Energy Networks Association submission to the 2023 Spring Budget

Introduction

1. Energy Networks Association (ENA) represents the companies that operate and maintain the gas and electricity network infrastructure in the UK and Ireland.
2. Serving over 30 million homes and businesses in every part of the country, they are responsible for the transmission (long-distance, high pressure/voltage) and distribution (short-distance, lower pressure/voltage) network of 'wires and pipes' that keep our lights on, our homes warm and our businesses running.
3. In summary:
    - The electricity network in the UK and Ireland comprises of around 1,000,000km of cables – enough to go around the world 25 times[1].
    - The gas network consists of 300,000km of pipelines, with 85% of homes in Great Britain relying on the energy they supply for their heating, hot water and cooking[2].
    - Energy network companies' assets in Great Britain alone are valued at £64bn.
    - Network companies already directly employ around 36,000 people across Great Britain and support the employment of 1,200 apprentices[3], providing direct and indirect jobs in supply chains help support long-term, good quality, high-skilled employment in the communities they serve.

Summary of our proposed policy changes

4. In this submission to the 2023 Spring Budget, **we propose legislative and regulatory changes in six areas** to current government and regulatory policy that are necessary to help unlock investment through energy network companies, which is required to ensure Britain's energy network infrastructure continues to support our country's economic needs as it decarbonises.
5. These changes are summarised as follows, with more detail provided in the table below.

i. Regulatory reform to unlock strategic investment in energy network infrastructure, by:

- Updating Ofgem's remit to incorporate the government's net zero target as set out in the 2008 Climate Change Act. This is important so that long term Net Zero goals are recognised and planned in now.
- Issuing guidance to Ofgem to unlock strategic energy network infrastructure investment, in the form of a Strategy & Policy Statement.

ii. Accelerating investment in hydrogen network infrastructure, by:

- Accelerating the development of a regulated asset base business model for hydrogen network infrastructure, with an interim measure introduced until that business model is finalised.
- Developing a business model to support the blending of hydrogen into gas networks by hydrogen producers.

iii. Reforming the land rights & consenting process for energy network infrastructure, by:

- Reforming the Planning and Electricity Acts to permit timely and cost-effective installation and maintenance of electricity infrastructure.

iv. Growing new smart energy markets to maximise energy network infrastructure capacity, by:

- Introducing new financial support, allowances, incentives or business models to reduce the upfront costs of smart 'behind the meter' low-carbon technologies for households and businesses.

[1] Energy Networks Association website, 'Energy Networks Explained', retrieved October 2022.
[2] Ibid.
[3] Ibid.

- Mandating that new low-carbon technologies in homes & businesses installed are 'smart' to they can take part in flexibility markets.
- Introducing a licence requirement on energy suppliers to offer flexibility services to households.

v. Confirming future innovation funding for energy network infrastructure, by:

- Confirming the extension of the Network Innovation Allowance beyond 2026 or confirm its intention to develop a successor allowance of a similar nature.

vi. Developing a policy strategy for seasonal energy storage, by:

- Updating the British Energy Security Strategy to include a commitment to deliver an energy storage strategy by the end of 2023, which defines what business models will be developed to secure investment in seasonal energy storage.

6. The section of this submission headed 'The economic role of energy network infrastructure' sets out the economic role of energy network infrastructure in the UK economy and how the needs of that role are changing in response to decarbonisation.
7. The section headed 'Proposed policy changes for the 2023 Spring Budget' sets out the details of why and how these policy changes should be made and the wider benefits they can deliver.

The economic role of energy network infrastructure

8. High-quality, well-run, efficient and capable energy network infrastructure is a crucial tool for supporting the United Kingdom's economic prosperity in **three key ways**. These areas underpin the policy changes which we propose in this submission.

By supporting productivity growth

8. Smart, innovative energy network infrastructure, with defined outputs which are incentivised through the price control system of regulation, supports the efficient production of goods and services by finding new ways to keep the cost of delivering energy as low as possible on an ongoing basis.
9. Energy network innovation incentives and the use of new energy markets (flexibility markets, see Appendix A) help improve this efficiency by finding new ways to use existing network capacity more effectively, with data of energy usages and profiles playing a key role in managing stable and reliable energy supplies.
10. There is a strong link between access to new forms of energy supplies and productivity growth. Innovative energy network infrastructure that can adapt to the needs of its customers allows producers to connect new, more efficient technologies to those energy supplies, whilst maintaining security of supply for all users in an affordable way, helping reduce productivity constraints in the economy. This is particularly relevant as our economy adopts new low-carbon technologies in response to decarbonisation.

By reducing inflationary pressures

11. Connecting new sources of GB-based forms of renewable energy, such as wind or solar farms and hydrogen production, to energy networks helps reduce the overall impact of energy price-driven inflation on our economy.
12. Increasing the capacity of our energy networks, by both building new infrastructure and making smarter use of existing infrastructure through energy flexibility markets, is key to ensuring those connections are delivered as swiftly as possible.
13. The use of data and new smart energy markets by network companies creates the opportunity for homes, businesses and communities to use energy at those times when costs are lowest, helping reduce the impact of energy bill-driven inflation further still.
14. Taking a 'whole-system approach' to the design and delivery of energy network infrastructure ensures energy resources are used as economically efficiently as possible, keeping the costs of those resources and the running of our energy system to our economy as low as possible (see Appendix B).

