



NEW ARDEN ACADEMY THE CENTRE FOR COMMUNITY LEARNING GREEN PROTOCOLS

Design protocols for protecting and enhancing our environment: Tackling climate change and environmental impact through our zero carbon ambitions.

ARDEN'S VISION FOR A NET ZERO CARBON DEVELOPMENT

The concept masterplan for Knowle, proposed in Solihull Metropolitan Borough Council's Draft Local Plan (Policy KN2), sets out the vision for a new Arden Academy that forms an invaluable hub for community learning, comprising a relocated home for the secondary school, along with a brand new co-located primary school.

These proposals represent a once-in-a-lifetime opportunity to greatly enhance the facilities and environment of our school and to create some fantastic new resources for the people of the area. Our aim is to create a development that is an exemplar for community learning: an inspiring facility that not only provides a flagship home for secondary and primary schooling, but also warmly welcomes the whole Knowle community, accommodating community sports, education, functions, events, and meetings.

The new, sustainable Arden will be a flagship for green technology and ecological responsibility, a focus of real pride in our community. Modern leaps in building efficiency mean we already know that the new buildings' annual energy bill will be less than half current costs, delivering a saving in excess of £50k per year. It is our aim to build on these baseline cost savings, to achieve even greater efficiencies using the most up-to-date technologies.

Of course, our aims for the new Arden go far beyond mere cost savings; we are determined to provide welcoming modern educational facilities surrounded by attractive, enriching open spaces. A core element of our plans is centred on a positive commitment to protect and enhance our environment. We seek to go above and beyond national and regional climate change targets to set new standards in environmental and ecological performance. In terms of the challenges of climate change, we are determined that the new Arden will become recognised as a new benchmark for green school design, construction, operation and travel to and from the site. Our aim is to deliver a genuinely net zero carbon facility by mitigating construction emissions, minimising energy consumption and maximising the environmental quality of the school buildings, their surroundings and all activity associated with Arden - in perpetuity.

The concept masterplan for Knowle provides a sustainable road map to meeting the needs of the whole community, including primary and secondary school learners; their parents/carers and teachers; families seeking more affordable homes and safer roads; and supporting local businesses by promoting footfall on the high street. The aims of the masterplan will also bring extensive benefits for the many and varied prospective users of the new academy itself. However, schools are primarily places for young people to learn and grow, and we will practice what we teach, in terms of creating a safe, healthy and environmentally sustainable planet. This green approach will be the learning springboard for the students in our care. Education will play a pivotal role in teaching them to understand, control and improve their environment in a positive and sustainable manner.

