

# Discover Energy Generation Opportunities

in Blaenau Gwent



ENERGY  
PROSPECTUS

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**Cover Image:** Ebbw Vale

Bedwellty House and Park, Tredegar

View of Ebbw Fach from St. Illtyd's Church, Abertillery

## BLAENAU GWENT - A SENSE OF PLACE

**Blaenau Gwent is an area steeped in industrial heritage, surrounded by areas of outstanding natural beauty and home to friendly and passionate communities in South East Wales; it offers a wealth of untapped potential, which alongside a range of emerging opportunities, makes it an ideal time to consider investing. We have a population of circa 70,000 residents or 31,000 households.**

**We are at the start of our energy journey, building upon the successful heritage of our former steel and coal mining industry. With Welsh Government support, collaborative partnership ventures including the Cardiff Capital Region City Deal of £1.25Bn and Tech Valleys investment we are in a strong position to support future energy growth.**

We want to create an environmentally friendly and sustainable retail and business environment, diversifying the evening and night time economy, creating improved transport connectivity through the County Borough and energy is central to our ambitious programme. We have experience in low carbon heat and power networks, improving energy efficiency of homes, public and commercial buildings and highways infrastructure.

The Council's core vision reflects upon who we are as a Council, how we do things and how we can shape the future by ensuring that these values apply to everything we do.

In Blaenau Gwent we recognise that increasing the choice of energy provision and security of renewable energy supply is integral to our wider social and economic regeneration plans. Having a strong environmental programme not only meets Welsh Government carbon reduction targets but is essential to creating sustainable and vibrant communities for the future.

Ebbw Vale Enterprise Zone Status has enabled Blaenau Gwent to confirm its position as a strategically important area in the region with a focus on advanced manufacturing, automotive, pharmaceutical and food businesses. Investment through the Enterprise Zone has provided a platform on which further opportunities can be explored not least through City Deal and Tech Valleys. Heavy investment in connectivity through road and rail infrastructure mean we are only a 1 hour drive from Cardiff International Airport, 1 ¾ hour drive from Birmingham and 2 ½ hour drive from London.



Heads of the Valleys Road

# OUR PLANS

**Our plans are ambitious and challenging but we believe that the time is right to capitalise on the exciting opportunities that lie before us including Cardiff Capital City Region, South Wales Metro and Tech Valleys investment. Not least to capitalise on the proximity to our beautiful natural landscape and clean energy potential.**

**Our prospectus offers a range of opportunities for collaboration with forward thinking and innovative partners from across the UK and Europe. From conceptual and speculative projects through to immediately available projects we are able to offer something for everyone who has an appetite for investing or becoming involved in creating a Low Carbon Future.**

The prospectus' aim is to support the Council to achieve it's ambitious targets for Blaenau Gwent to become a local Low Carbon Borough.

- Enhance energy and carbon efficiency
- A reduction in fuel poverty
- An improvement in the resilience of the local distribution network
- Maximise revenue generation potential

In November 2018, Britain's electricity grid reached a major green milestone. For the first time total energy capacity from renewable energy sources overtook capacity from fossil fuels. (Drax Electric Insights Quarterly, July to September 2018).

In Wales the Welsh Government have set an ambitious target to achieve a 30% reduction in carbon emissions by 2030. We aim to meet this target and the opportunities contained within this Prospectus will help us achieve it.