15. The costs of private investment in energy network infrastructure are socialised and, through a regulated asset base model, spread over several generations of energy billpayers, helping keep their upfront costs low to the billpayer.

By reducing regional economic imbalances

16. Higher levels of GDP are correlated with greater electricity use, access, reliability, and affordability[4]. As such, uniformity of high standards of energy network performance and service not only play a vital role in supporting economic growth across the country (avoiding 'postcode lotteries' in terms of access to, reliability of and affordability of energy supplies) but in helping address regional economic imbalances too.

17. The geographic size and scale of energy network infrastructure also means that the supply chain benefit of investment in that infrastructure to reach net zero will provide a long-term economic stimulus that is both national and local in its impact, creating new green skills and jobs across the country.

> **Case study: Supporting green, regional growth in Britain's Industrial Clusters**
>
> Many of Britain's heavy industries, such as those manufacturing steel, iron, paper, ceramics and chemicals, currently rely on natural gas in their manufacturing processes. In the UK, these industries are concentrated in six Industrial Clusters and contribute £170 billion to the economy.
>
> Low-to-zero carbon gases, such as biogas and hydrogen, need to be available to these businesses from our energy networks as an alternative so they can remain internationally competitive.
>
> Energy networks have proposed to invest £4.4bn in the next ten years so they can build the new and repurpose the existing gas network infrastructure needed to produce, store and distribute hydrogen while capturing and storing carbon from Britain's Industrial Clusters, helping secure the long-term future of these industries in a net zero economy.
>
> There is also a direct supply-chain benefit to this investment too. Using the Office of National Statistics methodology, the investment is forecast to create 17,000 high-tech green jobs in north-west England, the Humber and Teesside, Southampton, north-east Scotland and south-east Wales, as well as other locations.

9. The price control regime used for regulating Britain's energy network infrastructure is considered world-leading in terms of securing investment which in turn drives economic efficiency and performance that is related to agreed outcomes.

10. By 2019, investment since privatisation in 1990 stood at £100bn[5], much of which has been focussed on improving the performance and efficiency of existing infrastructure. As a result:

    - Since 1990 homes and businesses now have 59% fewer power cuts. The length of those power cuts has been reduced by 84%[6].
    - Since 2013, energy networks have successfully managed a significant increase in connections (due to the growth of renewable energy) whilst reducing the time taken to provide those connections. There has been a 23% improvement on the number of working days taken to connect to electricity distribution networks (compared to 2013 averages)[7]. A total of 24.4GW of distributed generation has been connected to electricity networks since the beginning of the RIIO-1 price control for energy networks in 2013[8].

[4] Stern, Burke & Bruns, "The Impact of Electricity on Economic Development: A Macroeconomic Perspective", 2018.
[5] Ofgem, 'Network price controls and you', 2018.
[6] Ibid.
[7] Chapter 2 Connections, RIIO-ED1 Annual Report 2020-21 Supplementary Data File.
[8] Table 6.2, DUKES, Department for Business, Energy & Industrial Strategy, July 2022.

- The total capacity of renewable energy connected to the GB electricity networks (distribution and transmission) now stands at 49.7GW[9].

11. Through the Ofgem-administered RIIO-2 price control, Britain's energy network companies are expected to invest a total of £43.7bn of private capital between 2021 and 2028 in energy network infrastructure in communities across the country[10], an average of £8.7bn a year.
12. Under the previous RIIO-1 price control, network companies will have delivered £65bn of investment infrastructure around the country between 2013 and 2023, an average of £8.1bn a year[11].
13. The strong performance of the current RIIO regulatory framework and its predecessors is a result of regulatory and government policy decisions that have successfully secured private investment which has been used to drive efficiency and performance, in terms of running existing and replacing energy network assets.
14. However, with the long-term direction of travel of decarbonisation policy well established towards the 2050 net zero target and near-term government targets for the developing of 10GW of hydrogen production capacity (2030) and the decarbonisation of electricity supply (2035), it is widely considered that this more focussed approach needs to be broadened.
15. There now needs to be an additional focus on unlocking private investment through the price control for energy network companies to build and transform energy network capacity, to meet the needs of the low-carbon technologies required to meet those targets and ensure that Britain's energy network infrastructure can continue to deliver the wider economic benefits set out above.

Proposed policy changes for the 2023 Spring Budget

16. The following proposed policy changes will make a major contribution to delivering the change in approach we set out above.
17. The table below also sets out the rationale for those proposed policy changes and their method of delivery, as well as the wider impacts of them.

