Notes:
View in conjunction with all relevant documents.
All dimensions to be checked on site before proceeding with work.
To be used only for the status specified.

All dimensions, levels, and coordinates are in metres unless defined.
All areas are approximate and indicative only.
All omissions and discrepancies to be reported in writing to Exagen Development Ltd.

Key

- Planning Application Boundary
- Land Under the Applicant's Control

Rev	Date	Description

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Client
Exagen Development Limited

Drawing title
Boundaries Plan North

Project
Old Wood Energy Park

Status
Planning Application

Date	Scale at A3	Status code
11/12/2023	1:2500	S4

Drawing number	Revision
WLL02A-EXG-00-00-D-K012	P01

0 200 300 400
metres

Notes:
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- Planning Application Boundary
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Client
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Drawing title
Boundaries Plan South

Project
Old Wood Energy Park

Status
Planning Application

Date	Scale at A3	Status code
11/12/2023	1:2500	S4

Drawing number	Revision
WLL02A-EXG-00-00-D-K013	P01

0 200 300 400
metres

Appendix 2 – Energy Policy Statement

1. Introduction

1.1. This Energy Policy Statement has been prepared by Pegasus on behalf of Exagen Development Ltd and should be read in conjunction with the supporting Planning Statement and other technical documents that accompany the pre-application advice request. Planning permission is sought for the construction, operation and subsequent decommissioning of a renewable energy park comprising ground mounted Solar Photovoltaics (PV) with co-located battery energy storage at the point of connection, together with associated infrastructure, access and landscaping. The Development is laid out across two separate Site Parcels, located on land to the west of Wysall, Nottinghamshire.

1.2. The purpose of this report is to highlight the legislative background and support for standalone renewable energy schemes, and solar technologies in particular, as part of both local climate change mitigation and wider national targets on the use of renewables in the UK. These documents form key components of central and local Government's policy and commitments to renewable and low carbon energy and should be considered material to the determination of this scheme.

2. Background

2.1. The background to the drive to increase the use of renewable sources of energy has its roots in the recognition that the burning of fossil fuels has an adverse effect on the climate of the world as a whole and that global measures are required to deal with it. The extensive use of fossil fuels that accompanied the industrialisation of the world's economy has released large volumes of CO2 back into the atmosphere. The accumulation of greenhouse gases in the upper atmosphere reduces the planet's ability to reflect solar radiation back into space, resulting in a gradual increase in mean global air temperature.

2.2. The scientific evidence on climate change is summarised in 'Climate Change Explained' first published on 23 October 2014 by the Department of Energy and Climate Change. To summarise, it states that there is clear evidence to show that climate change is happening. Measurements show that the average temperature at the Earth's surface has risen by about 0.8°C over the last century. 13 of the 14 warmest years on record have occurred in the 21st century and in the last 30 years each decade has been hotter than the previous one. This change in temperature hasn't been the same everywhere; the increase has been greater over land than over the oceans and has been particularly fast in the Arctic.

2.3. The UK is already affected by rising temperatures. The average temperature in Britain is now 1 Degree Celsius higher than it was 100 years ago and 0.5 Degree Celsius higher than it was in the 1970s.

2.4. Although it is clear that the climate is warming in the long-term, temperatures aren't expected to rise every single year. Natural fluctuations will still cause unusually cold years and seasons. Along with warming at the Earth's surface, many other changes in the climate are occurring:

- warming oceans;

- melting polar ice and glaciers;
- rising sea levels; and
- more extreme weather events.

2.5. Rising levels of carbon dioxide and other gases, such as methane, in the atmosphere create a 'greenhouse effect', trapping the Sun's energy and causing the Earth, and in particular the oceans, to warm. Heating of the oceans accounts for over nine tenths of the trapped energy. Scientists have known about this greenhouse effect since the 19th Century.

2.6. The higher the amounts of greenhouse gases in the atmosphere, the warmer the Earth becomes. Recent climate change is happening largely as a result of this warming, with smaller contributions from natural influences like variations in the Sun's output.

2.7. Carbon dioxide levels have increased by more than 40% since before the industrial revolution. Other greenhouse gases have increased by similarly large amounts. All the evidence shows that this increase in greenhouse gases is almost entirely due to human activity. The main contribution to this is the burning of fossil fuels for energy.

2.8. About 43% of the carbon dioxide produced goes into the atmosphere, and the rest is absorbed by plants and the oceans. Deforestation reduces the number of trees absorbing carbon dioxide and releases the carbon contained in those trees.

2.9. The Government advises that if action is now taken to radically reduce greenhouse gas emissions, there's a good chance that we can limit average global temperature rises to 2 Degree Celsius. By taking action now we could:-

- Avoid burdening future generations with greater impacts and costs of climate change;
- Enable economies to cope better by mitigating environmental risks and improving energy efficiency there will be wider benefits to health, energy security and biodiversity; and
- Benefit economically because if we delay acting on emissions, it will only mean more radical intervention in the future at greater cost.

2.10. It is also recognised that taking action now can also help to achieve long-term, sustainable economic growth from a low-carbon economy.

2.11. There is a plethora of Government legislation, guidance and policy which support the transition to a low carbon future and the continued roll out of renewables and low carbon energy and associated infrastructure. The UK is part of an international effort to combat climate change. The UK is a party to the United Nations Framework Convention on Climate Change (UNFCCC) and as such has signed up to international climate change obligations, such as the Kyoto Protocol and the Paris Agreement.

