

Net Zero 2050 Framework

Aim and Scope of Framework

The aim of the Blaenau Gwent Net Zero 2050 framework is to provide a high-level overview of what is needed to achieve Net Zero for Blaenau Gwent as a whole, in line with the Welsh Government ambition for Net Zero 2050. The framework will be structured around four themes: energy, housing, nature and transport, that reflect both the priorities of the Blaenau Gwent Climate Assembly and our major emissions sources. Net Zero 2050 is about how Blaenau Gwent can play our part in tackling the Climate Emergency and achieving global targets for limiting global warming to well below 2°C. But it is also about improving our green space, warm homes, affordable energy and accessible transport for all.

Level of local control/influence on Net Zero 2050

Blaenau Gwent will ultimately be dependent on wider changes to achieve Net Zero 2050, in areas such as policy, technology and finance. However, it is also the case that if all the required wider changes do take place (e.g. decarbonisation of the National Grid) that without substantial local action in Blaenau Gwent also taking place (e.g. electric vehicle charging and home heating systems) they will not result in Blaenau Gwent achieving Net Zero. This local action will also require significant financial support, the scale of change required cannot be achieved within the existing resources available locally.

Scope of action

Blaenau Gwent's territorial carbon emissions have been falling for a number of years, driven by two main factors, the decarbonisation of the electricity grid and widespread continuing improvements in energy efficiency. However, these two factors are not enough on their own to reach Net Zero. As the projections from the Tyndall Centre (p.6) show, on current trends Blaenau Gwent will fall significantly short of Net Zero without other forms of action. These additional actions include significant changes to infrastructure including home heating, transport and the energy grid, both locally and nationally. The approach of this Framework is to describe what needs to be done under each of the four themes to achieve Net Zero in Blaenau Gwent, which is dependent on significant additional resources being available, rather than describe what can be done to maximise carbon reductions within existing resources.

Resource Implications of Net Zero 2050

Costing the changes required to reach Net Zero 2050, and the potential costs of not doing so, is beyond the scope of this document. The framework starts from the assumption that by declaring a climate emergency the council accepts the substantial evidence that the benefits of reaching Net Zero 2050 outweigh the, very significant, costs of the changes needed to achieve it. Therefore, the focus of the Framework is on what Blaenau Gwent needs to do to reach Net Zero, rather than making the case for taking action to reach Net Zero or outlining the negative impacts of failing to act. In this context it is also worth noting that the alternative to the actions described in the Framework is not doing nothing. In the

25-plus year period to 2050 much of the infrastructure covered in the framework will reach the end of its useful life and need to be replaced regardless of the need to decarbonise.

The scope of the changes needed to reach Net Zero 2050, which include a range of actions that are outside of local control, mean that it is not realistic or proportionate to describe every aspect of the transition in a single document. In addition, Net Zero 2050 cannot be separated from Blaenau Gwent's wider well-being objectives, our aim is not for transport or housing to become Net Zero but remain otherwise unchanged. Therefore, Net Zero 2050 is part of our wider well-being objectives and plans. The framework aims to set our direction by providing a clear description of what Net Zero 2050 looks like for Blaenau Gwent and some of the key steps that we need to take to reach it. Much of the detail of how these transitions will be delivered will be contained in other plans, such as the LAEP. The framework will provide an overview that can inform climate action in these plans and help to identify gaps in existing plans and priorities for action.

Climate Mitigation

Climate mitigation is action to prevent the release of carbon emissions. The Framework covers all territorial emissions for Blaenau Gwent, this means all carbon emitted within Blaenau Gwent (from transport, housing, businesses etc.). Net Zero 2050 relates to production based territorial emissions, these include all the carbon emissions (i) directly released in Blaenau Gwent and (ii) released to produce energy that is used in Blaenau Gwent. It does not include consumption based territorial emissions, which are the emissions associated with making products elsewhere, which are then consumed in Blaenau Gwent. Consumption based emissions vary much less between one area and another than production-based emissions, reflecting that there is much more limited scope to influence them at the local level.

What does Net Zero mean?

Reaching Net Zero means that the level of carbon in the atmosphere has stopped increasing, not that we have stopped emitting carbon entirely, there are likely to still be a small amount of residual emissions but these will be balanced out by negative emissions (e.g. by natural carbon sequestration and/or carbon capture and storage). Achieving Net Zero is a very important element of responding to the climate emergency, but it does not mean that climate change is 'solved'. The amount of carbon released between now and when we achieve Net Zero, and therefore the level of further climate change, could vary substantially depending on the extent to which carbon reductions are concentrated in the next few years or closer to 2050. More broadly climate change is one example of a wider problem of the scale of human activity approaching or exceeding a range of planetary limits. In the very long-term the Net Zero energy system described in this framework cannot be reproduced indefinitely. As while renewable energy is limitless the physical resources needed to make the solar panels and wind turbines to convert this energy into a usable form are not. There are certainly sufficient materials for Net Zero 2050, but probably not for more than a few replacement cycles for this infrastructure.

Carbon Reporting and Budget

While recognising that Net Zero 2050 cannot be achieved only by action at the Blaenau Gwent level, it is important that as part of the framework that we report on an annual basis, in an accessible format, on the total territorial carbon emissions in Blaenau Gwent. As part of this reporting, it is also important to recognise that climate action is not just about reaching Net Zero, but also how much more carbon is emitted before we reach Net Zero. The more carbon emitted before reaching Net Zero, the greater the potential impacts.

Our carbon budget is the total emissions that we can release before reaching Net Zero, based on Blaenau Gwent's fair share of a science-based global carbon budget. The global carbon budget is based on how much more carbon can be emitted while still giving a given probability of avoiding over 1.5°C of global temperature rise. Blaenau Gwent's 'fair share' of this carbon budget is calculated on the basis of our population size, the UK's Paris Agreement commitments and historical emissions. Given that local actions at the Blaenau Gwent level alone cannot achieve Net Zero, the framework will also develop more specific targets in areas identified as being most subject to local influence.

Climate Adaptation and Resilience

We know that the climate in Blaenau Gwent is already changing and further changes are inevitable even if we achieve Net Zero. Climate adaptation involves action to reduce the potential risks to people, places and services. This is not just about responding to events such as flooding or hill fires, but also acting to build resilience to ensure that our communities, infrastructure and environment are better able to cope with changes in the future.

Who is this Framework For?

Blaenau Gwent Council took the leading role in developing this framework, due to our place shaping role and democratic accountability, but delivering Net Zero 2050 will require actions by partner organisations and the public to continue and accelerate the actions being taken in Blaenau Gwent. This framework will help to ensure that we are all working to a shared understanding of what we need to do and direct people to more detailed information and plans about specific areas of action.

Public Engagement

The transition to Net Zero is something that needs to be done with people, not to them. Blaenau Gwent held the first Climate Assembly in Wales in 2021, and the recommendations that emerged from the deliberations of a representative group of 47 Blaenau Gwent residents informed the structure of this Framework. Public engagement is also central to taking effective climate action. Many people are already taking action in Blaenau Gwent, and we know from the Blaenau Gwent Climate Assembly that the public do not expect local

or national government to do everything for them. However, they do expect us to provide accurate and accessible information about what they need to do and provide support where needed to help them do the right thing. Net Zero will involve big changes and our approach will be based on listening and working closely with the public to understand what works for them. The final section of this framework describes the view of the Blaenau Gwent Climate Assembly in more detail.

Just Transition/Fairness

A Just Transition is about answering the question posed to the Blaenau Gwent Climate Assembly, 'how can we tackle climate change in Blaenau Gwent in a way that is fair and improves living standards for everyone?' Some clear expectations about a Just Transition emerged from the Assembly. Most people were keen to 'think global' and tackle the climate emergency, but on the condition that we 'act local' and demonstrate commitment and action on the quality and safety of the local natural and built environment. Assembly members recognised the need for urgent climate action, but they started thinking about transitions from what would be fair and improve well-being, rather than from how to optimise carbon reductions and then considering their impact on people afterwards. Many Assembly members drew potential parallels between these transitions to the de-industrialisation that Blaenau Gwent has experienced, and highlighted the importance of making sure that people are supported to make the changes needed. Assembly members were also excited about the significant potential opportunities for people and businesses in Blaenau Gwent from the transition to Net Zero and identified the need to maximise the extent to which these benefits are retained in the local community.