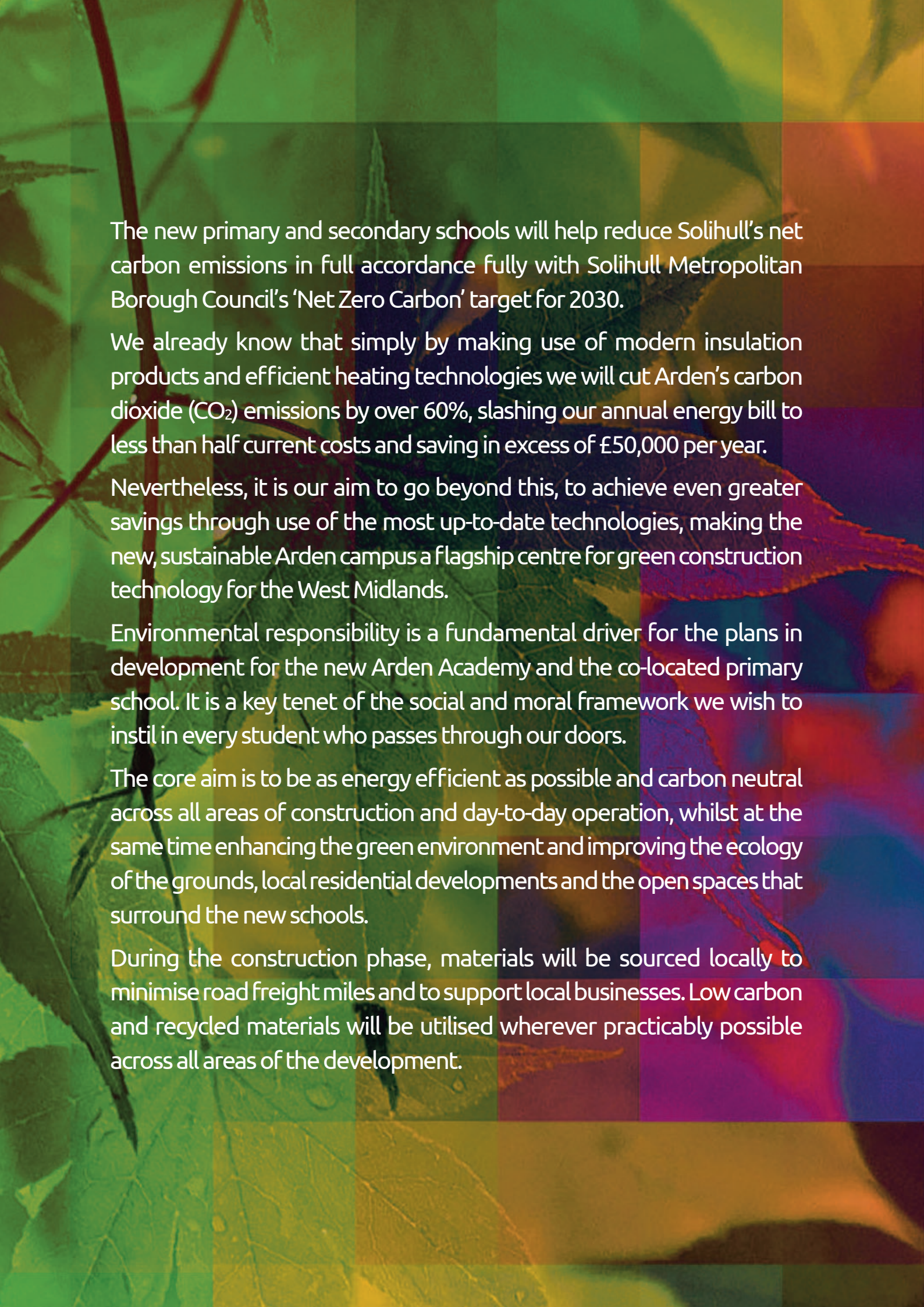
Ultimately, our aim is to create a place for living and learning in Knowle that represents a GREEN EXEMPLAR for the region. We very much welcome both your support and participation in helping us achieve our goal of making the new Arden the best, greenest, most enriching academy it can be.

Martin Murphy
Chief Executive of Arden Multi Academy Trust

Dave Warwood
Associate Head Teacher, Arden Academy



Our ultimate aim is to create a place for living and learning in Knowle that represents a **GREEN EXEMPLAR** for the region. We very much welcome both your support and participation in helping us achieve our goal of making the new Arden the best, greenest, most enriching academy it can be.



The new primary and secondary schools will help reduce Solihull's net carbon emissions in full accordance fully with Solihull Metropolitan Borough Council's 'Net Zero Carbon' target for 2030.

We already know that simply by making use of modern insulation products and efficient heating technologies we will cut Arden's carbon dioxide (CO₂) emissions by over 60%, slashing our annual energy bill to less than half current costs and saving in excess of £50,000 per year.

Nevertheless, it is our aim to go beyond this, to achieve even greater savings through use of the most up-to-date technologies, making the new, sustainable Arden campus a flagship centre for green construction technology for the West Midlands.

Environmental responsibility is a fundamental driver for the plans in development for the new Arden Academy and the co-located primary school. It is a key tenet of the social and moral framework we wish to instil in every student who passes through our doors.

The core aim is to be as energy efficient as possible and carbon neutral across all areas of construction and day-to-day operation, whilst at the same time enhancing the green environment and improving the ecology of the grounds, local residential developments and the open spaces that surround the new schools.

During the construction phase, materials will be sourced locally to minimise road freight miles and to support local businesses. Low carbon and recycled materials will be utilised wherever practicably possible across all areas of the development.



INTRODUCTION

The UK government has made a legally binding commitment to be carbon neutral by 2050. This will require major changes in the ways which we construct and operate our schools and associated buildings.