3. National Legislative Context & Guidance

3.1. With regards to the need for development, the explicit need to introduce a step change in how the country deals with climate change was recognised via the UK Government's declaration of an environmental and climate change emergency on 1 May 2019, following the findings of the Intergovernmental Panel on Climate Change (IPCC) who concluded that, to avoid a greater than 1.5°C rise in global warming, global emissions would need to fall by around 45 per cent from 2010 levels by 2030, and reach net zero by 2050 at the very latest.

3.2. The recently published IPCC Sixth Assessment report is a stark warning of the devastation that will be unleashed if we fail to urgently limit global temperature rises, and has been referred to as a "Code Red for Humanity "by the Secretary- General of the UN, António Guterres, illustrating the urgent and desperate need for rapid decarbonisation.

3.3. Through their climate emergency declaration, the Government recognises the need to move swiftly to capture economic opportunities and green jobs in the low carbon economy while managing risks for workers and communities currently reliant on carbon intensive sectors. As part of its contributions to international efforts, the UK also has domestic legislation and policies in place to reduce greenhouse gas emissions. These are focused on a number of key climate change challenges, these include:

- The reduction of CO2 emissions to tackle climate change;
- The promotion of competitive energy markets in the UK; and
- Security of decentralised energy supplies.

3.4. This subsection goes on to summarise the following relevant provisions:

Committee on Climate Change (CCC)

3.5. The UK Committee on Climate Change advises the government on progress on tackling climate change.

3.6. In June 2020, the Committee on Climate Change published its Reducing UK Emissions report which provides an annual review of UK progress in reducing greenhouse gas emissions. This was the first annual report since the UK set a legally binding 'net zero by 2050' target and was originally due to be released in the lead up to the UN climate conference COP26 in Glasgow (before this was postponed until 2021). Since the publication of the first Progress Report in June 2020, two further annual Progress Reports have been published by CCC in June 2021 and June 2022 respectively.

3.7. The report provides comprehensive overview of the UK Government's progress to date in reducing emissions and includes important new advice to Government to ensure that the UK remains on track with emissions targets in line with the Long-term temperature goal of the Paris Agreement. The key messages taken from the latest CCC Progress Report (June 2022) set out:

- **The UK Government now has a solid Net Zero strategy in place,** but important policy gaps remain.

- **Tangible progress is lagging the policy ambition.** With an emissions path set for the UK and the Net Zero Strategy published, greater emphasis and focus must be placed on delivery.

- **Successful delivery of changes on the ground requires active management of delivery risks.** Not all policies will deliver as planned. Some may be more successful than expected, while others will fall behind.

- **Action to address the rising cost of living should be aligned with Net Zero.** There remains an urgent need for equivalent action to reduce demand for fossil fuels to reduce emissions and limit energy bills.

- **Slow progress on wider enablers.** The Net Zero Strategy contained warm words on many of the cross-cutting enablers of the transition, but there has been little concrete progress.

- **The UK must build on a successful COP26**. The UK presidency of the UN COP26 climate summit in Glasgow last November successfully strengthened long-term global ambition and introduced new mechanisms to support delivery. It should prioritise making those new mechanisms work in practice and strengthening global 2030 ambition, while preparing for a focus on climate finance and adaptation at COP27 in 2022 and COP28 in 2023.

Climate Change Act 2008 and the Climate Change Act 2008 (2050 Target Amendment) Order 2019

3.8. As part of its contributions to international efforts, the UK also has domestic legislation and policies in place to reduce greenhouse gas emissions. The Climate Change Act 2008 established long-term statutory targets for the UK to achieve reductions in greenhouse gases by 2050 against a 1990 baseline. The Act originally set a legally binding target of an 80% cut in greenhouse gas emissions by 2050. On 12 June 2019, as a direct response to the climate change emergency declaration, the Government laid the draft Climate Change Act 2008 (2050 Target Amendment) Order 2019 to amend the Climate Change Act 2008 by introducing a target for at least a 100% reduction of greenhouse gas emissions (compared to 1990 levels) in the UK by 2050. This is otherwise known as a net zero target because some emissions can remain if they are offset by removal from the atmosphere and/or by trading in carbon units. The legislation was signed into law on 27 June 2019, following approval by the House of Commons and the House of Lords.

3.9. Following the Climate Change Committee's advice on the Sixth Carbon Budget, Prime Minister Boris Johnson agreed to legislate a new target to reduce national emissions by 78% by 2035, with the target enshrined in law at the end of June 2020. This builds on the nations new Nationally Determined Contribution (NDC) to the Paris Agreement, which will see the UK reduce emissions by 68% by 2030 compared to 1990 levels.

The Energy White Paper (2020)

3.10. The Energy White Paper ("EWP") was presented to Parliament on 14 December 2020 and builds upon the Prime Minister's Ten Point plan for a Green Industrial Revolution (which is discussed below).

3.11. The EWP sets out ambitious plans offering support for a variety of technologies and committing funds to support the growth of low-carbon green-technologies. It is intended to

entirely reshape British industry and the economy. At the core of the EWP is the commitment to achieve Net Zero and tackle climate change.