Most people do not experience the climate crisis as a crisis of over consumption, but as part of a wider crisis of quality of life and work opportunities. In the context of precarious personal circumstances people are often unable to afford, and/or unwilling to risk, making the type of large-scale transitions implied by Net Zero 2050, even though they can often see the potential long-term benefits of these transitions. A just transition is about making sure that the Net Zero transition addresses wider well-being, not just carbon reduction, and that everybody gets the opportunity to benefit from this transition.

Identifying Actions

Net Zero 2050 in Blaenau Gwent is not something that any single organisation can deliver on their own, the framework aims to provide an overview that will remain relatively unchanged over the lifetime of the framework and provide a common frame of reference for all partners. The framework will inform the development of short to medium term actions for each theme will through plans related to each specific theme (e.g. LAEP for energy). Each theme will be updated on a regular basis (3-5 years) to reflect changes in the local context, wider technology and policy developments. It is also anticipated that this updating will be a two-way process with the framework providing greater detail about our journey to Net Zero 2050 that can be integrated into key plans/strategies related to each theme over time as replacement policies are developed or, if necessary, as updates to existing documents.

Blaenau Gwent Territorial Emissions

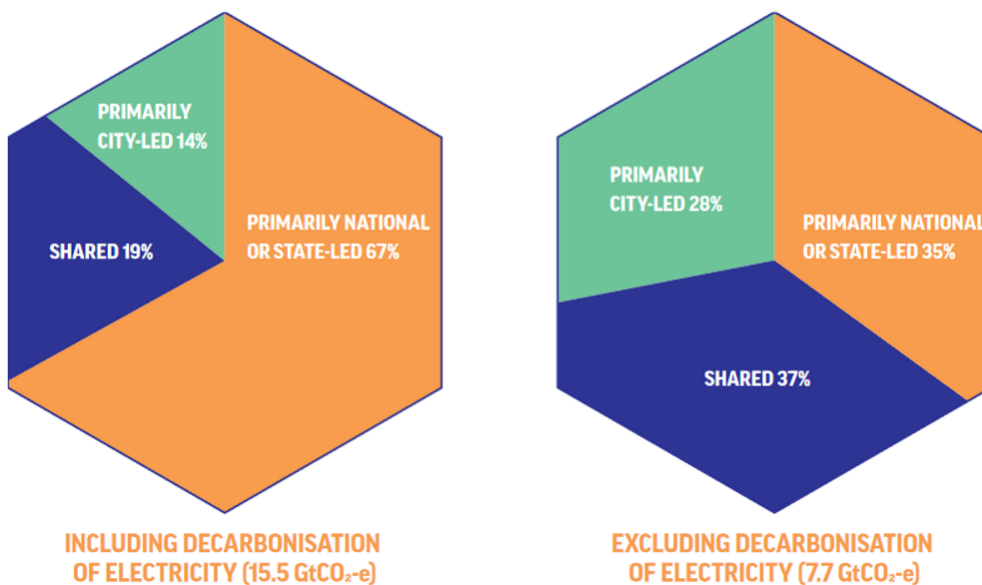
Territorial emissions in Blaenau Gwent have fallen 33% between 2005 and 2019, compared to 29% for Wales as a whole. 71% of these reductions in emissions are associated with electricity consumption, while some of these reductions will be due to actions taken locally to improve energy efficiency, a majority will be due to decarbonisation of the National Grid.

Where do BG emissions come from?



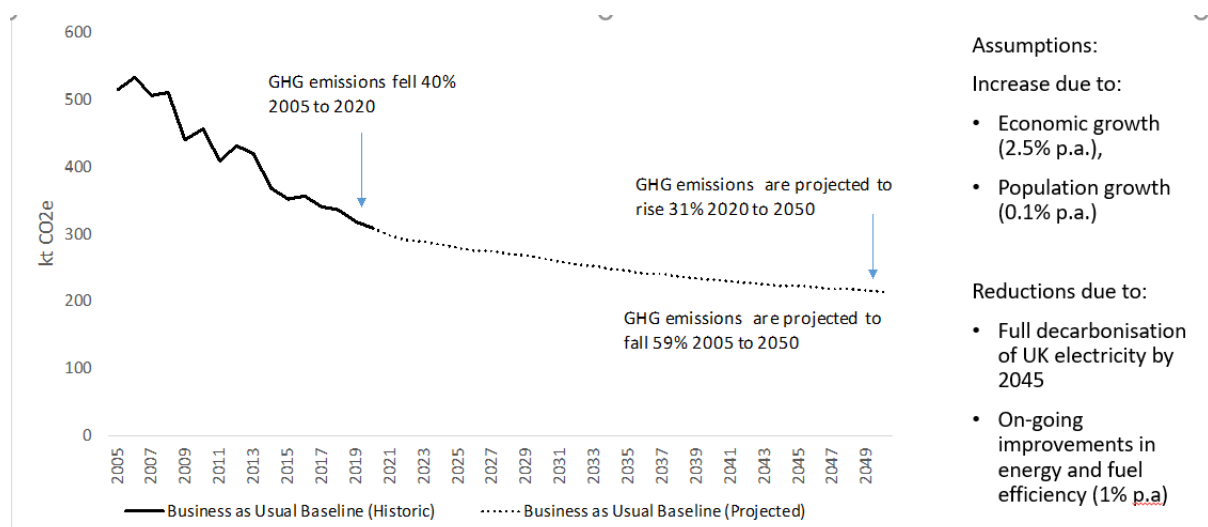
This is reflected in significant falls in both industrial and home carbon emissions, where electricity consumption plays a large role. In contrast reductions in transport emissions have been much smaller.

FIGURE 15. PROPORTION OF 2050 URBAN ABATEMENT POTENTIAL OVER WHICH DIFFERENT LEVELS OF GOVERNMENT HAVE PRIMARY AUTHORITY OR INFLUENCE.

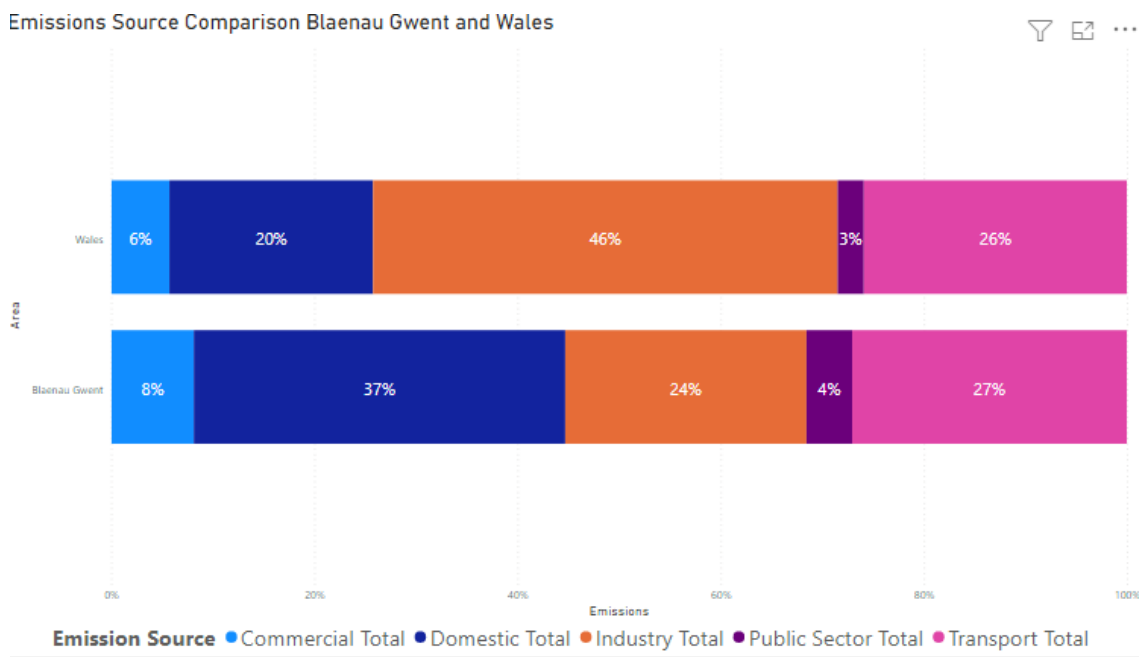


The graphic above estimates the share of territorial emissions that Local Authorities (city-led government) have influence over. The graph on the right excludes decarbonisation of the electricity grid, to show the influence local action has on the other half of non-grid emissions.