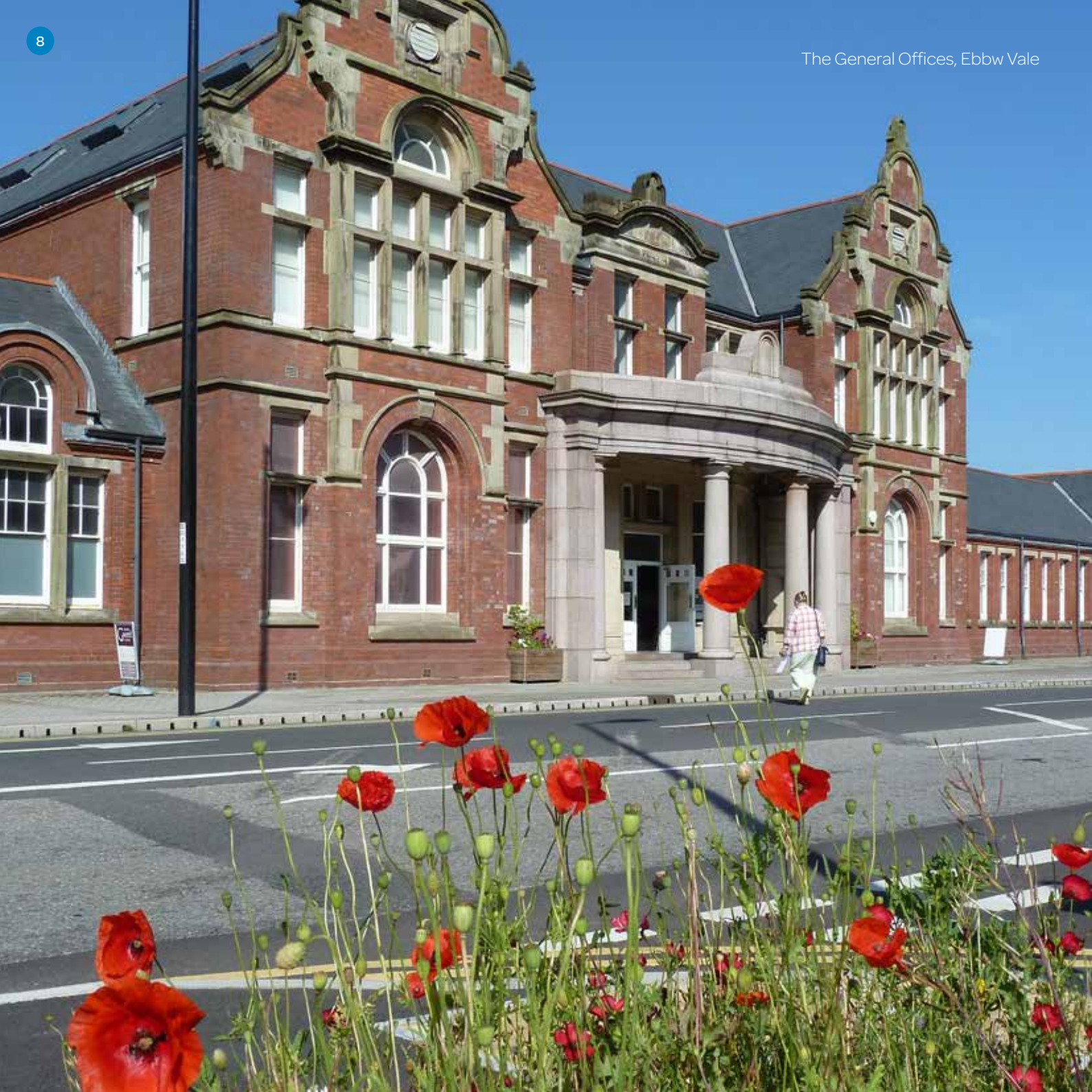
Aneurin Bevan Stones, Tredegar



## PROJECTS AT A GLANCE

The table provides a quick reference of the current project opportunities. Each of the projects are still subject to further project development therefore it is possible that costs etc. may be subject to change.

