

# WEST MIDLANDS: HOME OF THE GREEN INDUSTRIAL REVOLUTION

A prospectus for investment and transformation



West Midlands  
Combined Authority



West Midlands  
Growth Company



West Midlands at COP26  
Home of the Green Industrial Revolution

# HOME OF THE GREEN INDUSTRIAL REVOLUTION

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In the 18th century, the West Midlands was the crucible of the first industrial revolution. Coal and steam powered a global explosion in growth that was to last for over 250 years, touching every aspect of daily lives. This home-grown revolution underpinned advances in science and medicine, created new modes of transport and revolutionised food production. But we have since come to realise that it also did unimaginable damage to our planet, and in a sense, we now owe a debt to the rest of the world.



Now the West Midlands is looking to give something back. Our low carbon industries are thriving, now outperforming many other sectors of our regional economy. We need to capitalise on this growth and lead a new, green industrial revolution. This time we will grow whilst protecting our natural resources and reversing damage to our planet. Our goal is to reach net zero emissions by 2041, and we have a clear plan for the first five years, promising to create tens of thousands of new jobs in green industries.

It is no small task – our traditional industries are still some of the most polluting in the country, and the region remains over reliant on carbon-emitting forms of transport. But with the right investment, public and private, we can lead a transition to net zero that leaves nobody behind. This prospectus highlights some of those opportunities; in advanced manufacturing, future mobility, smart energy systems, retrofitting, 5G, and more. I hope you enjoy reading it.

**Andy Street, Mayor of West Midlands Combined Authority**





**The West Midlands as the manufacturing heartland** of the UK – 12% of the workforce employed in the industry vs 7% national average



**WM as the UK's automotive capital:** over £13.7bn worth of cars and parts exported in 2019 equal to 36% of the entire UK total and double any other region



**97,000 people currently employed** in the low carbon and environmental goods sector



Low carbon and environmental goods – the fastest growing sector in WM (**7% growth in 2019-20**) – worth **£12bn** to the regional economy with **5100 companies**



All 6 of the region's higher education institutions have **cutting edge research and innovation in low carbon solutions**



**WM is home of the UK's 5G- testbed** with a range of discovery projects optimising energy and resources using 5G enabled systems

**The West Midlands already employs a greater concentration of the workforce than many other areas of the UK in several aspects of low carbon – for example:**

**28x**



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Coventry & Warwickshire employs 28x the average UK proportion of its workforce in electricity transmission and 11x the average proportion of people in mains gas network operation

**5.5x**



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The Black Country employs 5.5x the average UK proportion of the workforce in securing recycled materials; and

**5x**



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Birmingham and Solihull employs 5x the average proportion of workers in building management systems and activities

**The West Midlands is leading the green industrial revolution.**  
We are global leaders in three low carbon sectors with unrivalled economic opportunities:



### **Future Mobility**

We are a leading developer of alternative and greener transport methods, making use of our status as a 5G testbed. We are primed to roll out this new technology being a leading manufacturer of transport equipment (automotive, rail and aerospace)



### **Smart Energy Systems**

The West Midlands is home to the national Catapult leading thinking on Energy Systems and the Energy Capital partnership putting innovation into practice with partners across five Energy Innovation Zones at the cutting edge of integrated local energy systems and industrial decarbonisation. We are the home of National Grid, EON UK, Co-op Energy and several other energy infrastructure organisations



### **Energy Storage and Resource Management**

The West Midlands hosts the UK Battery Industrialisation Centre at the heart of a cluster of world-leading companies specialising in battery recycling. It also hosts the National Brownfield Institute and leads the way on circular construction techniques



Each sector strength is underpinned by the West Midlands network of academic institutions and R&D consultancies which create an **unrivalled innovation ecosystem** including the Energy Systems Catapult, the Advanced Propulsion Centre and the Manufacturing Technology Centre.

# **FUTURE MOBILITY**



# FUTURE MOBILITY

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The transport sector is being revolutionised by the requirement to rapidly decarbonise and drive behaviour change. This is leading to huge investment in the sector both in terms of research & development and also new production activity.

As the most significant UK region in the manufacture of transportation equipment (and wider engineering), the West Midlands is playing a lead role in these developments.

Low carbon mobility therefore presents the next opportunity for the West Midlands as it builds its position as the home of the Green Industrial Revolution.

‘Bringing forward the phase-out date could create 40,000 extra jobs by 2030, particularly in our manufacturing heartlands of the North East and across the Midlands.’



**Grant Shapps, Secretary of State for Transport**



# FUTURE MOBILITY: AUTOMOTIVE

The West Midlands exported £13.7bn worth of cars and parts in 2019 - almost double the number of any other UK region and representing 36% of the UK total (HMRC). A third of all cars produced in the UK come from production lines in the West Midlands. One in 4 engines in the UK are made in the West Midlands.

As the automotive capital of the UK, the West Midlands car companies are already leading the way in the decarbonisation of transportation: with **Jaguar Landrover** investing £2.5bn into electrification to ensure a fully electric Jaguar brand by 2025, **Aston Martin Lagonda** launching electric sports cars and SUVs also by 2025 from its HQ in Gaydon, and **LEVC** providing the only dedicated EV factory for the London Taxi and the recently launched electric VN5 in the growing 'one-tonne' van sector.

As well as the electrification of the automotive industry, an expansive supply chain provides a wide range of components to increase vehicle efficiency and so reduce energy consumption and demand: from the likes of **Autins Group**, producing lightweight thermal and acoustic materials to enable manufacturers to develop lighter cars, to **Lightning Hybrids International** providing hydraulic hybrid technology to harness brake power.

Other automotive world leaders:

- UK Battery Industrialisation Centre, Coventry (see pages 23)
- HORIBA MIRA (see pages 23)
- National Automotive Innovation Centre at the University of Warwick
- The Centre for Advanced Low Carbon Propulsion Systems (C-ALPS)
- Hypromag Limited recycling rare earth magnets
- Warwick Manufacturing Group
- Dennis Eagle first all-electric refuse collection vehicle plant

# FUTURE MOBILITY: AUTOMOTIVE INVESTMENT

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## Infrastructure for Zero Emission Vehicles (IZEV)

WMCA is finalising an IZEV strategy to ensure that it can provide sufficient and appropriate infrastructure to allow the cost effective and fair transition to zero emission transport options by 2041.