The UK Climate Change Committee says ‘Progress to date has been largely achieved through centrally driven policy to phase out coal for electricity production. This required a small number of actors supported by local supply chains in specific places. But many of the urgent changes and decisions which are needed next to reduce emissions and reach Net Zero have a strong local dimension. Decarbonising buildings, transport, waste and industry, cutting emissions from agriculture and storing more carbon through land-use and forestry are dependent on delivery at a local scale.’

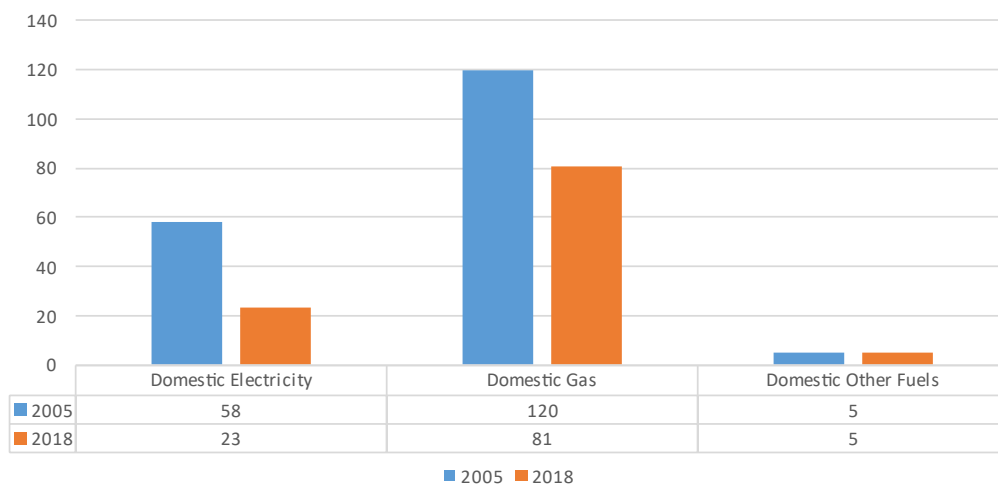


This is reflected in graph of Blaenau Gwent emissions above projecting that full decarbonisation of the National Grid is not enough to reach Net Zero 2050 without local action as well.



Compared to Wales overall a far higher proportion of emissions in Blaenau Gwent come from housing (37% vs 20%), and far less from industry (24% vs 46%), meaning that we likely have more local control over a higher proportion of our emissions.

Where do BG emissions come from?



Over 75% of our remaining emissions from homes are from gas usage, so decarbonising home heating is key to achieving Net Zero for Blaenau Gwent.

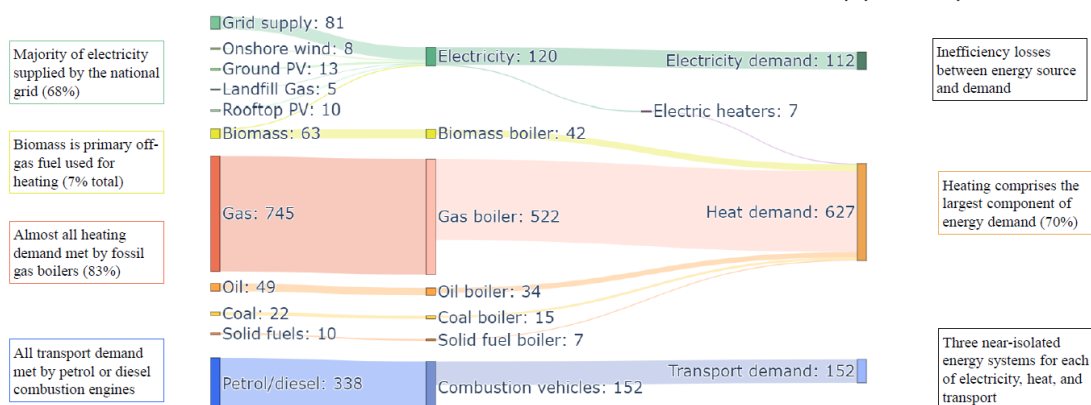
1. Energy

A Zero Carbon Local Energy System

Net Zero 2050 will require major changes to the energy system in Blaenau Gwent. These changes are likely to require greater levels of local planning of the energy system than have been necessary in the current system. The Sankey diagram below shows the current energy system in Blaenau Gwent. The left-hand side is the supply side of the system, showing the sources of energy generation. The right-hand side is the demand side, showing how energy is used.

Baseline and local context

Baseline energy use – Sankey diagram (in GWh per year, 2019)



The diagram shows that our energy system is currently effectively three almost entirely independent energy systems, one providing electricity (green), another heat (orange) and the third transport (blue). This is going to have to change to achieve a Zero Carbon energy system. Although there have been some significant improvements in the energy efficiency of the heating and transport energy systems (based on gas and petrol/diesel respectively), there is no way to make these systems zero carbon in their current forms. In contrast, decarbonisation of the electricity system has made strong progress, emissions from electricity have fallen by 50% since 2013 and 64% since 1990, and the UK Government has a good chance of meeting its commitment to decarbonise the electricity supply by 2035. Zero carbon electricity will be needed to replace gas and petrol/diesel in the energy system.

Electrification

The decarbonisation of electricity has so far mainly required action by a small number of national organisations. With the resulting changes to the energy mix being fed into the National Grid having little impact on end users. The rest of this transition is going to be more challenging for several reasons. The electrification of transport and heat will

effectively merge the three current energy systems into a single electricity-based system, significantly increasing the demand for electricity. Under the UK Climate Change Committees' Balanced Pathway, demand for electricity will increase by 50% by 2035 and 100% by 2050. All the electricity transmission network boundaries they examined would be expected to require some level of reinforcement, with an average doubling of their capability required between 2025 and 2035. The energy theme focuses primarily on the supply side of these changes. What the demand side changes mean for home and transport energy users is considered in more detail in those themes.

The transition to Net Zero is fundamentally changing nature of the electricity grid. This change is not just about increasing the capacity of the grid to meet increased demand. The grid was built for transmission connected generation, taking electricity from a small number of very large power stations and transmitting this power around the country. Increasingly the electricity grid incorporates distribution connected generation, where smaller renewable generation schemes feed in and are used locally. Distributed generation now makes up 29% of grid and this will only increase further, although the transmission element of the grid will remain important to ensure balancing between different areas. There are significant cost/efficiency benefits as well as carbon benefits to distributed generation. However, this will also require both investment and policy changes. The availability of grid connections is currently a significant limitation on renewable schemes, and until very recently the grid operators were not allowed to adjust the waiting list for connections to reflect the progress of project rather than order of initial application. At the level of individual households some larger houses may require an upgrade to three-phase electricity. But for the average three-bedroom house their current single-phase connection will usually be sufficient for a heat pump, standard 7kw EV charging point and solar panels.

From Peak Demand to Matching Supply and Demand

The challenges of electrification of the energy system go beyond increasing the total generation capacity and reinforcing the grid to cope with the increased load. The transition to zero carbon will fundamentally change the character of the electricity system. The biggest challenge running the current electricity system is in meeting peak demand, by ensuring sufficient peak supply from a highly centralised system with a very consistent base load from a relatively small number of power stations (the familiar challenge of everyone turning on the kettle at the end of an international match). This will no longer be the biggest challenge for the system as the potential total energy supply from renewables is many times higher than any plausible level of peak demand. The biggest challenge for the future electricity system will be in matching both the time and location of supply and demand.

Supply and Demand: Time

In the future energy system electricity supply will often be either far higher or far lower than the level of demand. Balancing energy supply and demand requires both planning of the national energy supply mix and a range of other actions at local level. At a national level the

UK Climate Change Committee suggests a balanced supply mix would be 70% variable renewables (primarily offshore wind), 20% from relatively inflexible generation such as nuclear and bioenergy with carbon capture and storage (BECCS) and 10% low-carbon back-up generation (e.g. hydrogen-fired turbines and fossil gas plants with carbon capture and storage – CCS). If the energy mix is not well balanced the significant costs of unutilised/wasted generation capacity will be passed on to people and businesses. In contrast, there are strong arguments for increasing grid capacity to the highest extreme levels of predicted future demand (over-sizing), as once work is being done to add some grid capacity the cost of additional capacity expansion at the same time is very low.