Area	Rationale	Proposed policy changes & their delivery	Wider impacts of these proposed changes
Regulatory reform to unlock strategic investment in energy network infrastructure	• Restricting the ability of network companies to invest leads to a lack of network infrastructure capacity, which slows down the deployment of low-carbon technologies. The current regulatory system should be adapted so that energy network companies can plan and deliver investment in new network infrastructure in a proactive, strategic way. • The existing process for securing regulatory approval for investment in energy networks via Ofgem is lengthy,	• The government should update Ofgem's remit to incorporate the Government's net zero target as set out in the 2008 Climate Change Act. • Under Part 5 of the 2013 Energy Act, the government should issue guidance to allow for strategic energy network investment, in the form of a Strategy & Policy Statement (SPS).	• Government analysis suggests that overall electricity demand from the UK economy could increase from its current level of 330 TWh per annum to between 450-500 TWh by 2035 and between 570-770 TWh by 2050[12]. New network capacity is essential to help meet that demand. • National Grid ESO modelling has estimated that network constraint costs could increase from around £500 million per year in 2021 to a peak of between £1-2.5 billion per year in the mid-late 2020s, before falling away at the end of the decade when new major investments in electricity transmission network capacity are assumed to come online[13]. • Distribution Network Operator Embedded Capacity Registers show that there is currently 20.7GW of renewable generation connected to the distribution networks in GB and a further 70.0GW of renewable

[9] Ibid.
[10] Calculated by ENA from Ofgem RIIO-2 price control Final Determination announcements in 2020 & 2022.
[11] Calculated by ENA from Ofgem Annual Network Performance Reports for the RIIO-1 period, 2013-2023.
[12] Rt. Hon. Chris Skidmore, 'Mission Zero: An independent review of net zero', January 2023.
[13] Ibid.

Area	Rationale	Proposed policy changes & their delivery	Wider impacts of these proposed changes
	reactive and based on a backwards looking assessment of existing needs, rather than a forward-looking assessment. • There is an absence of policy and legislative direction to Ofgem, to ensure that decisions made through the price control for energy networks deliver anticipatory, strategic investment which ensures sufficient network capacity is in place for low-carbon technologies to connect to the energy networks.		capacity presently expected to connect. The regions with the highest levels of new capacity classed as 'accepted to connect' include West Midlands, Eastern England, and East Midlands with 10.6GW, 10.3GW and 10.1GW respectively, indicating the parts of the country most likely to benefit economically from strategic investment in new network capacity[14]. • As there will be additional energy network capacity, it will be possible to connect new energy technologies to networks more quickly & efficiently than is presently the case. This includes new GB-connected sources of renewable electricity production (wind and solar farms), which can have a significant impact on reducing the UK's exposure to international fossil-fuel markets which are a core driver of inflation. • Producers of goods and services will be able to access low-carbon technologies, their related markets (flexibility markets) and services more easily and quickly. This will enable them to improve their energy efficiency whilst also responding to market price signals, enabling them to reduce their energy costs. This will help them to grow productivity, whilst improving their competitiveness. • Network companies will also be able to plan and deliver investment proactively rather than reactively, helping reduce the cost of that investment to the economy. • The costs of this private investment in energy network infrastructure, through the price control, are socialised and spread over several generations of energy billpayers, helping keep upfront costs low to the billpayer. No Exchequer funding would be required but supply-chain economic benefits are likely to contribute to revenues. • The nature of this investment be naturally dispersed in communities around the country in those areas where capacity is required, not only helping ensure access to electricity, low-carbon technologies and associated services for regional economies but also providing wider supply chain benefits too.
Accelerating the development hydrogen network infrastructure	• The overall pace of the government's progress on developing hydrogen network infrastructure business models means that, at the current speed, it is likely that the government will miss its	• The Department of Business, Energy & Industrial Strategy should accelerate its development of a regulated asset base (RAB) business model for	• Financial Investment Decisions on key hydrogen projects must be made in the next 12 months in order to meet the government's ambition for two CCS clusters by 2025. These decisions are dependent on the development of the business models.

[14]Cornwall Insight, 'Waiting to connect: the problems and solutions for network connection queues', January 2023.

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	target to develop 10GW of GB hydrogen production. • Blending up to 20% hydrogen into our existing gas network (by volume) could reduce carbon emissions by the equivalent of 2.5m cars a year, while providing a route to market for a nascent hydrogen production industry. However, no mechanism exists to encourage that blending to take place.	hydrogen network infrastructure. • An interim RAB-based model should be introduced for nearer term hydrogen transport projects, either via a bespoke mechanism or through the existing RIIO price control framework for energy networks, pending the finalisation of hydrogen transportation business models. • A business model for hydrogen blending should be developed, with sufficient funding to enable blending at scale.	• Network infrastructure is essential to provide an economically viable route to market for hydrogen production. Analysis by BloombergNEF estimates that it will be almost 90% cheaper to transport the clean hydrogen by gas pipelines than it will be by road[15]. Using existing pipelines over road is clearly more sustainable too. It will help ensure that Britain's maintains its leading position at the front of the emerging global market for hydrogen. At the same time, analysis by the Confederation of British Industry (CBI) suggests that Britain may lose market share in hydrogen electrolyser production to the value of £1.3bn in the next 7 years without greater support[16]. • Many of Britain's heavy industries, such as those manufacturing steel, iron, paper, ceramics and chemicals, currently rely on natural gas in their manufacturing processes. In the UK, these industries are concentrated in six Industrial Clusters and contribute £170 billion to the economy[17]. Low-to-zero carbon gases, such as hydrogen, need to be available from our gas networks as an alternative. • Hydrogen infrastructure will keep the cost of producing and delivering energy as low as possible for the economy as the use of hydrogen increases, both in terms of the running of the infrastructure and by providing the widest possible range of entry points for energy production and exit points for its consumption. • Hydrogen infrastructure, through a whole systems approach (Appendix B) will help reduce the annual £1.2bn cost to the economy due to constraint payments, with new markets for green hydrogen instead[18]. • Hydrogen blending breaks the historical 'chicken and egg' relationship between hydrogen supply and demand, by enabling the existing energy system to unlock hydrogen demand and support production[19]. • Blending makes hydrogen projects more investible as hydrogen producers are looking for ways to de-risk off-taker demand. Hydrogen blending in the distribution networks alone could support circa. 5 GW of hydrogen production and