3.12. In the introduction to the EWP (pages 2 and 3), the former Secretary of State for BEIS, Alok Sharma MP, states (inter alia):

> *"The government presents this white paper at a time of unprecedented peacetime challenge to our country. Coronavirus has taken a heavy toll on our society and on our economy. But we will overcome COVID-19 and rebuild our economy, building back better and levelling up the country. As we do so, we must address the intergenerational challenge of climate change. Unchecked, the impact of rising global temperatures represents an existential threat to the planet. So, building back better means building back greener.*
>
> *This white paper puts net zero and our effort to fight climate change at its core, following the Prime Minister's Ten Point Plan for a Green Industrial Revolution. The Ten Point Plan sets out how government investment will leverage billions of pounds more of private investment and support up to 250,000 jobs by 2030.*
>
> *The way we produce and use energy is therefore at the heart of this. Our success will rest on a decisive shift away from fossil fuels to using clean energy for heat and industrial processes, as much as for electricity generation. These are more than academic considerations; the shift to net zero will affect us all. This white paper presents a vision of how we make the transition to clean energy by 2050 and what this will mean for us as consumers of energy in our homes and places of work, or for how businesses use energy to produce goods and services."*.

3.13. The EWP seeks to put in place a strategy for the wider energy system that transforms energy and supports a green recovery (page 4).

3.14. Page 5 of the EWP sets out the Government's 'Compelling case for tackling climate change'. The salient points presented by Government are (inter alia):

- We need to act urgently. The future impacts of climate change depend upon how much we can hold down the rising global temperature. To minimise the risk of dangerous climate change, the landmark Paris Agreement of 2015 aims to halt global warming at well below 2°C, while pursuing efforts to limit it to 1.5°C, increasing measures to adapt to climate change, and aligning financial systems to these goals.

- At the global scale, however, we are not presently on track to reach the temperature goal of the Paris Agreement. Based on current national pledges, and assuming the level of ambition does not change, the world is heading for around 3°C of warming by the end of the century.

- The cost of inaction is too high. We can expect to see severe impacts under 3°C of warming. Globally, the chances of there being a major heatwave in any given year would increase to about 79 per cent, compared to a five per cent chance now. Many regions of the world would see what is now considered a 1-in-100-year drought happening every two to five years.

- To meet the temperature goal of the Paris Agreement, the world must collectively and rapidly reduce global emissions to net zero over the next 30 years. Success will mean

we are less exposed to flood and heat risks and preserve our national security, our prosperity, and our natural world which are threatened by the global disruption of climate change.

3.15. The Government recognises that decarbonising the energy system over the next thirty years means replacing, as far as it is possible to do so, fossil fuels with clean energy technology such as renewables (EWP Introduction, page 9). The EWP identifies how clean energy will become the predominant form of energy, entailing in a potential doubling of electricity demand and consequently a fourfold increase in low-carbon electricity generation (EWP Introduction, page 10). The Government recognises that growing and supporting green jobs across the country in green industries will also support a green recovery from COVID-19 (page 16).

3.16. The EWP, at page 43, identifies how the Government envisages that (inter alia) "While we are not planning for any specific technology solution, we can discern some key characteristics of the future generation mix. A low-cost, net zero consistent system is likely to be composed of predominantly wind and solar. But ensuring the system is also reliable, means intermittent renewables need to be complemented by technologies which provide power, or reduce demand, when the wind is not blowing, or the sun does not shine". Page 43 goes on to identify batteries as such a technology that can contribute towards the demand side response. Page 45 identifies how "Onshore wind and solar will be key building blocks of the future generation mix, along with offshore wind". It goes on to state how the Government recognised that sustained growth in the capacity of these sectors is needed over the next decade to ensure that we are on a pathway that allows us to meet net zero emissions in all demand scenarios.

UK Energy Security Strategy (2022)

3.17. On 7th April 2022, the Government published the UK Energy Security Strategy, a direct response to the energy market position following the significant spikes in energy prices resulting from the COVID-19 pandemic and Russia's invasion of Ukraine. Following the reopening of the global economy after the impacts of the COVID-19 pandemic, the sudden surge in demand for everything from foreign holidays to new cars has driven a significant spike in the demand for oil and gas, and consequentially greatly increasing the price of these fossil fuels. This has only been further compounded following the Russian invasion of Ukraine and the restrictions placed on Russian gas to the European market, which has resulted in prices increasing even further. As result of these factors, we have seen the price of European gas increasing by over 200% in the past 12 months, with coal prices increasing by over 100%. This has seen a record increase in global energy prices and had led to an inevitable rise in the cost of living within the UK as our energy mix is highly reliant on natural gas to generate electricity and also to heat the majority of the 28 million homes in the UK.

3.18. On the issue of affordability, a research briefing published by the Government on the House of Commons Library (Domestic Energy Prices, 6 January 2023) identifies that wholesale energy prices have increased rapidly from the second half of 2021 onwards, aided by the impacts of the Coronavirus Pandemic and Russia's invasion of Ukraine which has seen wholesale gas and oil prices dramatically increase over the past 12 months. This has been reflected in changes to the 'Default Tariff Cap' otherwise referred to as the energy price cap which covers prices for consumers on default or standard energy tariffs. The energy price cap was increased by Ofgem by 54% in April 2022 and was planned to be increased by a further 80% on October 1 2022.