From a carbon use perspective, the current Arden Academy buildings fall woefully short of what should be expected of a flagship place of learning in our region. The sad fact is that the bulk of Arden's school premises are no longer fit for purpose. Much of the site is more than sixty years old, with poor energy efficiency due to single glazing and poor insulation.

An Education Funding Agency survey undertaken in 2013 identified that key elements of the main school blocks would soon fail. Serious IT and communications infrastructure issues were highlighted. In addition, such crucial areas as electrical power, lighting, heating, water systems, drainage, gas distribution were deemed inadequate, and the design of all external doors and windows were inefficient and outdated.

This ageing infrastructure has a considerable negative impact on the current school's energy use:

Comparative school CO₂ emissions per annum

Arden Academy

60 years old: 497,052 kg

Park Hall Academy

12 years old: 285,272 kg

Comparable NEW Academy

Newly completed, rated 'Excellent' under BREEAM, approximate: 125,000 kg

These striking statistics indicate that Arden Academy performs more than 57% worse than Park Hall, a comparable more modern school within the Multi-Academy Trust portfolio, and around FOUR TIMES worse than a recently completed school which has been awarded a BREEAM 'Excellent' rating.

A new Arden Centre for Community Learning in Knowle with modern features and facilities will also realise the incredible potential for our students' attainment and wider community use:

- A new state-of-the-art carbon-neutral school and Centre for Community Learning with a new, co-located primary school benefitting from high quality shared facilities.
- Better community safety when travelling to and from the Arden campus also delivering a significant reduction in traffic on school routes.
- A Youth Zone, providing an inspiring resource where young people can be active and learn in a safe, inspiring educational environment.
- A substantial reduction in the school's overall bought-in energy consumption and costs.
- Significantly improved sport, leisure and learning facilities that will engage the whole community throughout the day, seven days a week.
- Supporting the sustainable growth of the local area and related infrastructure.

This document sets out the range of measures we are seeking to introduce to achieve a net zero carbon solution for the new Arden, a superb Academy that makes a significant positive contribution to mitigating the impact of climate change.





SITE ECOLOGY

The natural environment

The drive to protect, enhance and restore the natural environment will be a pivotal feature of the planned Arden Centre for Community Learning and will form important elements of our teaching modules. Not only minimising the environmental impact of the new build, but actually enhancing and, in fact, improving the ecology of the KN2 site is a key driver for the project.

The COVID-19 pandemic has clearly demonstrated how access to enriching green amenity space and the natural environment is fundamental to positive mental health and physical wellbeing. The whole population now understands the special value of these spaces for recreation, exercise and wellbeing. It now seems unlikely that we will slide back into the sedentary urban existence of the past.

Of course, every school has green space, with playing fields and neatly manicured box hedges and flowerbeds, but these are essentially a desert for wildlife. In contrast, the new Arden will form an intrinsic part of an enhanced local ecology within a pleasing natural environment that combines sympathetic residential development with ample public open space and a substantial new wildlife site flanking a stream to the south of KN2.

The land allocated for the new Arden Academy already includes a large, well established natural pond and several splendid stands of native trees. These will be very carefully protected from damage and potential run-off during the construction phase. Mature trees and ancient hedge lines will be retained wherever practicably possible, offering cherished opportunities for students' ecological studies.

The Forest of Arden

Whilst, inevitably, even the 'greenest' construction will utilise some new materials, this project aims to plant TWO new trees for each tree used during the construction of the new schools.

Every member of Arden's 1800-strong school role and every child destined for the new co-located primary school will be intimately involved in making a positive impact on the natural environment of the site during the naturalisation phase of the development. Our aim is to go far beyond mere carbon offsetting to involve every child and every staff member in planting their own tree on the Arden school site and within the new public and wildlife spaces that border it.

Financed through a school and community charity drive and the support of local businesses, this ambitious aim will see strong emphasis placed on the planting of native species. Alder, hawthorn, birch, oak and beech, as well as disease resistant strains of elm and ash; will be planted the KN2 site under the advisement of organisations like Natural England and The Woodland Trust.