This national power mix needs to be accompanied by local actions, including storage (e.g. battery, hydrogen, hydro) to capture surplus energy when demand is low and provide backup supply when demand is high. As well as flexible demand through automating demand shifting, such as pre-heating and storage in buildings and smart charging in transport (e.g., you plug your electric car in when get home from work, but it doesn't start charging until later at night) to shift electricity demand away from peak hours.

Local Supply-Renewables

The Renewable and Low Carbon Energy Assessment (RLCEA) for the replacement Local Development Plan (LDP) identifies our local potential for generation of power, with wind and solar making up the large majority of this potential capacity. The RLCEA shows that by 2033 the Gwent region could theoretically generate over five times its current electricity demand. The Welsh Government's target of providing 70% of electricity demand from renewable sources by 2030, could be met locally utilising just 15% of Gwent's total ground mounted solar PV generation potential. This 70% target would represent an increase of supply in Blaenau Gwent of almost three and a half times existing generation levels. These figures are given to help demonstrate the scale of the challenge and the resource available, rather than as specific targets. The intention is not for local areas to become islanded systems that supply all their own power needs locally. Locally the scale of potential supply, rather than potential demand, should be the main factor in setting renewables targets. The RLCEA identifies local search areas for renewable power, in addition to the national pre-assessed area for wind energy that covers much of the southern half of Blaenau Gwent. Renewable generation offers significant opportunities for investment in Blaenau Gwent, and it is important that we develop forms of community ownership to retain the benefits in local communities. It will also be increasingly important to ensure as early renewables schemes reach the end of their initial working life that they are repowered, wherever appropriate, with improved modern turbines and solar panels.

Supply and Demand: Place (Heat)

The location of supply and demand is also important both in ensuring sufficient local grid capacity, and in matching supply with demand as closely as possible to reduce waste and take advantage of excess energy production for other purposes. Which electrification technology is best suited will vary between different locations, particularly for heating. Housing, as well as being by far the largest element of our system in terms of energy

demand, is also likely to be more difficult to electrify than transport. One of the main reasons for this is that nearly all vehicles in use today will not still be in use in 2050, while most of our buildings today will still be in use in 2050 (although nearly all of their boilers will have reached the end of their working life by 2050). It is more difficult and expensive to retrofit zero carbon solutions to existing infrastructure than to build them into new infrastructure from the start.

Currently nearly all homes in Blaenau Gwent are heated using gas because gas is currently (and has historically been) much cheaper per unit of energy than electricity making it a cheaper heating fuel. Also gas boilers are very good at producing large volumes of heat, meaning they can relatively inexpensively heat the inefficiently/badly designed buildings that dominate our existing building stock. It is very unlikely that there will be a single technology that replaces gas heating in all our buildings, different technologies will be better suited to different areas, depending on factors such as building density and local heat demand. This will require a greater degree of local planning to identify which heating technologies are most suitable for different areas, to allow organisations and residents to plan ahead for this transition.

The two main potential replacement heating technologies are both based on electricity (full details of other elements of this transition are outlined in more detail in the housing section). First, heat pumps use electrical energy to redistribute heat from the environment (either the air or ground), meaning they require less energy per unit of heat than gas boilers, and can be net zero if run on zero carbon electricity. The draft Welsh Government Heat Strategy expects heat pumps to be the 'core solution for many' buildings. Stating that pilot studies have shown 'there is no UK property type or architectural era that is unsuitable for a heat pump', while also highlighting that in many cases improvements to insulation and/or heat emitters (radiators) will be important to optimise cost and carbon performance.

Second, hydrogen can be produced via a variety of methods, but only 'green' hydrogen produced by electrolysis, using zero carbon electricity to split water to produce hydrogen, is a zero-carbon energy source. It has been suggested that the existing gas network could be converted to hydrogen, however, the Welsh Government Heat Strategy states that cost, supply, leakage and air quality issues mean that 'there is a lack of strong impartial evidence to support it (hydrogen) as the ubiquitous heating fuel in Welsh buildings'. The limited supply of hydrogen means it should be prioritised for uses where it is most effective or there are no alternatives, including in high-industrial heat and heavy goods vehicles as well as a means of balancing intermittent supply from renewables by storing excess energy from peak power generation for later use. This means that the most likely use of hydrogen for heating building is around local hubs where there are high levels of industrial heat production (or offshore wind capacity). In these areas the existing gas network could be repurposed for hydrogen, which is likely to be used in hybrid hydrogen-heat pumps.

Other technologies will also play a part. Biomass can be a low/zero carbon fuel when the material burnt is sustainably regrown. However, there can be issues with verifying that this is the case, and more fundamentally the total amount of energy which can be produced from biomass is only a very small percentage of the total heating demand. District Heat Networks (like the system at The Works in Ebbw Vale) provide access to shared low carbon

heat sources across multiple buildings, producing carbon and cost savings through economies of scale. These networks can be based on any of the low carbon heat technologies listed above, and another alternative heat source for these networks could be geothermal energy from flooded mines, where geological processes heat the water. District heat networks require a suitable base load of demand from high heat building(s) and a relatively high density of nearby buildings to connect to the network. Local area energy planning will be needed to identify which of these heating technologies is most suitable for every neighbourhood, to allow businesses and residents to plan ahead for the changes they will need to make to transition to zero carbon heating.

Demand Reduction

Action to reduce energy demand is also important, particularly in the context of increasing electrification. Often energy efficiency is perceived as primarily being about reducing the wasteful use of energy, while actually reducing underlying energy demand is seen as being very difficult given the ever-increasing demand for energy for more and more services. However, while energy demand rises as new infrastructure enables new energy services, as demand for the service saturates, technical efficiencies continue to improve and energy demand falls. Lighting, refrigeration and laundry are all examples where there are higher service levels and lower energy use than in earlier decades. Therefore, energy demand reduction should not be conceptualised only in terms of eliminating waste and voluntary frugality. Policy, regulation, incentives and technological developments have all been far more influential in past energy demand reductions.

Climate Adaptation/Resilience

The cascading impacts of electricity failure are already significant. These will continue to grow as the economy becomes increasingly electrified and as extreme weather events become more common and severe. Therefore, it is vital that the local energy system is built to be sufficiently resilient to future climate conditions.

Heat Pumps in Welsh Climate

It seems counterintuitive to heat our buildings in winter using heat from outdoors. However, like solar panels, although heat pumps work better with warmer weather, they can still work effectively in less favourable conditions, heating homes when temperatures are well below freezing, although this requires more electricity. The three European countries with the highest proportion of homes heated with heat pumps are Norway, Finland and Estonia.

The relationship between pressure and temperature is the key to how heat pumps work. Pumping air at ambient outdoor temperature over a refrigerant liquid is enough to cause that liquid to evaporate into gas. Compressing this gas increases its temperature, this heat is then exchanged into the home heating system. As a result, the gas then returns to a

liquid state and the cycle repeats. The same process in reverse, using the same types of pumps, is how air conditioning units cool buildings using warmer air from outside.

2 Housing

Heating is largest source of home emissions.

Heating and hot water typically generate three to four times the emissions of all other home electricity use for appliances and lighting. In addition, the likely availability of zero carbon grid electricity means that existing home electricity use will be relatively easy to decarbonise (the largest home electricity emissions sources are wet appliances (washing machine, dish washers etc.) and refrigeration). Therefore, home heating is the focus of this theme and in particular the demand side, whole fabric retrofit to make homes more energy efficient. The main supply side elements, how the energy for home heating will be produced, are covered in the energy theme. Theoretically housing could be made Net Zero entirely through supply side actions by utilising Net Zero energy sources, but practically this approach would have major drawbacks. Firstly, the cost of generating the large amounts of energy required would be significant both at the societal scale, and for householders who would have to pay for unnecessarily large amounts of energy at higher prices, exacerbating already high levels of fuel poverty. Secondly, it would not address issues around comfort and warmth of homes linked to energy inefficient homes. In reality, supply side changes to the energy used to heat homes cannot be separated from demand side actions to make homes more energy efficient.

