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Wales

Energy Guidance Note



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1.0 Introduction

1.1 Background

The Climate Change Act 2008 provides a guiding context for the UK's transition to a low carbon economy. It also provides a long-term framework for the UK's energy and climate policy, including a target to reduce greenhouse gas (GHG) emissions by 80% from 1990 levels by 2050.

The energy industry is a major contributor to climate change and is also a sector that climate change will disrupt. It is the largest contributor to global GHG emissions; with the majority of anthropogenic CO₂ emissions produced since pre-industrial times resulting from fossil fuel combustion and cement production (68%)¹. According to the International Energy Agency² the energy sector is responsible for 37% of all carbon dioxide (CO₂) emissions from human activities. It creates about 23 billion tonnes of CO₂ emissions per year – in excess of 700 tonnes a second. Fossil fuel combustion also contributes significantly to air pollution, an increasingly pressing problem around the world as public health and economic damages continue to accrue in countries at all levels of development. This presents critical challenges for the production and use of energy, which is central to economic growth and development.

Conversely, the energy sector has its own challenges. These include an urgent need to address the energy trilemma of security of supply and infrastructure, social equity (affordability and accessibility) and environmental sustainability (emissions and climate change). The continued consumption of fossil fuels globally is not sustainable and the UK faces a potential energy capacity gap. Over the last decade, energy has advanced rapidly up the public and political agenda and there is consensus among governments, businesses, communities, organisations and even individuals on the need to act urgently to mitigate climate change and safeguard the security and affordability of our energy supplies. Investing in 'decarbonising' the energy system is therefore a necessary element of climate change mitigation, which may be achieved by increasing the proportion of energy produced from low carbon sources and by utilising technologies such as carbon capture and storage.

1.2 Purpose of Guidance Note

As a key environmental organisation for Wales, climate change is a major driver for the work of Natural Resources Wales. We recognise it is the biggest challenge facing humanity and are committed to playing our part in addressing climate change mitigation and adaptation in Wales, the UK and beyond. Our Corporate (2014-17)³ and Business Plans⁴ recognise climate change as a priority and we are committed to mainstream considerations of climate change throughout the organisation and all the work we do, which includes our multiple roles within the energy sector.

This Statement sets out NRW's various roles within the energy sector, and our approach in undertaking these roles within the context of our core purpose⁵ and in supporting Welsh

¹ IPCC, 2013 , pg 9

² IEA, Energy, Climate Change & Environment, 2014 Insights

³ Natural Resources Wales, Corporate Plan 2014-2017

⁴ Natural Resources Wales, Business Plan 2017/2018

⁵ Environment (Wales) Act 2016, S5

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Government's aspiration to move towards a low carbon energy. It also outlines our guiding energy principles and the energy hierarchy that we advocate in supporting the transition to low carbon economy whilst ensuring the sustainable management of our natural resources.

2.0 Policy Context

2.1 UK Policy

The Climate Change Act 2008 includes a UK Government commitment to reduce greenhouse gas emissions by 80% (from 1990 levels) by 2050⁶. The UK Government also has an EU target to increase the amount of energy generated from renewable technologies to 15% by 2020⁷. The UK Government therefore needs to continuously ensure that the future framework for energy policy address all three objectives of sustainable development – environmental, economic and social – and not just energy security. Given that the energy supply produces 29% of the UK's greenhouse gas emissions⁸, the delivery of climate change objectives must largely be achieved through the decarbonisation of the energy system. Thus, moving away from the traditional energy source of fossil fuels is a significant challenge, and low carbon and renewable options are key to reaching this target⁹.

The UK's four energy policy goals¹⁰ are:

- to be on a path to cutting the UK's carbon dioxide emissions - the main contributor to global warming - by some 60% by about 2050, with real progress by 2020;
- to maintain the reliability of energy supplies;
- to promote competitive markets in the UK and beyond, helping to raise the rate of sustainable economic growth and to improve our productivity; and
- to ensure that every home is adequately and affordably heated.

Since 2007, there have been a number of plans and strategies from UK Government to help the UK move towards its commitment to a low carbon future and help achieve its climate change and renewable energy target. These include;

- The Energy Efficiency Strategy: The Energy Efficiency Opportunity in the UK
- UK Renewable Energy Roadmap; Updated 2013
- UK Community Energy Strategy; Updated 2015
- Implementation of Electricity Market Reform
- The Future of Heating: Meeting the Challenge
- Electricity System: Assessment of Future Challenges
- Future of Retail Market Regulation

⁶ Climate Change Act 2008 - <http://www.legislation.gov.uk/ukpga/2008/27/contents>

⁷ UK Renewable Energy Roadmap, July 2011, Chapter One.

⁸ DBEIS, 2015 UK Greenhouse Gas Emissions, Final Figures, pg. 19

⁹ Energy and Climate Change, World Energy Outlook Special Report, 2015, International Energy Agency

¹⁰ Meeting the Energy Challenge: A White Paper on Energy, May 2007, Executive Summary

2.2 Wales Policy

The Welsh Government's Climate Change Strategy launched in 2010¹¹, sets out the measures for annual emission reduction of 3% pa within sectors with devolved competence from 2011 onwards. This strategy drives the Welsh contribution to the legally binding UK target for emissions reductions set out in the Climate Change Act 2008. This was recently strengthened by the Environment (Wales) Act 2016 which provides a statutory framework for action on climate change including targets for reducing emissions of greenhouse gases. This means Wales will now set its own interim emissions target and carbon budget for each budgetary period at a level consistent with meeting the 2050 emissions target. The Welsh public sector has further duties through the Well-being of Future Generation (Wales) Act 2015 which describes the goal of a prosperous Wales in the following terms;

“An innovative and **low carbon society** which recognises the limits of the global environment and therefore uses resources efficiently and proportionately (**including acting upon climate change**); and which develops a skilled and well educated population in an economy which generates wealth and provides employment opportunities, allowing people to take advantage of the wealth generated through securing decent work”

To achieve the aspirations of becoming a low carbon economy, the Welsh Government has set out its strategic policy direction in 'Energy Wales: A Low Carbon Transition'. Energy Wales is supported through several strands of work which help drive the delivery of the energy targets and aspirations for Wales, all of which must be achieved within the devolved power bestowed to Wales.