Needless to say, native tree species encourage native wildlife, with as many as a staggering 2,300 different plant and animal species known to live on native oak trees. The aim is to recreate a pocket of the natural woodland and lowland heath that once covered our area, helping re-establish part of the ancient Forest of Arden that is our namesake in an urban Knowle setting.



School Wildlife Pond

The existing ancient pond located within the planned boundaries of the new Arden KN2 site will be retained, protected and enhanced to provide a much improved habitat for wildlife and an invaluable ecological study resource for students.

1.6

1.6 miles of existing mature hedgerows retained on-site providing important wildlife corridors and nesting sites.

700

New homes to be built at the KN2 site. From starter homes and flats, through quality family dwellings up to premium executive properties.



500

NEW Native Trees

Around 500 native trees to be planted in and around the new Arden Academy campus, with a long term aim of planting a tree for every student.

If as planned TWO trees are ultimately also planted for every one used during its construction, the new academy will actually remain 'carbon-negative' for about the first 20 years of its life!

Amenity Spaces

The planned wildlife site and adjacent open public spaces towards the south of the KN2 site will provide an excellent amenity for leisure cycling, jogging and family exercise in close proximity to both existing residential areas and the new housing to be built within the site.



12



12 dedicated school access points for students on foot or bicycle, many from new footpaths away from traffic.



750

Projected overall reduction in operational carbon emissions from heat and light for a new BREEAM 'Excellent' school compared to the existing Arden.

Warwick Road Drop-off

A dedicated drop-off point will be installed at the new Warwick Road main entrance to the Arden KN2 site. Marshal-controlled during peak periods and accessed via a mini roundabout, it will help ensure traffic flows freely at even the busiest times.

Natural Ventilation



Careful orientation of the new buildings takes full advantage of prevailing winds to provide natural ventilation with fresh, unprocessed air with minimal energy requirements.

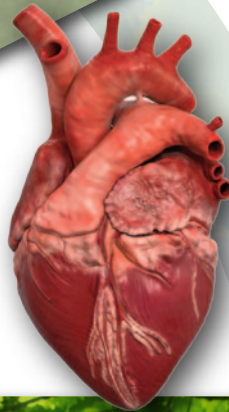
Nanogel Glazing Technology

Proposed use of leading edge nanogel glazing technology will provide automatic shading, diffusing harsh sunlight and reducing radiant heat, whilst the approach of dusk will see it gradually become clear, increasing light penetration.



50%

Projected increase in the number of students cycling to school as a result of improved access and safety.



Health and Wellbeing

With multiple safe pedestrian and cycle routes into the school away from hazardous main roads, this should significantly reduce local car journeys to and from school and more importantly will improve the health and wellbeing of the additional students who walk or cycle into school.

70%

Projected reduction in congestion on Station Road during the peak rush hour-school pick up/drop off clash periods.

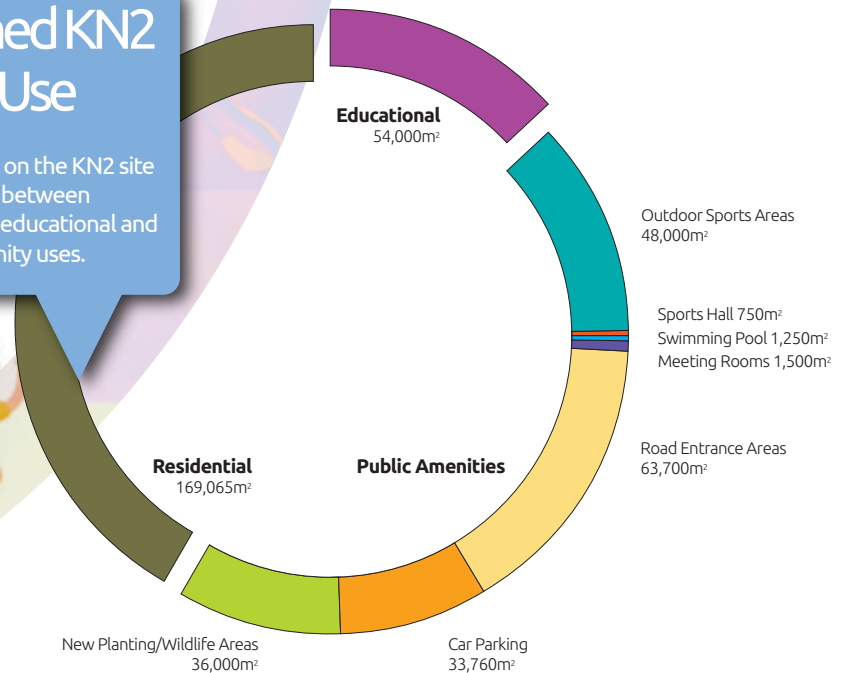
250 Trees

Existing mature trees to be retained at the KN2 site.