New Homes

The average amount of energy consumed by new houses built today has reduced by more than half compared to those built in the 1980s. Building a genuinely zero carbon home is now possible, although this is not currently being achieved for most new properties. As zero carbon standards for, and bans on installing gas boilers in, new homes have repeatedly been put off. It will be more expensive to retrofit new homes to a zero-carbon standard later than to build them to this standard initially. National standards are likely to drive the move to zero carbon new build, given the challenges in setting different new build standards locally, given the potential effect of higher locally specific standards for new developments on their relative commercial viability, particularly for areas like Blaenau Gwent where profit margins are lower. It is also important to note that new homes are only a small element of this transition, more than 90% of the current Welsh housing stock is predicted to remain in use by 2050. The main challenge in this theme will be retrofitting our existing housing stock, which is particularly old, one third of Welsh homes were built before 1919 while just 6% were built in the last 30 years.

Retrofit

The social rental sector is leading on retrofit, helping to create retrofit capacity and knowledge, but decarbonising 1.4 million Welsh homes regardless of tenure will be

financially impossible simply by spending public sector funds. The evidence is clear that policy can have an impact on retrofit levels across all tenure types, unfortunately the clearest evidence is the 95% decrease in annual insulation rates since 2012 when previous support was withdrawn. Support can be targeted at times when retrofit is more likely to take place. Although 90% of homes will still be in use in 2050, most, if not all, gas boilers currently in use will reach the end of their working life before 2050. The Climate Change Committee has recommended banning the installation of new gas boilers in existing homes by 2033, the Welsh Government is proposing social landlords should stop installing fossil fuelled boilers from 2026 onwards. Carrying out wider retrofit at the same time as installing a new heating system has practical benefits, but also requires advanced planning. People are far less likely to make wider changes if the trigger for boiler replacement is their existing boiler failing.

There are also potential cost and practical benefits for people in retrofitting their homes at the same time as they are undertaking building work for other non-climate reasons. As UK homes change ownership every 18 years on average, most homes will change owner before 2050, presenting potential opportunities for retrofit to be combined with other works. Similarly existing homeowners are likely to carry out refurbishment and home improvement work in many homes over this period. However, realising these potential opportunities is reliant on residents having access to information about their retrofit options and the non-carbon benefits to them in terms of cost and health. In addition, it requires builders and other tradespeople carrying out this work to also have the skills to deliver retrofit.

A whole fabric approach to retrofit is devised with the aim of ensuring that a property operates in as energy-efficient a manner as possible, with all aspects of the building complementing each other. If carried out correctly, the end result should be a home that's not only in excellent condition but as close to carbon neutral as possible. The risk of piecemeal actions is that even if an action reduces heat loss it may cause other problems such as increased humidity, or not be the most cost-effective option available for that home or have been carried out in the wrong order so it does not fit well with future work.

Public Engagement

Currently there is very low public awareness of why retrofit is needed, what it involves and the potential benefits. Most people do not have a sense of retrofit, either as a collective project or of what it may mean for their home. Home Energy Performance Certificates (EPC) ratings are important indicator of progress and are widely used for target setting for retrofit (examples). However, they are also in need of reform because they are not fully aligned with Net Zero in important ways that limit their usefulness to the public as indicators of their homes carbon performance. Currently the EPC rating does not provide an easy to interpret headline figure that directly indicates a home's energy efficiency, or directly indicate how much carbon/energy residents would save by improving their rating. Welsh Government identified 14 housing archetypes that make up 80% of the Welsh housing stock and the types of retrofit action that each of these require. These archetypes could form the basis of

useful public guidance for most homes. Property specific logbooks could record the history of home energy improvements and provide a map of future improvements for each property. Registered social landlords are already being asked to develop this type of information and plan to achieve EPC targets for all their properties.

Over recent years a series of UK government schemes, all reliant on individual households proactively deciding to retrofit their home, have significantly under achieved their targets. Low public awareness of retrofit and the complexity of the work needed has meant applications for these schemes have been very low. In addition, the low level and short-term nature of the demand for retrofit work generated by these schemes has not been sufficient to build significant supply chain capacity. In contrast, schemes operating at a community scale have been more successful in retrofitting significant numbers of homes. Including programmes targeted at communities with high levels of fuel poverty (such as Arbed) and work by the social rented sector via Welsh Housing Quality Standard and Optimised Retrofit Programme. Programmes of this type can help to create local capacity by creating steady demand for retrofit. Also, people are more likely to take action when they see it works for their neighbours, as demonstrated by the clustering of roof top solar panels.

There is no doubt that the costs of retrofit will be significant both for individual households and in terms of overall costs. There are potentially significant energy cost savings from retrofit, but these often require up-front costs to be met first. The Blaenau Gwent Climate Assembly recognised that delivering retrofit in a way that is fair and allows all to access the benefits will be very complex given households' different circumstances, e.g., tenure type. The Assembly recognised that retrofit will require residents to do their part, but they also expected that they would be given support, starting with independent and locally specific information about what the local requirements and options for decarbonising their homes are that is accurate and accessible.

While making housing Net Zero is going to be a long-term and resource intensive process, there are also low cost retrofit options with relatively low up-front costs and/or quite short payback times that are not currently being adopted at the rate that would seem possible within current resources. While these actions are not going to get housing to Net Zero on their own, they are relatively easy opportunities to save energy and money that could also help drive public engagement with the larger retrofit process.

All local authorities face similar challenges around the need for public engagement around retrofit and for intelligence and data to support this engagement. As a result, there are likely to be economies of scale from pooling resources, rather than each local authority attempting to develop very similar capacities in this area independently. Similarly, the evidence strongly suggests that for many of the advice and support services that local authorities are most likely to want to provide, such as retrofit advice service or collective purchasing of solar panels for domestic properties, a single local authority area is too small to support the minimum level of demand needed to make these services viable.

Local Delivery/Supply Chain

Some of the challenges for large-scale retrofit are largely outside of local control. The current price differential between electricity and gas per unit of energy can often make heat pumps financially uncompetitive with gas boilers, even though they offer superior energy efficiency. There is widespread agreement that high carbon standards for both new and existing homes need to be driven at the national level as it is very challenging to set higher standards locally. Although enforcement of these standards largely takes place at the local level and needs to be properly resourced.

However, within this national policy context the delivery of retrofit, to a great extent, has to take place locally. This is both a significant challenge and opportunity for Blaenau Gwent. The skills and supply chain requirements of retrofit at the scale required by Net Zero 2050 are far beyond current capacities both locally and nationally. However, they also present large-scale opportunities for jobs and businesses, many of which will have to be located in Blaenau Gwent, and there is significant potential for these benefits to be retained in local businesses and communities.

The right training and support are important to ensure the quality of retrofit work required and that local providers can raise awareness and provide accurate advice to residents. There are potential opportunities to do this by building on retrofit capacity that is already developing locally. For example, RSLs in Blaenau Gwent have pooled their resources to deliver retrofit for all their tenants, other local areas have explored how these services can also be offered to households in other tenure types.

Hydrogen Ready Boilers

Boilers that can run on 100% hydrogen fuel are called 'hydrogen-ready'. Only 100% hydrogen boilers are (potentially) zero carbon. There are no truly hydrogen-ready boilers consumers can buy today.

What consumers can buy are 'hydrogen-blend ready' boilers, which are able to run with a mixture of 20% hydrogen fuel and 80% natural gas.

Heating your home with 100% hydrogen would be much more complicated than just buying a 'hydrogen ready' boiler. Besides the fact that the national gas grid would need to support this, you would likely need renovations in your home. Specifically, you'd need to swap out your gas pipes for new ones.

The Cartrefi Hydrogen Homes project is trialling this full hydrogen conversion at a demonstration property in Blaenau Gwent.

From <<https://www.which.co.uk/reviews/boilers/article/hydrogen-boilers-what-you-need-to-know-afWnI9h2Bory>>

3 Nature

Carbon Impact of Nature Based Solutions

There are two main elements to the carbon impact of different types of land use:

- **Carbon Sinks** are the total amount of carbon stored in plants and soil.
- **Carbon Sequestration** is the annual net change in the amount of carbon stored in carbon sinks.

