed within [NPS EN-5](#)) represent more established guiding principles for new overhead lines, stating: "avoid altogether, if possible, the major areas of highest amenity value, by so planning the general route of the line in the first place, even if total mileage is somewhat increased in consequence".

However, even in the context of National Landscapes, it's possible that lower lying "above ground" distribution solutions may still be needed – albeit in very rare instances where no other engineering solution (eg undergrounding) is viable, or where the benefits of doing so aren't outweighed by the associated physical landscape, nature and other impacts.

Above ground or burying?

While [transmission lines can be buried underground](#), which is now the "strong starting presumption" in protected landscapes (NPS EN-5), it's worth noting that substantial cost differentials and other issues (such as nature impacts and time delays) also come into play. The National Grid estimates the comparative costs of burying versus erecting pylons as "considerable," while [research undertaken by the Institute of Engineering and Technology and Parsons Brinkerhoff](#) suggests burying is 7x more expensive than traditional pylons (although actual burial methodology, terrain type, length, designation etc all influence such costs). A more [recent government estimate](#) puts the cost differential at 10x.

The timeframes of burying are longer, and any serious problems are harder to fix due to accessibility. In addition, due to the amount of heat insulation needed around higher capacity transmission lines, the physical requirements of cable burying need spreading across a very wide trenching area (estimated at 65 metres to accommodate 12 separate cables in 4 trenches), which suggests other harms that would also need very careful consideration, including:

- Physical landscape harms in clearing, cutting and directly tunnelling into the landscape.
- Associated nature harms linked to clearing hedgerows, trees or other vegetation.
- Possible impacts on nesting/ breeding birds and other protected species as a result of "disturbance" ¹⁵

The need for sealing compounds, which transition overhead lines to underground, also results from undergrounding. Although landscape and visual harm here is more residual, it's still worth noting.

Overall, in terms of undergrounding, NPS EN-5's wording is highly relevant, in that it won't be allowed "where the harm that it causes [...] is not outweighed by its corresponding landscape, visual amenity and natural beauty benefits".

Our verdict

Despite grid providers being bound by Schedule 9 to the Electricity Act 1989 to have regard to visual and landscape amenity and to "reasonably mitigate possible impacts thereon," community concern around new transmission lines and associated infrastructures will inevitably remain.

We accept a level of concern is warranted in certain specific circumstances, such as where transmission/ distribution lines and associated infrastructures are proposed in internationally and nationally protected landscapes, or where scheme design is obviously so poor as to go against Schedule 9 principles/ NPS EN-5 landscape and amenity principles and local plan policies.

However, we also need to accept, societally, that a lot more stuff (ie transmission and distribution lines) needs to get built to achieve our 2030 NDC, 2035 grid decarbonisation and 2050 net zero targets. Not all of this grid infrastructure can be buried due to different cost, engineering and time factors – a view supported strongly by the CCC's former Chair Lord Deben.¹⁶

Not all landscapes will be nationally designated or highly sensitive, although some will also possess more capacity than others to absorb such change, either because they already accommodate pylons or have features that break up cumulative views. Sensitive siting and design of any new pylon grid will be critical in all areas, as well as robust landscape and visual assessments. Overall, a balance is needed to ensure new grid infrastructure can be rolled out quickly, but sensitively.

Our position: nature

Nature and biodiversity across the UK have been in steady decline over recent decades, with the [2023 State of Nature Report](#) stating that the species monitored have “on average, declined by 19% in the UK since monitoring began in 1970” – although for birds this figure is 43%. Habitats are also at a low point according to the same report, with “most of the important habitats for the UK’s nature in poor condition”. While Local Nature Recovery Strategies (LNRs) are slowly being introduced as a statutory means to identify land and networks to help species (flora and fauna) recover at a local level, their future implementation and location will need to be considered by grid developers, as will those of statutory protected European and national designations, especially when NESO starts formulating its approach to the Strategic Spatial Energy Plan for the UK.

Concerns for nature around new net zero grid transmission, distribution and associated infrastructures are therefore understandable. Poor system design and geographical location could have unintended consequences (eg ["disturbance"](#)) for protected sites and species already in notable decline, while annual maintenance to cut back growth could pose risks to any form of nature growing around existing sites.