The strategy is designed to bridge the gap between energy, transport and spatial planning processes, bringing stakeholders together to:

- Ensure the region's energy infrastructure is able to support the decarbonisation of a wide range of modes of transport
- Utilise the public sector's planned investment in transport services to catalyse wider investment and
- Harness the location of the West Midlands to provide infrastructure to support both national and local needs

## Investment Proposition

### **EV Transit Charging Hubs**

WMCA are looking to bring forward a spine network of ultra-rapid charging transit stations akin to a petrol filling station. This is just one of the ways that will give confidence to residents and local businesses looking to make the transition to electric vehicles, as well as those transiting around or across the region.

## Case Study

The **Advanced Propulsion Centre (APC)** was established in 2013 as a £1bn joint investment between government and industry, focussed on making the UK a centre of excellence for low carbon propulsion technology. Since its launch the APC has funded over 110 low-carbon projects, involving more than 290 partners and supporting 36 major R&D projects worth a total of £589m.

The APC invests in projects low carbon emission technology projects (including battery technology, hydrogen fuels, motors & drives) with applications for cars, buses, heavy goods vehicles. Most recently in March 2021, APC announced £54m of R&D funding for projects including hydrogen-powered buses. As well as financial support, the APC provides technological support and strategic business advice.



# FUTURE MOBILITY: PUBLIC TRANSPORTATION

The UK's first 'Future Mobility Zone' was established in the West Midlands and positions the region as the UK's location for trialling future and autonomous technologies. This brings together future innovative transport schemes, including alternative fuel, electric vehicles, electric bicycles, eSooters, connected and autonomous vehicles and other technologies and services which can be trialled locally.

Coventry City is one of only two cities in the UK to receive government funding to introduce a whole **electric bus fleet**, and ambitions are to roll this programme across the region to support the zero carbon ambitions.

The region is also at the centre of an expanding network of Light Rail through the **West Midlands Metro**; with up to 50 new trams planned as part of an £83.5m investment which will also create opportunities in new control, communications and passenger information systems.

**Air-One** will be one of only four 'urban airports' supporting electric drone technology for product distribution and ultimately passenger transportation.

There are more people employed in the rail industry in the West Midlands Combined Authority area than any other combined authority area, with 40,000 people employed in the industry. Innovation too is well represented in the region, in both hydrogen propulsion and Very Light Railway systems.

The **Birmingham Centre for Railway Research and Education (BCRRE)** at the University of Birmingham has been researching different options for fuelling rail vehicles. In 2020, the University in partnership with Porterbrook launched the UK's first Hydrogen train, the HydroFLEX. The University also has a Centre of Excellence in Rail Decarbonisation, with expertise in sustainable traction systems, power electronics and energy, climate adaptation and rail resilience, and aerodynamics, and Porterbrook has announced a £1bn capital investment into battery and hydrogen power.

As with the automotive sector, lighter vehicles reduce energy demand, and the West Midlands is leading the way in developing light weight rail solutions. The **Very Light Rail National Innovation Centre (VLRNIC)** in Dudley, which includes a 2.2km test track and research labs, is a facility dedicated to supporting the development and growth of the VLR industry. Leading companies in the sector include **Severn-Lamb**, designing and building ultra-light rail cars, and **Vivarail**, developing rechargeable electric trains for the replacement of diesel engines where line electrification is unviable.

# FUTURE MOBILITY: INNOVATION INVESTMENT

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The West Midlands is the UK's first Future Mobility Zone, leading the way to enable rapid scaling up of new transport system solutions focused on travellers across all major urban centres in the UK. Government specifically excluded freight and logistics activity, albeit this remains a critical focus for the West Midlands. £20m capital and £2m revenue funding has been secured from the Department for Transport to fund a programme taking place from 2019-2023.

## Investment Propositions:

We are looking for partners to work with us on these exciting new programmes of work:

- Demand Responsive Transport delivers the regions first “app based” DRT programme and is now available in and around Coventry through a Collaboration with the University of Warwick with more DRT roll out planned. This gives passengers on demand flexible travel through their phone.
- E-Scooters offer the potential for convenient, fun, clean and affordable travel, reduce reliance on car trips and lower harmful tailpipe emissions. As part of the response to Covid-19, the Department for Transport (DFT) has made changes that allow e-scooters to be used on public roads within an allocated operational zone, often using the same road space as cyclists. The aim of the scheme is to trial the new form of transport locally, and offer local people a greener way to travel around in the future. There has been a considerable interest and roll out in the West Midlands.
- Mobility Hubs are an area where multiple modes of transport are co-located to offer integrated and connected transport options. These can also be supplemented with a number of alternative services and facilities, in particular sustainable transport options, allowing the user to benefit from further aspects alongside targeting all of their transport needs. These sustainable transport options can range from human-powered (bicycles), shared mobility (car share clubs) to electric mobility (e-bikes, e-scooters, EV). This opportunity to choose from a variety of multimodal transport choices is recognised as the key influence in encouraging people to trial, and continually use mobility hubs. A mobility hub also offers a place for local facilities, such a shared working space or pop up businesses.
- Mobility as a Service: Target to create regional MaaS product that builds upon core ticketing functionality already available through Swift but applies a new customer interface and service integration capability to make the most compelling customer offer. The opportunity is for this to expand into the communications and energy sectors.



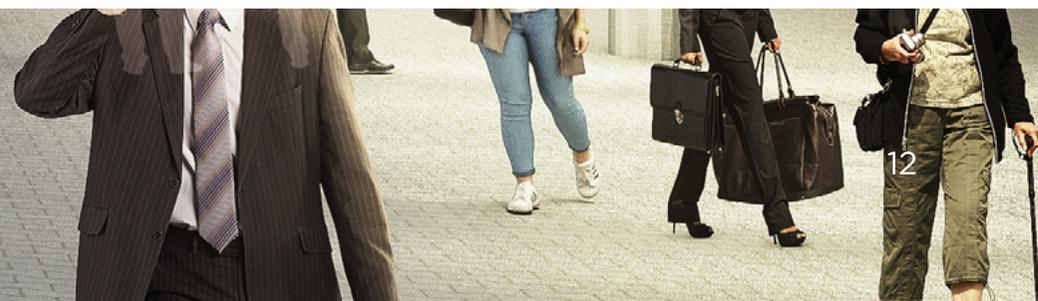
## Case Study

HS2 represents a nationally significant market opportunity. In total, there are approximately 350 businesses currently in the local HS2 supply chain; ranging from large companies to small to medium sized businesses.