[15] BloombergNEF, 'Hydrogen Economy Outlook', 2020.
[16] Confederation of British Industry (CBI), 'Green growth: The UK is falling behind', 2023.
[17] Department of Business, Energy & Industrial Strategy, 'Industrial Decarbonisation Strategy', 2021.
[18] Calculated by the Department of Business, Energy & Industrial Strategy using data from National Grid ESO, Monthly Balancing Services Summary, 2022.
[19] Hydrogen UK & REA; "The Value of Blending in the Nascent UK Hydrogen Economy", December 2022.

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			has the lowest risk profile of hydrogen off-takers[20]. • Blending has the potential to generate over £2.7 billion p/a of social value in reduced emissions[21]. • Hydrogen production and blending will take place from diverse and dispersed locations, so the locational impact of its associated network infrastructure will mirror that.
Reforming the land rights & consenting process for energy network infrastructure	• Most of the gas and electricity network infrastructure in Great Britain is built on private land. Access by network companies is required for the building, operation, maintenance and upgrade of network infrastructure. • The current framework (Planning Act 2008 & Electricity Act 1989) for building new and the upgrading of existing electricity infrastructure is not fit for purpose and needs reform. • The processes for securing land rights and Section 37 consents currently risk being one of the main contributors to delays in the delivery of the nationally significant network infrastructure projects that are required to reduce our carbon emissions.	• The Planning Act 2008 and Electricity Act 1989 and their supplementary legislation should be reviewed to permit timely and cost-effective installation and maintenance of electricity infrastructure – both for new and existing energy network assets. • ENA has delivered and submitted to BEIS its 9-Point Plan: "A blueprint for modernisation of the land rights and consents framework for electricity networks", which sets out the detail of how these reforms should take place (see Appendix C).	• Because there will be additional energy network capacity, it will be possible to connect new energy technologies to networks more quickly and efficiently than is presently the case. • This includes new UK-connected sources of renewable electricity production (wind and solar farms), which can have a significant impact on reducing the UK's exposure to international fossil-fuel markets which are a core driver of inflation. • Distribution Network Operator Embedded Capacity Registers show that there is currently 20.7GW of renewable generation connected to the distribution networks in GB and a further 70.0GW of renewable capacity presently expected to connect. The regions with the highest levels of new capacity classed as 'accepted to connect' include West Midlands, Eastern England, and East Midlands with 10.6GW, 10.3GW and 10.1GW respectively, indicating the parts of the country most likely to benefit economically from strategic investment in new network capacity[22]. • Producers of goods and services will be able to access low-carbon technologies, their related markets (flexibility markets) and services more easily and quickly to grow their productivity, whilst improving their competitiveness. • Network companies will also be able to plan and deliver investment proactively rather than reactively, helping reduce the cost of that investment to the economy. • These changes are legislative with no major expected cost to the Exchequer but will have a significant impact in unlocking private investment in energy network infrastructure. No Exchequer funding would be required but supply-chain economic benefits are likely to contribute to revenues. • Energy network infrastructure investment is naturally dispersed both in communities

[20] Ibid.
[21] Ibid.
[22] Cornwall Insight, 'Waiting to connect: the problems and solutions for network connection queues', January 2023.

Area	Rationale	Proposed policy changes & their delivery	Wider impacts of these proposed changes
			around the country in those areas where capacity is required but in those areas where access to existing infrastructure is needed. It will not only help ensure access to electricity, low-carbon technologies and services for regional economies but also provide wider supply chain benefits too.
Growing new smart energy markets to maximise energy network infrastructure capacity.	• Smart flexibility markets rely on low-carbon technologies (such as heat pumps, electric vehicle chargers or batteries) which can automatically vary their energy consumption in-line with signals sent by network operators responsible for balancing electricity supply and demand, in return for payment. This helps maximise the capacity of network infrastructure. • GB energy networks have successfully developed flexibility markets in recent years, mainly by working with industrial and commercial customers, such as manufacturing plants or supermarkets, who are already using smart low-carbon technologies as part of their commercial facilities management. • Household-installed low-carbon technologies have major potential to contribute to flexibility markets, and so help run network infrastructure more efficiently whilst freeing up new network capacity for connecting technologies. Supporting the adoption of those technologies will help fulfil that potential. • A lack of network capacity slows down the deployment of the low-carbon technologies. For those looking for a connection to the	• The government should Introduce new financial support, allowances, incentives or business models to reduce the upfront costs of smart 'behind the meter' low-carbon technologies for households and businesses. • New low-carbon technologies in homes & businesses installed should be mandated to be 'smart' so they can take part in flexibility markets. • It should introduce a licence requirement on energy suppliers to offer flexibility services to households.	• The UK market for smart system equipment and services could plausibly support nearly £1.3 billion GVA and 10,000 jobs per annum by 2050. Exports could plausibly support £2.7 billion in GVA and 14,000 jobs per annum to the UK economy in 2050[24]. • Energy costs for both homes and businesses will be kept low. By 2030, smart energy technologies using new smart energy flexibility markets could save the equivalent of £300 a year for households in Great Britain[25]. Producers of goods and services will be able to access low-carbon technologies, their related markets (flexibility markets) and services more easily and quickly to grow their productivity, whilst improving their competitiveness. • Whilst new network infrastructure will still need to be built, the costs of this investment will be will also be kept down. £8bn[26] a year could be saved by networks investing in innovative low carbon technologies that allow them to avoid building new network capacity which might otherwise be unavoidable. • Distribution Network Operator Embedded Capacity Registers show that there is currently 20.7GW of renewable generation connected to the distribution networks in GB and a further 70.0GW of renewable capacity presently expected to connect. The regions with the highest levels of new capacity classed as 'accepted to connect' include West Midlands, Eastern England, and East Midlands with 10.6GW, 10.3GW and 10.1GW respectively, indicating the parts of the country most likely to benefit economically from flexibility markets used to create additional capacity from existing infrastructure[27]. • New low-carbon technologies used by homes and businesses will be connected in a way that does not compromise the delivery of energy in a reliable & affordable way to all energy consumers.