At the same time, it's also reasonable to suggest that statutory protected sites are at much less risk from net zero grid infrastructure siting. New applications for grid lines (over 2 km and greater than 132 kV) and substation infrastructures are also subject to NPS EN-5 principles which embrace established Holford Rules (to guide the routing of new overhead lines) and Horlock Rules (which “should be embodied” into the siting of new substations). Those Holford and Horlock principles relevant to nature and biodiversity considerations include the following:

- Seek to avoid altogether internationally and nationally designated areas of the highest amenity, cultural or scientific value by the overall planning of the system connections.
- Consider environmental issues from the earliest stage to balance the technical benefits and capital cost requirements for new developments against the consequential environmental effects in order to keep adverse effects to a reasonably practicable minimum.
- Protect as far as reasonably practicable areas of local amenity value, important existing habitats and landscape features including ancient woodland, historic hedgerows, surface and ground water sources, and nature conservation areas.
- Avoid smaller areas of high amenity value or scientific interest by deviation, provided this can be done without using too many angle towers, ie the bigger structures which are used when lines change direction (Holford).

In addition to the above principles, DCO, TCPA and Electricity Act applications should also be subject to rigorous EIAs and Habitats Regulations Assessments (HRAs) where required. New DCO applications that failed to follow these long-standing environmental protection principles and legal requirements – by either failing to submit relevant environmental assessments or submitting a poor standard of such – could: not be “accepted”/ validated, **or** go on to be decided by the Examining Authority (re NSIPs), **or** be considered by planning committee (re smaller-scale TCPA 1990 applications).

That said, the risk of biodiversity and species impacts will always be contentious, even in instances where EU and national statutory nature sites aren't at risk. Here we'd expect grid developers and NESO (in formulating the new Strategic Spatial Energy Plan) to undertake a Strategic Environmental Assessment (SEA). This would help to mitigate major concerns by assessing the extent to which the Strategic Spatial Energy Plan (when judged against reasonable alternatives) would help achieve relevant environmental, economic and social objectives – in a nutshell, to ensure grid projects identified in the Plan are the most suitable for the context they're being located in.

With grid applicants needing to operate in line with the above mentioned Holford and Horlock principles, ensure compliance with statutory environmental protection regulations (eg EIAs and Habitats Regulations) linked to specific sites and species, and respect that even small-scale and local nature sites carry a value (whether to species on that site or wider (incoming) nature recovery network, it's likely that much-needed grid solutions can be compatibly sited to ensure protection of key existing nature designations (and their host species) as well as planned LNRSs.

Other policy considerations

We've chosen to focus on landscape and nature when coming to a policy position for new grid lines and associated infrastructures. That's not to say other planning matters are less important, only that we've prioritised these issues as they're more likely to evoke local community and wider concern.

Brief positions on some of these other considerations are given below. That's not to undermine their importance, but rather to ensure fair consideration of them for stakeholders:

1. **Heritage.** While we've included buffers to heritage assets from renewable energy generation for our [onshore renewable energy mapping](#), the more static nature of grid and associated infrastructures, and the urgency needed to help it unlock renewable energy capacity, have meant that we haven't included specific heritage policy concerns, apart from the potential for significant effects outlined above. While we acknowledge heritage considerations are relevant, the principles outlined in EN-5 and planning practice guidance above should ensure that grid developers bypass the most significant heritage assets in the first instance – although it's possible that less significant assets (eg grade II buildings) might experience some impacts on their significance (especially due to their number in rural areas). The extent of such impact needs to be weighed up against competing needs to reach binding net zero, grid decarbonisation and other climate-related commitments.
2. **Flood risk.** In many cases, electricity generation and grid lines are deemed "[essential infrastructures](#)," meaning their location within even the most susceptible areas of flood risk will likely be justified, subject to sequential and exception testing. Exception testing should ensure that grid proposed in areas more likely to flood should be climate resilient as the UK slowly starts to adapt to the effects of climate change.
3. **Health.** In terms of [Electric and Magnetic Fields \(EMFs\)](#), applicants have to demonstrate compliance with the [International Commission on Non-ionizing Radiation Protection \(ICNIRP\) guidelines 1998](#), usually by illustrating how their project meets the [government's document](#), "Power Lines: Demonstrating compliance with EMF public exposure guidelines – a voluntary Code of Practice" (February 2011). We've included a line on health in our landscape policy position to ensure we're cognisant of any such highly unlikely issues.

Conclusion

Time is running out to decarbonise the UK's power system by 2030, while a doubling of low-carbon capacity is also needed by 2050. In this context, why we need to build more net zero grid is evident, but where is somewhat less certain. By framing our net zero grid position in the context of landscape/visual **and** nature considerations – key points of concern for local communities – we've suggested a policy route through which grid delivery can be achieved, while also respecting key landscape and nature designations.

Annex: key definitions

Associated infrastructure:

- **Substations** known as the essential link between generation, transmission and the distribution systems that also allow circuits to be switched or voltage transformed to a useable level for consumers; and

- **Converter stations** to convert direct current (DC) power to alternating current (AC) power and vice versa, and particularly relevant to the conversion of long-distance offshore DC transmission to AC when it arrives onshore for distribution.