| Project Name                        | Technology                      | Lifecycle Revenue                       | Total Cost / Capex | Payback / Years | Investment Opportunity                             |
|-------------------------------------|---------------------------------|---|--------------------|-----------------|--|
| *RE:FIT                             | Lighting, CHP, Solar, PV et al. | £518k annum                             | £4.1m              | 8 Years         | Salix Loan   |
| The Works Expansion                 | Gas CHP, Biomass Boilers        | £80k annum                              | £1.24m             | 15 Years        | Private sector Council & Community                 |
| District Energy Network Development | Gas CHP                         | £2.5m annum                             | £9m                | 3.5 Years       | Private sector Council & Community                 |
| Opportunity One Wind Project        | Wind                            | £65k annum                              | £1.05m             | 10 Years        | Prudential Borrowing                               |
| Opportunity Two Wind Project        | Wind                            | £69,500k per annum                      | £3.58m             | 13.4 Years      | Prudential Borrowing                               |
| Hydro Generation                    | Hydro                           | £3.5k annum                             | £500k              | 10 Years        | Private sector & Community                         |
| Pentagon                            | Power to gas                    | N/A                                     | £324k              | N/A             | EU Commission H2020                                |
| Drive                               | Demand Response                 | N/A                                     | £300k              | N/A             | EU Commission H2020                                |
| Energy Brokering                    | Energy Purchase and Sale        | £1.2m per annum saving to businesses    | TBC                | TBC             | Council & Blaenau Gwent Businesses                 |
| Material Broker                     | Solar Lighting                  | £3.9m one off cost saving to businesses | TBC                | TBC             | Council, Private sector & Blaenau Gwent Businesses |
| Regional Collaboration              | Electric Vehicle Charging       | Subject to Procurement                  | £636k              | TBC             | OLEV, Local Authorities                            |
| Council Fleet Review                | Transport                       | Subject to Procurement                  | TBC                | TBC             | Public / Private Partnership                       |





# ENERGY EFFICIENCY

The Council is actively seeking to reduce both energy costs and carbon emissions across our property portfolio. We have considered a range of alternative delivery models to improve our buildings. Adopting the RE:FIT model offers the Council a commercial model to achieve financial savings, improve energy performance of buildings and importantly reduce their CO<sub>2</sub> footprint – typically range in the order of 10-35%.

**By using the RE:FIT model the Council will place an obligation on the contractor installing energy conservation measures to guarantee potential energy savings the specific technologies will bring through robust monitoring, measurement and verification measures to assess savings performance.**

A portfolio of buildings across the Council portfolio have been selected as having potential to benefit from the RE:FIT model. These include Council Buildings, Leisure Trust Locations and Schools.

To achieve the annual energy and carbon savings the Council has agreed to work with our Preferred Supplier, E.ON Solutions Limited to investigate the retrofitting of a range of Energy Conservation Measures across the selected estate.

Current project estimates indicate that the project will cost in the region of £4.1m to deliver. Capital funding for this project has been secured through the Welsh Government Salix Interest Free Loan scheme for Local Authorities.

Monitoring and evaluation of the performance of the Energy Conservation Measures is an essential requirement of the Contract and through this we will be able to monitor the success and improved energy efficiency that the measures bring to the portfolio.

**Although not an immediate project opportunity, inclusion of this project within this prospectus demonstrates the Council's commitment to developing a portfolio of energy projects offering both immediate savings and long term investment in our estate.**



Silent Valley, Ebbw Vale



## DISTRICT ENERGY NETWORKS

### OPPORTUNITY: EXPANSION OF THE WORKS DISTRICT HEATING NETWORK

The Works development in Ebbw Vale is a 200 acre site with a capital investment of over £200M incorporating a district energy network. The Network is a centralised energy system that provides electricity and heat to buildings throughout the site.

- Leisure Centre – heat supply
- General Offices and Gwent Archives – heat supply
- Secondary School – heat supply
- Multi Story Car Park – electricity supply
- Learning Zone – heat and electricity supply
- Funicular Railway – electricity supply

The district energy network is owned and operated by the Local Authority. It is run by a 375kW Gas Combined Heat and Power (CHP) Unit, 2x495kW Biomass Pellet Boilers along with 4 x 1,750 kW Gas Boilers.