Planned KN2 Land Use

Land usage on the KN2 site will be split between residential, educational and public amenity uses.



Please Note: All figures quoted within this document are projected based on currently submitted plans and available data at the time of publication. Whilst as accurate as possible, they may be subject to change without prior notification as a result of amendments to plans or change in detailed specification.

BUILT ENVIRONMENT

A Green Design Philosophy

The design of the new Arden Academy will incorporate a broad range of solutions for the reduction of environmentally damaging carbon emissions. Set out across the following pages is a list of measures we plan to explore. By no means exhaustive, ultimate choices will be made based on practicality, effectiveness and of course value for money.

Whilst the existing school is notoriously draughty and badly insulated, making it chilly in winter and sweltering during the summer months, efficiency of heating and ventilation as well as environmental factors will be pivotal in the development of the new site. Going forward we also aim to team-up with local providers to cost-effectively source environmental technologies and to develop the potential of emerging green technologies.

Looking to the future

We aim to introduce as many innovative green 'carbon neutral' design solutions as possible to the new Arden. We believe our new Academy should be as intrinsically energy efficient as possible, delivering low greenhouse gas emissions, whilst maximising students' health, wellbeing and performance.

A key consideration locally is that Arden and the wider Knowle community currently suffers from a woeful lack of suitable sporting and leisure facilities; it is a key aim of our plans for the new development to rectify this.

Where practicable, a range of advanced design features would be incorporated into plans for the new sports and leisure facilities.

Sustainable Design Features

'Sustainable design' maximises conservation of finite resources, cutting waste and reducing water, energy and materials usage during both construction and operation. Central to the aims of sustainable design is a process of evaluation that encompasses the entire school's 'footprint', analysing the lifecycle and sustainability of the materials used in construction.

Materials will be selected that are as environmentally friendly and durable as possible; materials that have longer life expectancy minimize the volume of waste entering landfills and, of course, negate the emissions and energy costs of replacement.

Reuse and recycling

Whilst the key aim of keeping the current Arden Academy open throughout construction of the new site precludes the recycling of materials to aggregate for use in the new school build, eventual demolition will see as much material as possible screened re-used in local construction projects.

However, all the topsoil at the new school site will be itself screened, improved and reused on-site, with any spoil resulting from the on-site demolition of the old farm being crushed and utilised as hardcore.

Building Orientation and Layout

Harvesting natural sunlight and energy efficiency form an integral part of the orientation and layout of the new buildings. Natural lighting is undeniably preferable to artificial, whilst passive solar design and natural ventilation systems will also help keep mechanical heating and cooling requirements to a minimum.

In the proposed plans the new building layout aims for an optimal southern exposure, achieving maximum natural heating through solar gain and exploiting prevailing wind flow through the building for ventilation.



If as planned TWO trees are planted for every one used during its construction, the new academy will actually remain 'carbon-negative' for about the first twenty years of its life!

Carbon Reduction

We aim to harness technologies that capture and store harmful emissions. Wherever possible materials will be locally sourced, minimising emissions of both CO₂ and pollutants - seeking out 'materials that don't have to travel far and which are also environmentally responsible' as opposed to simply what is cheapest and easiest to get, regardless of environmental impact.

