Grŵp Cynefin
Mwy na thai • More than housing

CARBON TRUST

Grŵp Cynefin Sustainability Strategy

Decarbonising our organisations, housing and communities 2021-2030

December 2021

Who we are

The Carbon Trust's mission is to accelerate the move to a sustainable, low carbon economy. It is a world leading expert on carbon reduction and clean technology. As a not-for-dividend group, it advises governments and leading companies around the world, reinvesting profits into its low carbon mission.

Established in 2001, the Carbon Trust works with businesses, governments and institutions around the world, helping them contribute to, and benefit from, a more sustainable future through carbon reduction, resource efficiency strategies, and commercialising low carbon businesses, systems and technologies.

The Carbon Trust:

- works with corporates and governments, helping them to align their strategies with climate science and meet the goals of the Paris Agreement;
- provides expert advice and assurance, giving investors and financial institutions the confidence that green finance will have genuinely green outcomes; and
- supports the development of low carbon technologies and solutions, building the foundations for the energy system of the future.

Headquartered in London, the Carbon Trust has a global team of over 200 staff, representing over 30 nationalities, based across five continents.

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Abbreviations

ASHP	Air-Source Heat Pump
BECCS	Bioenergy with Carbon Capture and Storage
BEIS	Department for Business, Energy and Industrial Strategy
CCC	Climate Change Committee
CCS	Carbon Capture and Storage
EPC	Energy Performance Certificate
ESG	Environmental, Social and Corporate Governance
EV	Electric Vehicle
GDPR	General Data Protection Regulation
GGR	Greenhouse Gas Removal
GHG	Greenhouse Gas
GSHP	Ground-Source Heat Pump
ICE	Internal Combustion Engine
IES	Intelligent Energy Systems
KPI	Key Performance Indicator
LED	Light-Emitting Diode
LETI	London Energy Transformation Initiative
MMC	Modern Methods of Construction
PV	Photovoltaic
RSL	Registered Social Landlord
SAP	Standard Assessment Procedure
SBTi	Science-based Target Initiative
ULEV	Ultra Low Emissions Vehicle
WBSCD	World Business Council for Sustainable Development
WDQR	Welsh Development Quality Requirements
WRI	World Resources Institute

Foreword

Shan Lloyd Williams

Chief Executive Officer

Grŵp Cynefin

Climate change is a reality facing Grŵp Cynefin and our communities. We recognise this challenge, and have brought together our Board, staff and tenants to build on our efforts to date and help lead the way in North Wales over the next ten years. Covid-19 has presented a huge challenge over 2020 and 2021, however, just as Grŵp Cynefin responded well to this pandemic, we are looking ahead with optimism and determination to putting sustainability at the core of what we do – whether reducing carbon emissions or helping to build more resilient and sustainable communities.

Reducing our carbon footprint is a key priority for us, as Wales has set a national target for Net-Zero emissions by 2050. Homes are a significant aspect of this, and we recognise we are morally obligated to invest in improvements so we can contribute to the full extent. We will be looking at how to make new developments eco-friendly, as well as seeking retrofit projects to provide our tenants with reduced energy bills in addition to decreasing our carbon footprint. Our approach will put tenants and service-users at its heart, listening to and empowering individuals to help create engaged communities across North Wales. We also recognise that we need to work together to address a challenge of this size, and will collaborate closely with government, local authorities, companies, community groups and other housing associations to make a difference.

Of course, Grŵp Cynefin is not starting from zero. We have already undertaken a number of sustainability and low carbon initiatives over recent years, and this work provides us with a strong foundation for our strategy. This includes the new Passivhaus dwellings in Dwyran and Penrhyn, the ground-source heat pump (GSHP) in Eithinog, and the air-source heat pump (ASHP) and insulation in Trevor, as well as the Saving and Energy Wardens programmes.

We are proud to announce this strategy, which sets out ambitious steps needed to put Grŵp Cynefin on track to become a Net-Zero carbon organisation by 2044. With almost 4,000 homes currently, clearly this is a very challenging target that will be highly dependent on collaboration, the availability of funding, technological solutions and close tenant and service-user support, ensuring any impacts are carefully identified and managed or avoided. However, despite these challenges, we remain fully committed to providing the leadership our communities deserve, and continuing to deliver more than housing.

Executive Summary

The Net-Zero Challenge

The Climate Emergency presents a multifaceted problem for Grŵp Cynefin. A rapid transition to a net-zero economy is needed, whilst those least able to pay must be shielded from energy price increases and not left behind. However, with policy announcements at both the Wales and UK-level, and a groundswell of public sector net-zero commitments and corporate Science-based Targets (SBTs), there appears to be growing will, momentum and resources to achieve progress.

Grŵp Cynefin has a carbon footprint of 9,596 tCO_2e (FY2019-20), and we have set an ambition to reduce emissions by 4% year-on-year. This will reduce our current footprint (scope 1 and 2) to net-zero in 2044. The bulk of Grŵp Cynefin's emissions (92%) sit with our housing stock, which is a challenging area to decarbonise. Within this, 71% of emissions are from burning natural gas, making the crux of our challenge how to move away from natural gas for heating our homes.

Our subsidiaries, Canllaw and Gofal a Thrwsio, face a very different challenge. Their carbon footprints (also FY2019-20) are 29.5 tCO_2e and 21.8 tCO_2e respectively. Neither organisation lease housing, but rather provide housing services, and as such, their dominant emissions area is fleet (particularly vans), representing 59% and 63% respectively.

The intermediary targets for Grŵp Cynefin to meet, shown in Figure 1, are a 24% reduction in 2025, and a 44% reduction in 2030. It is recognised that achieving this is dependent on Government funding.

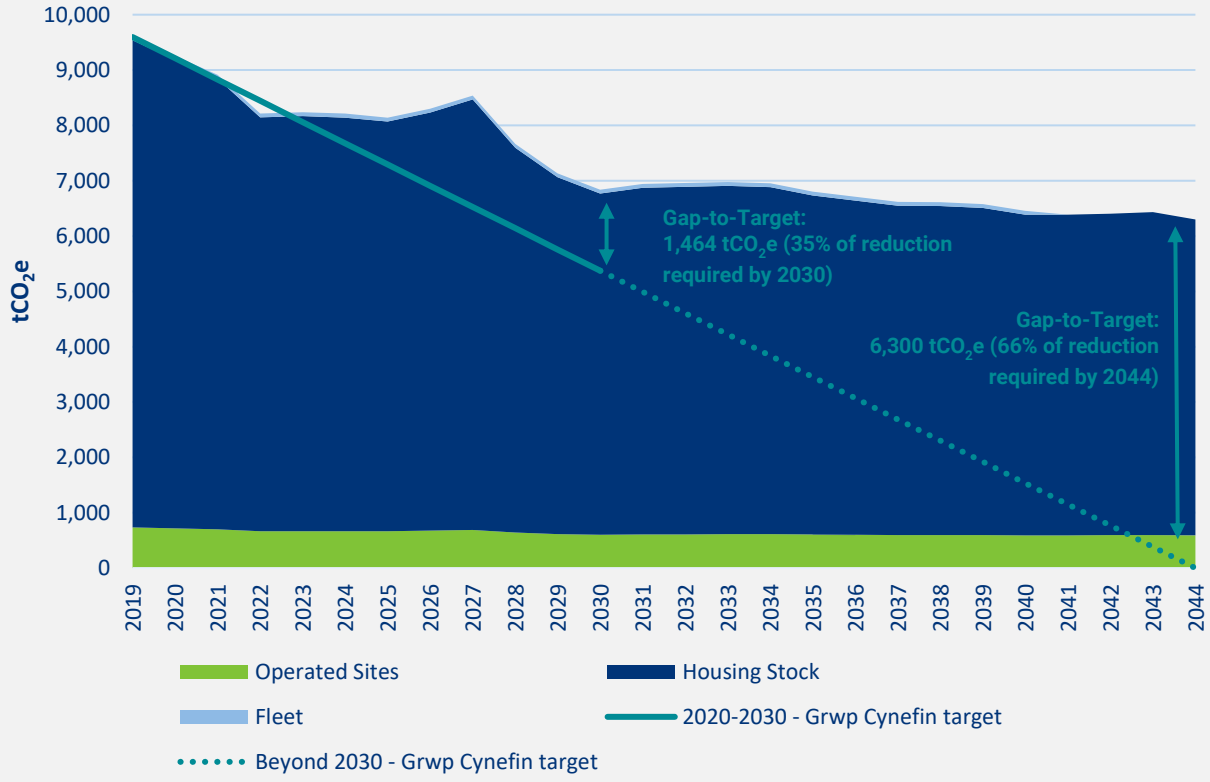


Figure 1. Grŵp Cynefin's target compared against business-as-usual reference scenario

Our Sustainability Strategy

Vision

Grŵp Cynefin recognise that we have a role to play. We will:

- Provide quality and affordable, green homes and services.
- Go beyond housing and contribute to the development of economically and environmentally sustainable communities.
- Provide community-centred sustainability leadership for North Wales.

Priorities

- Create long-term economic benefit for communities.
- Create partnership opportunities.
- Take a bold, proactive approach to communication.
- Set out a housing stock plan.

Key Actions

Operated Sites:

- ❑ Update our Asset Management Plan and develop a phased Retrofit Plan.
- ❑ Roll-out LED lighting and smart meters.
- ❑ Tackle 'low-hanging fruit' thermal fabric measures.
- ❑ On-site renewables.
- ❑ Joined-up controls system.
- ❑ Explore merging Grŵp Cynefin and subsidiary offices.
- ❑ Joint procurement with other RSLs.
- ❑ Work with Wildlife Trust.

Fleet:

- ❑ Vehicle usage data.
- ❑ EV and chargepoints partnership.
- ❑ Travel expenses policy update.
- ❑ EV pool car trial.
- ❑ Staff EV leasing scheme.
- ❑ Identify EV van solutions.

Housing Stock:

- ❑ Update Asset Management Plan and develop phased Retrofit Plan.
- ❑ Heat pump delivery plan.
- ❑ Review gas boiler replacement policy.
- ❑ Low- or zero-carbon new-builds.
- ❑ 'Low-hanging fruit' thermal fabric measures.
- ❑ Pilot whole house retrofit.
- ❑ Develop Energy Wardens programme.
- ❑ Customer-facing staff capacity building.

Monitoring and reporting progress

Framework:

- ❑ Share draft KPIs with sector stakeholders.
- ❑ Board KPI reporting template
- ❑ Set near-term goals.
- ❑ Footprint lead.
- ❑ Sustainability metrics in Annual Report.
- ❑ Publically report ESG metrics.

Progress Reporting:

- ❑ Structured progress review format.
- ❑ Establish tenant, staff and Board monitoring group.
- ❑ Input actions into corporate risk management software.

Data Management:

- ❑ Codify data management environment around strategy in flow chart.

Risk Management:

- ❑ Incorporate physical, transition and strategy risks into existing risk assessment process and risk register.

Governance and engagement

Strategy Governance:

- ❑ Recurring Board agenda item.
- ❑ Board Champion.
- ❑ Board sign-off.
- ❑ Recurring Leadership Team agenda item.
- ❑ Sprint Groups.
- ❑ Sustainability Manager.

Internal Alignment:

- ❑ Sustainability review of internal policies.
- ❑ Review of Environmental Statements.
- ❑ Include CO_2 targets in Business Plan and Annual Report.
- ❑ New Board report template and guidance.
- ❑ Business cases to include CO_2 reduction.
- ❑ Procurement guidelines.

Engagement and Collaboration:

- ❑ Sustainability comms plan.
- ❑ 'Sustainability Week' launch.
- ❑ Annual progress graphic.
- ❑ Tenant Newsletter.
- ❑ Review Tenant Engagement Strategy, explore Tenant Hub.
- ❑ Internal knowledge sharing sessions.
- ❑ Reach out to local colleges and suppliers.

The Net-Zero Challenge

Introduction

Growing acknowledgement of the latest science and recommendations from the Climate Change Committee (CCC) has resulted in unprecedented recognition of the global climate emergency, and the need to act urgently to reduce carbon emissions and limit further global warming and associated environmental impacts.

Global initiatives are now focused on limiting warming to well below 2°C, aligning to the pledges outlined in the Paris Agreement. Despite this, warming continues, with the impacts being felt both nationally and internationally.

The Welsh Government declared a climate emergency in 2019 and has a legislated target for net-zero by 2050 with a complementary target that aims to achieve net-zero in the public sector by 2030.

All businesses and organisations must play their part to drive the transition towards a more sustainable, low-carbon economy. As a Registered Social Landlords (RSL), Grŵp Cynefin is in a unique position to influence this transition; bringing together residents and communities, suppliers, staff and key leaders in the North Wales region.

Housing makes up 8% of emissions in Wales, and with one-third of homes were built before 1919, decarbonisation presents a challenge.[2] Nevertheless, decarbonising homes is key to meeting Wales' targets, and it offers a stream of co- benefits which could contribute to Wales' social, economic, environmental and cultural well-being, including:

- Helping to alleviate fuel poverty;
- Relieving the strain on health and social services, particularly in winter; and
- Creating new industries, with associated skills development and jobs.

The focus of this strategy is addressing carbon emissions, however it is recognised that the climate and bio-diversity crisis' are intersecting, and broader efforts will be required across material use, land use and waste. With this Strategy we seek to lay a foundation for success in the coming years, and make our contribution to prosperous, healthy, sustainable communities, which safeguard the needs of future generations.

[2] National Assemnly for Wales (2018), *Low Carbon Housing: the Challenge.*

Policy Context

National

In 2021, Wales set a target of reaching net-zero emissions by 2050. While production emissions in Wales have decreased significantly since 1990, there is still a long way to go to achieve this goal. As part of the net-zero strategy, the Welsh Government have enacted the **Environment (Wales) Act 2016**[3] and the **Well-being of Future Generations (Wales) Act**[4]**.**

The Environment (Wales) Act 2016 places a legal duty on Wales to reduce its emissions. It aims to address the challenge of protecting ecosystems while creating sustainable jobs, housing, and infrastructure. This has now been folded into the Climate Change Regulations 2021 (see Figure 3).