Existing technology within the Energy Centre has sufficient capacity to meet future opportunities offering potential housing, industrial and commercial developers an investment which would gain the environmental and economic benefits of being linked to a district energy network through provision of over 250 homes per annum up to 2021. We are also developing new industrial premises on site which will connect to the network and demonstrate the benefits of district energy to businesses.

### OPPORTUNITY: DISTRICT ENERGY NETWORK DEVELOPMENT

Following on from the success of The Works Network, the Council secured up to £155,000 of funding via the Heat Network's Delivery Unit of the Department for Business, Energy and Industrial Strategy, the Ebbw Vale Enterprise Zone Board, Welsh Government and Blaenau Gwent County Borough Council to investigate further opportunities to develop district energy across Blaenau Gwent.

The opportunities have been investigated in a series of stages including:

- Heat demand mapping
- Master-planning and Project Prioritisation
- Feasibility Study
- Business Case Development

To date we have completed heat demand mapping throughout Blaenau Gwent and utilised the masterplanning and project prioritisation stage to identify Northern Ebbw Vale as a site with potential for development of a new network.

This area has been investigated through a feasibility study. This alongside the Welsh Government announcement to invest up to £100m over the next 10 years in Blaenau Gwent means we have the opportunity to meet future energy demands and deliver in a sustainable way. The next stage is to undertake soft market testing to identify potential project partners and funding sources to find the investment required to take a project forward.

**We therefore present this speculative opportunity to developers and investors seeking prospective opportunities in the area through district energy network development network.**



# FUTURE RENEWABLE ENERGY GENERATION

## OPPORTUNITY: WIND GENERATION

In 2016, we reviewed energy installations across Blaenau Gwent and found we have the lowest rate of renewable energy development in Wales. We are a small Welsh Local Authority but ambitious, and have a small percentage of land that is suitable for large-scale renewable energy installations.

However, the Council are active research partners in the Welsh Government Smart Living Initiative and we are fully committed to investigating all opportunities to increase the level of locally generated electricity and we hope that this is highlighted in our prospectus.

At our highest point, we are 1,300 metres above sea level and have identified two Council owned sites that could be suitable wind generation opportunities.

## OPPORTUNITY ONE

The first site being presented is in excess of 50 acres and is used for a range of activities. The Council has explored a range of options and feels that the site offers potential for a wind project consisting of a 1.3MW single new or refurbished turbine of circa 80m subject to planning consent being obtained.