New construction materials will be selected for their durability, environmental credentials and their potential for ultimate reuse or recycling. Composite materials will be considered that incorporate high insulating but low carbon impact properties, for example:

- Use of a lightweight timber superstructure and the excellent subsoil on site mean that the amount of concrete needed for the foundations will be reduced, with attendant reductions in overall emissions during raw manufacture, transport and construction.
- Timber will be used extensively. It is highly thermally efficient, helping reduce heat loss in winter and minimising heat gain during summer.
- Recycled Rockwool insulation will help maximise energy efficiency, whilst potential use of green 'living walls' on main elevations and a green 'living roof' would be attractive and may improve air quality and help further offset the site's carbon footprint.
- Cost-effective, lightweight fabric air-con ducting, motion activated LED lighting systems and electric underfloor heating would further minimise the energy use.

Use of Timber

- Timber used will be exclusively from renewable sources. No wood will be used in construction that is not either recycled, or fully Forestry Stewardship Council (FSC®) accredited as sustainable.
- Extensive use will be made of prefabricated engineered structural timbers and highly energy efficient Structural Insulated Panels (SIPs), minimising overall timber use and significantly increasing rate of construction.
- Timber also absorbs carbon from the atmosphere, and about 3,095 tonnes of carbon dioxide (CO₂) will be stored in the timber forming building's frame. As a result, if as planned two trees are planted for every one used in its construction, the new building will remain 'carbon-negative' for about the first 20 years of its life!



Minimum 75% reduction in operational carbon emissions compared to the old Arden school.

Electrical and Gas Usage

Electrical and gas usage is one of the main areas of carbon emissions in the day to day operations of the school.

Subject to practicability, we propose to incorporate some, or all of the following features in the new heating and lighting plans for the site, with the aim of reducing annual CO₂ emissions resulting from heating and lighting from 497,000kg to around 100,000kg.

- Banks of Photovoltaic solar panels on the roof of the Gym, Sports Hall, Concert Hall and other buildings will generate a significant amount of electricity for the site. Use of solar thermal, as well as ground source and air source heat pumps could augment cost-effective infra-red radiant electric heating and the hot water requirements of the site, minimising bought-in energy costs.
- We will explore the use of solar or Hydrogen fuel cells where possible for all heating and lighting. If practicable, we propose use of the latest Lithium battery technology to store school-generated renewable electricity. Whilst currently expensive, this technology is evolving rapidly, and we hope to team up with a local company to source these batteries and similar green technologies cost-effectively.
- Photovoltaic cell systems (PV) harness solar energy to directly generate electricity. Solar water heating systems utilise heat from the sun to supplement conventional water heating, which traditionally consumes a great deal of energy. Combining these two renewable technologies on-site could greatly reduce our carbon footprint.
- In recent years LED lighting has helped slash energy use. Combined with introduction of passive lighting systems that switch off when rooms are not in use, they will help further cut the new schools' energy use.
- Finally, overall energy use will be closely monitored to validate Asset Management protocols and Building Information Modelling (BIM), enabling fine tuning to cut energy use to the bare minimum. Preliminary discussions have already yielded two household names interested in becoming involved the development of this feature.

Leading-edge solutions

- Highly innovative Xtralite 'nano-gel' technology roof lights are a key option. Nano-gel is light reactive; it becomes milky in bright light, helping diffuse the heat of harsh sunlight during the day, whilst gradually clearing to admit extra light into the building as dusk approaches.
- Whilst still in the developmental stages, 'graphene' may ultimately be incorporated into the new buildings' glazing to generate heat and power.

Water Usage

Water conservation technologies have undergone major changes over the past few years. We will look to integrate low-flow toilets, zero-flow urinals and shut-off controls in the lavatories/locker rooms.

Options for storage and reuse of 'grey' water and rainwater runoff will be investigated for potential summertime irrigation of green areas at the new academy site.

Flood Prevention and Mitigation

Whilst historically it has not been a significant problem, it has been identified that the proposed KN2 site has some very limited flood risk issues. Where there is the potential for flooding, effective prevention and mitigation measures will be introduced, including Sustainable Urban Drainage Systems (SUDS) and water flow measures.





BREEAM Building Assessment

According to one study, buildings are responsible for 40% of carbon dioxide emissions across the globe. BREEAM (Building Research Environmental Assessment Method) is the first criteria-based building assessment system devised by Building Research Establishment (BRE) in 1990.

BREEAM assesses a building through third party certification of its environmental, social and economic sustainability performance, using standards developed by BREEAM.