The scale and speed of carbon removals from nature based solutions mean that they can only contribute a small proportion of the emissions reductions needed to reach net zero by 2050. As ecosystems do not have unlimited capacity to remove carbon from the atmosphere and much of this existing capacity is already being used. In fact, over half of the carbon emitted into the atmosphere by humans in the last 20 years has been absorbed and stored by ecosystems, without this sequestration global temperature increases would already have substantially passed the Paris target. This absorption capacity can be increased by restoring degraded ecosystems. However, this type of restoration, such as restoring a peatland to a healthy state through re-wetting, takes multiple years, and accumulated carbon dioxide removals will only become apparent over a timescale of decades.

Nevertheless, the cumulative effect of these actions would be far more significant in the long-term than the carbon reduction figure alone would suggest, due to the continued effect on limiting temperature rises after Net Zero is achieved.

The potential impact of the release of even a tiny proportion of carbon sinks through land use changes is enormous. While carbon is initially absorbed by plants, 95% of land-based carbon in the UK is ultimately stored in soils. The total amount of carbon stored permanently in carbon sinks is over 300 times greater than the annual rate of sequestration. Which is why land-use changes are so potentially damaging, their carbon impact cannot be balanced by simply creating replacement habitats on other sites. The carbon impact is not just the loss of plants that would have absorbed carbon in the future, but the release of large amounts of carbon from existing stores, particularly through damage to soils.

Nature based solutions can be divided into three types:

- **Protect** existing habitats from land use change to avoid emissions from carbon sinks.
- **Manage** existing land types to enhance carbon sinks and increase sequestration.
- **Restore** habitats to native conditions to increase sequestration.

Different habitats have different levels of potential for carbon sequestration. At the UK level most of the potential for carbon sequestration is from forestland/reforestation, but both peatland and grassland can make significant contributions as well.

Right Tree, Right Place, Right Reason

Large-scale tree planting is an important element in most proposed responses to the climate emergency. The Welsh Government target is for 86 million trees in the next decade, and local authorities are also launching schemes, for example Cardiff Council has launched a project to increase tree coverage by a third by 2030. There is also significant potential for tree planting to help with climate adaptation by reducing flooding and soil erosion by slowing water run-off. However, despite a series of ambitious tree planting targets there has been very little change in Welsh tree coverage in recent decades, which remain low by European standards (15% vs 38%).

It is important that actions are driven by a wider range of considerations than just the number of trees planted. There is significant variation in the carbon impact of tree planting depending on the type of planting, where it takes place and how it is managed. Unfortunately, there are many examples of mass tree planting schemes with extremely high failure rates. Even when trees do survive poor planting choices can lead to schemes having limited or no carbon benefit and/or damaging biodiversity. Good management of existing, as well as new, trees is also important to ensure the potential carbon and other benefits are maximised. There are also important potential climate benefits from the use of timber, particularly as a construction material.

Nature Emergency

The climate emergency is part of a wider nature emergency, with Welsh Government declaring a Nature Emergency in 2021. The world is currently experiencing a sixth mass extinction event caused by humans, with rates of extinction at least 1,000 times higher than the pre-human baseline. 17% of species in Wales are at risk of extinction. The biggest driver of species loss is loss of habitat, which is mainly being destroyed for human use. As habitat loss increases, lack of connection between the remaining habitats increases and accelerates species loss. A lot of international efforts to address this emergency are focused on ensuring 30% of our land and sea are connected and protected for nature's recovery by 2030. At the Gwent level 50% of species for which there is data are currently declining, a Blaenau Gwent Nature Recovery Action Plan is being developed under a wider Gwent plan.

(Local) Impact of Nature Based Solutions

Nature based solutions have real and substantial climate benefits, but in terms of overall impact there are greater benefits in improving biodiversity, creating attractive neighbourhoods and to health & well-being. As a result, it is important that carbon calculations should not be allowed to disproportionately dominate decision making about how and where nature based solutions are delivered. The Blaenau Gwent Climate Assembly highlighted that many residents see these types of improvements to the quality of the local natural and built environment as essential elements of the wider transition to Net Zero. Both in demonstrating commitment to, and the credibility of, the larger-scale changes

needed to reach Net Zero and for their own sake in improving local quality of life. This would include building on existing community involvement, such as in managing nature areas and running community clean ups.

Nature Based Solutions and Planning

Nature based solutions are closely related to Future Wales 2040 (The National Plan) Policy 9 - Resilient ecological networks and green infrastructure. This policy has two main elements. The first, safeguarding, largely corresponds to the protect element of nature based solutions, preventing damage to carbon sinks and the future sequestration capacity of habitats, by ensuring that there is net benefit from development. The second element, identifying opportunities, is related to the manage and restore elements of nature based solutions. The Local Development Plan will be one important element in developing nature based solutions. There is not a binary choice between nature based solutions and new development. The scope of nature based solutions, such as the ambitious targets for reforestation identified by Welsh Government, relates to a far wider set of potential actions than just conditions on specific planning proposals.

Carbon Offsetting is something that is frequently mentioned in the context of nature based solutions. Carbon Offsetting is where a person or organisation pays for a specific carbon sequestration activity to take place to offset their emissions. Purchasing offsets in this way raises fairness questions about who can afford to pay for sequestration and buy the right to continue emitting carbon. But even more significant in the larger picture is that nature based solutions do not have the capacity to offset more than a small proportion of our total emissions. Given this the two legitimate uses of nature based solutions are generally considered to be: Firstly, removing historic carbon from the air (rather than balancing current emissions), crucially, nature-based solutions cool the planet long after emissions are reduced. In the global 1.5 °C scenario, they take a total of 0.4 °C off warming by 2100 — four times their suppression to the 2055 peak temperature. Secondly, counteracting a small residue of unavoidable emissions that there is currently no way to decarbonise. For these reasons Welsh Government accepted the UK Climate Change Committee recommendation that they should only use offsetting in truly exceptional circumstances.

4. Transport

Ultra Low Emission Vehicles and Wider Transition

There has been little change in transport emissions in Blaenau Gwent over recent years, mirroring the picture nationally. Improvements in vehicle fuel efficiency have been counter balanced by more cars on the road, rapidly rising van traffic and upsizing of cars to larger and less efficient models. However, recently ULEV (Ultra-Low Emissions Vehicles) have become technologically, and for many vehicle types, commercially, viable. As a result, the UK ban on the sale of new petrol and diesel vehicles has repeatedly been brought forward (currently to 2035), although actual sales rates, though rising fast, remain behind comparison countries. This means that it is very plausible that all ICE (Internal Combustion Engine) vehicles could be replaced with ULEVs (likely mainly battery electrical, but with hydrogen having an important role heavy and/or long-distance transport) well before 2050. However, there are very few, if any, people who advocate for a transition which takes the form of like for like replacement of all vehicles with zero carbon alternatives with no other changes to the transport system. As there are a range of other environmental and non-environmental issues with the current transport system that cannot be solved solely by adopting ULEV vehicles.

The main challenge in the transport theme, therefore, is not the technical viability of ultra-low emission vehicles, but the wider changes needed to the transport system to solve these other issues. These issues, and the solutions to them, are much more dependent on local context than the adoption of ULEVs. Non-carbon environmental issues include local air quality; a lot of the particulate matter that damages health and shortens life expectancy is not from engines, but from wear on brakes, tyres etc, so switching to ULEVs will not eliminate this pollution. Similarly, congestion and road safety problems are not addressed by this switch either. There are also a range of non-environmental issues with how well the current transport system meets people's needs in terms of accessing jobs and services. These have their own specific form in Blaenau Gwent and have been a significant public issue for a number of years now.

This theme, therefore, is about how to ensure Blaenau Gwent's future transport system is zero carbon, not how to decarbonise the existing system. The specifics of the transport patterns and needs in Blaenau Gwent that will inform the transport options we need to provide in this future system are beyond the scope of this outline. They will be covered in the second part of this framework and the key transport documents linked to it. The purpose of this outline is to explore the climate implications of the various options that may be part of this future transport system, so that we can plan for this wider transition to be net zero.

Avoid-Shift-Improve

The net zero element of the transport transition can be described as 'avoid-shift-improve'. This denotes the order of priority for action, the most effective action is to avoid the need to travel, for example, through home and agile working. Shift is about using less polluting modes of transport wherever possible, often called a modal shift. Finally, when neither of

these is possible we need to improve carbon impact of the existing mode of transport by switching to ULEVs. It is likely that modal shifts away from car journeys will be where the greatest proportion of carbon reductions are made. In this context, active travel (purposeful journeys e.g., to work or school by foot or bicycle) is the most energy efficient form of transport. Of course, for many journeys active travel is not possible, the best way to increase energy efficiency in these cases is to bundle together what is being transported, whether this is people or goods.