3.19. It was announced by former Prime Minister Lizz Truss on 8th September 2022 that from 1 October the government would introduce a new Energy Price Guarantee, set at £2500 a year for typical levels of consumption and was originally planned to last a total of 2 years. Following a change in Prime Minister and Chancellor, the new Chancellor of the Exchequer announced that the Energy Price Guarantee would now only last a total of 6 months at its current level and then be increased by a further 20% in April 2023 for another 12 months. Whilst the energy Price Guarantee introduced by the Government is lower than the levels the energy price cap would have otherwise been increased to in Q4 2022 and Q1 2023, it will still mean average energy prices for households have seen increase of 27% in October 2022 and were originally due to increase a further 20% in April 2023.

3.20. On 15 June 2022, an article in the Sky News identified how the British Government has extended the life of a coal power plant in a bid to "bolster" energy security. This was a direct action to the uncertainty in Europe following the invasion, as the Government seeks to explore all options to bolster supply. This highlights the urgency for the acceleration of renewables and low carbon projects, such as the application proposal.[4]

3.21. The published Energy Security Strategy highlights the urgent need to both develop an energy system which is more self-sufficient and further accelerate the Country's transition away from oil and gas. The Strategy reiterates how Government will ensure a more flexible, efficient network system for both generators and users by encouraging the deployment of renewable energy generation technologies such as Solar PV and encouraging all forms of flexible electricity storage systems to balance the overall system and reduce overall costs of electricity.

3.22. It is acknowledged that this transition is not a fast process and is critically dependant on the speed at which we can deploy new renewable energy technologies. The UK Energy Security Strategy outlines the urgent need for the rapid deployment of a range of renewable technologies including on and off-shore wind, nuclear, solar and other technologies. It is acknowledged that net zero targets cannot be sustainably met through the exploitation of only one or a few technologies and requires the exploitation of all available renewable technologies. For ground mounted solar technologies, the new Energy Security Strategy states that the Government will:

> ***"…consult on amending planning rules to strengthen policy in favour of development on non-protected land, while ensuring communities continue to have a say and environmental protections remain in place.***
>
> ***We will continue supporting the effective use of land by encouraging large scale projects to locate on previously developed, or lower value land, where possible, and ensure projects are designed to avoid, mitigate, and where necessary, compensate for the impacts of using greenfield sites."***

UK's National Energy and Climate Plan (NECP)

3.23. BEIS published the UK's National Energy and Climate Plan (NECP) for 2021 to 2030, on 7 June 2021, in order to uphold the Government commitments under the Withdrawal Commitments .

[4] https://news.sky.com/story/government-keeps-coal-power-station-open-to-boost-security-in-spite-of-lobbying-to-consign-coal-to-history-12633856

The NECP (at page 30) identifies how the EU has a target under the Renewable Energy Directive of 32% of energy coming from renewable sources in 2030, with Member States required to set their own nonbinding contributions to collectively achieve the EU target. As of 31 January 2020, the UK has left the EU and will therefore not contribute to EU targets or be bound by the RED after the Transition Period ends. However, to comply with Government commitments under the Withdrawal Agreement with respect to the NECP, the UK has set out a proportion of renewables in final energy consumption in 2030 of between 22%-29%. This represents a significant challenge as RED progress in 2020 is only 13.6 per cent.

Net Zero - Opportunities for the Power Sector

3.24. The National Infrastructure Commission (NIC) , official advisor to the Government on Infrastructure, has published a report (Net Zero - Opportunities for the Power Sector, March 2020) setting out the key infrastructure requirements needed to meet the UK's 2050 net-zero target, including the amount of renewable energy development that would need to be deployed.

3.25. The NIC recommends that in meeting these targets, the UK's energy mix needs to be made up of around 90% renewables. At page 18 of the report, it is recommended that across all scenarios, significant levels of solar, onshore wind and offshore wind, will need to be deployed in order to ensure that between 129 – 237 GW (gigawatts) of renewable energy capacity is in operation by 2050. To achieve this, the report recommends the following split:

- 56-121 GW of solar;
- 18-27 GW of onshore wind; and
- 54-86 GW of offshore wind.

3.26. To achieve the above targets would require a significant increase in installed solar capacity across the UK, including over nine times the current installed capacity of solar technologies in the UK, which as of September 2021 is around 13.6GW according to BEIS .

Clean Growth Strategy – Leading the way to a low carbon future (2017)

3.27. The Clean Growth Strategy, published in October 2017, sets out a comprehensive set of policies and proposals that aim to accelerate the pace of "clean growth", i.e. deliver increased economic growth and decreased emissions. The Executive Summary (page 9) confirms that for the UK to achieve its fourth and fifth carbon budgets (2023 - 2027 and 2028 - 2032) it will be necessary to drive a significant acceleration in the pace of decarbonisation.

3.28. To achieve the clean growth, the Government states that the UK will need to nurture low carbon technologies, processes and systems that are as cheap as possible, this includes subsidy-free ground mounted solar farms as per the Development. The Government places significant emphasis on securing increased investment across the energy systems whilst minimising, as much as possible, the public costs for securing such investments and makes multiple references to how they are seeking the delivery of solar without subsidy. Moreover, page 99 specifically states that the 'Government wants to see more people investing in solar without government support'. It estimates that the low carbon economy could grow 11% per year between 2015 and 2030, four times faster than the projected growth of the economy as a whole. The application proposal would clearly contribute to the delivery of the Clean Growth Strategy.