The rolling stock procurement will provide openings in areas including: design, engineering, technology and customer experience. Trains will be introduced into service from 2026.

HS2 has established an Accelerator programme with the Connected Places Catapult and Innovation Birmingham to foster collaborative working with small and medium enterprises and the core members of the HS2 supplier network.

The Accelerator will drive innovation in the design & build of HS2; innovate railway operations to delivery world class leading customer experiences; and to build a legacy of knowledge, expertise and new commercial opportunities as HS2 is developed.



The background consists of several overlapping, semi-transparent geometric shapes in shades of dark green and grey, creating a modern, abstract pattern.

# **SMART ENERGY SYSTEMS**



# SMART ENERGY SYSTEM DEVELOPMENT

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The West Midlands is the leading location in the UK for the deployment of large-scale, place-based energy innovation. Energy Innovation Zones (EIZs), a concept developed in the region by the unique [Energy Capital partnership](#), pioneer smart approaches to energy system development and management.

The region is home to some of the leading minds nationally in energy systems, including the Energy Systems Catapult and the UK BIC, as well as the Universities of Birmingham, Aston and Warwick, that share their expertise through the [Energy Research Accelerator](#) to develop the next generation of energy leaders, and demonstrate low carbon technologies that help shape the future of the UK's energy landscape.

Energy powers our economy and to decarbonise transport systems and building stocks requires integrated energy planning and investment. To achieve genuine integration, the West Midlands is pioneering collaboration through the establishment of a Net Zero Infrastructure Delivery Board, bringing together those responsible for energy infrastructure in a 'place', to plan and target investment to support net zero objectives. The announcement made in March by the Mayor, of the region as a [Net Zero Energy Systems Pathfinder](#), will ensure our learning from the West Midlands is shared with decision makers nationally to help inform the role of 'place' in the energy system.

The West Midlands lies at the heart of the UK's power distribution network and is home to the HQ of Cadent Gas. **Employment in energy distribution far outstrips the rest of the UK with 28x the national proportion involved in electricity transmission and 11x in gas distribution.**

**This means that the decisions on investment that will enable the distribution and efficient use of clean energy in the UK as we strive to achieve our net zero goals, will be made here in the West Midlands.**

# A KEY MARKET FOR SMART ENERGY SYSTEMS

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The West Midlands pathway to net zero is all about how we decarbonise the buildings we live and work in, the way we travel around our region and the industrial foundations of our economy. The energy systems that will enable this are therefore crucial to our success and as a region we need to harness the value found in the complexities of the energy system.

The EIZs developed in the region aim to fast-track new clean energy technologies and the smarter infrastructure necessary to give regional businesses a competitive edge. The resulting energy innovation projects are creating opportunities for smart homes, energy efficiency, retrofit and combined heat and power solutions; microgeneration, storage and flexibility services; smart charging, fuel cells and vehicle to grid technologies, as well as identifying ways to achieve industrial decarbonization through BEIS's industrial cluster mission in the Black Country.

This activity supports a robust and diverse supply chain, with local specialist companies including **Kelvatek (Camlin)** producing intelligent monitoring products for grids and the HQ of **Quartzelec**, manufacturing AC/DC rotating mechanisms and other products for power grids. In themselves, they are also driving innovation and enterprise - such as Cadent's deployment of biogas through its power system and development of bio-substitute natural gas (Bio-SNG)

Although the region may not be covered in swathes of wind turbines and solar PV, the West Midlands is a major player in the supply chain to the renewables industry with 37,000 people employed in developing the products and technology for the wind, solar and biomass sectors.

**Osmium**, who provide cutting-edge digital support for wind turbine control, and **McCamley's** in Halesowen, designing vertical blade turbines for national and international markets, are just two examples of these pioneering renewable companies.

# SMART ENERGY SYSTEMS: ENERGY INNOVATION ZONES

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Energy Capital is WMCA's energy delivery body and the smart energy innovation partnership for the West Midlands, facilitating and co-ordinating collaborative public-private investment projects across the region. Working with local communities, public bodies and national government Energy Capital aims to create an attractive and creative environment for companies that want to become part of the global low carbon and smart energy transition.

The Energy Capital partnership developed the concept of Energy Innovation Zones, designed to be replicable in cities and towns across the UK. EIZs: integrate low carbon technologies; develop the business models and infrastructure needed to support new approaches to clean energy; as well as overcome the regulatory barriers necessary for them to flourish. They aim to stimulate local clean energy innovation and drive productivity within the region, exports and growth.

With support from InnovateUK, BEIS and Ofgem, we hope that EIZs can also offer a controlled environment in which innovators of all types could trial new services, technologies and business models, with the aim of accelerating energy solutions in areas such as transport and low carbon buildings. The Zones could also provide a route to market for the smart local energy system innovations developed through the UK's 'Prospering from the Energy Revolution' programme.

The West Midlands is also host to a range of energy innovators including:

- The Energy Research Accelerator involving Warwick University, Aston University and University of Birmingham
- Birmingham Energy Institute at University of Birmingham
- The Manufacturing Technology Centre
- The Energy Systems Catapult
- Tyseley Energy Park in Birmingham
- The Energy & Bioproducts Research Institute (EBRI) at Aston University
- Grid Edge, a spin out company of Aston University
- and many more.

## Investment Proposition

National Centre for the Decarbonisation of Heat - led by University of Birmingham, the Manufacturing Technology Centre, Energy Systems Catapult and the Energy Research Accelerator, the Centre will integrate cutting-edge research and innovation to enable the rapid scaling up of manufacturing, skills and deployment of heat solutions, all necessary to meet carbon reduction targets.

# SMART ENERGY SYSTEMS: FIVE EIZ INVESTMENT OPPORTUNITIES

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## Coventry: 'Regional Energy System Operator' (RESO)

The 'Regional Energy System Operator' (RESO) Project looks to explore the advantages of a new kind of energy system operating at city scale. The system will include local low carbon energy generation, storage and management and will integrate future mobility assets such as electric vehicles into its overall envelope. The proposal is to prove the concept in Coventry and then to roll this out to other parts of the West Midlands. Such a roll out presents a significant investment attraction for suppliers to this industry.