AONB: Area of Outstanding Natural Beauty.

DCO: Development Consent Order, which is a wide-ranging permission given to a NSIP for major road, electricity, energy generation etc projects following examination and recommendation from an Examining Authority.

Distribution network: lower voltage lines from 132 kV to 230 V from transmission substations to the end user, usually via smaller towers/ monopoles (and underground cables).

District Network Operators: [licensed companies](#) that own and operate the network of towers, transformers, cables and meters that carry electricity from the national transmission system and distribute it throughout Britain.

ESO: the National Grid Electricity System Operator, whose principal role includes being responsible for real-time management of the electricity system in Britain. The ESO is required to maintain a [safe, reliable and efficient electricity network](#). In practice, this means maintaining grid frequency at 50 Hz at the least cost to consumers. It achieves this by developing balancing and frequency response markets and using these to manage the system in real time. See NESO below.

EIA: Environmental Impact Assessment, a form of environmental assessment of projects to establish likely significant effects to the environment (as to the Town and Country Planning (EIA) Regulations 2017).

Examining Authority: panel of planning Inspectors assigned to ensure a DCO application has a pre-application held, processed, examined and a recommendation made to the secretary of state linked to a relevant proposal.

GVLIA 2013: [Guidelines for Landscape and Visual Impact Assessment \(2013\)](#).

HRA: Habitats Regulations Assessment, which is a requirement for the appropriate authority to undertake an Appropriate Assessment of any plan or project that's likely to have a significant effect on a protected site in its boundary area.

IROPI: "imperative reasons of overriding public interest" test, associated with the Habitats Regulations Assessment (see SPA/ SAC below), necessary where it's been demonstrated that a scheme or project is likely to impact on the integrity of an internationally protected site.

NESO: National Energy System Operator, which is a new, independent, public corporation that will be responsible for planning Britain's electricity and gas networks and operating the electricity system. As the electricity grid has become more decentralised, with intermittent renewables replacing centralised thermal generation, the system has also become significantly more complicated and expensive to manage. NESO will expand the role of the system operator (ESO, see above) significantly to address this challenge. The new system operator is able to strategically plan electricity and gas networks, provide advice to the government, and identify risks and interactions within the whole energy system. The requirement came from the 2023 Energy Act, which legislated that a "future system operator

(FSO)" be created and expand upon the role of the ESO (eg future planning).

NSIP: Nationally Significant Infrastructure Project, as defined by the Planning Act 2008 (as amended).

National Grid (plc): a British multinational electricity and gas utility company headquartered in London, England.

Residential amenity: subject to objective assessment, legal judgments have suggested that where "visual impacts from new development are such to render a property as unattractive to live, then planning permission should be refused". This led the Landscape Institute to publish a separate test, called a Residential Visual Amenity Assessment, to be used by landscape professionals, including assessing whether new development is "overwhelming in views in all directions," "inescapably dominant" or "unpleasantly encroaching". If a certain threshold is reached, such impacts can become a matter of relevance to the residential amenity of the property and then a material consideration in the planning process. It's likely such instances would be rare based on the guiding principles (eg Horlock and Holford Rules) mentioned above as well as NPS EN-5 considerations, which are also relevant and material for TCPA applications.

Right to a private view: under planning law, private individuals don't have a right to a view. Where new development is likely to significantly alter an existing view from a private property, this isn't normally a legal ground on which planning approval can be refused.

Special Area of Conservation: a designation under the EU Habitats Directive (92/43/EEC) to protect certain natural habitats (European sites) as well as fauna and flora (European species) that are considered to be under serious threat. Special Areas of Conservation also continue to apply in the UK.

NB: there are significant restrictions on development affecting a Special Area of Conservation (and related Special Protection Areas). The appropriate authority is required to undertake an appropriate assessment of any plan or project that's likely to have a significant effect on a Special Area of Conservation. This is known as a Habitats Regulations Assessment (HRA, see above) in England and Wales. Importantly, if a plan or project has a negative assessment and there's no alternative solution, it can only be undertaken if it's for "imperative reasons of overriding public interest" (IROPI, see above), including those of a social or economic nature.

Special Protection Areas: a network of areas listed (designated) to protect:

- Vulnerable wild bird species listed in Annex 1 to the EU Birds Directive (2009/147/EC) which naturally occur in the EU member states and the UK.
- Regularly occurring migratory species of birds not listed in Annex 1 which naturally occur in the EU member states and the UK.

Special Site of Scientific Interest: a site designated as being of special interest due to the flora or fauna present, or the geological make-up or physiography of the area under section 28(1) of the Wildlife and Countryside Act 1981 in England and Wales, and section 3 of the Nature Conservation (Scotland) Act 2004 in Scotland.