[24] Vivid Economics, 'Energy Innovation Needs Assessment: overview report', 2020.
[25] National Infrastructure Commission (NIC), 'Smart Power', 2015.
[26] Department of Business, Industry & Energy Strategy website, 'Official Statistics Electric vehicle charging device statistics', retrieved January 2022.
[27] Cornwall Insight, 'Waiting to connect: the problems and solutions for network connection queues', January 2023.

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	electricity transmission system alone, the queue currently comprises nearly 240GW of new electricity generation and interconnector schemes (compared with 82GW of connected capacity today), made up of over 600 projects and extending 11 years into the future[23].		• Because flexibility markets existing network infrastructure to be run more efficiently, it will be possible to connect new energy technologies to networks more quickly than is presently the case. • This includes new GB-connected sources of renewable electricity production (wind and solar farms), which can have a significant impact on reducing the UK's exposure to international fossil-fuel markets which are a core driver of inflation. • Financial support for low-carbon technologies is likely to be funded via Exchequer revenue but can be expected to contribute to the government's target to reduce energy demand, and its related costs to the economy, by 15% by 2030, improving the productivity of the UK economy. • It will also help ensure broader access to those technologies than might otherwise be the case, widening participation in flexibility markets from both businesses and households across the country.
Confirming future innovation funding for energy network infrastructure	• Innovation and adaptability are critically important for energy network infrastructure to keep pace with the development of low-carbon technologies and fuels such as wind and solar farms, electric vehicle charge points, hydrogen boilers, heat pumps and green gases. • This is because network companies need connect these technologies whilst not compromising reliable, affordable and secure energy supplies to all energy users. • The Network Innovation Allowance (NIA), regulated through the price control for energy networks, is an important means of ensuring network companies can use their spending allowances to fund smaller-scale innovation projects in an agile way	• Ofgem should either confirm the extension of the Network Innovation Allowance beyond 2026 or confirm its intention to develop a successor allowance of a similar nature.	• NIA funding will help support the wider UK energy innovation industry, with 88% of all energy network innovation projects in 2020/21 including collaboration with third-party organisations. Between 2013 and 2022, energy network companies invested a total of £660m in NIA innovation projects across 1285 projects. The outcomes of those projects were required to be publicly shared with the wider energy industry, helping boost wider understanding of the impact of that innovation. • NIA projects have and are playing a key role in developing a smarter energy system. The UK market for smart system equipment and services could plausibly support nearly £1.3 billion GVA and 10,000 jobs per annum by 2050. Exports could plausibly support £2.7 billion in GVA and 14,000 jobs per annum to the UK economy in 2050[28]. • A total of £8bn[29] a year could be saved by networks investing in innovative low-carbon technologies that allow them to avoid building new network capacity which might otherwise be unavoidable. • NIA funding can make a noteworthy contribution to the UK's innovation funding targets. UK R&D investment is 1.7% of GDP while average spend in OECD

[23] National Grid Electricity Transmission website,' Queue management: the next step in accelerating grid connections', November 2022.
[28] Vivid Economics, 'Energy Innovation Needs Assessment: overview report', 2020.
[29] Department of Business, Industry & Energy Strategy website, 'Official Statistics Electric vehicle charging device statistics', retrieved January 2022.