The Well-being of Future Generations (Wales) Act sets in law a requirement that any decisions made by Welsh public bodies must consider the impacts on the well-being of future generations based on 7 key goals. The goals are intended to create sustainable development in Wales and encourage public bodies to take a long-term approach to decision-making.

Figure 2. Well-being goals and sustainable development principles

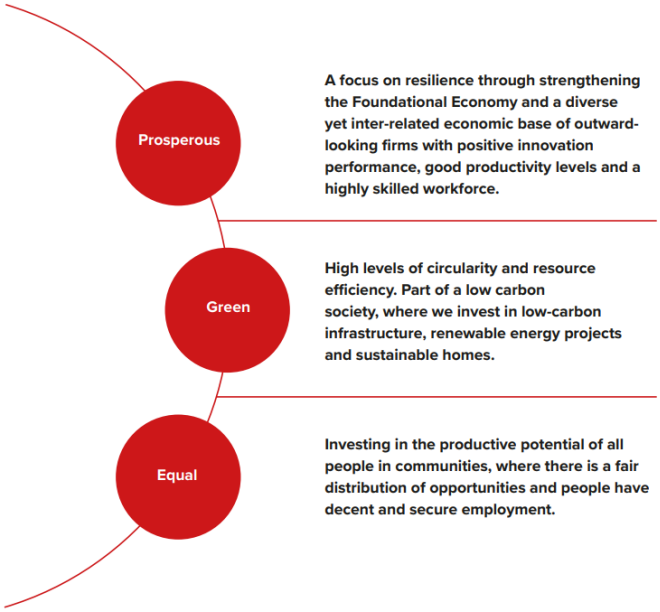


Figure 3. Three outcomes of the Economic Resilience and Reconstruction Mission

Wales recognises that the actions taken in the transition to a low carbon economy must not only improve the health of the environment but also respect societal and economic well-being.

COVID-19 has drastically changed the economic and social context in Wales, the UK and the world. This will, in turn, affect how the net-zero transition is planned. Drawing on the principles set out in the Well-being of Future Generations Act, the Welsh Government have produced the **Economic Resilience and Reconstruction Mission**[5] which outlines the pathway to recovery following the pandemic. The mission sets

[3] Welsh Government, *Environment (Wales) Act 2016.*
[4] Welsh Government, *Well-being of Future Generations (Wales) Act 2015.*
[5] Welsh Government (2021), *Economic resilience and reconstruction mission*.

three targets: 'prosperous', 'green', and 'equal' as outlined in the illustration. It aims to create a just, green recovery – addressing the socio-economic impacts of the pandemic while simultaneously tackling the net-zero challenge[6].

The UK **Net-Zero Strategy: Build Back Greener**[7] was published in October 2021 and sets out the policies and proposals required for decarbonising the UK economy in line with the UK carbon budgets, the 2030 Nationally Determined Contribution, and 2050 net-zero target. One such proposal is additional funding of £1.75 billion for the Social Housing Decarbonisation Scheme.

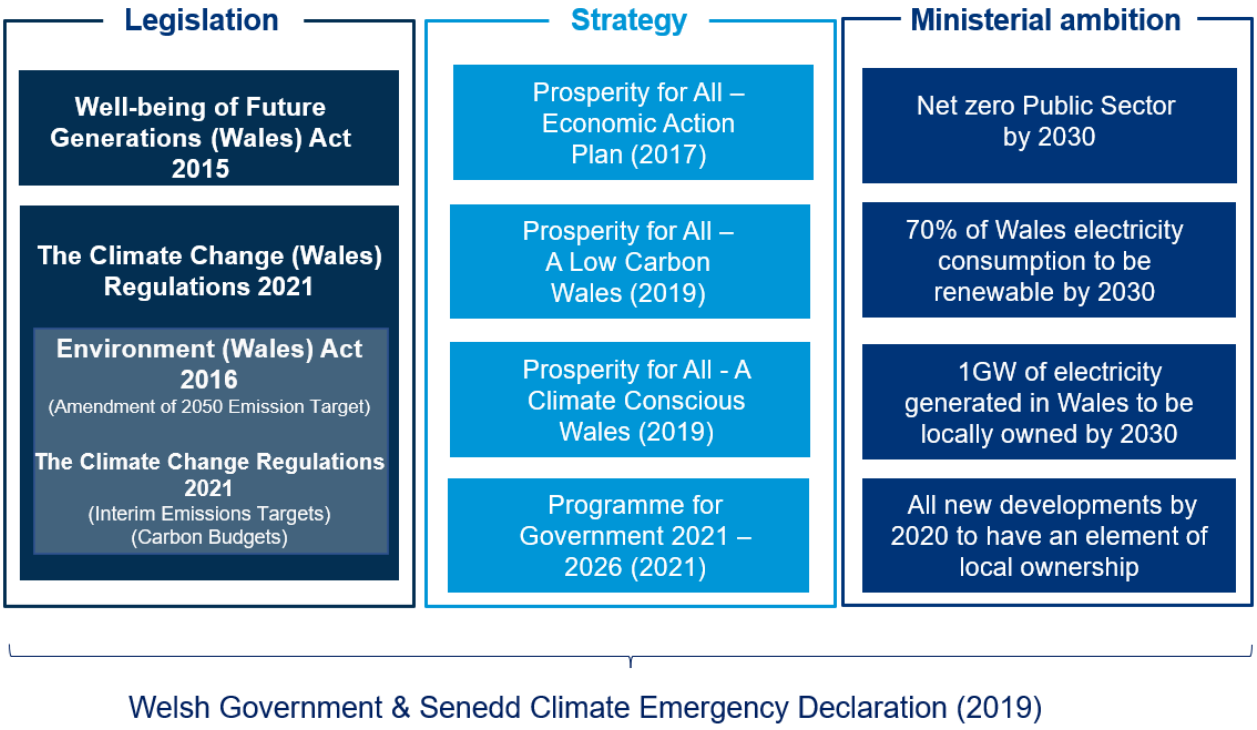


Figure 4. Policy and strategy overview of Welsh decarbonisation

Sectoral

In addition to the 2050 net-zero target, Wales has also committed to meeting **net-zero in the public sector** 20 years earlier, **by 2030**. The policy in place to achieve this includes the **Welsh Development Quality Requirements 2021**[8] and the forthcoming **Welsh Housing Quality Standards 2.0.**

Similarly, the **Welsh Development Quality Requirements 2021** (WDQR 2021) sets out requirements for homes to be "high quality, innovative and sustainable". For example, all homes must demonstrate value for money, meet EPC A through minimum fabric standards and non-fossil fuel heat sources, and use Modern

[6] Welsh Government (2021), *Net Zero Wales Carbon Budget 2 (2021 to 2025).*
[7] UK Government (2021), *Net Zero Strategy: Build Back Greener.*
[8] Welsh Government (2021), *Development quality requirements for housing associations and local authorities.*

Methods of Construction (MMC). The WDQR 2021 also considers social factors such as health and safety as well as the changing needs of households over time.

The **Welsh Housing Quality Standards**[9] (WHQS) was originally implemented in 2002 and revised in 2008 and 2016. It sets a minimum standard for social housing in Wales, including being in a good state of repair, adequately heated, and safe and secure. Following an implementation review in 2021[10], the Welsh Government have recommended that the WHQS programme delivers a **clear decarbonisation pathway** by considering how decarbonisation measures should be implemented in existing homes to align with national net-zero commitments. This would ensure that all housing is adequately heated at an affordable cost and would improve data collection and monitoring within the industry. The goal would be to achieve net-zero emissions across social housing stock by 2033 while addressing fuel poverty.

The UK **Heat and Buildings Strategy**[11] was published in October 2021 and seeks to provide a pathway to high-efficiency low-carbon buildings. The document highlights a number of core principles, including: taking a whole-building approach to retrofit and accelerating no- and low-regret actions in the near term. To support this, the Boiler Upgrade Scheme will launch in April 2022 to support homes in England and Wales cover the additional expense of an air source heat pump (up to £5,000).

Carbon Footprint 2019/2020

The Carbon Trust were contracted by Grŵp Cynefin to calculate a carbon footprint of its activities. This included direct and indirect emissions sources from scopes 1 and 2, including Grŵp Cynefin's housing stock. Grŵp Cynefin selected FY 2019/20 as a benchmark year against which to compare its future carbon consumption. The carbon footprint is an integral part in developing a wider sustainability strategy for the organisation. It is key to understanding the scale of the challenge and focusing efforts where the organisation can have the greatest impact. Further details on the methodology, exclusions and breakdown of the footprint can be found in the *Carbon Footprint Report*.

Key Findings

- **Grŵp Cynefin's scope 1 and 2 emissions for the financial year 2019/20 were 9,596 tCO2e.**
- **92% of Grŵp Cynefin's total emissions arose from energy consumption in its housing stock (3,695 properties).**
- **The top five emitting sites operated by Grŵp Cynefin constitute 76% of all heating fuel emissions and 64% of all electricity emissions from operated sites.**

[9] Welsh Government (2008), *The Welsh Housing Quality Standard.*
[10] Welsh Government (2021), *Summative evaluation of the Welsh Housing Quality Standard.*
[11] UK Government (2021), Heat and buildings strategy.

Methodology

The footprint was prepared in line with the internationally recognised **GHG Protocol** developed by the WRI and WBSCD.[12] Activity data was multiplied by the appropriate conversion factor to calculate the emissions for each source. Conversion factors released by BEIS[13] on an annual basis were applied.

Boundary and Scope

The organisational boundary agreed for the carbon footprint follows an operational control approach. This means that all entities or operations where Grŵp Cynefin has operational control, are included in the carbon footprint. For Grŵp Cynefin, this included operated properties, fleet vehicles, and housing stock, as well as its two subsidiaries, Canllaw and Gofal a Thrwsio.

Once the organisational boundary had been decided, emissions sources within that boundary are identified and assessed against a set of criteria outlined in the GHG Protocol. As a minimum, the GHG Protocol states that scope 1 and 2 emissions sources should be reported.

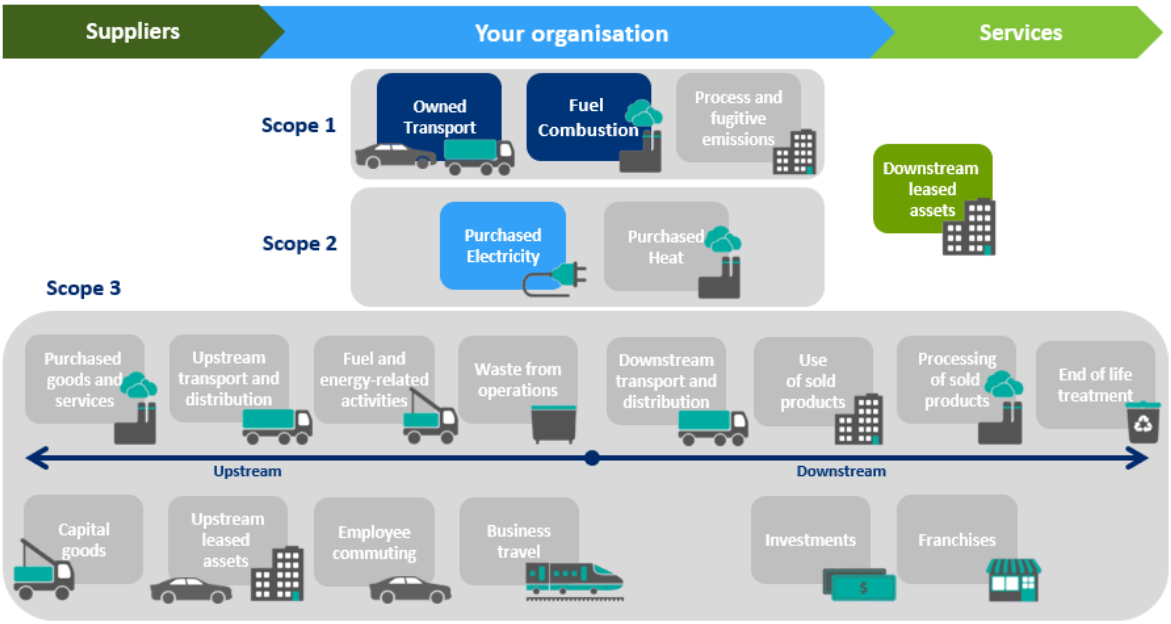


Figure 5. GHG Protocol definition of scopes

Grŵp Cynefin chose to only report scope 1 and 2 emissions sources in this first iteration of our carbon footprint. This is due to potential challenges in gathering the required data. However, scope 3 emissions sources will considered in future reporting.

[12] GHG Protocol (2015), *Corporate Accounting and Reporting Standard.*
[13] BEIS (2019), *Greenhouse gas reporting: conversion factors 2019*.

Grŵp Cynefin Analysis

The carbon footprint was calculated by multiplying annualised activity data for each emissions source by an appropriate emissions factor taken from **BEIS GHG Conversion Factors 2019**[14]. There are three main areas of the carbon footprint – operated sites, housing stock, and fleet.

Carbon Footprint Breakdown

Grŵp Cynefin's total emissions for the 2019/20 reporting period were **9,596 tCO_2e.**

Grŵp Cynefin's housing stock was responsible for **8,804 tCO_2e,** which made up **92%** of the total carbon footprint.

Emissions from natural gas consumption were **5,470 tCO_2e** and made up **57%** of Grŵp Cynefin's carbon footprint.