The Ten Point Plan for a Green Industrial Revolution (November 2020)

3.29. 'The Ten Point Plan for a Green Industrial Revolution – Building back better, supporting green jobs, and accelerating our path to net zero', was published on 18 November 2020 and is aimed at delivering a 'Green Industrial Revolution' in the UK, with the foreword by the Prime Minister stating that the Ten Point Plan will aim to mobilise £12 billion of government investment and potentially three times as much from the private sector, to create and support up to 250,000 green jobs. The Ten Point Plan is followed on from and built on by the Energy White Paper discussed above. Point ten seeks to accelerate the commercialisation of innovative low-carbon technologies, systems and processes in the power.

National Infrastructure Plan (HM Treasury, 2014)

3.30. The National Infrastructure Plan (NIP) 2014 presents an overview of the Government's policies, investments and record on infrastructure delivery since 2010 and details the Government's approach to ensuring that the Top 40 priority investments remain on track to deliver.

3.31. The report confirms a future pipeline investment of £80bn in energy infrastructure.

3.32. The stated objectives (paragraph 8.1) with regard to energy are to:

- ensure power, heat and transport are affordable for households and businesses
- provide energy security to facilitate day-to-day activities and support economic growth
- reduce carbon emissions in order to mitigate climate change and meet its legally binding targets

National Infrastructure Assessment (The National Infrastructure Commission, 2018)

3.33. The first National Infrastructure Assessment (NIA) set out the Commission's plan of action for the country's infrastructure over the next 10-30 years.

3.34. The NIA sets out a number of recommendations to a pathway for the UK's economic infrastructure:

- nationwide full fibre broadband by 2033
- half of the UK's power provided by renewables by 2030
- three quarters of plastic packaging recycled by 2030
- £43 billion of stable long term transport funding for regional cities
- preparing for 100 per cent electric vehicle sales by 2030
- ensuring resilience to extreme drought
- a national standard of flood resilience for all communities by 2050.

National Infrastructure Strategy: Fairer, faster, greener (HM Treasury, 2020)

3.35. The National Infrastructure Strategy (NIS) was published on 25 November 2020, a week after the Prime Minister's Ten Point Plan. The NIS sets out the Government's plans to deliver an infrastructure revolution in the UK, while "levelling the country up" and achieving its Net Zero target by 2050. The Government's plans to transform the UK's infrastructure networks. It is based around three central objectives: economic recovery (page 11); levelling up and strengthening the Union (page 12); and meeting the UK's net zero emissions target by 2050 (page 13).

3.36. Page 51 confirms (inter alia) "To deliver net zero, the share of generation from renewables needs to dramatically increase. While the UK leads the world in the deployment of offshore wind, greater generation capacity will need to come from onshore wind and solar as well".

3.37. Chapter 4 (page 68) recognises that record-breaking levels of investment in UK infrastructure will be required in the coming years to meet the Government's objectives for economic growth and decarbonisation. It goes on to state that the Government remains strongly committed to supporting private investment and maintaining the UK's status as a leading global destination for private investment.

3.38. Chapter 5 (page 78) of the NIS deals with the need to accelerate and improving delivery. It states (inter alia) "The government wants to deliver infrastructure projects better, greener and faster. That means addressing longstanding challenges such as complex planning processes, slow decision-making, and low productivity in the construction sector"

Net Zero Review: Interim report (December 2020)

3.39. HM Treasury's interim Net Zero Review (NZR) - the first of its kind from a finance ministry – was published on 17 December 2020 to inform next steps in the UK's transition to net zero by 2050. The NZR supports the government's work in maximising opportunities and benefits for the UK over the next 30 years as we transition to net zero and help to ensure an equitable balance of contributions between households, businesses and the taxpayer. The interim report contains initial analysis, rather than policy recommendations, which will guide further work ahead of the publication of the Review's final report next year.

3.40. The NZR (page 24) considers the potential changes in energy process for business and households and states (inter alia) *"Costs of wind and solar energy have already seen significant falls, and some forms of renewable electricity generation in the UK, such as onshore wind, are expected to have lower estimated costs per unit than electricity derived from fossil fuels. Lower long-run energy costs and greater energy efficiency could benefit both businesses and households. One of the priorities of the Energy White Paper is keeping energy bills affordable as the UK decarbonises, especially for the most vulnerable households. Analysis by the National Infrastructure Commission further suggests that household energy bills could be potentially lower or equal to current levels after switching to clean energy"*

3.41. The NZR (page 56) identifies how solar is a proven technology where market institutions are well established, and the technology is commercially viable.

Mission Zero – Independent Review of Net Zero (Rt Hon Chris Skidmore MP, January 2023)

3.42. A recent Independent Review of the UK's Net Zero Targets and current progress, published by the Rt Hon Chris Skidmore MP, makes several recommendations to the Government to

ensure UK remains on track to realise it Net zero targets by 2050. The main recommendations made to Government resulting from the review are as follows:

1. *Using infrastructure to unlock net zero*

   - *accelerating the implementation of the British Energy Security Strategy to update the mandate of Ofgem, creating the Future System Operator and accelerating the connection of cheaper renewables such as solar and onshore wind*

   - *developing a cross-sectoral infrastructure strategy by 2025 supporting the building and adaptation of infrastructure for electricity, hydrogen, other liquid and gaseous fuels and CO2 networks that support the green economy*