In September 2017, Welsh Government set out three key ambitious energy targets for Wales which are;

- Wales to generate 70% of its electricity consumption from renewable energy by 2030.
- A target of 1GW of renewable electricity in Wales to be locally owned by 2030.
- All renewable energy projects to have an element of local ownership.

Additionally, in 2017 new devolved powers included in the Wales Act 2017 will see the Welsh Government and National Assembly of Wales take on a number of responsibilities that will have a bearing on the energy system, including;

- Power to consent energy projects with a generating capacity of 50MW-350MW.
- Responsibility for licensing onshore oil and gas, including the extraction of shale gas which is currently under a moratorium, and for new coal mines.
- The ability to give the power of consent for 'associated development' for energy projects, for example transport links, to the same body as is responsible for the main project.

¹¹ Climate Change Strategy for Wales, Welsh Government, 2010
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- Responsibility for marine licensing in the Welsh offshore region. Marine licensing fees were recently revised in Wales and extra protection measures put in for harbour porpoises and seabirds.
- Power to designate areas in the Welsh offshore region as marine conservation zones (MCZs).
- Power to make building regulations in respect of 'excepted energy buildings' - buildings that form part of energy infrastructure.
- Power to legislate over water supply and sewerage. (water-energy nexus)

2.2.1 Energy Wales

Energy Wales¹² launched in 2012 sets out Welsh Government's programme in moving towards a low carbon future. It contributes towards the Wellbeing of Future Generation (Wales) Act 2015, which aims to enhance the economic, social and environmental wellbeing of the people and communities of Wales – to achieve a better quality of life for our own and future generations. It sets out Welsh Government's ambition to;

- Be a leader on energy;
- Maximise economic benefit; and
- Act for Wales' long term energy future.

The programme outlined Wales' current stance on low carbon, Welsh Government's aspiration by the year 2020 and how it will be achieved.

Subsequently, in 2014, Welsh Government published the Energy Wales: A Low Carbon Transition Delivery Plan¹³ which outlined how Welsh Government would develop and deliver the proposals set out in Energy Wales: Low Carbon Transition.

2.2.2 Green Growth Wales

In 2015, Welsh Government published Green Growth Wales: Local Energy¹⁴ which sets out the approach to local energy generation. It provides a vision of a future where all communities and businesses use more locally generated electricity and heat to reduce dependence on central generation. The document sets out how the Welsh Government would;

- Set a clear direction for local energy.
- Remove barriers to generation where right and responsible.
- Support people and organisations.
- Enable access to capital funds.

The approach will be guided by the Wellbeing of Future Generation (Wales) Act, as Welsh Government continues to develop a range of support mechanisms to maximise the benefits of energy developments for Wales. For example, this includes programmes of support around the proposed development at Wylfa, and the Swansea Tidal Lagoon project, all of

¹² Welsh Government, 2012, Energy Wales: A Low Carbon Transition

¹³ Welsh Government, 2014, Energy Wales: A Low Carbon Transition Delivery Plan

¹⁴ Welsh Government, 2015, Green Growth Wales: Investing in the Future

which, will ensure that NRW's advice is fully considered to make sure that businesses in Wales maximise their opportunities to deliver these projects.

2.2.3 Resource Efficient Wales

The Resource Efficient Wales (REW) service launched by Welsh Government in 2014 includes a number of programmes to help support individuals, communities and businesses to become more resource efficient. REW is the Welsh Government's single point of access which provides information across a range of resource efficiency topics, delivered mainly through advice on how to reduce energy, water, resource use and waste which equips communities and businesses with knowledge on the benefits of resource efficiency.

2.2.4 Welsh Government Local Energy Service

The Welsh Government Local Energy service was launched in January 2016 and continues to develop a pipeline of locally owned renewable energy projects. Replacing the Ynni'r Fro service, the Local Energy service helps communities and SMEs develop renewable energy projects that deliver local benefit as well as decarbonisation.

2.2.5 Welsh Government Warm Homes

Welsh Government Warm Homes, which includes the Arbed and Nest schemes, provides funding for energy efficiency improvements to low income households and to those living in deprived communities across Wales. It supports the Welsh Government's commitments to:

- reduce climate change.
- help eradicate fuel poverty.
- boost economic development and regeneration in Wales.

Both schemes consider a whole house approach to home energy efficiency improvements. This helps to tackle harder to treat homes where the impact of fuel poverty tends to be most severe. Since 2012, the Welsh Government has invested over £150 million and improved over 27,000 homes, reducing energy bills and helping households to heat their homes at a more affordable cost.

2.2.6 Natural Resource Policy

The Natural Resource Policy (NRP) published in September 2017 is a requirement under the Environment (Wales) Act. The key focus of the NRP is on improving the way we manage our natural resource. It is also key to the delivery of the Well-being Goals set out within the Well-being of Future Generation (Wales) Act and our international contribution to the delivery of the UN's Global Goal.

The NRP identifies three national priorities for the management of our natural resources. They are;

- Delivering nature-based solutions
- **Increasing renewable energy and resource efficiency**
- Taking a place based approach

These priorities are designed to work together to help tackle the challenges and realise opportunities that natural resources provide. The NRP covers and integrates a broad range of traditional policies (energy, water, flood, forestry, farming etc) with the aim to maximise contribution across the Well-being Goals.

3.0 NRW's Role and Remit

NRW's general purpose is to pursue the sustainable management of natural resources in relation to Wales¹⁵ and we do this by applying the principles of Sustainable Management of Natural Resources (SMNR)¹⁶ in the exercise of our functions¹⁷, so far as consistent with the proper exercise, and through maximising our contribution to the Wellbeing Goals enacted in the Wellbeing of Future Generation (Wales) Act 2015¹⁸. Within the energy realm, we aim to contribute towards the delivery of Welsh Government's energy and low carbon aspirations by applying the principles of SMNR in all our roles.