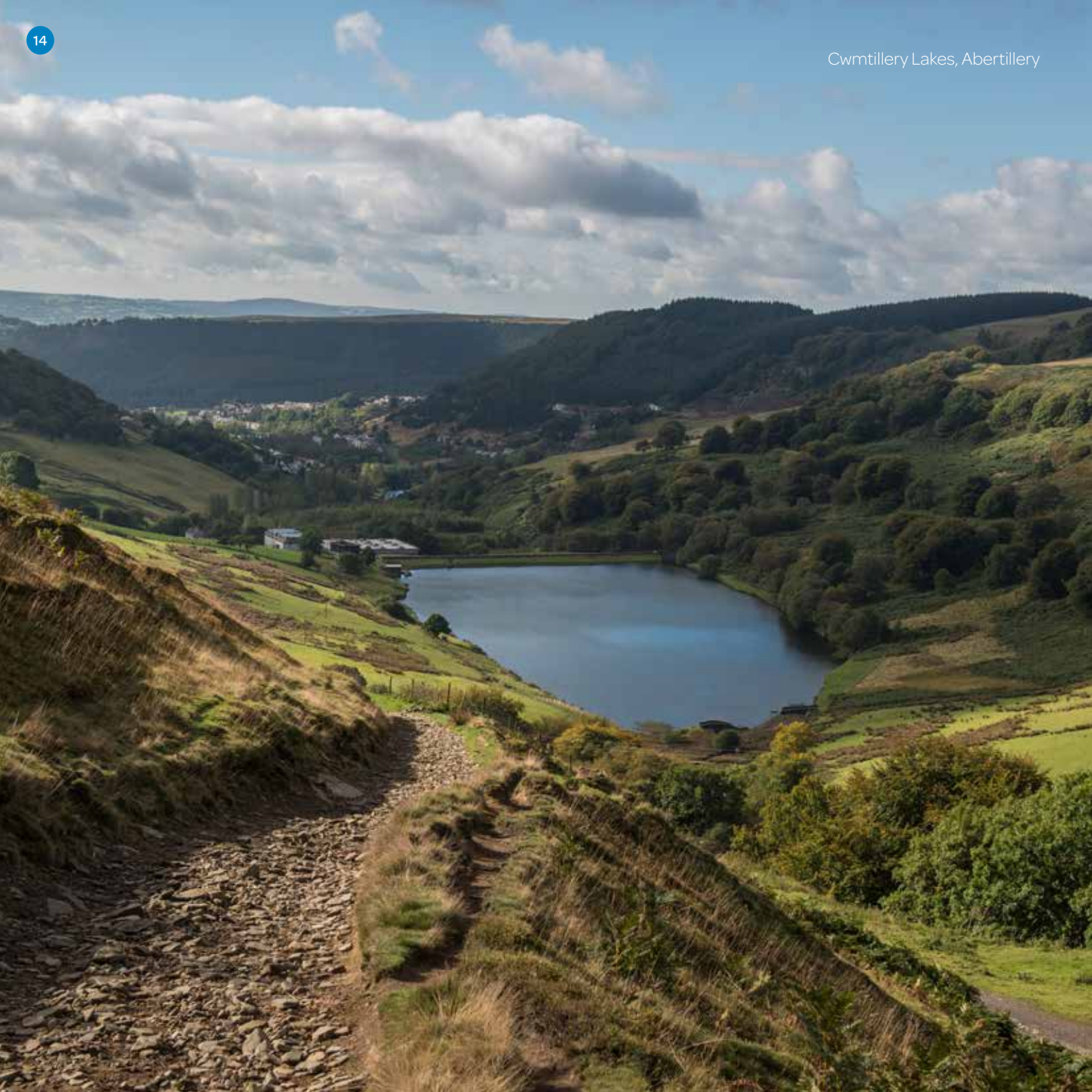
## OPPORTUNITY TWO

The second site also owned by the Council offers high wind speeds, easy access from an adjoining A-road and sufficient separation distance from residential properties to develop up to 2MW of wind energy generation, including two medium-scale wind turbines with a wind turbine blade tip height of no more than 80m with an installed capacity of up to 2MW.

The site offers potential for an annual average generation of up to 4,517MWh based on 1.7MW project made up of 2x850KW turbines subject to planning consent.

Wind Turbine





## OPPORTUNITY: HYDRO POWERED ENERGY GENERATION

In collaboration with Cardiff University, opportunities for small scale hydro schemes have been investigated and several micro-hydro schemes in the range of 6kW system with a maximum usable energy output of 3kW have been identified across the Borough.

Examples of some of the sites have been included below:

|   | Town        | Location                                | Power Output (kw) | Total Estimated Investment (GBP) | Payback Years |
|---|-------------|---|-------------------|----------------------------------|---------------|
| 1 | Abertillery | Anvil Court Culvert                     | 8 – 16            | 25,000                           | 8             |
| 2 | Abertillery | Cwmtillery Lake                         | 1 – 5             | 15,000                           | 16            |
| 3 | Blaina      | Waun Pond                               | 6                 | 41,000                           | 34            |
| 4 | Blaina      | Tanglewood Stream                       | 6                 | 21,000                           | 16            |
| 5 | Ebbw Vale   | Rassau Industrial Estate Culvert (a, b) | 8                 | 12,000                           | 8             |
| 6 | Ebbw Vale   | Carno Reservoir Rassau runoff           | 2                 | 6,000                            | 15            |
| 7 | Ebbw Vale   | Carno Reservoir                         | 10                | 15,000                           | 8             |
| 8 | Tredegar    | Sirhowy Tributary (b)                   | 38                | 64,000                           | 8             |
| 9 | Tredegar    | Culvert off Parc Bryn Bach              | 5                 | 20,000                           | 18            |

The list of sites listed above is not exhaustive and it is possible that further sites will be investigated in the future.