The top emitting activities were:

- **1. Emissions from heating fuel used in housing stock (52%)**
- **2. Emissions from electricity used in housing stock (40%)**

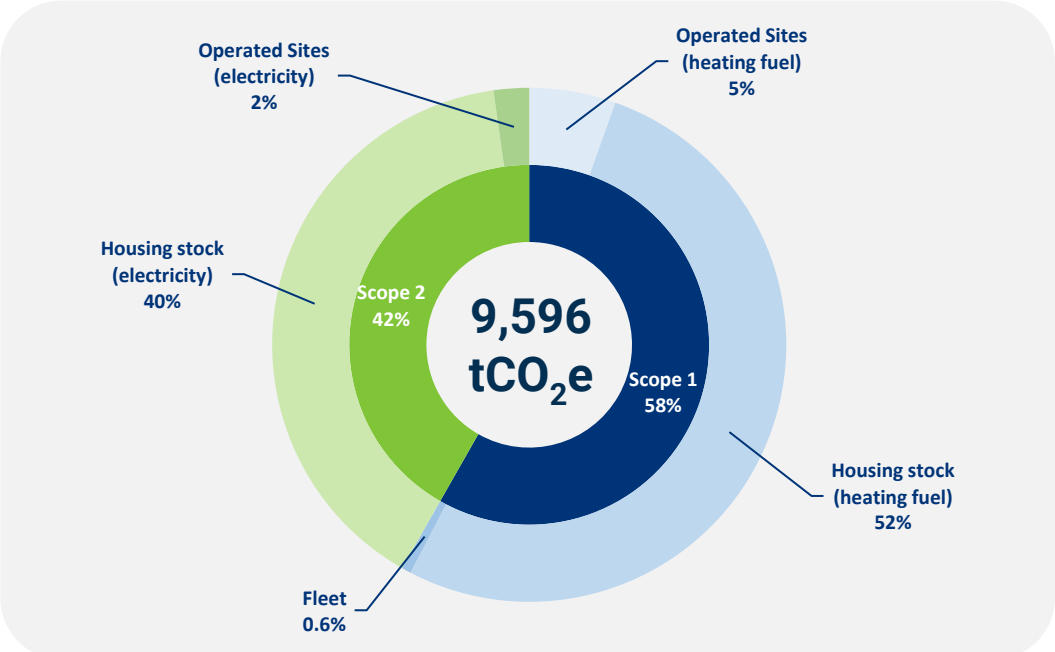


Figure 7. Grŵp Cynefin emissions by scope and source FY19-20

[14] BEIS (2019), *Greenhouse gas reporting: conversion factors 2019*.

Operated Sites

Sites directly operated by Grŵp Cynefin include buildings associated with the Extra Care Scheme, communal buildings, offices, supported housing, refuges and flats. The number of sites was determined by the number of meter points. Therefore, there were 320 sites where heating fuel consumption data was collected, and 289 sites where electricity consumption data was collected. The meter data provided also accounts for the impact of any on-site renewables.

Figure 8. Grŵp Cynefin operated site emissions by scope FY19-20

Of the operated sites, the Extra Care Scheme is responsible for the most emissions, and this is dominated by natural gas consumption. By contrast, electricity emissions are relatively evenly spread across the three highest emitting building types. However, the top 5 emitting sites operated by Grŵp Cynefin constitute 76% of all heating fuel emissions and 64% of all electricity emissions from operated sites, meaning that efficiency opportunities are well concentrated.

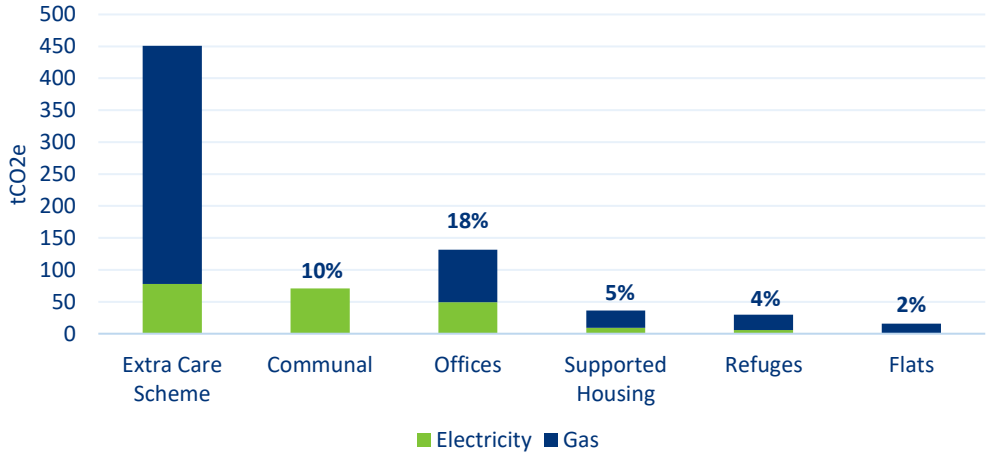


Figure 9. Grŵp Cynefin operated site emissions by building type and fuel FY19-20

Housing Stock

The housing stock are assets wholly owned by Grŵp Cynefin and leased to tenants. Grŵp Cynefin's housing stock is made up of 3,991 properties, most of which are billed independently to the tenants by their chosen energy supplier. 3,695 properties have been included in this category as 296 sites (Extra Care Scheme and Supported Housing) are on heating paid for by Grŵp Cynefin directly, and so have direct metered data available as operated sites.

Due to the complexity of accessing this billing data, electricity and gas consumption, energy consumption was estimated based on published benchmarks for UK social housing per unit floor area, by Energy Performance Certificate (EPC) rating and dwelling type.[15]

Energy use across the 3,695 properties contributed 92% (8,804 tCO_2e) to the total footprint. Most properties in the housing stock (74%) use natural gas, which corresponded to 72% of the heating emissions from housing stock. Meanwhile, 21% of properties use electric heating, and only 5% of properties use other heating fuels.

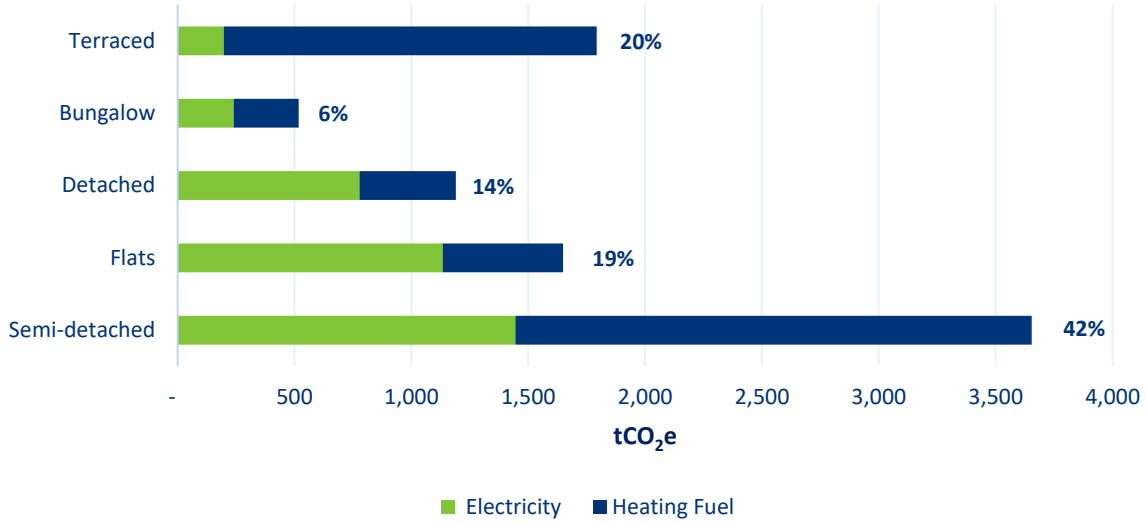


Figure 10. Grŵp Cynefin housing stock emissions by dwelling type FY19-20

When broken down by property type, semi-detached properties proved to be the highest emitting category, contributing 42% to total housing stock emissions. This is in part because they are the most common type of property in the housing stock (34%). In contrast, despite constituting only 3% of Grŵp Cynefin's housing stock, detached properties emit 14% of total housing stock emissions. Terraced properties are the second highest emitting, contributing 20% to the emissions from housing stock. Emissions from these properties are heavily dominated by heating fuel use, more so than any other type of property.

Table 1. Grŵp Cynefin dwelling type breakdown

Dwelling type	*Number of units*	*Annual emissions per dwelling (tCO_2e)*
Detached	109	5.6
Flat	950	1.4
Semi-detached	1,266	2.9
Terrace	1,112	2.5
Bungalow	258	2.0

[15] BEIS (2015), *Domestic energy consumption by energy efficiency and environmental impact*.

Does a higher EPC rating mean lower emissions?

When considering EPC ratings as an indicator for decarbonising homes, it is important to understand how the EPC rating is defined, and what it can be influenced by. Some key considerations are:

1. EPC ratings are assessed based on notional building models, and are not based on operational performance. Research shows that there is a significant gap between theoretical and operational energy consumption.
2. The EPC rating is a cost-based index; final value is linked to energy costs. Natural gas is currently much cheaper than electricity, so a dwelling that uses electricity in preference to gas will be penalised. However, a preference for electricity over gas will result in a decrease in the Environmental impact rating which is another rating produced through the EPC assessment and reported on certificates
3. The EPC rating includes the offsetting effect of any PV panels, so you can achieve a very high EPC rating with an average fabric performance by adding a modest amount of PV generation.

The general recommendations are to apply a fabric-first approach to building improvements, which will have a much more long-lasting effect, and will be independent of energy sources whose emissions intensities are continuously changing.

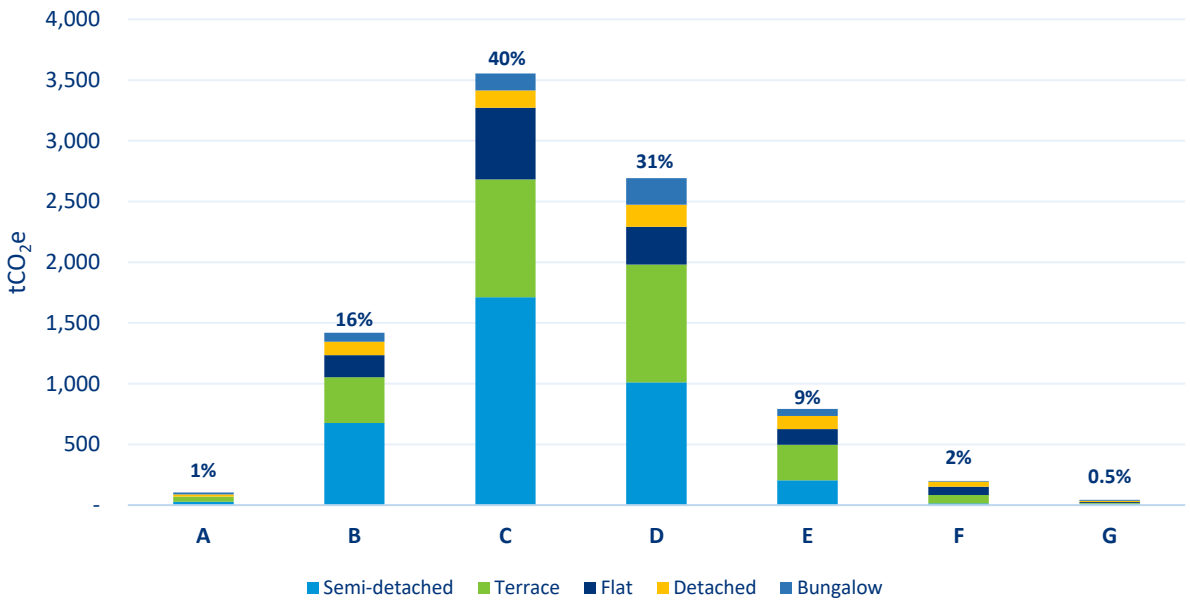


Figure 11. Grŵp Cynefin housing stock emissions by EPC band and dwelling type FY19-20

The graph above shows the total emissions estimated for the housing stock, broken down EPC rating (including estimates). By reviewing emissions from the housing stock by EPC rating, it can be seen that 40% of emissions arise from properties rated EPC C, and 42% are from properties rated D and below. While the emissions associated with an EPC rating to correlate with the number of properties in that category, it should be noted that the emissions associated with lower EPC-rated properties are higher than those with a higher EPC rating.

Electricity vs. Natural gas emissions factors

Emissions from the consumption of natural gas in operated sites and housing stock makes up 57% of Grŵp Cynefin's carbon footprint. In 2019, the emission factor for natural gas was lower than for grid-supplied electricity. However, as investment in renewable power generation ratchets over the next few years, the electricity emissions factor will decrease significantly.

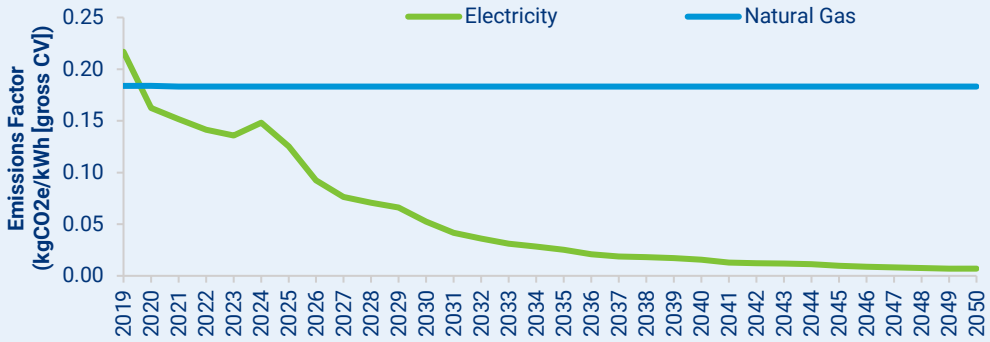


Figure 12. Forecasted electricity and natural gas emissions factors (BEIS)

Fleet

Grŵp Cynefin has 13 either owned or leased vehicles, which travelled a total of 156,204 miles in the FY19/20 – equivalent to approximately 521 return trips from Cardiff to London.[16] This fleet is comprised of seven vans, three medium sized cars, and three small cars. Emissions from the fleet contributed to 1% of Grŵp Cynefin's total footprint (57 tCO_2e). Vehicles owned by employees and used for business purposes are not included in this category. All of Grŵp Cynefin's vehicles currently run on diesel, which is approximately 17 more emissions-intensive per unit of energy consumed compared to an electric vehicle.