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## Tyseley Energy Park (TEP) (part of Birmingham Energy Innovation Zone)

TEP, is a private / public partnership, developed by Webster and Horsfall's 300 year old manufacturing business, and is set to shape the way the City of Birmingham develops infrastructure for renewable heat and power, energy storage, clean transport fuels in combination with advanced waste processing.

Key partnership is with the University of Birmingham who are building an innovation hub (the Birmingham Energy Innovation Centre) that will provide businesses with the chance to develop their technology and training in collaboration with university staff at the energy park. Investment opportunities include a biomass power plant; low & zero carbon refuelling station; and waste reprocessing facility.

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## Repowering the Black Country

This initiative, supported by UKRI and the local partnerships, will move the region's industrial areas towards zero carbon by creating local energy hubs. These will showcase Black Country manufacturing technology and use local resources, including commercial waste and renewable energy, to deliver zero carbon power. Investment opportunities lie in the design, planning, construction and operation of the energy hubs. This is proposed as a flexible, multi site programme and therefore presents a different proposition to the larger scale, fully integrated systems found elsewhere.

# SMART ENERGY SYSTEMS: FIVE EIZ INVESTMENT OPPORTUNITIES

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## Zero Carbon Rugeley

Zero Carbon Rugeley is a project to produce an innovative design for a town-wide Smart Local Energy System (SLES) including the former Rugeley Power Station site. This will demonstrate how carbon emissions and energy costs can be reduced whilst also providing a boost for local regeneration.

Private / public sector partners are led by Engie and include Opus One, Keele University, Conigital, and Cadent alongside the local councils and community groups.

The project offers an opportunity to work closely with the lead private sector partners to ascertain the true opportunity that will lie in the design, planning, construction and operation of this site

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## UK Central

The UK Central Hub is an economic area which includes the significant infrastructure of Birmingham Airport, the National Exhibition Centre, Jaguar Land Rover, Birmingham International Station and Birmingham Business Park. From 2026 it will also include the High Speed 2 rail station and the enormous mixed use Arden Cross development. Each of the stakeholders has ambitious growth plans that will dramatically increase the level of employment and housing in the Hub area, and support the wider West Midlands economy. In order to support this opportunity Solihull Council formed the Urban Growth Company (UGC) to concentrate public sector investment on removing infrastructure constraints. As an EIZ, the wider significance of UK Central Hub is that it epitomises the energy challenges of a modern multi-modal transport hub.

# SMART ENERGY SYSTEMS: ZERO CARBON HOMES AND RETROFIT

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The West Midlands is considering how it uses its position to support the decarbonisation of new and existing homes.

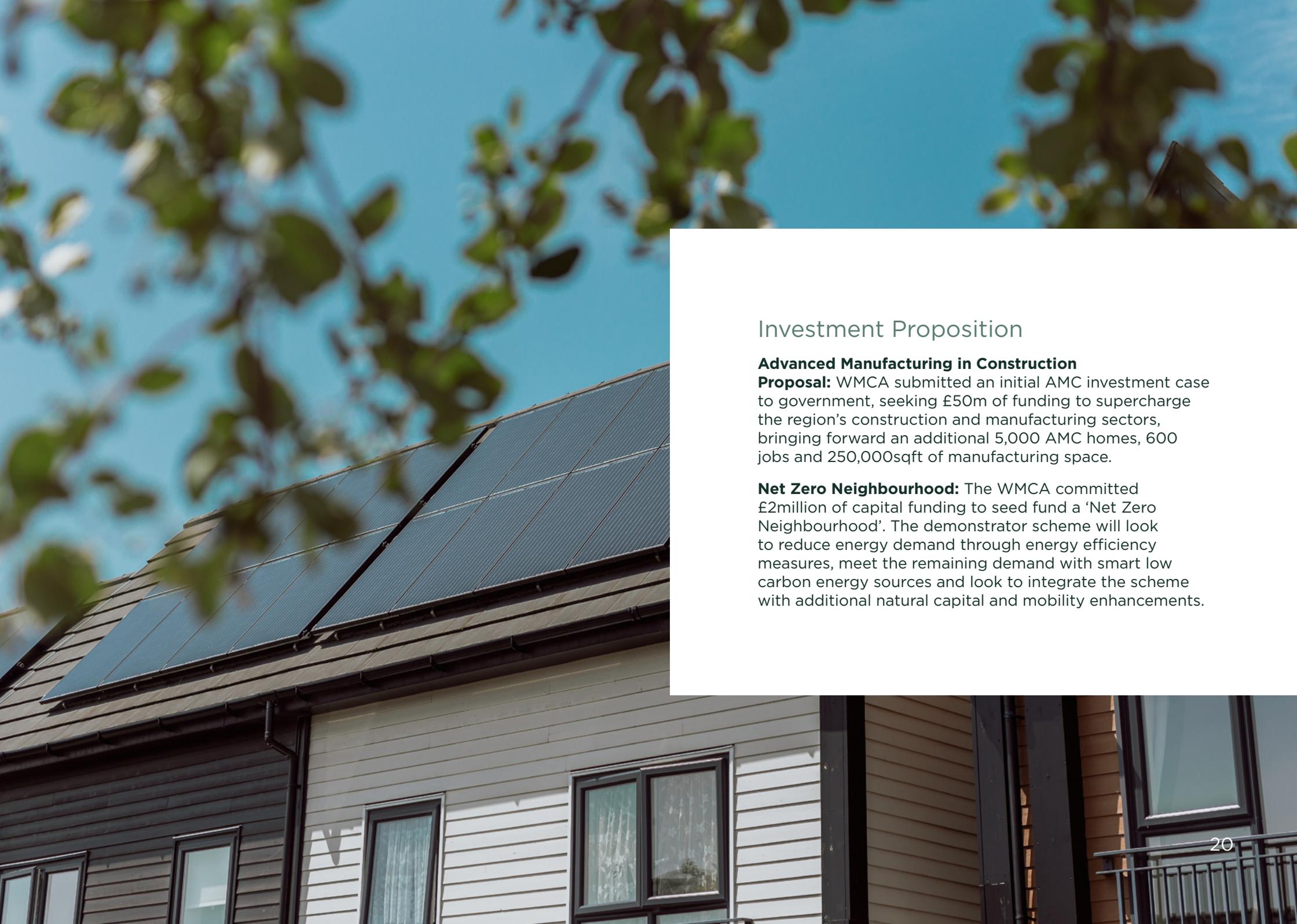
We are looking to ensure that our new build homes achieve these standards by embedding the minimum requirements set out in our **Zero Carbon Homes Routemap** within the Single Commissioning Framework as pre-qualification criteria for all sites in which we invest. These targets have been determined in line with other industry exemplars such as LETI and RIBA 2030 and tested with our expert Zero Carbon Taskforce. We are also considering our role in developing the capacity of the region to deliver zero carbon homes, lowering the viability gap by providing certainty of pipeline and growing our capacity in building techniques and materials.