We have a number of specific roles in relation to energy matters, including land management, advisory and regulatory roles. This provides an opportunity to create a new and innovative approach to deliver integrated natural resource management by making the most of our tools and roles to better achieve positive outcomes for people, the environment and the economy.

3.1 Decision Maker/ Regulator

As a decision maker and regulator, our main aim is to protect people and the environment, including marine and forest, and take proportionate enforcement action against those who breach the regulations that we are responsible for. From an energy perspective, we have a statutory duty to decide and regulate many of the environmental impacts that can result from energy generation, transmission and consumption. The details of our permitting role vary according to the types of technology – ranging from coal and gas fired power stations to nuclear power stations and small-scale hydropower schemes. In addition to determining environmental permits, we also ensure that, once granted, operators undertake relevant activities in accordance with requirements set out in permits through our compliance activities.

We are also responsible for the implementation and enforcement of the EU Emission Trading Scheme (EU ETS) regulation in Wales, including issuing permits to installation captured by regulation and checking that they comply with the system's operational rules. NRW also administers the energy efficiency schemes such as, Carbon Reduction Commitment (CRC) and the Energy Savings Opportunity Schemes (ESOS) with the aim of ensuring high levels of compliance.

3.2 Land Manager/Facilitator

¹⁵ Environment (Wales) Act 2016 S5

¹⁶ Introducing Sustainable Management of Natural Resources, NRW,

¹⁷ Environment (Wales) Act 2016 S4

¹⁸ Wellbeing of Future Generations (Wales) Act s4 lists these goals.

We manage 7% of Wales' land area including woodlands, National Nature Reserves, water and flood defences. We also maintain visitor centres, recreation facilities, hatcheries and a laboratory.

We own and manage land throughout Wales together with the Welsh Government Woodland Estate (WGWE) which we manage on behalf of the Welsh Government. Here we have enabled and facilitated the deployment of renewable energy production such as wind farms, hydropower, solar and biomass.

3.3 Statutory Adviser

We are a statutory consultee in the town and county planning system, and respond to around 7,000 development planning consultations annually. We also provide advice to developers and planning authorities on Strategic and Spatial Plans and Programmes for both terrestrial and marine, which includes Strategic Environmental Assessments, Habitats Regulation Assessments and Environmental Impact Assessments.

We encourage early engagement with developers and, when responding to consultations we advise developers and planning authorities on the potential environmental impacts from development proposals, including energy schemes, and where appropriate; how adverse effects may be mitigated. We also advise planning authorities on how planning policies should protect and enhance the environment, as well as ensuring the sustainable management of our natural resources.

More information on how NRW engages with the development planning system in Wales can be found in our [Development Planning Advice: Service Statement for Delivery](#).

3.4 Technical/Policy Adviser

We are the principal adviser to Welsh Government, and an adviser to industry and the wider public and voluntary sector on matters relating to the environment and natural resources. We also provide impartial advice and evidence to the Welsh Government and UK Government within a wider energy policy and planning framework.

3.5 Designating/ Notifying Body

We have a statutory duty to designate or notify sites for their landscape importance or their biodiversity interests. These include Sites of Special Scientific Interest (SSSI), which are areas of a particular value for their wildlife or geology, Areas of Outstanding Natural Beauty (AONBs) as well as declaring National Nature Reserves (NNRs). We provide advice to Welsh Government on the designation of National Parks. Our work involves assessing activities that might have an impact on such sites, which allows us to understand how development proposals including energy schemes may affect such sites, to ensure development is directed to the most appropriate locations.

3.6 Responder

We deal with a range of incidents from floods, air, land and water pollution, wildlife crime, nuclear and radioactive substances and Control of Major Accident Hazards (COMAH), to other incidents where we act as advisors to the emergency services. We respond to some 9,000 reported environmental incidents a year as a Category 1 emergency responder.

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3.7 Partner, Educator and Enabler

We are a key collaborator with the public, private and voluntary sectors, providing grant aid, and helping a wide range of people use the environment as a learning resource; acting as a catalyst for others' work. Our work on the Carbon Positive Project (more details in section 8 – Examples of our Work) is a good example of how we are striving to showcase NRW's low carbon opportunities and our experiences of carbon management. Additionally, NRW's role on the Welsh Government Woodland Estates outlines our enabling role in actively promoting energy efficiency and renewable energy on the land we manage.

3.8 Evidence Gatherer

NRW also has a role in monitoring our environment, commissioning and undertaking research, developing our knowledge, and being a public records body. We are committed to increasing our understanding on the environment, economy and people which will continuously improve our decision making on energy development. For instance - we will continue to provide positive planning frameworks so that the most appropriate energy sources are exploited in the most appropriate places which integrates economic, social and environmental benefits and impacts.

For instance, our work on the [State of Natural Resource Report](#) (SoNaRR) is groundbreaking and exemplary. The report sets out the state of Wales' natural resources. It assesses the extent to which natural resources in Wales are being sustainably managed, and recommends a proactive approach to building resilience. It also links the resilience of Welsh natural resources to the well-being of the people of Wales by highlighting some of the risks to our well-being and the opportunities that are out there to improve not only the state of our natural resources, but all the benefits that we get from it.

4.0 NRW's Principal Energy Team

NRW's roles and remit on energy matters are undertaken across many teams and directorates. The principal energy teams are however based within the following directorates;

Evidence, Policy & Permitting
Operations
Finance and Corporate Services

4.1 Evidence, Policy & Permitting Directorate

The Evidence, Policy and Permitting Directorate provides the advisory and regulatory aspect of NRW's role through the;

- Planning, Landscape, Energy & Climate Change Team which provides strategic advice and guidance on development planning, landscape, energy and climate change matters on land and at sea. NRW's Carbon Positive Project sits within this Group. In collaboration with strategic leads, the Carbon Positive Project is setting

strategic direction in decarbonisation across NRW and delivering a carbon reduction programme for the organisation.