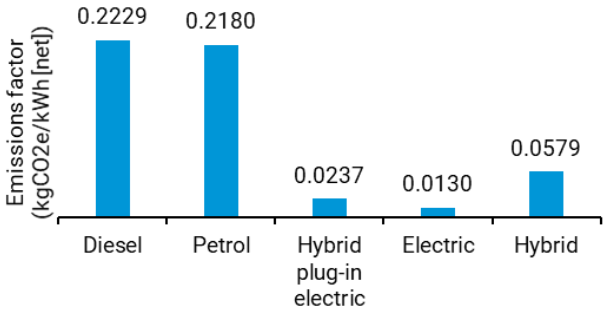


Figure 15. Emissions factors of vehicle types

The data used to estimate the fleet's footprint were the total distance in miles travelled by the fleet, and the types of vehicles. To calculate the footprint more accurately, in future Grŵp Cynefin could provide actual fuel consumption in litres.

[16] Based on a Cardiff to London return trip distance of approximately 300 miles.

Subsidiaries Analysis

Canllaw

In the 12-month period FY19/20, **29.5 tCO_2e** were emitted from Canllaw's own operations and associated activities under scope 1 and 2.

Scope 1 emissions contributed **92%** of the total footprint, the majority of which was attributed to emissions associated with the fleet (59%), which is constituted of 4 diesel vehicles

Scope 2 emissions contributed **8%** and are entirely attributed to electricity. Electricity and gas emissions are constituted of one site – 8/9 Llys y Fedwen, Parc Menai, Bangor.

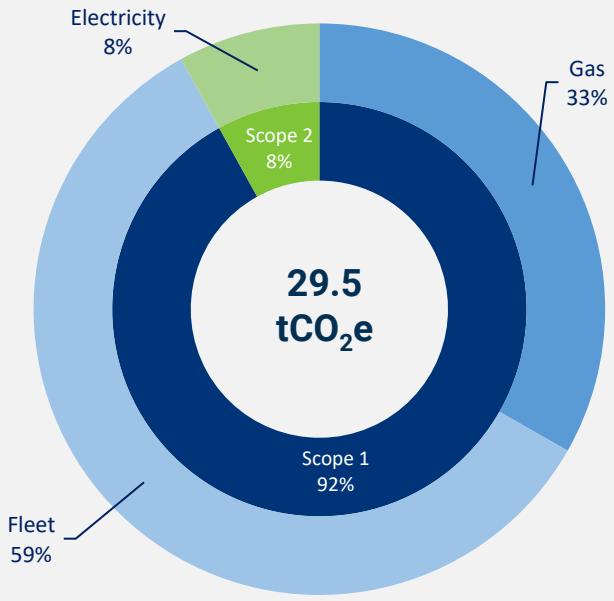


Figure 16. Canllaw emissions by scope and source FY19-20

Gofal a Thrwsio

In the 12-month period FY 2019-2020, **21.8 tCO_2e** were emitted from Gofal's own operations and associated activities under scope 1 and 2.

Scope 1 emissions as captured in this report contributed **71%** of the total footprint, the majority of which was attributed to emissions associated with the fleet (63%), which is constituted of 8 diesel vehicles.

Scope 2 emissions contributed **29%** and is entirely attributed to electricity. Electricity and gas emissions are constituted of one site – Care & Repair Offices.

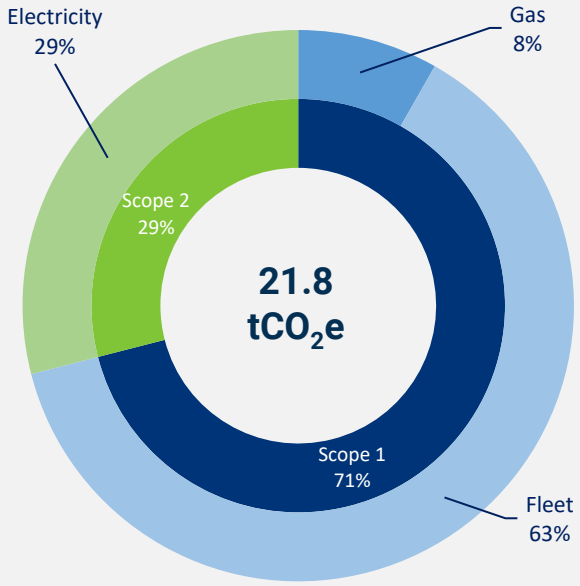


Figure 18. Gofal a Thrwsio emissions by scope and source FY19-20

Recommendations for Future Reporting

Table 2. Recommendations for future reporting

 **Prioritise collecting actual activity data for key emissions sources**	To further improve the accuracy of the estimates around the energy consumption in the housing stock, primary energy consumption data for indicative properties should be sought to validate the assumptions made for FY2019-20, and asset information such as floor area, boiler age and boiler condition should be collated for all properties (along with Energy Performance Certificate data). Surveys can be used to collect more accurate information around customer behaviour (e.g. Energy consumption) and assets (e.g. Floor area, condition).
 **Set up data management process**	Set up clear data management process (including data owners) to speed-up future data collection. Also aim to roll out smart metering that can automate the collection of real consumption data, providing a significantly more accurate picture than EPCs. (See action: M-8)
 **Complete a Scope 3 screening exercise**	Scope 3 emissions include all other indirect emissions that occur in Grŵp Cynefin's value chain. Grŵp Cynefin should complete a full scope 3 screening exercise to ensure the carbon footprint is comprehensive, including all relevant and material emissions sources, and reflecting the greatest emissions reduction opportunities. This could include emissions sources such as those from purchased goods and services (often the most significant), waste generation, water production, employee commuting and business travel. The screening will identify the scope 3 hotspots which can be focused on in more detail through direct engagement with suppliers. Engagement can be in the form of improving data quality, as well as encourage behaviour change.

Target Setting

- **If Grŵp Cynefin follows its target of a 4% emissions reduction per annum, it can reach net-zero by 2044.**
- **This target is almost in-line with the Science-based Target Initiative's (SBTi) emissions reduction pathway which keeps global warming within 1.5°C above pre-industrial levels – however, it is important to note the Grŵp Cynefin footprint does not include scope 3.**

Aligning with the Science

The IPCC's 2018 report asserts that to avoid the most catastrophic impacts of climate change, CO_2 emissions must be halved by 2030 and reach net-zero by 2050. In light of this, an increasing numb er of organisations are illustrating their commitment to net-zero targets. With momentum building behind this level of ambition, the Science-based Targets Initiative (SBTi) has produced a Net-Zero Standard that will help provide consistency and credibility to the commitments that are emerging.

"Reducing scope 1, 2, and 3 emissions to zero or to a residual level that is consistent with reaching net-zero emissions at the global or sector level in eligible 1.5°C-aligned pathways, and neutralizing any residual emissions at the net-zero target year and any GHG emissions released into the atmosphere thereafter."

Targets define a clear end-goal to work towards, and provide a way of tracking and recognising positive progress. Setting an ambitious science-based target demonstrates a recognition of the latest climate science and fosters a more innovative, transformational culture within the business.

Grŵp Cynefin has considered a target of reducing their emissions by 4% per annum (384 tCO_2e). For comparison, the SBTi 1.5°C pathway (based on an annual reduction of 4.2%) has also been shown. By the end of this Strategy in 2030, successful delivery of this target will have resulted in a 44% reduction in Grŵp Cynefin's footprint.

	2019	2021	2025	2030
Emissions (tCO_2e)	9,596	8,828	7,293	5,374
% reduction			24%	44%

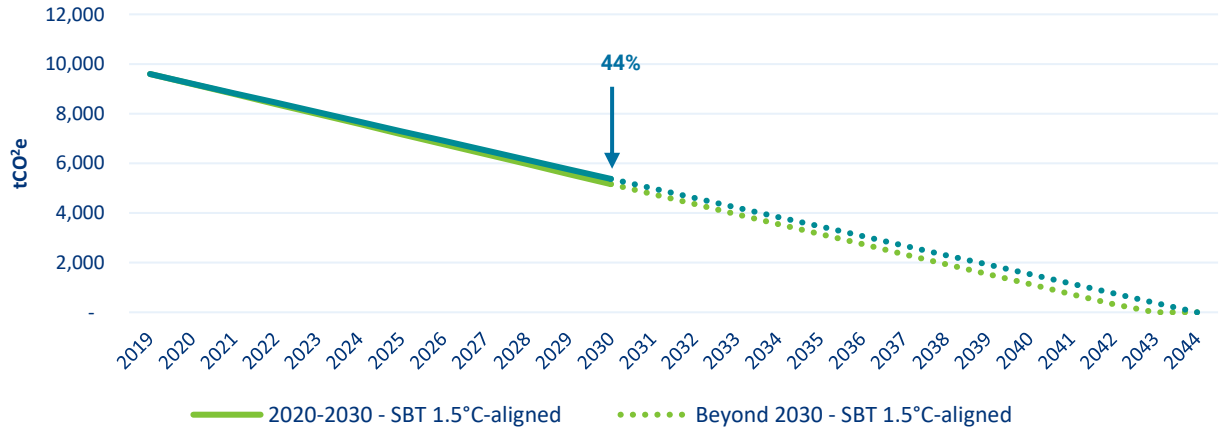


Figure 19. Grŵp Cynefin's committed target compared against SBTi-aligned target

Comparing against Business-as-Usual

- **Under a business-as-usual scenario, emissions will decrease by 29% by 2030 due to electricity grid decarbonisation. However, this will still leave a gap-to-target of 1,464 tCO_2e.**

Before assessing the potential impact of actions Grŵp Cynefin can take, it is important to set a reference point of how the organisation's emissions will change over time where little or no proactive actions are taken – this is a business-as-usual scenario.

Two assumptions were used to drive this high-level view: (See Appendix A)

- **Grid decarbonisation:** The UK electricity grid will continue to decarbonise in line with the National Grid's Future Energy Scenario 2021 – Steady Progress projections.
- **New build construction:** Grŵp Cynefin will construct 120 new units per annum (this is a conservative assumption, as current construction is below this target rate).

The extent of projected decarbonisation of the electricity grid is such that emissions associated with Grŵp Cynefin's electricity consumption will more than half. However, there will be no corresponding decrease in the emissions intensity of natural gas, which is the primary heating fuel.

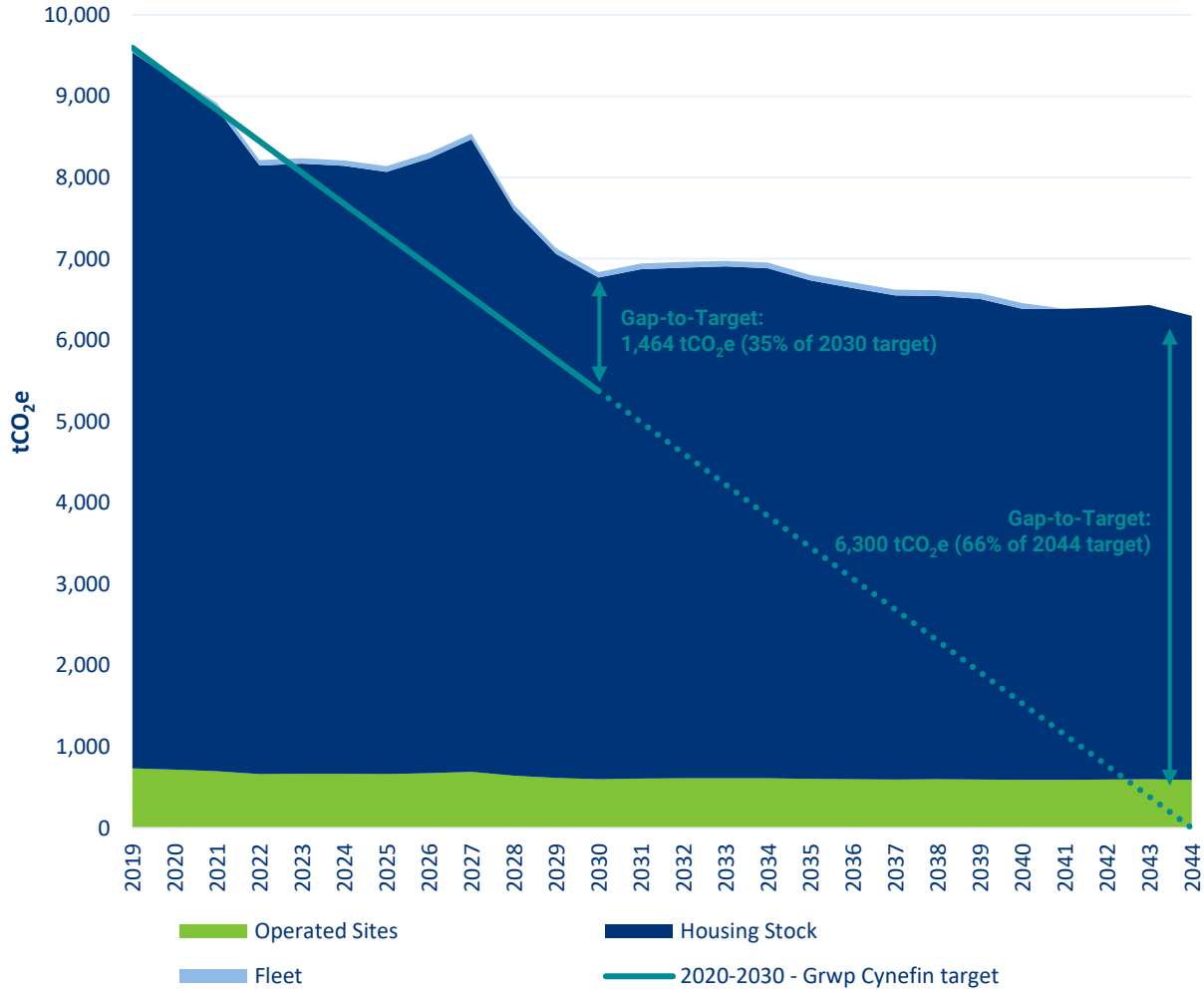


Figure 20. Grŵp Cynefin's target compared against business-as-usual reference scenario

Based on the above graph, grid decarbonisation appears to contribute strongly to achieving Grŵp Cynefin's target, at least pre-2030. However, looking at this same emissions gap-to-target comparison cumulatively, the scale of the challenge, and importance of near-term action, is put in perspective. Insufficient action pre-2030 to lay a strong foundation for decarbonisation, enabling the 'flattening of the curve' post-2030, will result in significant emissions above the Grŵp Cynefin carbon budget (which is based on a 4% annual reduction).