As a manufacturing region, we are exploring how we can use advanced manufacturing techniques and modern methods of construction to both facilitate the path to zero carbon new homes and build a market for retrofit. The design and manufacture of components such as roof cassettes and energy pods are being explored by partners in the region, with potential options for roll out through the development of our **Net Zero Neighbourhood Demonstrator**.



Recognising that we do not want to leave anyone behind in the decarbonisation of homes across the region, we are looking to protect the most vulnerable by initiating our **'Warm Home Save Lives'** programme to redress the impacts of the transition on the fuel poor and most vulnerable. This is particularly important as the region already has the second highest incidence of fuel poverty and the largest fuel poverty gap of any English region. Existing mechanisms to address this imbalance are not effective enough, as they focus on energy measures, rather than looking at the situation of the person in fuel poverty.

To ensure the West Midlands is able to rise to the retrofit challenge, we are working closely with BEIS and the Midlands Energy Hub through the provision of support to local authorities to access **Local Authority Delivery Scheme** funding. We have also established a central resource within the WMCA to provide capacity to our local authorities in the form of a **SMART Hub**, designed to help build a Sustainable Market for Affordable Retrofit Technologies.

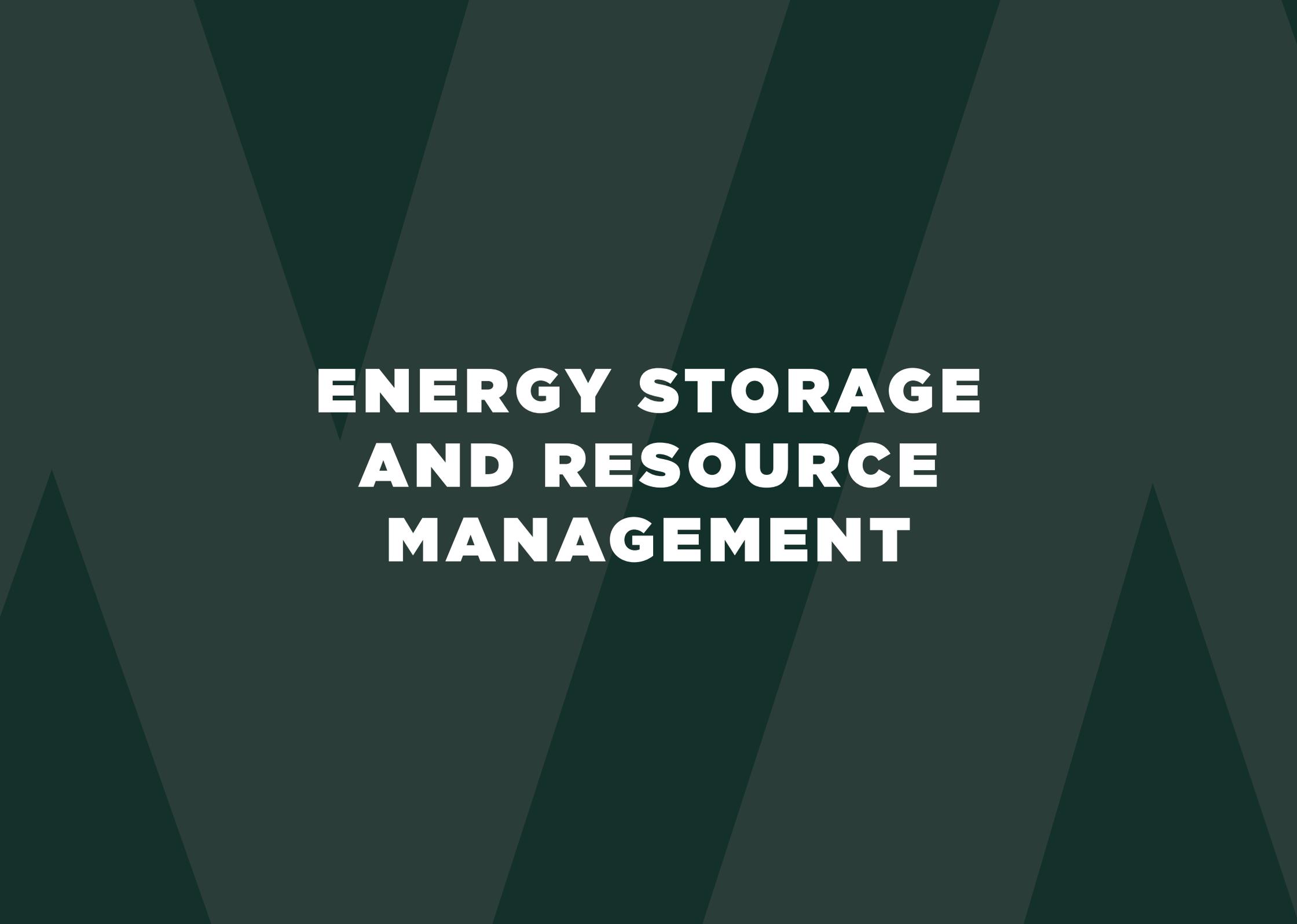


## Investment Proposition

### **Advanced Manufacturing in Construction**

**Proposal:** WMCA submitted an initial AMC investment case to government, seeking £50m of funding to supercharge the region's construction and manufacturing sectors, bringing forward an additional 5,000 AMC homes, 600 jobs and 250,000sqft of manufacturing space.

**Net Zero Neighbourhood:** The WMCA committed £2million of capital funding to seed fund a 'Net Zero Neighbourhood'. The demonstrator scheme will look to reduce energy demand through energy efficiency measures, meet the remaining demand with smart low carbon energy sources and look to integrate the scheme with additional natural capital and mobility enhancements.