- The Permitting Service is responsible for a wide range of permitting activities. Permitting Service includes registrations, exemptions, approvals, permissions, licences, consents, assents and other authorisations.
- The Future Regulation team provides strategic advice and guidance across NRW on regulation and future regulatory approaches. This includes improving, streamlining and implementation of regulation and regulatory methods.
- The Radioactivity and Industry Regulation team provide strategic advice and guidance across NRW and to external stakeholders on a range of industry regulation work streams. This includes national and international policy matters in the energy sector, primarily the conventional coal, oil, gas and nuclear energy sectors. It includes working closely with fellow regulators such as the Environment Agency (EA), Scottish Energy Protection Agency (SEPA), Northern Ireland Environment Agency (NIEA), Office of Nuclear Regulation (ONR), Health and Safety Executive (HSE), Government Departments within Department of Business Energy and Industrial Strategy (DBEIS, formerly DECC), Welsh Government and as well as the coal, oil, gas and nuclear energy generating operators, developers and trade associations.

4.2 Operations Directorate

The Operations Directorate leads on all operational activities which includes our land management, regulation, compliance and advisory role through the following teams;

- The Energy Delivery Programme which sits within the Enterprise Team is responsible for promoting the NRW Managed Estate as a suitable place for energy development and for delivering energy projects on and over the Natural Resources Wales Managed Estate.
- Development Planning Advice Service teams in operations provide advice to developers and local planning authorities on the likely impacts from onshore to marine energy schemes on Wales' environment and natural resources.
- The area Pollution Prevention Control (PPC) teams regulate energy industries in Wales including ensuring compliance with NRW environmental permits and COMAH licences issued by the joint competent authority (HSE and NRW) to the operators. In Wales, energy generating sites include coal, gas, oil and nuclear fired power stations as well as Environmental Permitting Regulation (EPR) permitted industrial sites such as oil and gas storage facilities.
- The NRW Energy Island Programme, which is part of North & Mid Wales Operation team, coordinates the delivery of NRW's roles and responsibilities for a number of low-carbon energy projects on Anglesey, with the focus being upon the proposed nuclear power station Wylfa Newydd (See Section 8 – Examples of Our Work). The Programme's multi-disciplinary team has a wide remit that includes:

- Project managing NRW's delivery in relation to the Wylfa Newydd Programme (e.g. managing resourcing challenges and financial agreements with the developer).
- Managing NRW's engagement with developers, regulatory partners and key stakeholders.
- Coordinating delivery of pre-application advice and guidance.
- Delivering NRW's communications and stakeholder engagement with regards to Wylfa Newydd.
- Responding to development planning consultations.

Although based within the North and Mid Operations directorate, the Programme brings together specialists from various teams and disciplines throughout NRW including project management, permitting, planning, conservation, communications and nuclear specialisms.

4.3 Finance and Corporate Services

The Corporate Assets team includes the Environmental Management System (EMS) team, facilities management and fleet management, all of which have a key role in energy efficiency measures in NRW's buildings and fleet services. The NRW EMS is certified to the ISO14001 environmental standard, which ensures continuous improvement in our environmental performance.

The EMS team functions in relation to energy include;

- Setting annual carbon, energy and travel reduction targets.
- Monitoring and reporting carbon, energy and travel performance.
- Working with facilities management and Carbon Positive Project to install carbon and energy saving measures.
- Working with fleet management and reduce travel emissions.
- Working with the carbon positive team to reduce carbon and energy.
- Raise staff awareness and behavioural change (energy campaigns and travel decision tree)

5.0 NRW's Guiding Energy Principles

This section outlines a set of guiding principles to inform NRW's engagement with the energy sector. The principles are a simple guide on the work NRW does in relation to energy, why we do it and how.

- Energy Hierarchy should be made the cornerstone which provides a clear pathway of steps to develop rigorous energy management.
- All energy management should start with energy conservation - reducing energy consumption, such as turning off appliances and lighting, turning down the thermostats and decreasing hot water thermostats.
- Energy conservation and energy efficiency should become central to Wales'/UK's energy system transformation in achieving the low carbon economy. A combination

of efficient technology and behaviour changes can help achieve large reductions in energy consumption.

- Energy and environmental imperatives should go hand in hand in ways that will result in the most sustainable outcomes.
- We will continue to ensure that our strategy, decisions, operations and advice to Government and others are underpinned by regulation and objective evidence.
- We encourage, and where possible support communities to generate and use energy from sustainable resources locally by harnessing the benefits of their natural resources.
- We encourage the use of evidence, environmental, social and economic considerations to inform energy policy which supports investment decisions.
- We will continue to engage early with stakeholders to provide a more efficient and effective service.
- We will continue to improve and help design regulatory processes that aid responsible energy development, whilst protecting Wales's natural resources.

6.0 Energy Hierarchy

The concept of 'Energy Hierarchy'¹⁹ is a simple one, but it has profound implications for energy strategy or policy. It is a simple principle for prioritising solutions which states that a coherent energy policy must start with energy demand reduction and then with improving energy efficiency before different types of energy supply are considered²⁰. It has five tiers of priorities. Tier 5 provides no benefits in addressing the climate change issue but captures the short to medium term energy security, known as the 'bridging technology' as regarded by the UN's Intergovernmental Panel on Climate Change (IPCC) report²¹.

We support the energy hierarchy approach as it is similar to the established waste hierarchy. The concept of a 'Waste Hierarchy'²² was very influential in advancing the debate about ways of controlling waste. A similar approach can help the prioritisation of new solutions for energy management. The energy hierarchy provides an effective framework to guide energy policy and decision making. The hierarchy does not require for one tier to be completed before moving on to the other. In fact, it would be beneficial to practice all tiers at the same time.