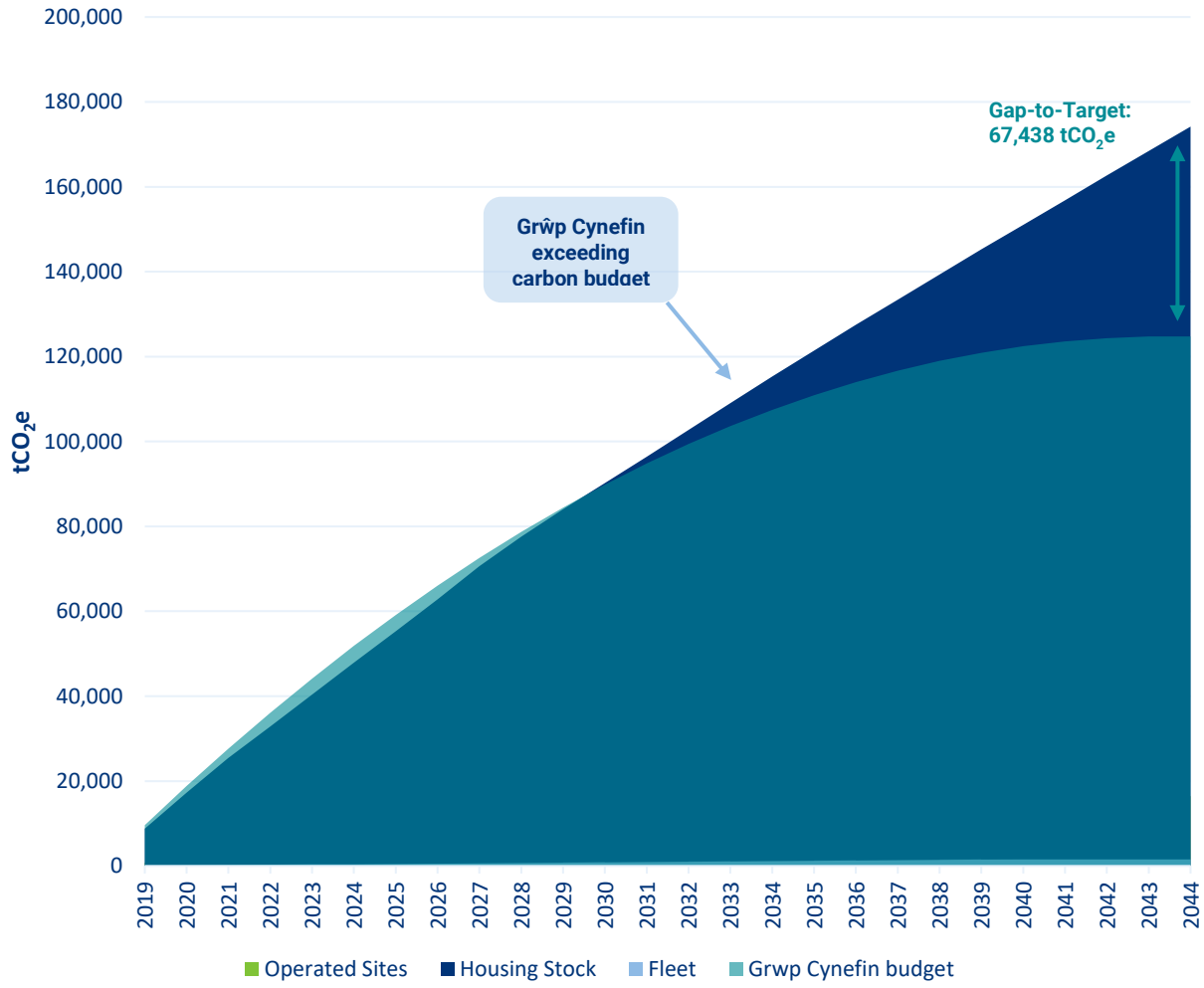


Figure 21. Cumulative business-as-usual emissions compared against the carbon budget allowed under Grŵp Cynefin's target

Our Sustainability Strategy

Strategy Framework

The overarching framework of the sustainability strategy is constituted of the vision, values and priorities. These elements govern the overarching direction of the strategy, cutting across the key actions which sit within it. This particularly relates to determining how the opportunities identified through the carbon footprint and business-as-usual analyses as well as the working group discussions should be progressed.

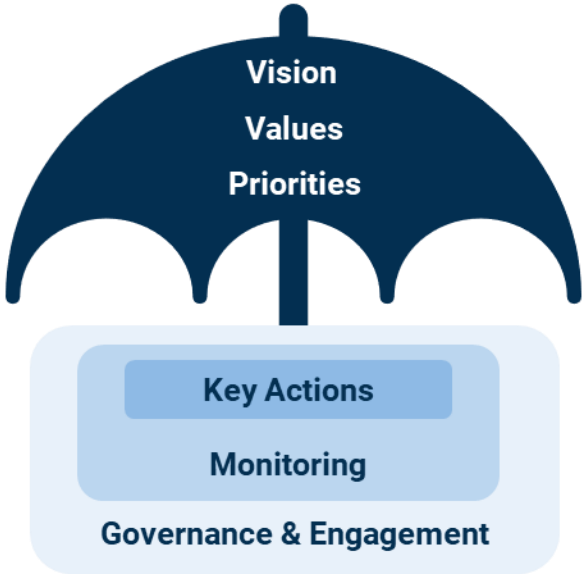


Figure 23. Strategy structure

Vision

Environmental sustainability already lies at the core of Grŵp Cynefin's organisational vision. To offer **'more than housing'** means to provide services and developments that are future-proof, resilient and improve the living standards of the tenants, service-user and communities they serve.

Our Sustainability Mission Statement

We will:

- Provide quality and affordable, **green homes** and services.
- Go beyond housing and contribute to the development of economically and **environmentally sustainable communities**.
- Provide community-centred **sustainability leadership** for North Wales.

Figure 26. Sustainability mission statement

Values

We are aware that sustainability needs to be integrated within the organisation, and everything we do. To reflect this, we are flowing the values from our Corporate Plan down into our Sustainability Strategy, joining them.

	Corporate Plan 2019-24	Sustainability Strategy 2021-30
Openness	Transparent in the way we work and make decisions. Willing to work together to achieve the best results.	Transparent in the way we work and make decisions. Willing to work together and with partners to improve sustainability.
Innovation	Innovative and willing to challenge ourselves to find new ways of delivering and providing services of the highest standard to our tenants and service users.	Innovative and willing to challenge ourselves to identify and deliver the right solutions for our tenants and service users, the environment and the local economy.
Support	Work with passion to support our tenants and service users, our colleagues and our partners in addition to helping our communities thrive.	Work with passion to provide close support to our tenants and service users where they are impacted by changes.
Achieve	Act professionally and use our expertise to ensure the success of the company and our people. Always strive for continuous improvement and ensure value for money.	Achieve sustainability ambitions whilst ensuring value for money, affordability, improved wellbeing and minimal disruption for tenants and service users.
Respect	Respect each other and others, promote equality and reject any prejudice.	Respect each other and others, promote equality and reject any prejudice.

Figure 27. Sustainability values

Priorities

Strategic

- **Create long-term economic benefit for communities** through pro-actively building local skills and promoting local job opportunities and apprenticeships, in line with the community development strategy.
- **Create partnership opportunities** with other registered social landlords, local authorities, community groups and strategic organisations in the region (such as the North Wales Economic Board), particularly around funding applications where economies of scale can be achieved.
- **Take a bold, proactive approach to communication** with tenants and service users, ensuring they feel part of the solution (and process) from the outset.
- **Set out a housing stock plan** that includes new-build aspirations and readies Grŵp Cynefin for Government guidance and funding for retrofit by gathering detailed stock information and testing (and monitoring) different measures, and packages of measures.

Technical

- It is best practice to follow a hierarchy approach with respect to how we pursue improving the sustainability of the organisation – this covers both the carbon hierarchy and waste hierarchy – and will **ensure that the most direct and cost-effective actions are pursued first**. A summary of this is shown below:

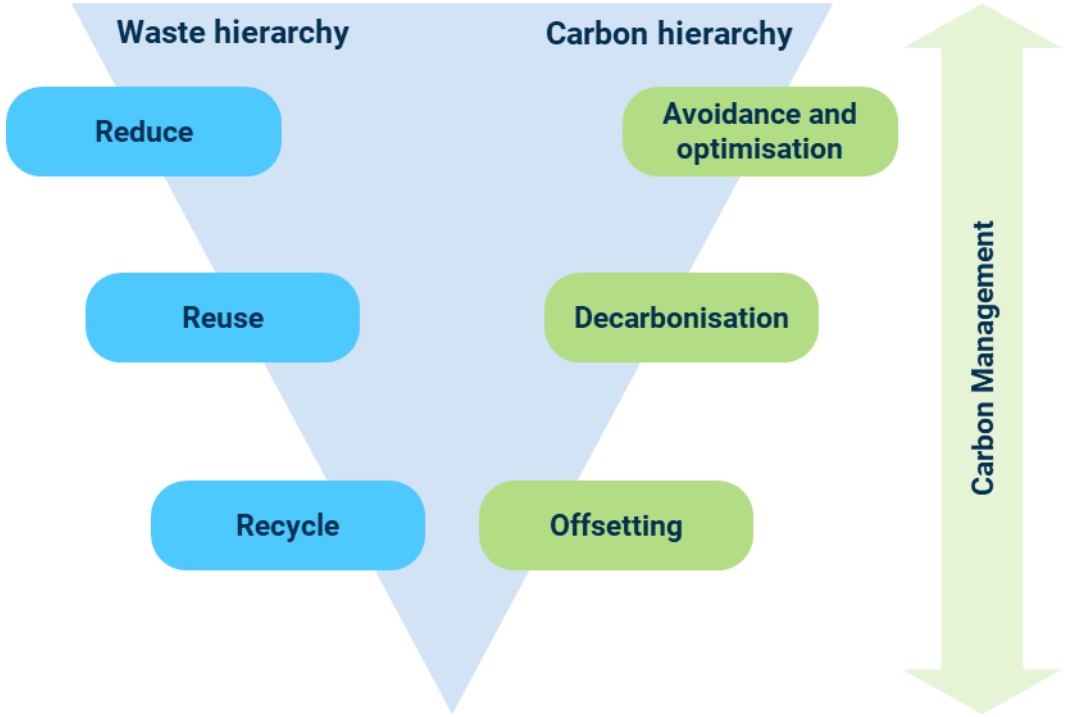


Figure 28. Hierarchy of priority sustainability action

- **All sustainability actions considered by the group will be assessed using this initial framework of priority**. In particular, offsetting and greenhouse removals (GGRs) will be pursued following best practice guidance on page 49.

Key Actions

Approach

- **Grŵp Cynefin established a Sustainability Strategy Working Group in September 2021**, comprised of senior team leaders from across the organisation and subsidiaries. In weekly sessions, the group identified a broad long-list of carbon reduction opportunities and established the core details surrounding the most critical actions.
- Regarding the strategy more widely, the group also established **how the strategy could be governed** (see p.42), **how it could be communicated** (see p.44), and **how progress should be monitored** and reported over time (see p.46).
- Carbon impact and cost factors for different actions have been provided in Appendix B. This will be an **ongoing resource for managers to use when developing businesses cases for specific projects**. The benefit of this approach is that the defined business case details will result in carbon and cost estimates that are sufficiently accurate to be tracked against the carbon target. To develop a broader reduction view across the housing stock, it is recommended that carbon and cost factors are applied to the updated Asset Management Plan.

Details of Key Actions

This section will delve deeper into the key actions identified for the strategy to guide forwards. This covers the technical interventions, as well as broader behavioural, communications and planning actions. A crucial theme of working group discussions around actions was for those included in the strategy to be achievable, both within the 10 year timespan of the strategy and preferably in the near term. Consequently, the focus of the key actions for Grŵp Cynefin is tangible low- and no-regret interventions and market-ready technology.

It is also worth noting that the actions are presented below in a strategic level of detail. Further detailed work will be required to scope up exact business cases for each intervention. In order to support this effort, the strategy includes useful data on estimated energy and carbon savings, and investment costs in Appendix B.

In order to streamline the broad range of possible activities and maximise impact, it is important to differentiate between areas where Grŵp Cynefin is owner and operator (offices, Extra Care Scheme and fleet etc.) and areas where Grŵp Cynefin has limited operational control i.e. the property is rented out and operated by the tenant (housing stock). For the latter, Grŵp Cynefin has limited control over user behaviour and supply procurement which makes it harder to implement, maintain and monitor emissions, or recover investment costs via associated energy bill savings. Key actions have therefore been split across the following areas:

> **Operated sites**
> **Fleet**
> **Housing stock**

Operated Sites

Grŵp Cynefin have 114 sites under direct operational control. These account for 7% of the FY 2019-20 carbon footprint, the majority of which (5%) was related to heating fuel. Given that the Extra Care Scheme represents 61% of these emissions, of which 5/6^{ths} are associated with gas heating, there is a strong case to focus on this hotspot. The next highest emitting site is the offices, accounting for 18%, with a more even split of electricity and gas-related emissions.