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	that is quickly responsive to wider industry needs. • Under existing arrangements, these projects must be focussed on supporting the delivery of net zero and/or supporting vulnerable customers. • It is unclear whether NIA funding will continue from 2026 onwards, which means energy network companies cannot plan innovation projects through the NIA in the medium to long-term, just at the point when the connection and management of low-carbon technologies is due to accelerate.		countries is 2.4%. In July 2020, the government reaffirmed its commitment to increase R&D investment to 2.4% of GDP[30]. • New low-carbon technologies used by homes and businesses will be connected in a way that does not compromise the delivery of energy in a reliable and affordable way to all energy consumers. • Producers of goods and services will be able to access low-carbon technologies, their related markets (flexibility markets) and services more easily and quickly. This will help them find new ways to reduce their energy bills, as these technologies and markets develop. The proportion of innovation active businesses in the UK has decreased from 49% in 2014-2016 to 38% in 2016-2018[31]. • Energy costs will also be kept as low as possible as the energy system decarbonises to meet net zero obligations, as network companies find new ways to run their existing network infrastructure more efficiently. • UK connected sources of renewable electricity production (wind and solar farms) will be connected more quickly which can have a significant impact on reducing the UK's exposure to international fossil-fuel markets which are a core driver of inflation. • Network company innovation supply chains will remain intact, avoiding suppliers to investing and exploring other sectors outside of energy, keep the cost of innovation as low as possible. • The costs of NIA funding (which is private investment delivered through the price control) are socialised and spread over several generations of energy billpayers, helping keep its upfront costs low to the billpayer. No Exchequer funding would be required but supply-chain economic benefits are likely to contribute to revenues. • NIA funding is accessed by all energy network companies and does not have any geographic constraints; it is deployed at those locations where it is required. Therefore it can be expected to have a diverse and dispersed location impact. • Under current arrangements, NIA funding must be used for either supporting vulnerable customers or assisting the transition to net zero. In the case of the former, examples include projects using

[30] Department of Business, Industry & Energy Strategy, 'Evidence for the UK Innovation Strategy', October 2021.
[31] Ibid.

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			smart meter data to identify customers in vulnerable or fuel poor situations to inform network companies' vulnerability strategies, and projects to support the roll out of public electric vehicle chargers for disabled blue badge parking bays, to improve the accessibility of EV charging facilities.
Developing a policy strategy for seasonal energy storage	• It is estimated that 150 TWh of hydrogen storage is required to replace the seasonal variation in natural gas production that is currently used by our economy. There is potentially up to 6,900 TWh of hydrogen storage capacity in UK gas fields and a further 2,200 TWh of potential in saline aquifers[32]. • The starting point for any consideration of seasonal storage should be what role it will play in our energy system, particularly in terms providing energy system flexibility and security of supply. • Disused oil and gas fields are most suitable for long-term hydrogen storage (monthly and seasonal), with salt caverns being used for mid-term storage (daily, weekly, monthly). • A policy strategy is needed to define the business models that are required to unlock private investment in developing these energy storage assets.	• Update the British Energy Security Strategy to include a commitment to deliver an energy storage strategy by the end of 2023, which defines what business models will be needed to secure investment in seasonal energy storage.	• Seasonal energy storage will be crucial to running an efficient, resilient energy system for our economy, as we shift away from a market that is orientated around easily storable and transportation fossil fuels to one which is based around more inflexible electricity generation. • Seasonal storage lies at the centre of a whole system approach to decarbonisation (Appendix B), allowing our energy system to replace system costs such as constraint payments (currently at £1.2bn a year (2021)) with new markets for storable energy such as green hydrogen. • Without seasonal storage, a significant amount of installed electricity generation capacity would be necessary to maintain energy system resilience, at a significant cost to the economy. ENA analysis suggests that 500 - 600GW of installed wind capacity would be required to deliver the same level of resilience without seasonal storage[33]. • Seasonal storage improves resilience of energy supplies at the point of highest demand, helping provide a buffer against energy price shocks that have an inflationary impact. • Repurposing disused oil and gas fields for hydrogen can help support the transition of the UK's North Sea fossil fuel production industry and communities on the east coast of England and Scotland. • Large scale storage capacity will also create greater opportunities to take part in international hydrogen markets from a stronger position. • There would be no short-term cost to the Exchequer of developing this strategy, though it will be necessary to consider how any business models developed through it funded, if not through private capital under a price control.

[32] Scafidi, Wilkinson, Gilifillian, Heinemann, Haseldine (Edinburgh University), International Journal of Hydrogen Energy, 'A quantitative assessment of the hydrogen storage capacity of the UK continental shelf', February 2021

[33] Energy Networks Association, "System For All Seasons", 2021

Concluding remarks

18. Britain's world-leading energy network infrastructure plays a vital role in the economic health of country, with safe, reliable and sustainable energy supplies being a precondition of continued growth, productivity and prosperity.
19. Through the price control system, energy network companies have a strong track record of successfully delivering private capital that leads to improvements in performance outputs that deliver economic benefits to the wider UK economy.
20. However, that investment and those performance outputs have, to date, largely focussed on driving efficiency, affordability and reliability improvements of existing infrastructure. That focus now needs to be broadened to deliver the investment in network infrastructure that is necessary for the decarbonisation of the UK economy and wider benefits that flow from that, which we set out in this submission.
21. The proposed policy changes set out in this submission can have an immediate impact in terms of delivering that change, with the resultant economic benefits we have highlighted.
22. ENA would welcome the opportunity to discuss these proposed changes in more detail either before or after the 2023 Spring Budget. If you would be interested in doing so, or require additional information about the proposals in this submission, then please contact Edward Gill, Head of Markets Policy, via edward.gill@energynetworks.org.

Appendix A: What are smart energy 'flexibility' markets?

Traditionally, the job of energy network companies was to simply build enough wires and pipes so our energy system had enough capacity to deliver a fairly fixed amount of electricity and gas at fairly predictable times of the day. This made planning how much infrastructure was needed to do that, within certain tolerances, fairly straightforward.