¹⁹ The Energy Hierarchy, Institution of Mechanical Engineers

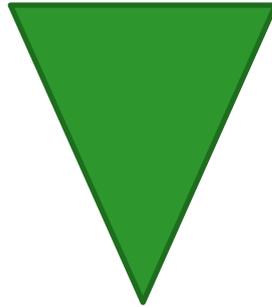
²⁰ National Energy Efficiency & Savings Plan, 2011, Welsh Government

²¹ Summary for Policymakers, IPCC WGIII AR5, April 2014

²² Guidance on applying the Waste Hierarchy, Defra, June 2011

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More Sustainable



Less Sustainable

Reduce Energy Demand (Energy Conservation)
Use Energy Efficiently
Renewable Energy Generation
Low Carbon Technologies
Conventional Technologies

6.1. First Tier – Reduce Energy Demand (Energy Conservation)

Energy demand minimisation (or energy conservation) can often be best achieved through behavioural changes. It can also be done through using less energy (e.g. turning down room temperature by a degree or two) or no energy systems (e.g. natural lighting system). Within a domestic or commercial environment, reduction means reducing the amount of energy needed by the occupants of a building while still maintaining their living conditions. It often involves small changes like switching off appliances when not in use (e.g. printer, coffee machine, and computer), thus reducing the need for additional installed generating capacity. Effective policy measures should be targeted at where the greatest savings can be achieved.

How NRW applies and promotes energy conservation in our work

NRW encourages energy conservation (and energy efficiency) through our climate change mitigation and adaptation role, as well as demonstrating actions through our own Environmental Management System (EMS) by raising staff awareness and behavioural change programmes such as the energy campaigns and travel decision tree.

We also advocate the development of policies and regulations that consider the impact on energy demand. NRW launched the State of Natural Resources Report (SoNaRR), which is first of its kind and a new statutory duty for NRW as part of the Environment (Wales) Act 2016. The SoNaRR report highlights the potential impacts of energy consumption, energy demand, energy supply and climate change on our natural resources and ecosystem and utilise this information to inform and influence others.

We also aim to show leadership to the Welsh public sector by becoming exemplar in carbon management and sharing this best practice across the Welsh public sector through the 'Carbon Positive Project'. The work of the Carbon Positive Project builds upon some of our existing successes and we aim to embed best practice carbon management across NRW, to further improve our energy management. We will also manage our own carbon impact and demonstrate to others the actions they can take.

More information about our work can be found [here](#)

6.2 Second Tier - Energy Efficiency

Energy efficiency can be defined as maximising the productivity of energy consumed – it means demand for energy will eventually reduce as efficiency improves, provided it is not affected by other factors like a growing population or an increase in other energy requirements. Energy efficiency affects both energy demand and energy supply. On the demand side, enormous savings can be made through technical measures by using more efficient domestic appliances, more efficient vehicles, more efficient heat delivery systems. Energy efficiency also has the potential to significantly affect a country's future choices on the supply side. For example, waste energy produced by a plant when harnessed and utilised then provides heat energy from the same amount of fuel that would have been used to generate the electricity in the first place, thereby leading to an efficiency gain.

How we apply and promote energy efficiency in our work

Much of NRW's work on energy conservation and energy efficiency goes hand in hand. Any action, advice and guidance on energy conservation aims to include energy efficiency measures as well. We advocate the advice and service provided by Welsh Government's Resource Efficient Wales programme.

Internally the EMS team continue to improve both the energy conservation and energy efficiency culture of the organisation by improving our business practices.

We also pursue energy efficiency measures through our land management/facilitation role – for instance, the efficiency of the renewable energy technology is one of the key criteria for our consideration which we encourage through the commercial competitiveness process through our land management role.

6.3 Third Tier – Renewable Energy

The 3rd tier is about the utilisation of renewable, sustainable resources to supply energy in many forms, not solely electricity. Efficient and sustainable energy provision is not just about the availability of a resource. It must also consider wider issues such as affordability, social acceptability, environmental impact and security of supply, all which NRW has a duty to consider through the Wellbeing of Future Generation (Wales) Act 2015.

How we support renewable energy in its work

NRW permits and regulates many renewable energy technologies and monitors the impact of these technologies on the environment. We also advise on mitigating the impact of these technologies on the environment to ensure that any renewable energy development delivers the most sustainable outcome.

We continue to streamline and improve the design of our regulatory process to aid responsible energy development, whilst protecting Wales's natural resources.

Through our land management/facilitator role, we are responsible for four distinct programmes of work:

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- Onshore Wind Energy Programme
- Small Scale Hydro Programme
- Third Party Access for Energy Programme
- Energy Business Opportunities Programme

By working with developers to deliver energy projects on or over the land we manage, we generate commercial income for Natural Resources Wales and Welsh Government and we create economic opportunities in the local and wider Welsh economy, through the supply of services by Welsh companies in the development of energy projects at both large and small scales. Individual energy projects also provide funding for local community initiatives, which is often used for local energy efficiency and renewable energy projects. Additionally, the energy projects also offer funding for environmental mitigation work which enable NRW to restore habitats, including peat to increase carbon stocks in soils. This helps deliver the multiple benefits required by the principles of Sustainable Management of Natural Resources.

Internally NRW offices are equipped with onsite power generation such as photovoltaic, solar water, biomass and wind generation where possible and appropriate. From April 2017, NRW will source all its electricity (bought from the grid) from 100% renewable tariffs/suppliers.

6.4 Fourth tier – Low Carbon; Non – Renewable Generation

The 4th tier concerns the utilisation of low greenhouse gas emitting resources. A good example of this is the use of nuclear generation for base load electricity.

The UK Government has set out plans to develop approximately 16GW of new nuclear power which is set to provide reliable and low carbon base alternative to fossil fuels. This is primarily several large new nuclear power stations and a number of these projects have been proposed in England and Wales. This will replace the current generation of ageing nuclear reactors which produce around 21% of the UK's electricity²³. The proposed new nuclear station in North Wales (Wylfa Newydd) is anticipated to generate 2700 Mw and the development is proposed to begin electricity generation in the mid-2020s. The UK Government are also looking at the feasibility of other nuclear technologies such as Small Modular Reactor (SMR) technology and the viability of these smaller cheaper nuclear energy installations being cited in the UK, which may include Wales. As such, in addition to the current Wylfa Newydd project, there is the possibility that other nuclear energy plants - SMRs may be proposed for Wales in the future.

How we engage with non-renewable generation

NRW recognises nuclear energy could make an increasing contribution to a low carbon energy supply and its role in the transition for Low Carbon Economy as envisioned by Welsh Government. NRW also recognises that continued use and expansion of nuclear energy in the UK will require continued and greater efforts to improve safety, economics, uranium utilisation, waste management and proliferation of materials.