Table 3. Key actions for operated sites

Code	Action	Description	Next steps
O-1	Update Asset Management Plan and develop phased Retrofit Plan.	Collect detailed information on the current state of all assets owned or operated by Grŵp Cynefin (this will also include the housing stock, see H-1). Grŵp Cynefin are already progressing with an asset condition survey, which is planned to feed into the renewal programme, WHQS or WHQS2 reporting and broader 30-year management planning. The survey will likely use a representative sample approach. The survey data gathered for operated sites will feed into an updated Asset Management Plan, and within this should be an ambitious phased Retrofit Plan for operated sites. This will bring together the site-level emissions analysis, the survey outputs and the carbon and cost factors provided in the Appendix B to lay out a phased and prioritised programme of works. This should be cross-referenced with scheduled maintenance and refurbishment across the sites, and associated budgets.	• Appoint consultants to deliver the condition survey. • Review selected operated sites for survey, and cross-reference with site-level carbon analysis. • Agree approach for how the Retrofit Plan could be nested within the broader Asset Management Plan.
O-2	Roll-out LED lighting and smart meters in all Grŵp Cynefin-operated communal areas.	Grŵp Cynefin have already made strong progress on LEDs, they are installed across many Extra Care Scheme sites. However, as this aligns with the Value for Money Strategy, it is beneficial to push further. Value for Money Champions have already been tasked with looking at extending coverage, so there is momentum to build upon. It may also be worth installing occupancy and daylight controls helps to automatically de-illuminate areas which are not used. We are also trying to get smart meters into all communal spaces, and have a list of outstanding properties still needing to be changed over. We recently centralised all communal areas with a single supplier across electricity and gas, this will make it easier to rollout smart meters, as well as monitor consumption and measure positive impacts. **LED - Carbon saving potential:** Up to 30% **LED - Typical payback:** <5 years	• A key step will be establishing the lighting sources of the remaining communal areas. If light fittings were upgraded less than 5 years ago, it is suggested to assess whether the replacement is (i) still viable (e.g. modern T5 florescent luminaires are almost as energy efficient as LED) and (ii) if the disposal of a working piece of kit is proportional to the expected energy savings (e.g. does the entire light fitting need replacement or just the luminaire).
O-3	Ensuring all appropriate thermal fabric	The single largest area of emissions for operated sites is the gas heating of the Extra Care Schemes. Installing thermal efficiency measures to reduce	• Identify priority emissions hotspot sites and assess

	measures are installed in Extra Care Schemes, Supported Housing and Refuges.	the heating load for these sites is therefore a priority. This should reduce gas bill expenditure and improve thermal comfort, in a group of sites that Grŵp Cynefin have a high level of direct control over. The recommendation is to deliver 'low-hanging-fruit' and 'top-up' measures to full coverage, avoiding costly measures such as solid wall insulation. Alternatively, these sites could offer an opportunity for us to build a track-record and level of experience with the 'whole-house retrofit' approach. If this approach was pursued, it is recommended that the LETI retrofit process (see Appendix F) is followed. **Carbon saving potential:** (See Appendix B) **Typical payback:** (See Appendix B)	the extent of existing thermal efficiency. • If simple thermal fabric improvements are an option, complete a high-level carbon impact and cost assessment (see Appendix B), to determine suitability for progressing to detailed design.
O-4	Developing on-site renewables on land assets and operated sites.	Grŵp Cynefin own a significant amount of land across our sites, some of which could be assessed for on-site renewables. Should the organisation wish to look into large-scale renewables, more land may need to be procured. This being said, there is an opportunity to work with agricultural land owners to pursue this initiative in alternative discussions. Additionally, there are likely further opportunities to install solar PV across our operated sites. **Carbon saving potential:** Up to 100% if not fed into grid **Typical payback:** ~10 years	• Undertake initial rough suitability assessment of land assets and operated sites. • If suitable assets are found, reach out to local renewable energy engineers for initial scoping and sizing. For land assets specifically, engage with local community energy groups to assess joint venture opportunities.
O-5	Canllaw and Gofal a Thrwsio collectively engage Welsh Government regarding installing renewables on leased office spaces.	Gofal a Thrwsio is half way through a 10 year office lease with the landlord as the Welsh Government. Similarly, Canllaw is also in an office space leased from the Welsh Government. The Welsh Government have previously funded renewable installations for their sponsored bodies and own estate. **Carbon saving potential:** Up to 100% if not fed into grid **Typical payback:** ~10 years	• Canllaw and Gofal a Thrwsio to reach out to the Welsh Government to better understand potential options.
O-6	Deploy a joined-up controls system across Grŵp Cynefin-operated sites.	Grŵp Cynefin could align control technology (e.g BMS) into a single system across all sites for energy-related processes, such as heating and lighting. This enables remote control of energy-consuming equipment at these sites, reducing the requirement for staff travel to individual sites to make adjustments, and allowing remote monitoring with respect to unusual consumption peaks and performance of technology upgrades. **Carbon saving potential:** Up to 25% **Typical payback:** <5 years	• Discussion with site and operations leads to ascertain feasibility.
O-7	Consider merging Grŵp Cynefin and subsidiary office spaces.	With Covid-19 creating a new landscape of working practices, there is potentially room for the staff of the subsidiary companies within Grŵp Cynefin's main offices at Penygroes and Denbigh. However, this is highly dependent on future use, and is too	• Hold a group discussion with Grŵp Cynefin, Canllaw and Gofal a Thrwsio.

		early to come to a definitive recommendation. However, ongoing discussions should be held. Additionally, Grŵp Cynefin is developing plans for a new office, replacing Denbigh, to potentially be constructed as part of a new development. In this scenario, the integration of the offices could be built into the plans.	
O-8	Integrate sustainability criteria in contracts/ITTs	Joint procurement with other RSLs will help increase the impact of sustainability criteria, provide scale efficiency and therefore push down costs. Additionally, it will provide greater opportunity to include serious sustainability criteria in the ITT or contract. This is also discussed under Governance on p.44. Although Grŵp Cynefin can certainly include sustainability criteria in the procurement process, with a positive effect. Without having completed a footprint including 'procured goods and services' (a scope 3 emissions area), it will be unknown if the service being targeted is significant for emissions, and not possible to measure progress after implementation.	• Complete Future Reporting Recommendation – Scope 3 Screening Exercise to identify key hotspots for focus.
O-9	Work with Wildlife Trust to assess estate green spaces for nature-based solutions.	Through our assets, Grŵp Cynefin owns a large amount of open space. Rewilding some areas, or looking at natural drainage and rain gardens, could have a positive bio-diversity and resilience impact, whilst also reducing groundskeeping maintenance costs, and therefore affording an opportunity to reduce service charges for tenants.	• Organise initial kick-off meeting with Wildlife Trust.

Fleet

Grŵp Cynefin's directly owned and operated fleet (13 vehicles) is a minor emissions source (approximately 1% of the total footprint), however, actions in this area can have a broader ranging impact across wider business travel, staff commuting and community travel. Alternatively, fleet emissions represent the majority of both Canllaw (4 vehicles, 59%) and Gofal a Thrwsio's (8 vehicles, 63%) footprints, and therefore a material opportunity for decarbonisation.

Currently, the composition of Grŵp Cynefin's fleet is primarily diesel, EURO6 standard. Efficient driver behaviour can be encouraged, accompanied by telematics solutions for monitoring, to encourage fuel saving; however, Grŵp Cynefin is aware that the key emissions reduction lies in electrifying the fleet. The critical starting point for this is understanding the detailed usage profiles of the vehicles, this will empower decision-making regarding EV suitability.

An obvious dependency for fleet electrification is the need for improved charging network coverage across the North West Wales region. This will require regional collaboration, however recent government funding schemes (Workplace Charging Scheme, and Electric Vehicle Homecharge Scheme) could assist in building initial momentum.

Table 4. Key actions for fleet

Code	Action	Description	Next steps
F-1	Collect detailed data on vehicle usage.	In order to make decisions of fleet vehicles and suitability for electrification, it is critical that the average daily mileage and the maximum daily mileage are tracked across all vehicles for a period of time. This will ensure that any EVs introduced are correctly sized to the usage pattern of the vehicle's role, and avoid any risks to service delivery. Developing a clear picture of these usage profiles will provide certainty regarding the size of the challenge, and the gap to EV capabilities, if they exist. In particular, understanding the mileage will help to inform decisions regarding the practicalities of existing models (see Appendix B) and available charging points.	• Identify where data might already be held, and the feasibility and costs associated with temporarily installing monitoring equipment.
F-2	Partner with subsidiaries, other RSLs, public bodies and regional groups to roll-out electric vehicles and chargepoints across the North Wales region.	The charging network is the foundation upon which EV rollout will build. This is not a challenge that any organisation can solve independently. The value of the charging network comes from it being broadly spread across a geographic area. It would therefore be highly beneficial for Grŵp Cynefin to bring together regional partners and develop a proposal for significantly improving network coverage in North Wales. This could feasibly provide a network of chargers across car parks, with charging access open to partner organisations. This could potentially also be extended to benefit the local community, for example by introducing an EV car club which would could have dedicated parking spaces. A starting point for initial funding could be: Workplace Charging Scheme, and Electric Vehicle Homecharge Scheme. It is worth noting that, for cars, when looking at the whole-life vehicle cost (fuel, maintenance, leasing cost – if applicable, or upfront cost – and tax), the monthly cost of an EV is competitive or lower.	As a complex, multi-stakeholder action, this will likely need to be progressed in phases. The first steps are: • Engage with Canllaw and Gofal a Thrwsio, the existing decarbonisation group, North Wales Economic Ambition Board, Gwynedd Council and others to gauge interest. • Identify potential charger sites across the region, and how many EVs this might support.
F-3	Updating travel expenses policy to reward use of EVs.	Grŵp Cynefin, Canllaw and Gofal a Thrwsio all currently use the Welsh travelling expenses policy (aligned with HMRC). This offers pence per mile, which is higher based on the size of the engine: ◦ Petrol engines of 1400cc or less - 10p per mile ◦ Petrol engines of 1401cc to 2000cc - 12p per mile ◦ Petrol engines of over 2000cc - 17p per mile ◦ Fully electric engines - 4p per mile However, we can set our own travel expenses, should we choose to. A local authority has already scrapped the old Welsh expenses policy approach. The objective behind this is to look to incentivise a transition to EVs amongst staff travel (both staff commuting and using staff vehicles for business travel). In order to successfully do this without penalising employees, some form of support may be needed to assist with purchasing or leasing an EV. Ultimately this shift will require close consultation with staff and a close examine of how it intersects with working from home impacts. This is something that is already being investigated by the Value for Money Strategy, and	• The starting point is checking in with the existing working group and consultation to understand thinking and progress to-date on the topic. • Following this some form of staff consultation will be necessary.

		the New Working Practices working group are starting a consultation on the topic.	
F-4	An EV pool car based at Denbigh and Penygroes could provide an opportunity to test feasibility in a worked example.	It is difficult to ascertain exactly what the uptake and usage of an EV pool car might look like until it is tested in practice. It therefore makes sense to run a pilot where the pool car can be mainly used to ferry between offices to build familiarity with the technology. More broadly there are challenges around having pool cars and working from home, as if staff drive them home, they would need to have a charger installed at home, and would pay for that electricity. Additionally, staff at Grŵp Cynefin, Canllaw and Gofal a Thrwsio are spready over a relatively wide geographic area. Covid-19 also presents an added layer of complexity, both in the sens of sharing an enclosed space, and in terms of a lower critical mass of staff working in, and moving between, concentrated locations (offices).	• Explore staff interest and high-level financial cost of purchasing and operating an EV pool car.
F-5	Introduce an EV leasing scheme for staff.	As mentioned in F-3, changes to the staff travel expenses policy may necessitate other support being brought in. One such option could be an EV leasing scheme for staff. This would provide the benefits of using an EV, without the upfront cost.	• Such a scheme will require careful planning. A good starting point will be examining successful examples elsewhere in the UK.
F-6	Identify solutions for vans and commercial vehicles.	The Asset Management Department's six vans constitute 77% of Grŵp Cynefin's total fleet emissions, and all subsidiary-owned fleet vehicles are vans. Additionally, as we are looking at increasing direct workforce to reduce dependency on contractors, this will require an increase in the van fleet. Commercial vehicles therefore present a challenge. On the one hand, they are used very intensively, whilst on the other, market options are not as developed as for smaller cars. This is changing quickly however (see Appendix B). Currently, the best commercial option is to prioritise procuring high-efficiency EURO6 vehicles. However, alongside the other fleet actions (particularly F-1 and F-2), commercial vehicle solutions should be kept under periodic review. The average electric van emits 39 gCO_2/km, 5.5 times less than a diesel van. Future UK targets will state manufacturers have to achieve a 15% reduction in emissions by 2025 and 31% reduction by 2030 for vans from the new 2021 baseline. As part of this drive, the Government announced a ban on new petrol and diesel vehicles from 2030, and introduced grants for plug-in vans.	• It is important to recognise that there is some dependency between this action and F-2. A more comprehensive charging network is crucial to enabling EV vans to operate across the North Wales region. However, this collaborative effort will have a longer lead-in time. • Grŵp Cynefin could look to install two depot chargers and procure one EV van (following F-1) to test its operational capacity in a real-world-setting, whilst F-2 is being progressed.