Renewable energy production, such as electricity produced from wind or solar farms, means that the times and quantities of electricity transported by the energy networks varies more than it used to. These energy sources often behave differently too, which if not managed correctly can affect the stability of electricity supplies.

At the same time, many of these sites are connected to locally based infrastructure that was originally designed for distributing electricity in one direction, from a small number of large, centralised power plants.

In the last twenty years or so, the number of renewable energy projects connected to local distribution grids has increased markedly.

To accommodate this change, electricity networks have been changing the way they run their infrastructure from being a 'one-way street' to a 'two-way street' using 'flexibility markets'. These markets use data and smart technologies in homes, businesses and communities, like electric vehicle chargers that can vary how fast they charge, ensuring energy demand more closely matches electricity production. They allow network operators to make more use of existing infrastructure, avoiding the need to build new network infrastructure in some instances. This improves the efficiency and reduces the costs of meeting net zero.

These markets make it easier for renewable electricity producers to connect to the energy networks because network operators have more certainty about how energy will be produced and used, freeing up spare grid capacity and also reducing the possibility that producers will have to be constrained from producing electricity.

These markets are an essential tool in the toolbox that energy networks will use to deliver net zero.

Britain is a world leader in this area of energy expertise. Figures published by ENA in July 2022 showed that in the preceding 12 months 3.7GW of distribution network flexibility capacity was tendered – more than the capacity of the Hinkley Point C nuclear power plant.

Appendix B: Using decarbonisation to create a more efficient energy system

The amount of electricity that wind and solar farms generate varies from hour to hour, day to day and season to season, in accordance with the weather.

For 24 hours a day, 365 days a year, we need to ensure that not only the quantity of electricity fed into the grid match the demand for it, but the supply of electricity remains stable too.

Flexible power plants which use natural gas today (and in the future are expected to use hydrogen or biomethane) play an important role in providing that stability by generating electricity for those times when the wind doesn't blow or the sun doesn't shine, ramping production up and down as and when needed. For the most extreme periods, where high pressure weather systems lead to freezing temperatures and very lower wind/solar output (often referred to as 'Dunkeflaute' in the industry), gas plays an incredibly important role in keeping the lights on, our homes warm and our factories productive. These periods will become ever more critical as our electricity system becomes more dominated by renewables, and we will need to look to develop renewables gases (hydrogen and biomethane) as the key tool to manage the system in these periods.

On the other hand, there are also times when the amount of electricity produced by wind and solar exceeds the amount that is needed by our homes and communities. During these times, 'green' hydrogen can be produced using surplus electricity and stored for use at a later date, increasing the efficiency and productivity of renewable generation, helping increase revenue streams and attract future investment. This approach turns the cost of existing constraint payments paid to inflexible power producers to stop generating electricity (currently £1.2bn a year)[34], into new markets that can deliver wider economic value.

Potential uses for this hydrogen include flexible electricity generation for those times when wind speeds are slow or sunlight hours are short, domestic consumption for heating, cooking and hot water as an alternative to natural gas and as a source of decarbonised gas for the energy intensive industries producing ceramics, steel and other products.

[34] Calculated by the Department of Business, Energy & Industrial Strategy using data from National Grid ESO, Monthly Balancing Services Summary, 2022.

Appendix C: A blueprint for modernisation of the land rights and consents framework for electricity networks

Setting a legislative framework that best facilitates quicker more efficient delivery of new, upgraded and refurbished electricity infrastructure across all voltage levels i.e. transmission and distribution in England & Wales and Scotland is necessary and will require coherent change.

The current framework (Planning Act 2008 or Electricity Act 1989) for building new and the upgrading of existing electricity infrastructure is not fit for purpose and is in need of reform. Large parts are now 33 years old and electricity Transmission and Distribution goals are substantially different today and will be more so in the future.

Primary and supplementary legislation should be reviewed to permit timely and cost-effective installation and maintenance of electricity apparatus to address the needs of our customers and stakeholders.

ENA has developed a 'Nine-Point Plan' *A Blueprint for Modernisation of the Land Rights and Consents Framework for Electricity Networks.* The plan provides a high-level summary of the statutory changes that the industry believes are required as a minimum to better enable it to succeed in delivering its part of the Net Zero and security challenge.

Nine Point Plan - Summary of recommended changes

Point 1: Acquisition of new land rights (EA 1989, Section 10, Schedule 3 & Schedule 4 para 6)

The current statutory process whether using schedule 3 or 4 can be disproportionally expensive, slow and has a high degree of uncertainty, with vulnerability to unreasonable landowner expectations. The increased costs which arise are subsequently borne by all electricity network users. Consequently, it is unsuitable for ensuring the timely and cost-effective delivery of network upgrades and new connections which are essential for the large-scale deployment of technologies, like EVs and heat pumps and connection of new low-carbon generation.

Frameworks that govern other utility sectors exist or have been modernised consistent with best practice in order to ensure that barriers do not exist in the acquisition of rights over private land to construct, maintain and retain critical infrastructure.

ENA recommend that the current process be replaced by a simple procedure which would provide for a reasonable period of time for the industry to complete the installation of infrastructure works without undue delay and coupled with fair and appropriate compensation arrangements. The industry places high importance on landowner relations and compensation should be fair and adequate. We endorse a form of simple dispute resolution to settle claims quickly and expediently.