²³ Digest of UK Energy Statistics 2016, Statistical Press Release, 28th July 2016, DECC

We have a critical role in ensuring these low carbon non-renewable energy developments have minimum impact and that all necessary mitigation actions are in place to safeguard the people and the environment. We play a critical role delivering our part in the regulation and advice on the nuclear reactor design assessment, construction, operation and decommissioning phases of existing and new nuclear power stations in Wales including the Wylfa Newydd Nuclear Power Station project being proposed for North Wales by Horizon Nuclear Ltd.

We are also responsible under the Environmental Permitting Regulations (EPR) for regulating the disposal of radioactive waste on and from nuclear licensed sites (NLS) in Wales. This includes the permitted discharge of radioactive discharges to air and water and of solid waste to licensed disposal facilities. As well as being responsible for delivering advice and guidance for new and existing sites, delivering permitting, permit compliance and enforcement, we also have a role in delivering an extensive environmental monitoring programme from nuclear sites including radiological assessments. This is done in conjunction with our regulatory partners and results are published annually in the joint environmental regulators report; 'Radioactivity in the Environment (RIFE)'

6.5 Fifth tier – Conventional Technologies

The 5th tier is the least sustainable energy source – comprising petroleum, natural gas and coal. In 2016 primary oil (crude oil and NGLs) accounted for 42% of total UK production, natural gas 32%, and coal 2%²⁴. Although coal production fell to a record low in 2016 due to closures of all large deep mines, primary oil rose by 1.2% in 2016 compared to 2015. A similar pattern was observed for UK energy consumption where by oil and gas accounted for around 45% and 30% respectively and coal 1.4% in 2016²⁵ which indicates our dependence on conventional sources. Wales shared a similar scenario whereby in 2013 petroleum was the most consumed fuel type in Wales, followed by gas and then electricity (generated from coal)²⁶. Thus, it is important that energy goals and strategies involve continuous reduction, and the eventual phasing out in the long term of conventional fossil fuel use, recognising its contribution to energy security in the short and medium term. This is reflected in the UK Plans to phase out unabated coal-fired power stations by 2025, provided the security of electricity supplies is maintained.

How we engage with the conventional energy sector

Natural Resources Wales acknowledges the need to carefully manage the transition to a low carbon economy. As part of our commitment, we are reducing our own dependency on fossil fuels where possible. The Carbon Positive Project aims to identify our key emissions (including those from fossil fuels) and provide a strategic assessment of mitigation options to reduce the organisation's use of fossil fuels in future. This will include procuring energy from 100% renewable sources and increasing the uptake of energy efficiency and renewable energy technology for our office premises and reducing our travels.

²⁴ UK Energy in Brief 2017, DECC

²⁵ UK Energy in Brief 2017, DECC

²⁶ Energy Generation & Consumption for Wales, 2013. Statistical Bulletin, Welsh Government
www.naturalresourceswales.gov.uk

We are also a regulator of conventional technologies whereby we regulate large power stations and industrial processes under the Pollution Prevention and Control Directive through the UK Environmental Permitting Regulations (EPR). Our key role is to ensure the energy developments use best available techniques to prevent, or, where that is not possible, minimise emissions to the environment. We also have duties on air quality management.

In addition, we have a land facilitation role in relation to conventional technologies (coal & gas). The NRW managed estate hosts considerable quantities of coal and gas which falls within the UK Petroleum Exploration and Development Licence (PEDL) portfolio. If, and when the deposits are subject for exploration and development, NRW will ensure this is done with appropriate licencing and regulation, as we do with all other technologies. We will also ensure that there is clear separation of duties, clarity of role and transparency in the way which we administer our functions.

7.0 Forward Look

We are committed to playing our part in ensuring a rigorous energy management which will lead to energy transition that move Wales towards a low carbon economy.

- We will continue gaining wisdom and understanding of our natural resources and how we affect them. We will use this knowledge along with evidence and apply learning from experience so that we make good decisions in assisting energy developments. Our work on the State of Natural Resource (SoNaRR) report is exemplary.
- We will continue to work with government, business and industry to support energy development and continue to encourage development in the right places to ensure sustainable management of natural resources.
- We will manage the Welsh environment in an integrated way ensuring our ecosystems are resilient, wildlife and landscapes are enhanced, and natural resources are used wisely.
- We will strive to be an exemplar of public sector delivery, operating efficiently and sustainably. Our work on the Carbon Positive Project a very good example of this. (see section 8 – Examples of our work)

We advocate, support and encourage the transition to sustainable energy economies and urge

UK Government to:

- Adopt a whole system approach to policy around its chosen pathway to 2030 and 2050. This should include robust assessment of the impacts of its policy decision across electricity, heat and transport.
- Provide a clear long term policy and funding framework to boost the confidence of businesses and communities to plan for the next few decades. Businesses, communities and consumers should be rewarded and seen as part of the solution for the energy and climate change dilemma.

Welsh Government continue to;

- Provide strong leadership on energy conservation, demand management, decarbonisation and low carbon energy development.
- Develop goals and strategies for the short term (to 2020), midterm (to 2030) and long term (to 2050) involving the phasing out of fossil fuel, while recognising its contribution to the energy security of Wales in the short term.
- Develop a robust plan to increase energy conservation, energy efficiency and renewable energy and where possible encourage actions in these areas through the Environment (Wales) Act 2016 which requires Wales to establish statutory climate change target and carbon budgeting to help drive further action on climate change.
- Develop and deliver energy policy in line with the Wellbeing and Future Generation (Wales) Act duty, such as reducing carbon footprint and fuel poverty through effective energy efficiency and renewable energy measures.
- Provide positive planning frameworks so that the most appropriate energy sources are exploited in the most appropriate places which integrates economic, social and environmental benefits and impacts.
- Facilitate a healthy and enabling sector in Wales through close co-operation between public, private and third sector organisations.

8.0 Examples of Our Energy Work

Natural Resources Wales has a strategic role in enabling Wales to transition to a Low Carbon Economy.