Housing Stock

2050 is now within the lifetime of 30 year asset management plans, and as such we need to plan for a net-zero housing stock. Operational energy use from the housing stock constituted the Grŵp Cynefin footprint, however, considering embodied energy and carbon from construction will also be key. Although

decarbonising the housing stock is a challenge, action here can be a positive driver of other co-benefits, such as thermal comfort, health and wellbeing, skills training and local jobs. These five key points guide our approach:

- **Emissions from buildings effectively need to be absolute zero by 2050** – there is no scope for retaining fossil fuel heating systems and off-setting. Residential building emissions in Wales have fallen 25% since 1990, however, this reduction has plateaued since 2015 and we are over halfway between 1990 and 2050.
- **Waiting for hydrogen[17] to heat buildings is not a credible strategy based on current evidence** – the crux of the residential transition will involve electrifying heat and this presents a significant challenge. It is therefore beneficial to start quickly and build experience and expertise.
- **'*When*' we use electricity will become as important as '*how much*' we use.** Flexibility has huge potential to reduce fuel bills and provide revenue streams.
- **Improving thermal fabric is the key foundation required under any scenario.** Improved thermal performance enables electrification and flexibility whilst shielding tenants from fuel bill rises. However, the focus of thermal fabric efficiency needs to shift from '*what measures are installed*' to '*how is this house performing*'.
- **Tenants are core to this** – and when put at the heart of decision-making will often lead the charge.

Grŵp Cynefin has 3,695 properties in its housing stock, of which 32% are located in Gwynedd Gogledd, 16% in Ynys Mon, 15% in Sir Ddinbych and 11% in Wrecsam (the remainder are relatively spread). The stock accounts for 92% of the FY 2019-20 carbon footprint, the majority of which (57%) relates to heating. Within these heating emissions, 78% are from the combustion of natural gas. The most common housing types are semi-detached (1,266), terraced (1,112) and flat (950). Semi-detached homes constitute 42% of stock emissions, whilst detached homes, despite representing only 3% of the stock, constitute 14% of emissions. As areas of the housing stock with a high intensity of associated emissions, they should be a priority focus for a stock retrofit plan.

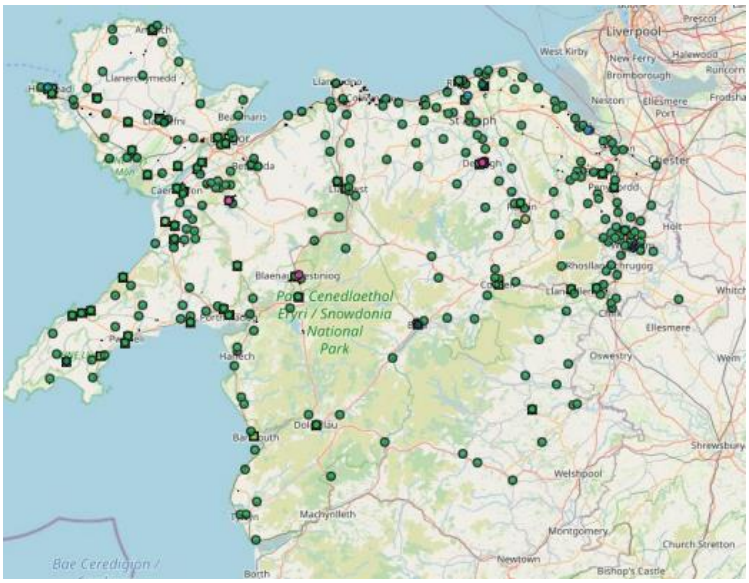


Figure 29. Geographic spread of Grŵp Cynefin stock

It is important to note that the housing stock emissions data is based on energy-use estimates, as, although Grŵp Cynefin manages and maintains the properties, tenants procure their energy tariffs independently.

[17] The Holyhead Hydrogen Hub is a demonstration hydrogen production plant and fuelling hub for HGVs to serve freight traffic at Holyhead and port-side vehicles. The UK Government also recently announced capital funding of up to £4.8m (subject to business case), and the Hub could be operational by 2023. Close attention should be paid to how this develops incase potential opportunities arise in the long-term.

Standardising the energy provider and installing monitoring equipment could help unlock real data for future footprinting, developing targeted solutions and performance monitoring. In the longer-term, this could develop into Grŵp Cynefin procuring the energy tariff centrally, and then charging an energy service fee to tenants.

Table 5. Key actions for housing stock

Code	Action	Description	Next steps
H-1	Update Asset Management Plan and develop phased Retrofit Plan.	Collect detailed information on the current state of all assets owned by Grŵp Cynefin (this will also include operated sites, see O-1). Grŵp Cynefin are already progressing with an asset condition survey, which is planned to feed into the renewal programme, WHQS or WHQS2 reporting and broader 30-year management planning. The survey will likely use a representative sample approach, the last survey was a 20% sample. The survey data gathered for the housing stock will feed into an updated Asset Management Plan, and within this should be an ambitious phased Retrofit Plan for homes. This will bring together the survey outputs, EPC data and the carbon and cost factors provided in the Appendix B to lay out a phased and prioritised high-level programme of works. This should be cross-referenced with scheduled maintenance and refurbishment (in line with Welsh Housing Quality Standards), and associated budgets. The nested Retrofit Plan will be a high-level prioritisation exercise, aiming to lay out the priority targets for retrofit, and measures, and not the specific technical retrofit details the building themselves. The Welsh Government's independent report, Better Homes, Better Wales, Better World, recommends a ten-year programme timeframe for decarbonising housing association stocks. The Plan's objective is to identify the properties that are falling short in terms of performance, as well as those which represent a cost-effective intervention point due to broader works. Planned refurbishments are the best opportunities to retrofit low carbon technologies since an investment on-site has been scheduled already. See Annex B of the LETI Retrofit Guide for a list of potential retrofit opportunities during larger building works.Recent investment in a new SAVA system and upgraded housing management software (introduced November 2021) will also help provide greater visibility over housing stock performance. A potentially achievable level of detail for priority homes is to estimate how measures might impact SAP scores and EPC ratings. This does not require complex building energy modelling, however is linked to funding and so could be treated as an initial stage-gate, prior to further detailed assessment. The recently published LETI Retrofit Guide will help in shaping the Retrofit Plan and subsequent detailed	• Appoint consultants to deliver the condition survey. • Agree approach for how the Retrofit Plan could be nested within the broader Asset Management Plan, it's level of detail and ambition, and what its output is (e.g. a prioritised list of homes for retrofit).

		design. The best practice retrofit process is summarised in Appendix F, good practice building energy targets and targets for specific measures in Appendix D, and an exemplar semi-detached archetype in Appendix E. LETI also provides guidance on avoiding condensation when installing a range of different measures. Archetypes may prove to hold limited utility for Grŵp Cynefin however, as, alongside having many solid wall homes in the stock, the stock has disparate archetypes, making mass delivery difficult. The Plan could also lay out a gradual introduction of requirements for building contractors to meet in order to be aligned with this strategy.	
H-2	Develop phased heat pump delivery plan.	This action is closely linked to H-1, however at a much smaller scale. Whereas H-1 will focus on low performing homes and opportune intervention points, this action will look at installing heat pumps in the better performing homes in the stock. The objective is to utilise government funding, the Boiler Upgrade Scheme (BUS), and build a track-record of successful installation and operation in the Grŵp Cynefin housing stock. Overally, heat pumps should be only installed in the most efficient existing properties and high EPC new-builds. This can gradually expand to the wider existing stock once or when thermal insulation is installed to reduce the heat load. Due to the billing risk of heat pumps this will need to be a slow and carefully monitored process. Grŵp Cynefin have already installed heat pumps in some new properties (including GSHP at Tredgnog and ASHP at Pennygroes and Trevor), and we are installing piping that can be used with heat pumps in others, however heat pumps can only be installed in homes with good thermal efficiency. One near-term option could be the use of hybrid heat pumps. Within explorations of heat pumps, alternative business models such as Warmth- or Energy-as-a-Service could be considered. It is also important for this plan to set out clear guidance and messaging regarding changing gas-to-electric cookers, and other practical questions important to tenants.	• Review data on currently installed heat pumps. • Engage with other RSLs in the area to share experiences and learnings. • Identify priority areas of housing stock, and submit BUS application. • Assess maintenance needs against local supply chain, and consider internal upskilling to fill any gap. • Work with Tenant Engagement team to plan tenant training on how to use new heating systems.
H-3	Review policy of replacing existing gas boilers with new efficient equivalents.	The life-time of a standard gas boiler is between 10 and 15 years and any gas boiler installed today will probably operate beyond 2030. As a result, homes with faulty boilers requiring replacement should be assessed for alternatives as a first resort. Due to a range of reasons such as poor thermal efficiency or high bill sensitivity, installing a heat pump in a given property may not be the correct solution, so this should not be a blanket policy.	• Maintenance and operations teams to hold technical discussion on the feasibility of this policy shift.
H-4	Ensure all new builds are being built to a	Grŵp Cynefin currently has a target of 120 new units per annum, and within this approximately 30 low- or zero- carbon units. With regulation soon coming into	• Hold internal discussion with new-build leads, and

	low- or zero-carbon specification, and are future-proofed.	force regarding new builds meeting an EPC A standard, and with our experience working with Zero Carbon Housing Wales, Grŵp Cynefin can scale up ambition to ensure all new builds are built to the highest performing standards possible. As part of this, it is crucial to ensure that all new builds have sufficient grid connection capacity to support both an EV charger and heat pump, should they need to be installed in the future (if they are not part of the plan). It could even extend to ensuring there is suitable infrastructure in place for an electric bike. Wiring is the most common cause of delay and higher costs in EV charger installation. The LETI Design Guide and Guidance on Embodied Carbon (summary available) could be useful in guiding this higher specification.	those responsible for the Development Strategy. • Hold discussion with building contractors to assess feasibility and costs.
H-5	Complete roll-out of standard thermal fabric improvements in line with Retrofit Plan within broader Asset Management Plan.	Thermal fabric improvements have multiple benefits, are a highly cost-effective intervention, and are a prerequisite to more complex and costly interventions around decarbonising heat. In like with the approach of O-3, this action would seek to capitalise on homes where standard thermal fabric improvements can be supplemented. This could include insulation (loft, cavity, underfloor, pipes), glazing and draft-proofing. See Annex C of the LETI Retrofit Guide for a range of insulation strategies, and Annex G for details on determining appropriate levels of insulation. It is also critical that any improvements to insulation, even when delivering simple measures, be balanced with considerations of ventilation to avoid damp and mould. See Annex D of the LETI Retrofit Strategy for a range of ventilation strategies, and Annex H for how to avoid moisture risks. For a full breakdown of the carbon savings and costs of different fabric measures, see Appendix B.	• Closely monitor the outcomes of H-1 to identify houses which have not yet received thermal fabric improvements.
H-6	Whole house retrofit (combining fabric, heat pumps, solar PV and battery /thermal storage).	This action could start building familiarity with the whole-house retrofit process (Appendix F). This is complex and costly, but delivers lasting results. As a consequence, the most appropriate approach is to slowly build familiarity with the process, and test it on a small number of houses. Working closely with Zero Carbon Housing Wales with provide supporting technical expertise. The semi-detached archetype example (Appendix E) lays out the full scope of what whole house retrofit entails. One potential idea is that, installing solar PV, which can earn tenants revenue in the summer, could offset the additional costs of switching to electric heating via a heat pump in winter. Although it is true that the time when a heat pump is most needed (winter) is when solar PV generates the least electricity, if looking at the bill annually, it may be possible to find	• Engage with Zero Carbon Housing Wales, and closely monitor the outcomes of H-1 for appropriate pilot properties.

		balance overall for the tenant. This balancing approach could be naturally integrated within an Energy-as-a-Service business model.	
H-7	Develop the Energy Wardens programme.	Supporting tenants is going to be central to all housing actions. This support will not be about a single visit, but rather an entirely different model of constant support, guiding them through the process and helping them get accustomed to new equipment. The initial objective of the Energy Wardens Programme is to help all tenants get smart meters. This is a strong starting point for engagement, as smart meters are a low-regret option. As a model, wardens have the potential to be vehicles for driving behaviour change amongst communities, avoiding a top-down approach and instead transmitting information tenant to tenant. However, demographic changes and working across different varied communities will present a challenge.	• Discuss options beyond the smart meters campaign, as well as potential linkages with a Tenants Hub.
H-8	Capacity building amongst tenant- and user-facing staff.	Staff will need to have a strong grasp of the products inside out, with the ability to answer tenant questions on-hand. These kinds of service-experience will help reassure tenants despite potential changes.	• This has started with all members of staff going through carbon literacy training.

Governance and Engagement

Having a clear governance structure that spans all levels of the organisation is key to ensuring that climate-related risks and opportunities are given sufficient clout when strategic and financial decisions are being made. Adapting existing mechanisms used for providing Board and management-level oversight of priority issues is a good starting point for increasing the organisation's accountability for addressing climate-related issues, and ensuring the Board is well-informed when making key decisions.

Organisational structures must be put in place to deliver and maintain a focus on sustainability over time, as well as protect the agenda from being too dependent on a single individual. Additionally, ownership and buy-in at the most senior level gives a strong mandate for the progression of actions, whilst clearly defined roles and responsibilities break down the huge challenge into more manageable pieces.

Grŵp Cynefin have already started working to embed the sustainability strategy within the organisation. We have done this through Board meetings, a leadership-level strategy working group and staff feedback sessions, and will continue to socialise the strategy with colleagues, tenants and service-users, listening and refining based on feedback.

Strategy Governance

The Sustainability Strategy will sit with the Leadership Team, whose collective role is to oversee and guide the successful implementation of the Strategy, including meeting the annual carbon reduction target. Collectively, the Leadership Team will perform several functions:

- Providing regular oversight and monitoring of progress towards the Grŵp Cynefin target;
- Raising 'blockages' to the Board level where they can be addressed e.g. resource issues;
- Contributing to keeping sustainability on the high-level agenda at Grŵp Cynefin; and
- Managing the expectations of key stakeholders and recognising achievements on carbon reduction.

Within the Leadership Team, Melville Evans, Group Director of Innovation and Growth, will hold specific ownership and operate as the Strategy Sponsor. This involves:

- Providing the link between the Leadership Team and the Board, through regular briefings to the Board Champion, and through reporting highlights, risks and issues to the Board;
- Overseeing the Sustainability Manager and strategy delivery, and harnessing other colleagues' personal interests in driving certain issues (this is crucial as it is important that the delivery of the strategy is not over-reliant on a small number of individuals);
- Co-ordinating action with relevant leads at Canllaw and Gofal a Thrwsio; and
- Managing potential partnerships and engagement with senior stakeholders.