TCPA development: development considered under the Town and Country Planning Act 1990 by local planning, minerals and waste authorities.

Transmission network: the high-voltage electric power transmission network serving Britain, connecting power stations and major substations, and ensuring that electricity generated anywhere on the grid can be used to satisfy demand elsewhere. This includes the long distance transfer of electricity through 400 kV and 275 kV (and 132 kV in Scotland) lines, which can either be carried on towers/ monopoles or – in some instances – undergrounded. The network serves the majority of Britain and some of the surrounding islands. (NB: it doesn't cover Northern Ireland, which is part of the Irish single electricity market.) Since the privatisation of the Central Electricity Generating Board in 1990, the National Grid in England and Wales is owned by National Grid (plc) (see above) and is referenced in the above policy statement as a company.

Notes

- [1.](#) Including Sixth Carbon Budget pathways, our Nationally Determined Contribution (NDC) of 68% CO₂e reductions (compared with 1990 levels) by 2030 and a decarbonised grid by 2035.
- [2.](#) In the context of Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (and Guidelines for Landscape and Visual Impact Assessment 2013).
- [3.](#) Including harms to nature, “disturbance,” landscape and visual impacts to the national landscape (including cumulative) etc.
- [4.](#) Re Habitats Regulations Assessment (in the context of the Habitat Regulations).
- [5.](#) Cumulative, direct or indirect in the context of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017.
- [6.](#) Including the incoming Local Nature Recovery Strategy network, although some new grid could be compatible in such locations.
- [7.](#) In which a Development Consent Order (DCO) is issued by the relative secretary of state following recommendation from an Examining Authority (Planning Inspectorate).
- [8.](#) Rather than only deciding if a scheme had been “called in” or an appeal “recovered” by the secretary of state.
- [9.](#) In the case of grid and transmission lines, the DCOs system applies to “above ground” electricity lines with nominal voltage 132 kV or above; whose length is 2 km or greater; that aren't a replacement line; and that are not otherwise exempted for reasons set out in Sections 16(3)(b) and (c), (3A) and (3B) of the 2008 Act. Underground lines will only be considered if constituting “associated development” for which consent is sought along with NSIPs for overhead or offshore wind generating stations, or if the secretary of state directs that it should be treated as an NSIP (see sec 25 of 2008 Act) and requires a DCO – see page 6 of NPS EN-5:
https://assets.publishing.service.gov.uk/media/64252f852fa848000cecc0f53/NPS_EN-5.pdf
- [10.](#) As a result, the government’s latest move to try and speed up the NSIP process has been to focus on “inappropriate” legal challenges, which it says are causing “undue delays”. Lord Banner (KC) was commissioned to review whether such challenges are a major factor in holding back DCOs from being granted. From our own analysis, the fact is that many DCO judicial reviews relate to climate, especially as – up until recently – most National Policy Statements (NPSs) had not been updated since 2011, meaning their climate stances were not in line with the UK’s binding carbon budgets. With climate challenges usually brought by civil society groups as well as climate and transport charities, such indirect targeting of the sector and the potential association with wider perceived DCO delays feels slightly uncomfortable in the above context, although it should be highlighted it is usually more polluting NSIPs (such as road schemes) that are targeted. The legitimacy of such climate claims also remains, especially when such cases are usually given permission to proceed to trial by High Court judges. Fortunately, the National Infrastructure Committee’s 2023 report findings echo our own understanding: that as many NPSs hadn
- [11.](#) Eg NGO concerns around the interaction of the CNP with the well-regarded Habitats Regulations, and a proposed shortening of statutory DCO pre-application and examination timeframes.

- 12.** These can include outlook, amenity, noise, scale, impact on character or appearance of area, effect on listed buildings etc, national policy and written ministerial statements but not, for instance, the loss of a private view or property devaluation.
- 13.** Eg in Bristol, local planning officer resource is so limited that almost no enforcement is being undertaken, with resources instead being focused on application processing – mainly as decision making carries more "stick" from central government if targets are missed. <https://www.bristolpost.co.uk/news/bristol-news/planning-enforcement-bristol-almost-no-9234425>
- 14.** The Landscape Institute published a separate test, called a "Residential Visual Amenity Assessment," to be used by landscape professionals, including to assess whether new development is: "overwhelming in views in all directions," "inescapably dominant" or "unpleasantly encroaching". However, the threshold is high to reach, and the weighting attached is based on subjective judgement in planning terms.
- 15.** Although an element of "disturbance" would also apply to maintaining/ strimming vegetation underneath existing and new pylons, especially if crossing through woodland etc.
- 16.** Lord Deben mentioned this again as recently as 20 June 2024 on BBC Radio 4's PM Programme.