   - *reforming our approach to planning, so that where locally supported, more solar and onshore wind can be developed more easily, helping communities reap the benefits of cheaper low-carbon electricity*

2. *Creating sustainable governance structures for net zero*

   - *developing an over-arching government financing strategy by the end of 2023*

   - *establishing an Office for Net Zero Delivery, responsible for placing net zero delivery at the heart of government thinking*

3. *Backing businesses to go green*

   - *reviewing incentives for investment in decarbonisation, including via the tax system and capital allowances, and protecting British industries from environmental undercutting by progressing plans on carbon leakage measures and providing more detail on the UK's new Emissions Trading Scheme (ETS)*

   - *building skills needed for the transition by driving forward the Green Jobs Taskforce recommendations and launching a 'Help to Grow Green' campaign, offering information and support to SMEs to plan and invest in the transition*

4. *Catalysing local action*

   - *reforming the planning system at local and national level to place net zero at its heart*

   - *back at least one Trailblazer Net Zero City, local authority and community, with the aim for these places to reach net zero by 2030*

5. *Increasing transparency and engaging people*

   - *expanding the government's public reporting on net zero*

   - *ramping up public information through a new engagement plan, a new carbon calculator on the carbon cost of choices, and a standardised approach to ecolabelling on products*

   - *developing a Net Zero Charter mark, acknowledging 'best in class' among firms for their work in reaching net zero*

6. *Delivering cleaner, cheaper, greener homes*

- *legislating for the Future Homes Standard, meaning no new homes will be built with a gas boiler from 2025, and for all homes sold to be EPC C by 2033*
- *adopting a 10-year mission to make heat pumps a widespread technology in the UK and legislate for the end of new and replacement gas boilers by 2033 at the latest*
- *reforming EPC ratings to create a clearer, more accessible Net Zero Performance Certificate (NZPC) for households*

7. *Capitalising on international leadership*

- *conducting a strategic review on the UK's international climate leadership and introduce environmental and climate protections in future free trade agreements, removing trade barriers to environmental goods and services*

8. *Setting ourselves up for 2050 and beyond*

- *ramping up investment in research and development (R&D), with a new net zero R&D and technologies roadmap up to 2050, supporting up to 3 10-year demonstrator projects*

Industrial Decarbonisation Strategy, BEIS (March 2021)

3.43. The Industrial decarbonisation strategy sets out how industry can decarbonise in line with net zero while remaining competitive and without pushing emissions abroad. The strategy recognises that reaching the net zero target will require extensive, systematic changes across all sectors, including industry and emphasises that the 2020s will be a crucial decade to lay the foundation to enable the switch away from fossil fuel combustion to low carbon alternatives, including electrification, hydrogen, and biomass.

3.44. The strategy describes that to deliver net zero a minimum of 20TWh of fossil fuel use will need to be replaced by low carbon alternatives in 2030.

3.45. The scale and pace of decarbonisation required to achieve this target is therefore urgent.

3.46. The modelling contained within the report indicates that electrification of industry could reduce emissions by between 5 MtCO2e and 12.3 MtCO2e per annum by 2050 and describes that as new technologies emerge and renewable electricity prices continue to drop, electrification will become a more attractive option for industry. The role of smart technologies, such as storage and demand side response, are emphasised in relation to facilitating this transition and the report highlights at page 31 that "smart technologies, such as storage and demand-side response, can also provide flexibility to the electricity system, helping industrial consumers use energy when it is cheapest and cleanest".

3.47. The report makes clear that electricity networks will need to accommodate significant increased demand from the electrification of industrial processes and will therefore need to be fit for purpose to achieve this to achieve net zero. Increasing the flexibility of the electricity system will make a positive contribution towards achieving this objective.

Smart Systems and Flexibility Plan- Transitioning to a Net Zero Energy System, BEIS (July 2021)

3.48. The Smart Systems and Flexibility Plan sets out a vision, analysis and suite of policies to drive a net zero energy system and replaces the previously published 2017 plan.

3.49. The Ministerial Foreword to the Smart Systems and Flexibility Plan, 2021 makes clear that:

> *"The government is committed to leading the way in the transformation of our energy system. A smarter, more flexible system will utilise technologies such as energy storage and flexible demand to integrate high volumes of low carbon power, heat and transport and reach a carbon neutral future. A smart and flexible energy system can deliver significant benefits for consumers, the system and the wider economy whilst lowering carbon emissions."*

3.50. The Executive Summary emphasises the need to deliver system flexibility quickly:

> *"It will be very difficult to achieve the deep power sector decarbonisation needed to achieve the sixth Carbon Budget without significantly higher levels of system flexibility. The need for flexibility will rapidly increase as variable renewable power replaces fossil fuel sources, and we electrify heat and transport. The illustrative scenarios in our analysis indicate the scale of deployment that could be needed. Around 30GW of total low carbon flexible capacity in 2030, and 60GW in 2050, may be needed to maintain energy security and cost-effectively integrate high levels of renewable generation."*

3.51. The report highlights that this represents a significant increase in deployment needed relative to the 10GW of low carbon flexibility currently on the system and emphasises that failure to achieve the targets cited risks the need to have to build more fossil fuel generation instead to maintain energy security in the 2030s.