This section includes some examples of NRW's engagement with the energy sector. It highlights some of our roles and our innovative approaches in addressing issues relating to the energy trilemma – to mitigate climate change and safeguard the security and affordability of our energy supplies.

8.1 Energy Park

NRW has a key role to facilitate renewable energy development and grid connection on the Welsh Woodland Estate (WGWE). In collaboration with Renewable UK Cymru, NRW has developed the [Energy Park](#) concept in Wales. Energy Park aims to optimise the renewable energy opportunities on the WGWE. NRW is looking to manage such areas profitably by integrating the development of wind, solar and hydro power, biogas units, heat pumps, anaerobic digesters and other emerging renewable technologies. The Energy Park concept is an opportunity that we believe should be explored across the estate where such development can appropriately integrate with other land uses.

Cyfoeth Naturiol Cymru Natural Resources Wales

Energy Park of Future Generations

Well-being of Future Generations (Wales) Act 2015

NRW Well-being goals:

- Innovative, productive low carbon industry & skilled jobs.** High number of jobs during construction, including supply chain, followed by good quality specialist support during operation.
- Functioning & adaptable ecosystems supporting social, economic & ecological resilience.** Clean energy replacing fossil fuels contributing to improved ecosystems & energy security.
- Physical & mental well-being maximised.** Choices & behaviours for future health understood. Clean energy replacing fossil fuels, which are known to have a detrimental effect on air quality, which adversely impacts on health.
- Everyone enabled to fulfil their potential.** Employment opportunities & supply chain benefits.
- Attractive, viable, safe & well connected communities.** Community ownership and Trust Funds contributing to communities.
- Society protects & promotes Welsh culture, heritage & language.** Community Trust Funds contributing to Welsh culture & language.
- Making a positive contribution to global well-being.** Clean energy replacing fossil fuel contributing positively to overcoming global climate change.

Outcomes from SMNR: Environment (Wales) Act 2016

- Use of the natural environment for access & recreation. Opening up forest roads, interpretation & investment in recreational mitigation.
- Natural Resources that provide something for everyone. Using the natural resource of wind to create clean renewable energy for everyone, reduce CO2 & impact air quality & climate change.
- Communities protected from flooding, drought & pollution. Multi Em Community Funds available for purposes determined by communities, which might include flood mitigation measures.
- Community Projects that make sustainable use of natural resources. Multi Em Community Funds available for purposes determined by communities.
- A natural environment that adds to a sense of place & history. Potential for these windfarms to become important industrial heritage sites of the future.
- Natural Resources managed in ways that reduce carbon emissions & demonstrate SMNR. Wind is a sustainable natural resource adding to the energy mix & replacing fossil fuels.
- Jobs & Investment in SMNR. High number of jobs during construction, including supply chain, then good quality specialist support during operation & lasting SMNR - positive climate change impact.
- Timber & Non-timber Products. Construction gives rise to timber production through Compensatory Planting resulting in overall gain at end of development.
- Healthy ecosystems. Habitat Management Plans provide opportunities & investment in landscape change for great restoration, habitats & species impact.

SMNR = Sustainable Management of Natural Resources

Working together: **renewableUK** **innogy** **VATTENFALL**

www.cyfoethnaturiol.cymru
www.naturalresources.wales
0300 065 3000

For more information about the Energy Park click [here](#)

8.2 Marine Energy

The UK has large natural resource of marine energy. It has the potential to deploy a range of technologies that are designed to extract energy from wave and tides and off shore wind farm developments that could make a meaningful contribution to the UK energy mix from around 2025.

Utilising the marine environment to produce energy can have important benefits to society. The marine environment is a source of significant renewable energy which helps to reduce reliance on fossil fuels for energy generation, thus it helps to reduce our carbon emissions. However, inappropriately sited and designed marine energy developments could have harmful effects on other parts of the environmental receptors such as biodiversity, landscape, fisheries and could also cause implications for coastal erosion and flood defence. NRW therefore works with government, regulators and developers to ensure that the right technology is deployed in the right place.

NRW has multiple roles in relation to marine energy development. We are a licensing authority with responsibility for issuing marine licenses under the Marine and Coastal Access Act 2009 for individual developments and some of the associated activities (such as some survey work). We may also issue licences related to the protection of species and Sites of Special Scientific Interest (SSSI), as well as a range of other consents that may be required, especially where deployment of infrastructure is on or close to the shore.

NRW is also a statutory consultee and provides advice to regulatory authorities and developers about the environmental implications of deploying marine energy infrastructure. Finally, NRW also advises government and other organisation about the environmental implications of policy, plans and programmes that they may introduce to support marine energy development.

Many marine renewable energy technologies are in their infancy. The wave and tidal technologies particularly as there are gaps in our knowledge about the kind of effects they may have on the marine environment. Several research initiatives have been established across the UK to help fill these gaps in our understanding, and NRW plays a full and active role in undertaking this work, for example, we sit on the steering group of the UK Offshore Renewables Joint Industry Programme for Ocean Energy. This helps NRW to continue to base our advice and consenting decisions on the best available evidence.

There is considerable potential for wave and tidal stream energy in Welsh waters, with very high tidal ranges especially in the Severn estuary. There are a few consented projects and emerging plans and proposals within demonstration zones and sites around Wales for which NRW anticipate a list of applications for small scale development in the coming years. Currently, the tidal range industry comprises a partially consented project in Swansea Bay and several other projects that are in the early stages of planning around Cardiff, Newport and Colwyn Bay.

The Welsh Coast also has good wind resource and the offshore wind industry is fairly mature with a number of developments off the Welsh coasts. Several interconnector cables for the transmission of electricity also pass through Welsh waters and connect to the National Grid in Wales.

8.3 Nuclear Energy - Wylfa Newydd Project

Horizon Nuclear Power are planning to develop a new nuclear power station on the North coast of Anglesey, representing an investment of approximately £10 billion. The power station, Wylfa Newydd, would deliver approximately 2,700 megawatts of electricity, enough power for around five million homes. The proposed development includes:

1. The Wylfa Newydd Generating Station - the proposed new nuclear power station including two UK Advanced Boiling Water Reactors (UK ABWR) to be supplied by Hitachi-GE, associated plant and ancillary structures and Off-Site Power Station facilities. The development will also include significant marine works including, a marine offloading facility, cooling water intake / discharge facilities and an offshore breakwater.
2. Associated Development - development to support the delivery of the Power Station, for example highways improvements along the A5025, Park and Ride facilities for construction workers, Logistics Centre, Temporary Workers' Accommodation and Site Preparation & Clearance works.