The background is a dark green color with several large, light green geometric shapes, primarily triangles, pointing towards the center. The text is centered in white, bold, uppercase letters.

**ENERGY STORAGE  
AND RESOURCE  
MANAGEMENT**



# ENERGY STORAGE AND RESOURCE MANAGEMENT

The West Midlands region is home to numerous world leading circular economy businesses, research projects and industrial ecology expertise. This has much to do with our industrial legacy, track record of innovation and with the fact that it was home to the National Industrial Symbiosis Programme that we are building on.

Three initial clusters of circular economy activities have been identified in Coventry, Wolverhampton and Birmingham focusing on manufacturing, construction, and food systems. These are featured in the West Midlands Circular Economy Routemap.

Allied to this, power storage remains one of the vital areas of the shift to zero carbon power generation and battery developments are at the centre of work in this area. The West Midlands has considerable expertise in energy storage – from an R&D perspective Warwick Manufacturing Group has a focus of attention in the sector and was instrumental in ensuring that Coventry became the home of the UK Battery Innovation Centre, as well as expertise at the University of Birmingham's Energy Institute. Energy storage assets can be used to manage and ultimately reduce peak power demands. Birmingham based **Grid Edge** are developing data platforms that can analyse and manage smart energy assets to reduce demand and save cost and carbon.

Key regional circular economy assets:

- Through its lifetime, **NISP West Midlands** has helped divert 4,250,385t of waste from landfill. It has eliminated 83,970t hazardous waste, saved 10,040,326t virgin materials and 13,339,274m<sup>3</sup> of water, as well as 5,086,770 CO<sub>2</sub>e.
- **Repowering the Black Country** proposes to create strategically-selected circular economy zero carbon industrial hubs. A first feasibility study for an initial hub based on aluminium re-processing at Phoenix 10 in Walsall has been completed and the hubs are currently being planned.
- A **National Brownfield Institute (NBI)** is being built on the University of Wolverhampton's Springfield Campus. The NBI will focus on the practical application of future brownfield regeneration through the work of research teams, leading policy development and commercial services. The NBI will lay the foundations for the delivery of a National Centre for Sustainable Construction and Circular Economy, which will focus on sustainability and the climate change emergency.

# BATTERY INDUSTRIALISATION AND RECYCLING

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Ever since the inception of renewable energy technology, the biggest challenge faced has been the efficient and effective storage of power. The West Midlands is leading the way in the research, testing, manufacture and recycling of batteries for deployment within energy systems and new transportation.

The £130 million **UK Battery Industrialisation Centre (UKBIC)** is a pioneering concept in the race to develop battery technology for the transition to a greener future. The unique facility provides the missing link between battery technology, which has proved promising at laboratory or prototype scale, and successful mass production. Based in Coventry, the facility welcomes manufacturers, entrepreneurs, researchers and educators, and can be accessed by any organisation with existing or new battery technology if that technology will bring green jobs and prosperity to the UK.

The University of Birmingham are involved in the **Re-LiB** project (Reuse & Recycling of Lithium Ion Batteries), part of the Faraday Institute's Battery Challenge looking into the sustainable management of end-of-life lithium-ion batteries in the automotive industry.

**HORIBA MIRA's** comprehensive battery development centre, enables end-to-end engineering and test solutions for cell, modules and complete battery packs. Its state-of-the-art facilities include a new £1.5m battery development facility, featuring a large Climatic Vibration Laboratory and the UK's first Battery Abuse Facility - enabling battery charging and discharging whilst in use.



**Aceleron** is a Birmingham-based developer of sustainable and reusable batteries. They manufacture lithium ion batteries that are fully serviceable, upgradeable and recyclable, negating the challenge of waste from lithium-ion batteries. This circular economy approach could be vital in tackling the anticipated 11 million tonnes of battery wasted over the next 20 years globally. Aceleron are also advancing research into 'end-of-life' battery cell and module repurposing, whilst offering immediate reuse opportunities for waste battery packs to help reduce carbon emissions and underpin the clean energy revolution.



## Investment Proposition

The Gigafactory site is located at Coventry Airport represents the potential for 4.5 million sq. ft. of commercial space. It is located adjacent to Jaguar Land Rover's global HQ and to the UKBIC - positioning the site as an ideal location for a battery plant. Outline planning permission is currently being submitted for the site

It will provide high volume battery manufacturing facilities to drive advances in the high-tech automotive industry as well as a wide range of future mobility products. It would also create over 10,000 jobs across the region and its initial £250million of funding could leverage over £2bn of private sector investment: clearly demonstrating the economic power of the green industrial revolution.

One of the Gigafactory's unique selling points is its potential to become one of the world's first circular battery factories, building on the region's academic and business expertise in battery technology. Given the rapid increase in demand for lithium and other scarce raw materials, there is a need to increase efficiency in the use of these materials and to ensure that they can be recovered and recycled at the end of their life. The West Midlands has a burgeoning cluster of innovative companies and research institutes working in this space to build the supply chain and skills required.

# CIRCULAR ECONOMY OPPORTUNITIES

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Research centres range from the **Energy and Bioproducts Research Institute** (EBRI) at Aston University, exploring the commercial development of emerging renewable energy, bioenergy, bioproducts and supporting technologies, through to the **Brownfield Research and Innovation Centre** at the University of Wolverhampton, ensuring that land 'reuse' plays a major part in protecting our planet's environmental and biodiversity resources.

Meanwhile practical implementation of the principles of the circular economy can be found in organisations ranging from **The Active Wellbeing Society** in Birmingham, reducing food waste and creating sharing libraries in communities, through to **International Synergies Limited** applying whole system approaches to resource management through their 'industrial symbiosis' methodology.

Although featuring towards the end of the circular economy 'cycle', recycling is also crucial to the optimisation of resources, not only in materials, such as the **RECOVAS** project led by the Warwick Manufacturing Group and European Metal Recycling, or the reuse of tyre and inner tube waste to create carbon black for the chemical industry through EBRI's **Velorim** project.