Future of the Car

The need to shift away from car journeys for climate reasons, coincides with widespread acknowledgement of fundamental flaws in the 'predict and provide' road building model that has dominated transport planning for decades. Traffic levels are recognised to be primarily the result of policy choices, rather than, as 'predict and provide' suggested, a pre-existing factor that policy choices should respond to. In particular, 'induced demand' from road building, where increased road capacity creates more traffic, quickly leaving congestion and journey times no better, or even worse, than before. This shift in understanding has been reflected in the recent Welsh Government Roads Review. It is also worth noting that although both traffic volumes and car ownership have continued to rise, there has been a persistent downward trend from the 1990s onwards in the average annual miles travelled by car per person. Driven by persistent reductions in car travel by younger generations (aged 45 and under) compared to the previous generation at the same age.

A big question in this context is whether this modal shift means only a shift away from car journeys or also a reduction in the total number of cars on the road (which has continued to rise despite the reduction in miles travelled per person). From an environmental point of view there are strong arguments for both a reduction in the total number of cars and the right sizing of cars given how under occupied and over-sized for their current use many of them are. The average car is only in use for 3-4% of the time and even at the rush hour peak only 15% of cars are in use at any one time. More intensive use of fewer vehicles would be less environmentally damaging, particularly as the carbon impacts of manufacturing vehicles are the most difficult to eliminate. It will also be far more difficult to realise the potential local environmental and quality of life benefits of transforming car dominated roads into liveable streets without reducing the total number of cars that physically dominate many spaces. On the other hand, all the evidence shows that people are currently much more likely to reduce the number of journeys they make by car than they are to give up a car entirely. Reflecting that currently a car is essential to access many jobs and services, particularly outside of large urban centres.

This situation is particularly acute in Blaenau Gwent where we have relatively low levels of car ownership combined with high levels of car dependency. In this situation while car ownership is a significant element of the cost of living, the risks of being unable to make essential journeys if you give up car ownership are very high. This was reflected in deliberation in the Blaenau Gwent Climate Assembly. There was very high support for improvements to active travel and public transport and of willingness to use the car less if these were delivered. There was also significant interest in other shared transport

alternatives to car ownership, but very little consensus could be reached in the limited time available on what alternatives might be viable in Blaenau Gwent.

Shared Transport

The return of passenger rail services to Blaenau Gwent and the upcoming further expansion of services through the South Wales Metro, reflects the national situation where, despite ongoing issues with rail franchising and operating structures, passenger numbers had been on a long upward trend (until COVID). However, the obvious limitations of rail in terms of the limited range of destinations that it can directly serve mean that most public transport journeys, particularly local journeys, are by bus. This is despite the long and continuing decline since the 1980s in passenger and service numbers (outside of London) due to operating models and falling financial support. This decline also presents challenges for investment in ULEV buses, which are increasingly available, not just for public services but also for school transport.

New alternatives around vehicle sharing, either shared ownership or use of vehicles (e.g. car clubs), are being opened up by technology, including more energy efficient alternatives such as electric bikes and scooters. Significant reductions in vehicle numbers are possible, for example, each round-trip car club vehicle put on the road replaces 10.5 privately owned vehicles. On-demand transport is also growing (e.g. flecsi bus), due to both technology and the growing community transport sector, and could potentially have a greater reach than traditional fixed route public transport. However, all these models face the same underlying financial challenges as public transport in Blaenau Gwent, that due to lower passenger density outside of major urban areas all forms of shared transport services are likely to require subsidy in many cases. Taxis should be supported to transition to ULEVs, to ensure their service remains available, but cost means that taxis are unlikely to have significant role in reducing car ownership.

Place Shaping

Local place shaping has an important role to play in the transport transition. Over decades most places have become increasingly designed around the car, from out-of-town shopping to the transformation of many streets from community spaces to roads dominated by cars. Reshaping places around other forms of transport is likely to be a similarly long-term project involving all aspects of planning. There is potential for more immediate impact, particularly around the first/last/only (FLO) mile of journeys. Integrated transport is key to a modal shift, as one of the greatest advantages of cars for most people is the convenience of a journey not being split into multiple parts. The first/last mile is often one of the most significant barriers to accessing alternatives to a car for many journeys and is largely under local control. Improvements to this leg of the journey are fundamentally about local environment quality and safety, including, quality of routes to local transport hubs and services, as well as the facilities available when people arrive. The major challenge for integrated transport journeys is the need to make multiple improvements to the transport system as journeys are only as attractive/viable as their weakest leg.

Charging Infrastructure

The transition to battery electric cars will face specific challenges in Blaenau Gwent. As the life-time costs of electric cars are increasingly becoming the same or less than petrol/diesel cars, many Blaenau Gwent residents may not be able to benefit from the lower running costs due to the higher purchase costs of electric vehicles. In addition, in the future the decreasing number of non-electric vehicles may impact the availability and price of petrol/diesel for those who have not yet been able to switch. Lower running costs are dependent on being able to access the cheapest form of electricity, which is nearly always charging at home. Home charging for residents with on-street parking only, is more challenging and is likely to require new forms of infrastructure and potentially some modification to residential parking policies. There will also need to be a significant increase in public charging points as well as electric, and potentially hydrogen hubs, for public sector and commercial fleets.

Environmental Impact of Electric Battery Vehicles

vs Petrol/Diesel

Electric cars claim to be Net Zero ultimately relies on them being charged with zero carbon electricity. However, electric motors are also far more energy efficient than internal combustion engines (which is why they are so much quieter). Even a (theoretical) electric car charged entirely using electricity produced using coal would have lower carbon emissions per mile than a diesel car.






Car batteries contain lithium and other rare earth metals that require mining, this mining is environmentally damaging but typically not as damaging as oil drilling. Ultimately reducing the number and size of vehicles produced and improving production processes is the best way to minimise these impacts.

vs Hydrogen

Hydrogen does reduce the need for rare metals; however, hydrogen fuel cells are significantly more expensive and less energy efficient than batteries. Hydrogen also adds more weight to cars due to its relatively low energy density, even after significant compression for use in fuel cells. However, hydrogen is likely to play major role in long distance and heavy goods vehicles because it does have significant advantages in terms of refuelling speed and travel range. In addition, at the scale of heavy goods vehicles the relative energy density is reversed due to the large size of the batteries these vehicles require.

Blaenau Gwent Climate Assembly

In March 2021 44 residents of Blaenau Gwent got together online to discuss the question **'how can we tackle climate change in Blaenau Gwent in a way that is fair and improves living standards for everyone?'** The 44 Assembly Members were chosen at random to be representative of people in Blaenau Gwent (in terms of age, gender, where they live, type of housing etc.) The Assembly was organised by the four Registered Social Landlords in Blaenau Gwent (Linc, Melin Homes, Tai Calon and United Welsh) with Cynnal Cymru and funding from Welsh Government. The [Climate Assembly](#) met for a total of 23 hours online, hearing evidence from over 20 experts (from academics to local residents), and voted on recommendations they created themselves, five of which received the 80% support needed to become official recommendations:

Theme	Recommendation	Support %
Integrated Transport 	<p>Establish an affordable, integrated road & rail transport system accessible throughout BG.</p> <p>A one ticket system that links to bus, rail & cycle schemes - inclusivity for purchasing of tickets (digital or paper).</p> <p>Accessible all hours with safety via lighting, CCTV and to keep maintained.</p>	91
Walking and Cycling 	<p>Establish & improve a safe, easily maintainable infrastructure for walkers & cyclist, for either recreational or work purposes, with access to the public transport network. Including lighting & CCTV & Storage for bikes.</p>	88
Housing Retrofit 	<p>Train local tradespeople, create qualifications and upskill local businesses, involve FE colleges and local universities, future proof it and provide the right courses to enable them to do the work in all green construction.</p>	86
Woodlands 	<p>Implement a programme of woodland preservation and reforestation of BG, using the right tree in the right place for the right reason, increasing opportunities for jobs, biodiversity and connecting woodlands. Making sure the skills are available so we can create green jobs, e.g. saw milling and timber framed housing.</p>	86
Housing New Build 	<p>Ensure that all new build properties are built using the latest sustainable technologies (E.g. Glanffrwd development as a template), employing local builders and providing a variety of accommodation types appropriate for all inc. homeless/single occupancy up to large families.</p>	81