3.52. The report provides further breakdown and analysis of the various forms of technology which increase flexibility, including battery storage. Lithium-ion battery storage currently comprises approximately 1GW of the 4GW of electricity storage currently operation in Great Britain (the remaining 3GW provided by pumped hydro storage). Whilst the battery storage pipeline is highlighted as growing there is a need to significantly increase the deployment of battery storage to approximately 18GW by 2050.

National Grid Future Energy Scenario Report (FES), National Grid (July 2023)

3.53. The National Grid Future Energy Scenario (FES) report outlines how the energy system may need to transform to meet the target for net zero emissions by 2050. The FES illustrates four different, credible pathways for the future of energy between now and 2050: Falling Short; Customer Transformation; System Transformation; Leading the Way. Customer Transformation and System Transformation scenarios achieve net zero by 2050, with Leading the Way achieving it by 2046. The Falling Short Scenario doesn't get to Net Zero by 2050, diverging from carbon budgets around 2025, resulting in 179 Mt of residual annual emissions by 2050. The heat and road transport sectors are largely decarbonised by 2050 across all scenarios except Falling Short. However, even for the Net Zero scenarios, some sectors such as waste and aviation do not reach zero emissions by 2050, so the energy sector, particularly the power sector, must reach net negative emissions to balance this out.

3.54. Across all the four scenarios within National Grid's FES July 2023, the need for the rapid deployment of Solar PV generating development and increased energy storage capacity is emphasised. However, it is currently estimated that the targeted delivery of up to 70GW of Solar PV generation required under the British Energy Security Strategy by 2035, will only be met under two scenarios, with Leading the Way achieving this target by 2040 and Consumer Transformation achieving this target prior to 2050.

4. Digest of United Kingdom Energy Statistics (July 2023 Edition)

4.1. The Digest of United Kingdom Energy Statistics (DUKES) is the annual energy statistics publication produced by the Department for BEIS. It provides a detailed and comprehensive picture on the production and consumption of individual fuels and of energy as a whole. The digest is published annually, and the latest edition was published in July 2023. The salient points of the report are:

- Energy production rose by 3.1 per cent compared to the record low level of 2021. Oil production fell to a record low level and remains down by 28 per cent on pre-pandemic (2019) levels. Gas output rose by 16 per cent, nuclear output rose by 4.6 per cent despite reduced operational capacity, but coal reached another record low. Wind, solar and hydro output rose to a record high level due to increased capacity and more favourable weather conditions.

- Energy consumption in 2022 remained low, down 0.9 per cent on 2021 and down 11 per cent on 2019. Consumption levels in 2022 fell for all sectors except for transport due to warmer weather as well as the impact of higher prices towards the end of the year; industrial sector consumption fell by 3.8 per cent to a record low level.

- Net imports fell by 2.6 per cent. Imports increased by 11 per cent with gas imports at a record high level, and exports increased by 24 per cent with gas and electricity exports at record high levels, with the UK a net exporter of electricity for the first time in over 40 years. The UK has played a key role in supplying gas to Europe as it looks to move away from Russian gas. The UK's net import dependency stood at 37.3 per cent.

- The bulk of the UK's energy imports, over 90 per cent, comprise oil and gas and Norway is the UK's primary supplier of energy imports. The largest share of oil imports arrives from the US, whilst Norway provides the largest share of gas imports. Russian imports of oil and gas reduced significantly in 2022 and ceased by the end of the year and accounted for 2.6 per cent of total imports down from 9.6 per cent in 2021.

- Consumption of coal for electricity generation fell 15 per cent to 2.3 million tonnes in 2022. Wind generation was up 25 per cent due to higher-than-average wind speeds. Total renewable generation was up by 13 per cent in 2022, while gas and nuclear energy were also up (see Energy Trends table 5.4). Just four coal plants remained operational in the UK throughout 2022. Drax and West Burton had planned to close in Spring 2022 but remained available to ensure security of supply if needed over the winter. Coal use for

- electricity generation is expected to cease completely by October 2024.

- Oil formed 38 per cent of total energy demand in 2022. Following the upward trend since lows in 2020, demand for petroleum products increased by 10 per cent in 2022 compared to 2021. Much of this growth came from the transport sector, with road fuels accounting for a fifth of all UK energy demand in 2022.

- Natural gas made up 38 per cent of total energy demand and close to two thirds of domestic demand in 2022 and continues to play an important role in the UK energy mix. UK gas demand decreased by 7.9 per cent in 2022 compared with 2021, due to the warmest year on record, higher prices impacting on consumer behaviour, and record renewable output.

- Electricity demand decreased in 2022 to 320.7 TWh, down by 3.8 per cent from 2021. This is a larger year-on-year fall than in most recent years, driven by higher prices and the record high annual average temperature.

- Rising energy and other prices and higher average temperatures led to a record low domestic consumption, with industrial and commercial consumption also decreasing. Domestic consumption fell 10 per cent to 96.2 TWh while industrial consumption was down 2.7 per cent and consumption by other users (primarily commercial users) was down 0.7 per cent.

- Electricity generation rose in 2022 despite the low UK demand, as demand from Europe saw the UK switch to being a net exporter of electricity for the first time in over 40 years. Electricity generation rose to 325.3 TWh, 5.3 per cent higher than in 2021. Total imports fell to 15.5 TWh, half of 2021 levels. Meanwhile total exports increased fivefold compared to 2021, reaching 20.8 TWh, giving net exports of 5.3 TWh.