In this system the building is examined under nine different categories. These are 'Management', 'health and well-being', 'energy', 'transport', 'water', 'materials', 'waste', 'pollution', 'innovation', and 'land use and ecology'.

The BREEAM ratings range from a 'Pass', Good, 'Very Good', 'Excellent' and 'Outstanding'.

Under national and regional policies, major non-residential development is expected to conform to BREEAM 'Excellent'. It should provide at least 15% of energy from renewable or low carbon sources and source low carbon and sustainably resources building materials wherever possible.

Our ambition is to better the requirements on those policies and our ambitions will be to achieve a BREEAM Outstanding rating, which will a score on the assessed areas of above 85%

Use of Modular Construction

By 'going modular', energy consumption is reduced. With modules built in a remote controlled environment, the energy poured into the site assembly process is marginal compared to a traditional build. Modular construction also requires considerably fewer personnel and fuel thirsty mechanical plant.

In addition, even the largest modular buildings are usually erected in just a few weeks, benefitting schools with tight construction budgets, slashing completion time and reducing the impact on the local environment.

Noise pollution is also cut dramatically because there is no need for constant material deliveries, large numbers of staff or heavy on-site machinery. Besides benefiting the environment, this means our students can carry on learning without being distracted, and our building can be installed with the minimum to the surrounding community.

Low Carbon Innovations

Under the Local Plan, throughout duration of the concept masterplan delivery period new low carbon technologies will continue to evolve and become more widely available and affordable, enabling us to incorporate them into our plans, for example:

Graphene

'Graphene' is a single-atom-thick sheet of carbon. Graphene is exciting researchers and businesses around the globe, because it displays very interesting properties. It is the strongest material in the world, whilst also being incredibly lightweight and displaying some extraordinary electrical, thermal and optical properties.

Whilst this new technology is still very much in its infancy, there are already dozens of companies working on graphene-based materials and exciting potential applications in batteries, sensors, solar panels, electronics and more. Currently expensive, coming years will no doubt see prices drop significantly, enabling the development of cost-effective new graphene-based technologies that could significantly benefit the new Arden schools.

Hydrogen

Using a hydrogen fuel cell to power an electric motor is two to three times more efficient than using a combustion engine. This means that much greater fuel economy is available using hydrogen in a fuel cell and of course it generates only water when burned.

In the past the stumbling block was 'making,' the hydrogen though electrolysis, but today the UK has lots of wind and water-based renewable energy. Over the duration of the Local Plan delivery period it is likely that clean hydrogen power will rise to become much more prominent in everyday use.

The school aims to access hydrogen generated from renewable power where possible, or hydrogen blended into natural gas for our heating and lighting if no other, lower carbon energy source is available.

Transport to and from school

Our approach seeks to create a low-traffic neighbourhood in and around the school. It is our aim to make cycling and walking the most common, and healthiest means of travelling to and from the new Arden Centre for Community Learning.

Located away from major roads at the heart of a substantial new residential catchment, provision of safe and abundant pedestrian access routes has been a paramount consideration. It is proposed that there will be TWELVE access points to the school for pedestrians and cyclists. These will be fed by a network of footpaths and cycleways, and we propose to work closely with Solihull MBC and the West Midlands Combined Authority to also ensure ample provision of cycle lanes on the main school road routes.

Not only are cars and buses expensive to fuel and in terms of pollutants and carbon emissions, but they also discourage walking to school. Some districts are now planning school catchments with walking distances for students specifically in mind. They are encouraging carpooling and bike riding, or where this is not possible, they are developing alternative fuel sources for buses such as hydrogen.

As a centre for community learning, our school will also need to accommodate community functions, events, and meetings: A source of community pride that is readily accessible on foot or bicycle for all community members.

It is proposed that the main vehicular entrance to the school will be from Warwick Road. This will move traffic away from Knowle centre, alleviating the current problems on Station Road where school and commuter traffic are currently combined to create significant congestion (and pollution) at the start and end of the school day.

In our plans, a safe drop off and collection point, where engines must be turned off when stationary, will be accessed via a mini roundabout. This will control traffic flow entering and leaving the school, reducing pollution and minimising fuel use.