These recommendations were endorsed by the council and our partners through the Public Services Board. The recommendations reflect the proposals that Assembly members were able to agree on in the relatively limited time available to them, not necessarily the full range of areas that they felt were important. The Climate Assembly produced a large amount of additional information about Blaenau Gwent residents' views and preferences about climate action from their discussions of potential recommendations. This section summarises some of the key points that emerged from their discussions across all four themes:

1. Energy

- There was strong support for all forms of renewable generation, and particularly for community ownership. Assembly members were interested in the potential for local investment in renewables and wanted to have a better understanding of the potential scale of investment that might be possible locally.
- Support for community buildings to invest in solar panels was seen as an important part of community ownership, particularly as it was felt it would spread understanding of the benefits and generate interest from more people to put renewables on their own home.
- There was very little concern among Assembly members about whether renewable energy was practical or reliable, the large majority were convinced it was. The issues raised were all around the potential cost and fairness for people of adopting these new technologies.
- Assembly members recognised the strong overlap between energy and the housing and transport themes. However, given the constraints on time, the Assembly did not aim to engage with the full complexities of the energy system and how it would need to change.
- Identified need for residents to be provided with information about what they need to do and when to fit in with these wider changes to the energy system. Including, element of locally specific information about what the plan is in Blaenau Gwent, for example, what will be the preferred heating technology for different areas, where will EV charging be available etc.

2 Housing

- Clear that Assembly members looked at new housing development for visual signs about how serious we are about climate action, in particular: (i) evidence of renewables, usually solar panels (this seen as non-negotiable for all new homes); (ii) enhancement of green space (including flood risk); (iii) location of housing including: bringing derelict brownfield sites back into use, not taking up green space and avoiding obvious issues with poor connectivity and transport links.
- There was strong positive interest in zero carbon homes, the use of timber construction and in the potential for modern methods of construction, with provisos about making sure that they actually delivered the potential benefits, but all were seen as plausible and desirable in principle.

- Most concerns were around cost, both to the house buyer and if the council can afford zero carbon development. Developers were seen as preferring to develop only the most profitable housing types, rather than not being able to afford to build a wider range of low carbon homes.
- There was a lot of discussion around wider housing challenges: concern about homelessness and ensuring that suitable housing types are provided for all needs at affordable prices.
- Transparency and availability of information about where and why new developments were taking place, including their environmental impacts, was a consistent theme running through the Assembly, people wanted to be better informed about development decisions.
- Retrofit and heat pumps were seen offering very significant opportunities for local business and job creation. Wanted to see active support to ensure local jobs and businesses benefit from this work.
- There was a lot of discussion about the complexity of how to offer support across all different types of households in a way that ensures fairness between different tenure types and personal circumstances. Agreed that there is not a one size fits all model for financing retrofit.
- Saw the potential for retrofit to address fuel poverty but also significant challenges around upfront costs.
- At the other end of spectrum identified that those who can afford energy bills and have a higher footprint may need to be given incentives to act.
- Assembly members recognised that home retrofit was not something that government could do for them. However, they did see, at minimum, a major information role for local government. Both in terms of having a good understanding of Blaenau Gwent's overall housing stock, so residents can know what the plan for their area is, and in terms of helping residents to understand their own home energy needs and journey.
- Therefore, bringing together trusted, locally specific information in one place was seen as a key need. Wanted one-stop shop for independent information about a lot of new unfamiliar technology and trusted local providers. Also want to see people being proactively engaged to help them see the benefits of retrofit including comfortable and affordable warm homes. Felt this needs presence on the high street as well as on-line.
- Enthusiasm for targeting empty homes for retrofit to bring back into use as examples of what retrofit can achieve.
- Solar panels seen as a no regrets option and a key catalyst to housing transition, many members wanted rapid roll out to all.
- Assembly members also wanted quality of work to be monitored/assured. With significant amounts of money involved, were aware of the potential for conflict of interests and mis-selling of work. Also noted that local suppliers needed to meet quality standards.

3 Nature

- There was a strong level of support for more community involvement in management of woodland and other green spaces. There was a recognition that this could only be achieved with support, both financial and practical, from the council and other organisations. There was also some concern in this context about the risk of this becoming bureaucratic or overly restrictive on what people could do.
- Addressing fly tipping and other forms of environmental crime was a strong theme running through this discussion. There was quite a lot of debate about the correct balance between the need for strong enforcement and for positive engagement and outreach in green spaces to change behaviour. Very few people felt that enforcement alone could solve all the problems.
- Strong feeling that needed to be more opportunities for children, young people and families to enjoy a range of outdoor activities, from formal play areas to accessing nature. Related to this there was strong feeling that engagement with climate in schools should not just be in school grounds but also about getting out into wider natural spaces in the community.
- Promoting civic pride was seen as an important element of this theme as well. Assembly members wanted to see support for opportunities for people to take part in projects to improve the appearance of public spaces from local road verges to train stations.
- There was a high level of awareness of importance of making right decision for nature, promoting native species and that not just about planting as many trees as possible.
- Need for more resources for maintenance both to maximise benefits to environment and accessibility to public. Support for greater on ground presence of rangers to promote both of these elements.
- Walking and cycling routes were seen as important elements of promoting use of natural spaces, number of anecdotal examples given of greater use of green spaces recently due to transport improvements.
- Interest in food growing opportunities, not just allotments, but making use of a range of spaces.
- Felt that important that not all actions concentrated on largest green spaces, strong support for improvements to small local green spaces adjacent to people's homes.
- Some support for actions to promote the most significant Blaenau Gwent green spaces more widely in order to maximise visitors to borough.
- Interest in exploring whether more Blaenau Gwent timber could be used to support climate friendly projects/housing.

4 Transport

- Safety and accessibility were common concerns across all transport options. These concerns often related to start and end of journeys. Strong focus on accessibility for older people, disabled, women and young people.

- Evening and Sunday travel on public transport was a massive issue for many people, not willing to give up car when effectively no way to travel at these times without one.
- High levels of dissatisfaction with current public transport: high cost (particularly train), infrequent and unreliable services which do not link up, safety and accessibility concerns particularly around stations. Single tickets covering all transport forms seen as key part of solution along with better co-ordinated and promoted timetables from single source. One concern around single ticket system was that given that it was very likely to be a digital system that it might prove to be a barrier for older people.
- There was very little opposition to reducing car use in principle, but a lot of uncertainty about how the transition away from cars would happen, i.e. people not going to make the shift until they are confident that there are sufficient alternatives, but how can we support these alternatives without the passenger numbers that come from a mass switch. Significant but not universal feeling that in this context it is not reasonable to use disincentives to discourage car use.
- These concerns led to a lot of the interest in ULEV car clubs and other forms of EV sharing as it was felt these potentially do not require such massive infrastructure change and the level of control they give people will result in more confidence that they will be able to complete their journey reliably. However, these were new ideas for most Assembly members and in the limited time available they were unable to agree on what they felt was a workable scheme that delivered on these potential benefits and overcame concerns about car availability and safety.
- Short local journeys were the one area where Assembly members did feel there was significant potential for many people to reduce their use of cars now, without significant changes to wider transport infrastructure. They also felt this would have potential benefits around congestion and air quality. The school run was a common example of a potential area for action.
- Town planning seen as important element of transport, out of town development and location of services seen as important factors in reliance on cars. Revitalising high street seen as way of reducing car travel.
- Linking public transport to job opportunities seen as key.
- More bike and walking routes were wanted, but also a lot of emphasis placed on the need for them to be well maintained and lit, with good storage facilities when arrive at destination. Cost of bike and equipment was seen as a barrier, although also significantly lower than a car if can be made into a genuine alternative. In this context, electric, cargo and more accessible bikes were seen as significantly expanding the range of people who could use bikes, the purposes they could be used for and counteracting some of the geographic barriers to active travel in Blaenau Gwent. (There was very little interest in bike hire schemes in discussions, with the exception of linking bike hire from public transport hubs into a single ticket system).
- Interest in trialling different solutions for on street EV charging.