Development of the Project will require a number of applications to be made under different legislation to different regulators. A nuclear power station is a nationally significant infrastructure project (NSIP) under the Planning Act 2008, thus, the developer must therefore obtain a development consent order (DCO), which is granted by the Secretary of State for the Department of Energy and Climate Change. In addition, Horizon will also

require a marine licence and environmental permits from NRW and a Nuclear Site Licence granted by the Office for Nuclear Regulation (ONR). Planning permission from Anglesey County Council will also be required for all the Associated Development.

NRW has the following roles and responsibilities with respect to the Wylfa Newydd Project:

Permitting and licensing - Horizon will submit applications to NRW for environmental permits for the disposal of radioactive and conventional wastes, combustion activities and water discharges during both the construction and the operational phases. NRW will also issue marine licenses for works undertaken in the marine environment and may also issue licenses related to the protection of European Protected Species and Sites of Special Scientific Interest.

Statutory Planning Advice - NRW is a statutory consultee and provides advice to planning authorities (e.g. Isle of Anglesey County Council and the Planning Inspectorate) and developers about the environmental implications of the power station and all associated development.

Generic Design Assessment (GDA) - The proposed nuclear reactor design for Wylfa Newydd is the UK Advanced Boiling Water Reactors (UK ABWR) to be supplied by Hitachi-GE Nuclear Energy, Ltd. As a new design that has not yet been used in the UK, the ABWR technology must undergo a detailed assessment to ensure it is fit for purpose and meets UK standards. The 4-year assessment, entitled Generic Design Assessment (GDA), is undertaken by the Office for Nuclear Regulation (ONR) and the Environment Agency (EA). However, as the design is proposed for a site in Wales, NRW are engaging in the design assessment process and will also consult the Welsh public on the Environmental aspects of the GDA process. This process is led by the RAIR Team within KSP.

Due to the scale and nature of the Project, there is a need for a joined up, cross-functional approach to delivery that includes staff from Operations, KSP, National Services and Communications within the 'Wylfa Newydd Project Team'. The Energy Island Programme Office, based within Operations North, works closely with the Wylfa Newydd Team to coordinate delivery of the Project.

8.4 Carbon Positive Project.

NRW has a key role in Wales to show leadership in tackling climate change. Part of this role involves setting an example of best practice carbon management, which can be shared with others to promote wider positive action on carbon across Wales. NRW's Carbon Positive Project aims to progress NRW becoming an exemplar in carbon management and sharing best practice for use across the Welsh public sector.

The Carbon Positive Project will evaluate NRW's net carbon status, accounting for both greenhouse gas emissions and carbon sequestration across the whole of NRW's estate. The project will identify mitigation opportunities to reduce our carbon impact as an organisation and deliver projects to demonstrate these measures. The project will also put in place a plan for future implementation of mitigation measures, embedding carbon management across the organisation and facilitating NRW becoming an exemplar in carbon management. Through sharing our approach and experiences, the Carbon Positive Project will help to disseminate best practice in carbon management across the Welsh public sector.

The Carbon Positive Project

- Comprehensively evaluating the whole of NRW's estate, estimating NRW's emissions and the carbon stored in habitats to evaluate the organisation's net carbon status.
- Investigating ambitious and innovative measures to reduce our carbon impact, delivering projects to demonstrate measures and embedding carbon management across NRW.
- Planning future implementation to accelerate delivery of measures to help meet national and international carbon reduction targets.
- Forming part of NRW's wider positive influence in tackling climate change and its role in ensuring the sustainable management of our natural resources.
- Delivering under key policy and legislation to provide wider benefits to Wales (e.g. the Wellbeing of Future Generations Act, the Environment Bill and the Sustainable Development Charter).
- Learning from others' experiences and extending our positive impact by sharing best practice for use across the Welsh public sector.

Contact us

If you'd like to know more about the Carbon Positive Project or share your experience of carbon management, please contact a member of the project team.

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Delivering a comprehensive approach to carbon management in five key steps

1. Calculating NRW's net carbon status	<ul style="list-style-type: none"> Collate greenhouse gas emissions data from buildings, transport and the management of our estate. Estimate carbon sequestration rates of habitats on our estate. Estimate carbon stocks held within habitats on our estate.
2. Evaluating options for mitigation	<ul style="list-style-type: none"> Evaluate options to reduce emissions, enhance sequestration and protect carbon stocks. Prioritise options for delivery by exploring costs, wider benefits and feasibility.
3. Demonstration projects	<ul style="list-style-type: none"> Deliver initial projects demonstrating potential mitigation options and best practice.
4. Communications and working with others	<ul style="list-style-type: none"> Collaborate with, and learn from, progressive organisations managing their carbon impact in ambitious and innovative ways. Engage staff and work collaboratively across NRW to embed exemplary carbon management into our activities. Facilitate and encourage positive action on carbon management across the Welsh public sector through communicating our approach and disseminating best practice.
5. Recording experience and planning future implementation	<ul style="list-style-type: none"> Produce reports to record and share our experience and approach. Develop a plan for future implementation of mitigation options within NRW to sustain action and to further develop NRW as an exemplar in carbon management.

A series of demonstration projects are showcasing the mitigation opportunities for the organisation including:

- Installing LEDs, solar PV, energy efficient and biomass boilers in our buildings.
- Integrating three fully electric vehicles into our fleet and installing charging infrastructure in our offices and key visitor centres.
- Delivering over 60 hectares of peatland restoration and over 14 hectares of broadleaved community woodland.
- Developing a Carbon Management Policy for NRW to guide carbon reduction in our procurement, and trialling tools to reduce carbon in our key contracts/frameworks.

9.0 Comments/Queries

For any further comments or queries with regards to this document please contact

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