- Renewable generation reached record high levels in 2022, rising 10 per cent to 135.0 TWh, due to high output from wind and solar generators. This was driven by substantial increases in wind generation capacity and more favourable weather conditions compared to 2021. Bioenergy was the only renewable technology where generation decreased, as outages continued at key bioenergy sites.

- Fossil fuel generation increased 0.9 per cent in 2022 to 132.8 TWh, with more generation from gas. Coal generation continued to fall, down to the second lowest value on the published data series.

- The share of generation coming from low carbon sources rose to 56.2 per cent in 2022, the second highest value on the published data series. This came as the share of generation from renewable sources (41.5 per cent) exceeded the share from fossil fuels (40.8 per cent) for the second time.

- Renewable generation increased by 10 per cent in 2022 to a new record of 135.0 TWh. This was just 0.5 per cent higher than the previous record set in 2020 when unusually favourable weather conditions hit the UK. The key driver in 2022 was new capacity and an improvement in weather conditions compared to 2021. Within the technologies, records were set for onshore and offshore wind, solar PV, and anaerobic digestion.

- Renewable capacity increased by 7.7 per cent (3.8 GW), the highest growth rate since 2018 and just below the 3.9 GW installed in that year. This remains lower than

the average annual growth rate between 2012 and 2018 which was 20 per cent. Of the 3.8 GW new capacity in 2022, 2.7 GW was in offshore wind, 0.7 GW in solar PV, and 0.3 GW in onshore wind.

- As a share of gross final consumption, overall renewables accounted for 14 per cent, an increase of 0.8 percentage points in 2021, a combination of increases in renewable electricity generation and use of biofuels in transport, combined with a slight fall in total gross final consumption.

5. International Legislative Context

5.1. This section summarises the following relevant provisions:-

- 1992 United Nations Framework Convention on Climate Change;
- 1997 Kyoto Protocol on Climate Change;
- 2009 Copenhagen Accord;
- United Nations Climate Change Conference, Durban, 2011; and
- Warsaw Conference of the Parties 19 (COP19).

United Nations Framework Convention on Climate Change

5.2. This convention acknowledged the need to protect the global climate. It was opened for signature at the 'Earth Summit' that met in Rio de Janeiro in June 1992, coming into force in March 1994. Recognising that human-induced changes to the atmosphere are affecting the climate, it set out to ensure that atmospheric concentrations of greenhouse gases are stabilised at a safe level.

The Kyoto Protocol

5.3. The Kyoto Protocol to the United Nations Framework Convention on Climate Change (United Nations, 1997) was ratified by the UK in 2002. It sets obligatory targets for committed Annex I countries (including the UK) to take measures aimed at reducing greenhouse gas emissions, such as carbon dioxide (CO2), by an average of 5 % against 1990 levels over the five year period 2008 - 2012. Under the Kyoto Protocol, the UK's commitment is for a reduction in greenhouse gas emissions of 12.5 % from 1990 levels by 2012.

Copenhagen Accord

5.4. The Copenhagen Accord, agreed by leaders representing 49 countries, marks a significant step forward, with countries agreeing to limit global temperature increases to no more than 2°C and making substantial commitments to support developing countries to take action. As a party to the Copenhagen Accord, the United Kingdom has agreed a range of proclamations and objectives, including that:

- climate change is 'one of the greatest challenges of our time', which must be combated 'urgently';

- the ultimate objective is to stabilise greenhouse gas concentration in the atmosphere 'at a level that would prevent dangerous anthropogenic interference with the climate system';
- any increase in global temperature should be 'below 2 degrees Celsius';
- 'deep cuts' in emissions are required;
- emissions should peak 'as soon as possible'; and
- lower emissions are 'indispensable to sustainable development'.

United Nations Climate Change Conference, Durban, 2011

5.5. The Durban conference considered how to cut emissions to limit global temperature rise to below two degrees to avoid dangerous climate change. Over 120 countries formed a coalition behind the EU's proposal of a 'road map' to a global legally binding agreement, to be put in place by 2015, to curb emissions. The talks resulted in a decision to adopt the second commitment period of the Kyoto Protocol. The conference also agreed to establish a green climate fund to assist poorer countries to make the transition to a low carbon economy.

Warsaw COP19

5.6. At the UN Climate Change Conference in Warsaw 2013, governments took further essential decisions to stay on track towards securing a universal climate change agreement in 2015. The objective of the 2015 agreement is twofold: Firstly, to bind nations together into an effective global effort to reduce emissions rapidly enough to chart humanity's longer-term path out of the danger zone of climate change, while building adaptation capacity; Secondly, to stimulate faster and broader action now.

Glasgow COP26

5.7. More recently, Glasgow was host to the 26th UN Climate Change Conference between 31st October and 12th November 2012. The COP26 climate talks have focused on getting countries to strengthen their emissions-cutting targets by the end of next year in a bid to limit global warming to 1.5 degrees above pre- industrial levels. The talks resulted in not only an official agreement but a series of commitments under the Glasgow Pact to various mitigation and conservation efforts, including but not limited to a pledge to halt and reverse deforestation by 2030, an agreement to end overseas financing of oil and gas projects and an agreement to 'phase down' the use of unabated coal as well as the phasing out of inefficient fossil fuel subsidies.

Town & Country Planning Act 1990 (as amended)
Planning and Compulsory Purchase Act 2004

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