## West Midlands Circular Economy Routemap propositions

The Circular Economy Routemap identifies a series of new regional opportunities for which business case development is now in progress. These include:

- A Circular Manufacturing Centre of Excellence to support circular design best practice; to develop advanced technologies (robotics, AI); and to test new technologies and processes for end of life resource recovery.
- A High-Value Fuels from Waste cluster to use advanced processing technologies to turn residual, municipal and industrial waste into high value fuels for aviation, logistics, heavy plant and other manufacturing sectors.
- Zero Construction Hubs to recover and exchange materials, as well as share and incentivise circular design and processes.
- A Circular Build Product Initiative to create a suite of regional circular building products, to increase the number of circular products and services, to support regional job creation.
- A Circular Agro-business Network to mobilise circular food supply chains, to reduce resource consumption and pollution, to support further R&D in sustainable agro-business processes.
- Local circular food hubs with optimised logistics to collect and redistribute food that would otherwise be wasted and improve local communities' access to healthy, affordable food, to reduce waste food, and to ensure better redistribution of food.

**LOW CARBON  
ECONOMY INNOVATION  
AND SKILLS**

# UNIVERSITIES, RESEARCH INSTITUTES & INNOVATION SUPPORT

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The higher education sector right across the West Midlands is pioneering new and innovative solutions to tackle climate change.

Some are very specific and focused, such as Birmingham City University's **Energetic Algae (EnAlgae)** programme working to address sustainable pathways for algal bioenergy, or Birmingham University's **Magnetic Materials Group**, the UK's only research group focussed on processing and recycling rare earth magnetic materials.

Many directly support the wider industrial and transportation eco-system, such as the **Warwick Manufacturing Group** and the **Energy Innovation Centre**, the national centre for battery research, at Warwick University, or the University of Birmingham's **Centre for Hydrogen & Fuel Cell Research**, and **National Centre for the Decarbonisation of Heat**.

Others bring multiple assets together, such as Wolverhampton University's **Centre of Engineering Innovation and Research (CEIR)** which combines scientific techniques and specialist engineering expertise to resolve problems in industry, the environment and healthcare – from metamaterials, to tissue engineering, energy-absorbing devices to advanced energy storage.

The research ecosystem across all six of the region's universities will touch almost every aspect of the green industrial revolution, and beyond.



The region is also home to national and international bodies leading innovation and new ways of thinking:

- **Energy Systems Catapult** – accelerating the transformation of the UK's energy system by bridging between industry, government, research and academia to bring new solutions to market more quickly.
- **Energy Research Accelerator** - the first truly embedded cross-disciplinary research hub, formed universities across the Midlands, innovating biomass, thermal, solar, hydrogen solutions.
- Global consultancies – **Enzen**, a world leading adviser on water and energy has its UK HQ in Solihull; **Arup's** second largest European presence is also in Solihull, consulting on everything from distributed energy to renewables; while **Mott McDonald** is leading BEIS's deployment of its 3-year 2050 Calculator programme.

# DEVELOPING THE SKILLS BASE FOR GREEN JOBS

There is forecast to be a net creation of 21,000 jobs by 2026 across key sectors.

Responding to green jobs challenge will need to include upskilling of current workers, reskilling and retraining those currently in different occupations or seeking work. This provides an opportunity to grow talent inclusively ensuring those communities most disadvantaged in the labour market currently are provided with the opportunity to train in new skills.

During the next 12 months we will be working with our colleges and training providers to build training and courses that will meet this challenge.

- We have made good progress in Electric vehicle training and will extend this across the region
- We are launching our new retrofit skill training offer across the region £500k
- There is a strong MMC training offer at Dudley College
- We are working with our automotive taskforce to develop battery tech training

Sector	Intervention	Net jobs created 2026	Net jobs created 2041
<b>Domestic</b>	Energy Efficiency	5,500	18,800
	Fuel Switching (Heat pumps)	6,900	23,500
	Microgeneration (domestic heat and power generation e.g solar, wind)	7,900	1,800
<b>Commercial</b>	Energy Efficiency	500	2,200
	Fuel Switching (Heat pumps)	500	2,200
	Microgeneration	100	600
<b>Industry</b>	Energy Efficiency	10	200
	Microgeneration	10	100
<b>Transport</b>	Fuel Switching (HGVs)	0	400
	Fuel Switching (Buses, Taxis)	500	800
	Demand Reduction (Trips)	40	120
	Mode shift	1,500	1,500
	Electric Vehicles	3,400	32,800
<b>Land Use</b>	Renewables	40	600
	Natural Capital	200	700
<b>Totals</b>		<b>21,000</b>	<b>71,000</b>

**#WM2041**  
**OUR NET ZERO**  
**FIVE YEAR PLAN**

# NET ZERO FIVE YEAR PLAN

In March 2021 the West Midlands Combined Authority adopted its first Net Zero Five Year Plan. The plan sets out how we create the right conditions for accelerating delivery and raising ambition to position the West Midlands as a leader in addressing climate change and futureproofing the region. It considers 15 different evidence-based goals that will achieve a 33% emissions reduction by 2026 setting us on the right path to achieving net zero by 2041.

The top five decarbonisation priorities, which have been identified as having the greatest impact in carbon terms, are:

- Domestic energy efficiency measures and heating retrofit
- Commercial energy efficiency measures
- Modal shift towards active travel measures
- Increased uptake of electric vehicles
- Planting trees and enhancing natural capital

The gross investment cost (excluding issues around system management, industry and some transport goals) is estimated to be **£4.3bn by 2026** and **£15.3bn** over the 20-year period to 2041.

A number of work programmes are now in place to move from strategy to delivery and to secure investment in key areas of work.

FYP Theme	Delivery next steps
<b>Domestic</b>	<ul style="list-style-type: none"> <li>• SMART Hub for Retrofit Delivery and Net Zero Neighbourhood Model</li> <li>• Warm Homes Save Lives Programme</li> </ul>
<b>Commercial</b>	<ul style="list-style-type: none"> <li>• Commercial Green Energy Taskforce</li> <li>• Local Area Energy Planning &amp; Network Connections Fund</li> </ul>
<b>Industrial</b>	<ul style="list-style-type: none"> <li>• Industrial Decarbonisation and Green Manufacturing Taskforce</li> <li>• Circular Economy Roadmap</li> </ul>
<b>Transport</b>	<ul style="list-style-type: none"> <li>• Updated Local Transport Plan</li> <li>• Infrastructure for Zero Emissions Vehicles (IZEV) Strategy</li> </ul>
<b>Land Use</b>	<ul style="list-style-type: none"> <li>• Natural Capital Board and WM Natural Capital Programme</li> <li>• Community Green Grants Programme</li> <li>• Large-scale Renewables Programme</li> </ul>
<b>Systems Management &amp; governance</b>	<ul style="list-style-type: none"> <li>• Green Skills Strategy</li> <li>• WM2041 Behaviour Change and Business Pledge roll-out</li> <li>• Place-based data hub</li> <li>• Net Zero Citizens' Panel</li> <li>• WMCA Carbon Literacy Programme</li> <li>• Whole-system governance including Net Zero Delivery Board</li> </ul>

# NATURAL CAPITAL

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Our vision is of a West Midlands where everybody has the opportunity to enjoy the benefits of the natural environment and that, through careful planning and collaboration, we protect, enhance, restore and expand the region's natural capital to address both the climate and ecological emergencies.