ENA recommend introducing a distinction between the acquisition procedure for new assets and existing assets, and wayleaves typically sought for low and high voltage wood pole lines (including underground cables) and easements / servitudes for extra high voltage tower lines. This recognises there are four categories of apparatus which are materially different but equally as important to deliver Net Zero.

Point 2: Consents in Private Streets (EA 1989 Section 10, Schedule 4 para 1)

There are provisions within the current framework to facilitate the acquisition of consents within a private street, that being a street that is not maintained at public expense or adopted by the local authority. These provisions are ambiguous and unclear in respect to an application to the Secretary of State under Para 3.

ENA recommend alignment with the rights granted by Sch. 4 Gas Act 1986: Para. 3(2) so as to be laid in '*streets*' with a broader definition.

Point 3: Retention of existing rights (EA 1989 Section 10, Schedule 3 & Schedule 4 para 8)

The industry endorses the rights of landowners to serve a notice to remove apparatus for legitimate reasons, however the current regime is subject to widespread abuse putting a significant burden on the industry to deal with these in order to protect the network and security of supply. The high volumes of notices made at all voltages under the current regime requires disproportionate use of the statutory process in order to protect assets, which is costly and time consuming. The current regime places no obligation on a landowner or their representative to use the statutory framework for its intended purpose, or to fully engage with the process and in this respect it provides inadequate protection for critical networks.

ENA recommend the current framework be amended to ensure that balance and fairness prevail in the process for retaining critical assets. The network companies regard it as reasonable for the hearing process to require landowners to justify the basis upon which they seek removal. The award of costs in this respect should also be a consideration.

Applying the same principle, which is outlined under Point 1, the ENA suggest that consideration should also be given to the implementation of a simple procedure for wood pole lines and the ability to acquire permanent rights for strategically critical assets, for example, for extra high voltage tower lines.

Point 4: Access rights to apparatus (EA 1989 Schedule 6 Para 9)

Although Distribution Network Operators have adequate rights to access their existing apparatus, i.e. entry for replacing, repairing or altering lines or plant, representation has been made from time to time that these do not extend to Transmission Companies, which gives rise to some excessive landowner demands and delays.

ENA recommend that the current provisions for DNOs are clarified to include Electricity Transmission Owners.

Point 5: Acquisition of land (EA 1989 Section 10 Schedule 3)

There will undoubtedly be a requirement to acquire land for new primary and distribution substations and where there is failure to complete this by voluntary negotiations, networks will need to revert to Compulsory Purchase Powers (CPP). The current provisions are expensive and time consuming so not aligned to the significant demands of delivering Net Zero. The industry is aware of other reviews in this area of statute and would endorse an improvement to the process in terms of both time and cost.

ENA recommend that CPP for networks be improved with focus on achieving greater efficiency and expediency in the delivery of electricity network infrastructure.

Point 6: Felling and lopping of trees etc (EA 1989 Section 10 Schedule 4 para 9)

The current provisions compel the network operator to request that the landowner and/or occupier arranges for any necessary clearance works to be carried out, i.e. where essential vegetation works to fell or lop the tree, or to cut back its roots on their land, are needed to be carried out because of a risk to safety or security of supply. This is neither practical nor safe in proximity to live overhead apparatus. The procedure is lengthy and time consuming and given that proximity to live overhead lines is a significant safety issue, in addition to a continuity of supply issue.

ENA recommend that the provisions are changed to a simple form of notice and written representations to conclude the matter quickly to allow Network Operators to carry out the works rather than the landowner.

Point 7: EA 1989 Section 37 Consent Permitted Development

Net Zero is a major driver of upgrading electricity networks, necessitating new build, asset replacement and refurbishment of overhead lines. The current process is unwieldy for certain works that have minimal impact, so should be regarded as permitted development. A change in this respect would significantly reduce the timescales and increase certainty for these works.

ENA recommend the current 1989 Act and the Overhead Lines (Exemption)(England & Wales) Regulations 2009 and Scotland 2013 are widened to include:

- **Rebuilding overhead lines from Single to Three Phase (i.e. 2-wire to 3-wire)**
- **Permit connection of more than one consumer without requiring S37 consent, increase the threshold from 20kV to 33kV**
- **Increasing the Nominal Voltage of existing lines, for example, 6.6kV to 11kV**
- **Alter Conductor type on low voltage networks, for example, open wire to bundled conductor.**

Point 8: Town & Country Planning Act - General Permitted Development Order

Under the provisions of the TCPA - General Permitted Development Order, network operators can install substations within a capacity of 29 cubic metres as permitted development. Future demands of customers who want connections for EVs, heat pumps etc will require an increase in the number and size of substations. The network companies are currently evaluating the capacity and size of substations needed to support this change.

ENA recommend the current provisions be extended beyond 29 cubic metres. ENA can establish a working group to develop an industry substation design standard to meet future needs.

Point 9: Code of Practice

The legislative changes described above can be underpinned by an Industry Code of Practice, itself founded in legislation. The Code will set out requirements in respect of how networks interact with landowners in the course of their duties and amongst other things provide for standardisation of approach in third party matters, including Alternative Dispute Resolution (ADR) that seeks to avoid the need for referral to the Tribunal or Court.

ENA recommend the development and introduction of a Code of Practice in connection with the implementation of any changes to the current statutory framework for electricity networks.

Energy Networks Association

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