Environmental Education

We are determined to achieve optimal levels of air quality, lighting, temperature and acoustics in our school buildings through environmental improvements that will help ensure our students achieve their full potential.

As well as making a statement in terms of how a school can be designed to mitigate the impact of climate change, the environment of a school building has a tremendous impact on how a student learns. Many people don't realise that factors like CO₂ levels and quality of lighting, can make a big difference on how well or badly students perform academically.

Optimising lighting, indoor air quality, thermal comfort and acoustics can not only help to improve students' learning outcomes but, depending on the strategy used, can also reduce energy use and cut carbon emissions. For example, simply designing learning spaces with ample windows, augmented by energy efficient LED lighting will not only reduce emissions, but can also create a more productive and healthy school environment.

Lighting

We can significantly improve school lighting through thoughtful design that balances natural daylight with carefully selected, energy-efficient artificial light. Exposure to daylight is undoubtedly beneficial to children. It reduces 'low-activity' time and contributes to increased physical activity at weekends.

Research suggests that exposure to blue spectrum ('north light') LEDs in the morning can actually make children more stimulated and alert at school compared to those working under dim, yellow lighting. Studies have also identified that students deliver a 36% improvement in oral reading fluency when exposed to high-intensity light, while those in standard lighting conditions increased by just 16%.



Acoustics

Poor acoustics in classrooms can directly impact student health and behaviour. 'Acoustically live' environments can intensify problems of hearing loss, negatively impact heart rate, increase blood pressure, aggravate stress responses and are a real problem for those with ADHD or who are on the Autism spectrum. Unsurprisingly, poor acoustics can also reduce overall student achievement.

Locating new schools away from permanent external noise sources like busy roads, minimising hard surfaces and optimising insulation all significantly improve the sound environment for learners.

Air Quality

It's an oft repeated image of the groggy child dozing in a stuffy classroom, but poor indoor air quality in schools really can have a significant negative effect on children's health and academic performance. Indoor air quality is defined by the levels of various pollutants, including CO₂, volatile organic compounds (VOCs), mould spores, dusts and airborne fungi. High concentrations of these pollutants, as well as bad ventilation, has been linked to Sick Building Syndrome (SBS), which can include symptoms like headaches and lethargy.

Elevated CO₂ levels have been linked to symptoms of wheezing among children and low ventilation rates have been associated with increase incidences of SBS and nurse visits.

Research shows that each 100ppm increase in CO₂ levels equated to a roughly one-half day per year reduction in UK school attendance. In warmer weather good indoor air quality and low CO₂ levels can be achieved through natural ventilation; refreshing indoor air without increasing energy consumption, though of course this requires good outdoor air quality.

In the plans, our building designs and orientation have been carefully optimised to exploit the local prevailing wind flow to achieve excellent natural ventilation. This 'free' fresh air will be further augmented by cost-effective, lightweight fabric air-conditioning ducting to ensure the best possible air quality throughout the school.

Thermal Comforts

Children are more sensitive to higher temperatures than adults because of their higher core body temperature and less developed thermoregulation capabilities. The right temperature in a classroom is therefore vital to children's health and academic achievement.

Natural ventilation from windows, if the outdoor air quality is good, can moderate the temperature and reduce energy needed for cooling and associated carbon emissions.

Otherwise schools can make use of energy-efficient and renewably-powered mechanical ventilation which can provide a comfortable temperature and humidity level.

Collaborative Partnerships

Arden Multi Academy Trust cannot achieve new zero carbon status for the Arden Centre for Community Learning alone. We therefore propose to work closely with a range of local and regional partners to realise our ambitions.

- Solihull MBC
- Warwick University
- Keele University
- University of Salford (Graphene Centre)
- West Midlands Combined Authority

Going forward we also aim to team-up with local businesses to cost-effectively source environmental technology solutions and to develop the maximum potential of the emerging green technologies.

For Further Information

Our aim for the KN2 site is to create a place for living and learning in Knowle that is a GREEN EXEMPLAR for the region. We very much welcome both your support and participation in helping us to make the new Arden Academy Centre for Community Learning campus the best community resource that it can be.

If you would like further information about our environmental plans for the new Arden Centre for Community Learning, please contact
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