Guardian, Six Bells, Abertillery  
Waterfall, Rassau, Ebbw Vale



## RESEARCH AND INNOVATION

**The Council is committed to delivering low carbon heat to our residents and businesses. We can only achieve this in the future if research and innovation in how our energy is delivered is carried out. We want to play a role in undertaking such research and through established partner relationships we have been successful in securing participation in a number of EU Research and Innovation funded projects.**

The first of these projects, RESILIENT was a four-year project, which commenced in 2012 and included 14 Partners from 5 European countries, including Italy, Belgium, France, UK and Spain with a budget of €8.1 million. The project designed, developed and installed a system of interconnectivity between buildings, Distributed Energy Resources (DER), grids and other networks at a district level, assessing the associated energy and environmental benefits.

### ONGOING: PENTAGON

Upon completion of RESILIENT the Council secured additional European Research opportunities funded through the Horizon 2020 programme. PENTAGON is a consortium consisting of 10 partners from 5 different Countries across Europe including the United Kingdom, Switzerland, Belgium, France and Italy.

PENTAGON is creating the next generation of eco-districts, leveraging on enhanced energy conversion systems and a fully fledged integrated management platform simultaneously acting on different energy carriers (thermal, gas and electric).

The core of the project focuses on two ground-breaking technologies:

- An innovative power to gas technology at the district level;
- An intelligent versatile and service based IoT (Internet of Things) platform for holistic, multi-vector energy management.

Our district energy network on the Works Site is key partner in this project and provides data and information about the operation of our network to assist in development of computer simulation models that will be used to simulate and test future renewable technologies.

**Power to gas is one of the most promising future smart grid technologies because it has the potential to solve the problem of renewable energy curtailments.**





# RESEARCH AND INNOVATION

## ONGOING: DRIVE

DRIVE, a consortium of 8 partners representing 7 EU countries are exploring flexibility in Variable Renewable Energy Sources (VRES), or the ability of a power system to maintain continuous service during rapid and large swings in supply and demand from the grid.

It is the second project funded through the Horizon 2020 programme and again we are using our District Energy Network at the Works to act as the demonstration site to provide data and information to build the models that will enable demand response in to practice

DRIVE will unlock the Demand Response potential of residential and tertiary buildings which represent 70% of the total Demand Response in the distribution grid through a full-fledge platform bridging seamlessly the value-chain from planning and design of assets/buildings towards optimal operations in the next generation Smart Grids.

**We are always seeking businesses and Research Organisations within the UK and across Europe with an interest in collaborating with us. In return we bring both our experience of European research-led projects together with the assets and equipment available in our demonstration site at The Works.**



## RESEARCH AND INNOVATION

### BLAENAU GWENT SMART LIVING ENERGY CATALYST MODEL

**Blaenau Gwent County Borough Council is continually assessing opportunities to reduce its costs whilst at the same time looking to provide real benefits for its communities and residents. An illustration of this is the Blaenau Gwent Energy Catalyst Model, one of seven demonstrator projects across Wales identified under the Smart Living Framework developed by Welsh Government.**

The aspiration is to alleviate fuel poverty in the Borough, encouraging industry and commerce to invest in the region, improve energy efficiency and reduce carbon emissions across Blaenau Gwent. Our ultimate ambition is to become an area which generates sufficient energy through renewable sources to meet the power demands of the Borough.