- As part of our delivery on natural capital programmes, we want to ensure the following is achieved:
- Everybody can access high quality green space within a 300m walk of their home.
- Forestry cover should be increased from approximately 1.5% today to 13%, aligning as much as possible with the long-term aims for England (5.7m trees by 2026 and 19m by 2041).
- Creation /restoration of 5 wildlife corridors along the Cole, Rea, Sherbourne, and Blythe and HS2 development in line with our key stakeholder's priorities.
- All rivers to be restored to good condition by 2030; high quality wildlife corridors along all rivers through West Midlands. Target 5 by 2025, 10 by 2030.
- Support the creation of 200 jobs in natural capital by 2026 (and 700 by 2041), as suggested by the Five Year Plan.



## Investment Propositions

**Community Green Grants** - Natural capital is a central part of our net zero agenda, as well as part of our wider environment programme. The project received £725,000 in grant funding as part of the Five Year Plan approval in March 2021. WMCA is currently designing the grant programme with regional partners and the new Community Green Grants Officer will lead the delivery. It is anticipated the grant will launch in Autumn 2021 for two years. Grants will be targeted at parts of the West Midlands where there is currently deficit of access to green space, forming an important part of the regional 'levelling up' agenda.

**Natural Capital 'Exchange'** - Our work to develop the sustainability legacy from the Commonwealth Games has identified a pipeline of projects focused on regional biodiversity and conservation. At the same time, work with Business in the Community has identified a commitment from West Midlands business to support natural capital projects through investment, provision of land and 'loan' of professional skills. The Natural Capital Exchange is an idea being explored to create a platform to bring different supply and demand requirements together to improve regional biodiversity.

# NET ZERO LEADERSHIP AND COP26

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WM2041 is an ambitious programme for change. Reaching net zero across the different thematic areas will require coordination and partnership working across local authorities, business, the research sector, charitable organisations and the voluntary sector. Dialogue with UK government will also be an important part of the delivery. The following are some of the ways that we are working together on our regional net zero journey:

- **Environment & Energy Board:** the WMCA's political decision-making Board, chaired by the Environment and Energy portfolio holder (Cllr Ian Courts, Leader of Solihull Council). Membership includes the 7 constituent authorities, Energy Capital and the Environment Agency.
- **Local Authorities Net Zero Directors Group:** established to ensure co-ordination at a local authority level with relevant Directors and Officers
- **Net Zero Infrastructure Delivery Board:** a Board designed to bring together those who invest in energy infrastructure in the region to collaborate to support our net zero objectives.
- **Citizens' Panel:** to be developed with the aim of informing and influencing regional plans for WM2041.

## Our Partnership with Business

A **WM2041 Net Zero Business Pledge** has been launched to provide an umbrella to support, engage and celebrate regional organisations on the journey to net zero, linking different regional networks together. We are working with other business-facing organisations (e.g. Sustainability West Midlands, the Chamber, Business in the Community and the Federation for Small Businesses) to coordinate action.

The **West Midlands Regional Energy Strategy** sets out a range of challenges facing the in relation to the cost of energy and how this impacts our businesses and our citizens. This is what makes our energy systems and how efficient and 'smart' they are, so important to our region. Although we don't have huge clean energy generation schemes in the region, the transition to net zero offers significant opportunities for local businesses; from vehicle to grid, demand flexibility, monitoring and storage opportunities; to solutions to the decarbonisation of our industrial base, commercial businesses and homes.



# WEST MIDLANDS AND COP26

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The UK's Presidency of COP26 provides a once in a generation opportunity to kick-start the practical delivery of climate change action and showcase this to the world. The West Midlands has unrivalled green industrial strengths and opportunities, and the region will combine this with public sector leadership to highlight that potential in the build up to, during and following COP26.

Our partnership between businesses, research institutes, public bodies and central government, is founded on the key principles of delivering net zero at the regional and local level, generating new trade and investment opportunities, and creating a genuine buzz about climate change among all of the communities of the West Midlands: perfectly exemplifying the UK government's campaign of 'Together for our Planet'.



## UK100

We are jointly leading the **Net Zero Leaders Summit** in July, which will start to frame a new policy relationship with central government around climate change.

At **COP26**, we will be collaborating with UK100 on their proposed side events with national and international partners, building on the work developed through our joint Summit, as an international exemplar model.

As part of our **COP26-legacy** events, we will be including UK100 and its network into our regional programme including the University of Birmingham's Forum for Global Challenges.

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## M10

We are supporting a coordinated approach across the M10 Group of Mayors to provide a coherent voice to government in the build-up to COP26. This will demonstrate the benefits to government of the individual assets of each of the regions as well as the benefits of combining those strengths.

At **COP26**, we will contribute strongly to the M10's engagement programme, both through UK100, ICLEI and C40 activities, and the M10's own expression of interest for the Green Zone.

We will be involving M10 partner regions in our series of events post-COP26, up to and including the Commonwealth Games in July 2022.

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## Core Cities

We have formed a collaboration group between Core Cities representatives, M10 and UK100 to ensure a fully coordinated approach across policy development, events and engagement with government in the lead-up to COP26.

At COP26, we will be participating with Core Cities through events and receptions across Glasgow to highlight the benefits of a collaborative place-based approach to achieving net zero carbon through local delivery.

Core Cities representatives will be important partners in our Spring-Summer 2022 events - providing insights into the implementation of new government policy announced at COP26 and the practicability of replication of initiatives arising from the West Midlands programme.

# KEY CONTACTS

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West Midlands  
Combined Authority



West Midlands  
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West Midlands at COP26  
Home of the Green Industrial Revolution