To do this we have developed collaborative methods of working with energy researchers, business, the public sector and academia. Investors will be able to build upon and invest in these relationships pursuing the potential for developing an 'Energy Catalyst' model for the district.

By creating smart platforms for energy demand management we can connect commercial and business premises and private and social housing, leading to the bundling of resources or services to residents and businesses. Communication and education about energy behaviours will also form a key element of the project.

Recognising this, the Council and Welsh Government through the Smart Living Framework sought to investigate current demand and supply requirements from four identifiable groups in the area: **Public Sector Buildings, Industrial and Commercial, Private and Social Housing.**

The aspiration of Blaenau Gwent is to create the first energy catalyst model in the district that will create, move and use energy and bundle with other services to encourage equality of support for residents. As part of this research we have mapped key characteristics of our industrial estates and business parks which include a "model business park" tool. We will create a series of smart platforms for energy which would connect commercial and business premises and private and social housing. This will offer investment opportunities for the bundling of services to residents and educating businesses about energy behaviours have formed a key element of the wider project.

Research to date has illustrated businesses are interested in energy generation, simplification of acquisition of energy and bulk purchase of energy. Phase two of the research has built upon the initial thoughts to investigate opportunities including:

- Energy Brokering
- Material Brokering e.g. lighting, solar PV etc

Such opportunities could make savings for those participating but further engagement with businesses and key stakeholders is needed to help inform our ideas and test opportunities.

## COLLABORATIVE PROJECTS

### ELECTRIC VEHICLE CHARGING INFRASTRUCTURE

The five Local Authorities in Gwent jointly commissioned a feasibility study across the region to investigate the potential to provide electric vehicle charging points across the Gwent area with the aim of working towards a greener, cleaner environment.

The consortium of Local Authorities includes:

- Blaenau Gwent County Borough Council;
- Caerphilly County Borough Council;
- Monmouthshire County Council;
- Newport City Council; and
- Torfaen County Borough Council

The Authorities were successful in obtaining funding from the Office for Low Electric Vehicles (OLEV) to purchase and install On-Street Residential Charge Point Scheme infrastructure in June 2019. The funding of £450,000 together with funding from the Local Authorities will be used to install a total of 73 charge points across 33 sites in the Gwent region.

Proposed locations were chosen to meet the current defined needs and future demands of residents, ensuring we have a coordinated approach across Gwent, so residents can easily charge their vehicles as they travel between the five Local Authorities.

Further funds have been announced by OLEV and the consortium will continue to develop proposals and consider bidding for funding to expand the electric vehicle charging network as part of regional working to develop low carbon travel solutions in South East Wales.

Transport Minister, Ken Skates announced up to £1m for 4 trials to look at innovative forms of demand responsive bus travel. Blaenau Gwent has been chosen as one of the locations.

### REVIEW OF COUNCIL FLEET

The Gwent Local Authorities have also recently commissioned a carbon reduction – fleet review and this included collecting data about mileage driven, fuel used by the directly operated fleets (owned, leased and rented) along with the business mileage driven by the staff owned grey fleet. Each of the Authorities received a report for their area alongside a Gwent wide report.

Alongside current targets in Wales for us all to reduce carbon emissions by 95% by 2050 there is also a target whereby Welsh Public Sector Fleets should transition to Ultra Low Emissions vehicles by 2025 for cars and small vans, 2030 for all other vehicles and 2040 is the target date for ending the sale of new petrol or diesel vehicles.

Next steps following the review are to develop a plan for the transition of our current fleet to ultra-low emission vehicles when making decisions around the purchase or new or replacement fleet.



## The Regeneration Opportunities Team

welcomes the opportunity to provide you with Energy Project Development advice. Guidance on what we expect from you and what we can provide is contained on the Blaenau Gwent website.

[www.blaenau-gwent.gov.uk](http://www.blaenau-gwent.gov.uk)



## Regeneration & Community Services

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