A Board Champion will be confirmed in the near-future. This will be an internal advocacy role, with the objective of maintaining momentum and focus on the agenda. The Board will be responsible for the overall strategy and funding decisions.

The Sustainability Manager, and colleagues, will focus on the day-to-day delivery of the Strategy actions.

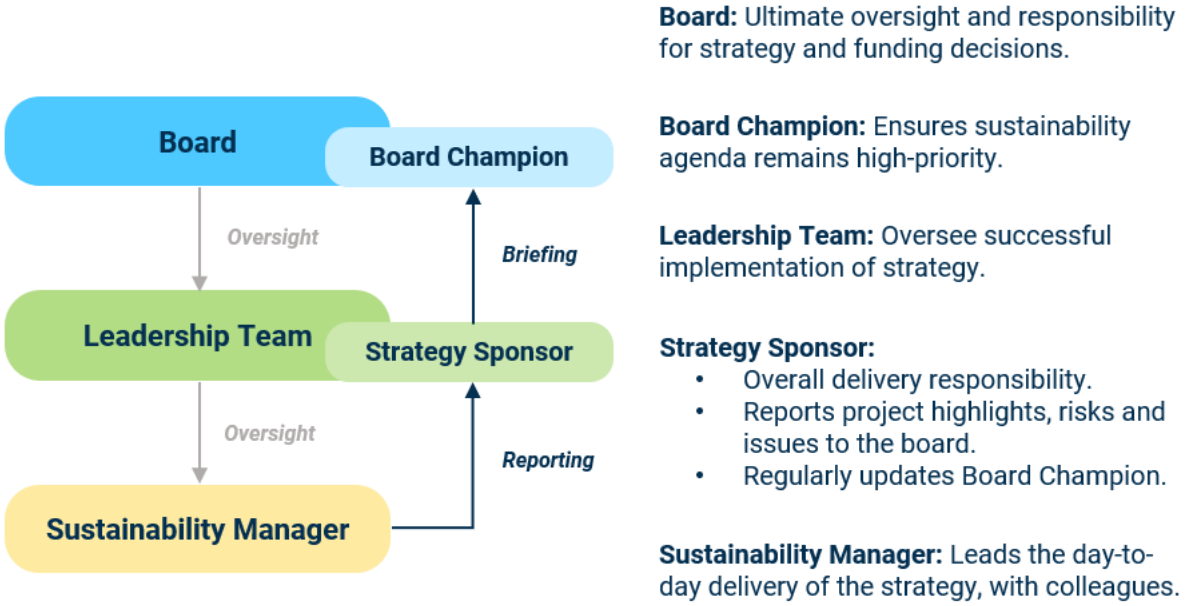


Figure 30. Summary diagram of strategy governance

Table 6. Strategy governance actions

Code	Action	Lead
G-1	Set the Sustainability Strategy as a recurring agenda item for the Board.	Grŵp Cynefin Board
G-2	Confirm a Board Champion for sustainability.	Grŵp Cynefin Board

G-3	Secure the endorsement and official sign-off of the Strategy by the Board.	Grŵp Cynefin Board
G-4	Set the Sustainability Strategy as a recurring agenda item for the Leadership Team.	Leadership Team
G-5	Within the Leadership Team, establish Sprint Groups of implementation-critical individuals around clusters of complementary actions.	Leadership Team
G-6	Appoint a Sustainability Manager.	Grŵp Cynefin Board

Strategy, Policy and Decision-Making Alignment

To ensure that sustainability and carbon management is established and maintained as an organisational priority, it should be integrated across existing strategies, policies and processes. To achieve this, current practices and procedures may need to be adjusted. Additionally, the connections between the varied Grŵp Cynefin strategies should be deepened, reflecting the integrated nature of the challenge, as well as our ambitions to provide a joined-up response:

- Corporate Strategy
- Estate Strategy
- Community Development Strategy
- New Ways of Working Strategy

An effective means of shaping sustainable change across the organisation will be through embedding carbon and climate criteria into the decision-making process and existing procurement guidelines. A new Board report template is already under progress, this will provide an agile process that avoids burdening staff whilst adequately capturing sustainability impacts. Inspiration can be drawn from a 'checklist plus guidance' approach (as used in Bristol City Council's Eco Impact Checklist), or from a 'decision-wheel' approach (as developed by Cornwall Council).

Traditionally, procurement has focused upon value for money considerations such as quality, cost and reliability. In order to leverage this spend to drive sustainability improvements both in Grŵp Cynefin's assets and services, and the wider community, additional criteria could be introduced around waste, carbon emissions, energy and water consumption and bio-diversity.

Table 7. Strategy, policy and decision-making alignment actions

Code	Action	Lead
G-7	Sustainability impact assessment of all internal policies.	Grŵp Cynefin Board
G-8	Review and re-alignment of all Grŵp Cynefin Environmental Statements to take account of the Sustainability Strategy.	HSE Manager / Strategy Sponsor
G-9	Inclusion of Grŵp Cynefin's carbon reduction targets in the Business Plan and Annual Report.	Strategy Sponsor / Grŵp Cynefin Board
G-10	Development of new Board report template which integrates sustainability, accompanied by user guidance and training sessions.	Leadership Team
G-11	All business cases submitted to financial management to be appraised for carbon reduction as well as costs & payback.	Strategy Sponsor / Finance
G-12	Integrate sustainability criteria into procurement guidelines. E.g. Requiring contractors to track fuel use, declare the number of low or zero emission vehicles	Strategy Sponsor / Finance

	which will be used in delivering the service (by number of miles driven), or onboard a local apprentice.	

Stakeholder Engagement and Collaboration

Taking a bold, proactive communication approach and creating partnership opportunities are two of the strategic priorities of the Sustainability Strategy, and will underpin stakeholder engagement. The message being delivered to tenants, service-users and communities should be inclusive and positive – sustainability is an opportunity, not a cost. In order to support this, tenants should be put at the heart of decision-making, empowered with information from case studies, and listened to through the use of feedback videos.

With potential partners, whether community groups, public bodies, suppliers or local government, a recognition that collaboration is the collective best option for achieving significant progress must sit at the heart of engagement.

Grŵp Cynefin are well placed as an organisation to collaborate with a large number of stakeholders. We are already working with Zero Carbon Housing Wales, and will be looking to engage closely with the North Wales Economic Ambition Board, Community Housing Cymru and other regional RSLs in collaboratively progressing transformational actions, such as charging infrastructure. Relationships with local colleges will also be key, ensuring they are offering courses which align with the skills gaps in the local supply chain, and linking them with contractors and suppliers.

Internally, managers should be regularly engaged on sustainability from the outset of transitioning into strategy delivery, with feedback passed up to the Leadership Team to reflect on what is, and what is not working. In the teams that are already very busy, the change management process will be crucial, specifically: emphasising sustainability as a long-term project; returning to the overarching priorities and aims to underline this; as well as setting clear expectations. Colleagues working directly with tenants will need to be agile in flowing the feedback they hear regarding the strategy and any specific actions to the Sustainability Manager, to ensure the agenda is truly responsive and user-centred.

Table 8. Stakeholder engagement and collaboration actions

Code	Action	Lead
E-1	Develop a sustainability communications plan, with audience-segmented messaging (including for young people and schools).	Sustainability Manager / Communications
E-2	Publish the Sustainability Strategy on the intranet and internet, along with a structured FAQs section that is updated with information relevant to specific actions as they are brought forwards.	Sustainability Manager / Communications
E-3	Hold a company-wide 'Sustainability Week' to accompany the Strategy launch.	Strategy Sponsor / Sustainability Manager
E-4	Communication & engagement to explain to core elements of the Sustainability Strategy to Grŵp Cynefin stakeholders, including staff, tenants and service users.	Sustainability Manager / Communications
E-5	Produce a progress summary graphic on an annual basis to share with tenants and service users.	Sustainability Manager / Communications
E-6	Include a regular energy saving or climate-related column in the Tenant Newsletter as a small but regular touch-point with the agenda for tenants.	Sustainability Manager / Communications

E-7	Add Sustainability Strategy as a permanent agenda item across team meetings.	Strategy Sponsor
E-8	Review Tenant Engagement Strategy, and consider establishing a hybrid (online and in-person) Tenant Hub and Tenant Champion. This can be a focal point for input when designing specific actions, and provide continuous training and mentorship to tenants, as well as a forum to share experiences. This should be aligned with Community Housing Cymru's Tenant Engagement Community of Practice.	Strategy Sponsor / Communications
E-9	Hold semi-regular internal knowledge sharing sessions where recent technologies, projects or approaches are presented and discussed by colleagues, or even other Housing Associations. This can also include mapping, and then sharing information from, collaborative groups senior staff are members of, e.g. the Chief Executive's Community of Practice Group on Decarbonisation.	Sustainability Manager
E-10	Reach out to local colleges regarding sustainability course offerings and apprenticeship placements. Investing in the local workforce via apprenticeships will improve the resilience of Grŵp Cynefin's contractor supply chain.	Sustainability Manager
E-11	Engage with external suppliers to explore options for collecting data for use in a future carbon footprint, as part of an expansion into including emissions associated with procured goods and services.	Sustainability Manager

Monitoring and Reporting Progress

Developing the Framework

A well-structured monitoring and reporting framework provides visibility of progress across the organisation, without requiring a resource-intensive exercise that can detract from the Strategy delivery itself. A key pillar of this will be the continued process of data collection, analysis and reporting for Grŵp Cynefin's carbon footprint. However, the framework should also cover monitoring the progress of specific actions.

The below areas lay out the framework elements for updating the carbon footprint, which will show the evolution of the carbon emissions picture for the organisation. However, the footprint does not necessarily show the disaggregated impact of specific actions, although carbon reduction estimates from business cases (based on Appendix B) could be compared with the footprint results.

- **Methodology:** Review which emissions source areas are being included, ensuring there is a clear methodology agreed for emissions calculations for each source, and that any estimation methods chosen accurately represent the characteristics of the source category.
- **Data:** Identify data owners, and ensure that quality data is available for included emissions sources (see Data Management)
- **Processes:** Identify a team responsible for the collection and review of data used for the footprint, integrating this into existing organisational processes.
- **Documentation:** Develop a comprehensive blueprint for collecting, analysing and reporting the footprint each year aligned to best practice, ensuring credibility and consistency across reporting years.

Due to the range of the Strategy actions across technical, behavioural and planning, some will need to be monitored qualitatively, whilst others can be monitored quantitatively. The details of this should be included in the business case or proposal for the action.

- **Qualitative:** E.g. Targeted series of survey questions to a limited representative pool of action beneficiaries.
- **Quantitative:** E.g. Ongoing meter readings of the addressed sites.

Overall, both the footprint and action-level monitoring will be assessed against a set of agreed Key Performance Indicators (KPIs). These should be as specifically defined as possible.

Key Performance Indicators

- Monthly energy consumption data for operated sites
- Percentage change in carbon emissions by year
- EPC/SAP performance of new and existing housing stock
- Average cost per kWh for tenants
- Number of project business cases approved, and total investment
- Total estimated carbon reduction of approved business cases
- Investment spend with locally-based contractors
- Number of apprenticeships with locally-based contractors

Figure 31. Key Performance Indicators (KPIs)

Table 9. Monitoring framework actions

Code	Action	Lead
M-1	Share draft KPIs with other Housing Associations, the North Wales RSL Group and Community Housing Cymru to drive a common aligned approach.	Strategy Sponsor
M-2	Develop a KPI reporting template for the Board.	Strategy Sponsor
M-3	Define a shortlist of realistic 'near-term' goals based on Leadership Team implementation discussion and the outcomes of other actions. These can be revised on an ongoing basis.	Sustainability Manager / Strategy Sponsor
M-4	Allocate a footprint lead.	Sustainability Manager
M-5	Increase the organisation's accountability for sustainability by integrating sustainability metrics alongside financial metrics in the annual report.	Grŵp Cynefin Board
M-6	Publicly report key ESG metrics to unlock potential additional funding opportunities and position the organisation as a leader.	Grŵp Cynefin Board
M-7	Integrate Strategy into ISO 14001 or 50001, or explore the Carbon Trust or Green Dragon Standards.	Grŵp Cynefin Board
M-8	Input the actions into the corporate risk management software already regularly used across the company in order to support monitoring.	Sustainability Manager / Strategy Sponsor

Strategy Progress Reporting

The progress of the Sustainability Strategy should be discussed and reviewed by the Management Group quarterly, and by the Board bi-annually (in line with the existing ESG targets). The Corporate Plan's annual target of 4% carbon reduction should be reported annually.

For each meeting of the Management Group, the progress of the Sustainability Strategy as a whole, as well as individual actions, should be discussed against the agreed KPIs. Grŵp Cynefin must adopt a way of flagging the actions that are stalling or not progressing as expected.

The KPI reporting template should be produced and presented to the Board, laying out progress against the KPIs, actions that have stalled, and any recommendations to add, remove or revise actions. The Sustainability Manager is responsible for monitoring, this role should cut across the organisation and help tie all the actions together. It is important to note a key dependency for progress, however, the continued and increased availability of Welsh and UK government funding will be critical to enabling technical actions, particularly in the housing stock.

Table 10. Progress reporting actions

Code	Action	Lead
M-9	Establish structured progress review format for Management Group and Board meetings.	Strategy Sponsor
M-10	Establish a group involving tenants, staff and Board Members to monitor and review the Sustainability Strategy.	Sustainability Manager

Data Management

Effective data collection has been a critical element of developing our Sustainability Strategy. It underpins the strategy and target and will continue to be a critical element as we monitor implementation progress. Data management is the broader framework within which data collection happens. It refers to a structured understanding of: (i) what are the data sources; (ii) who owns which data streams; (iii) who is processing the data; and (iv) where is the data being stored (and in what format). Developing a strong understanding of this amongst colleagues will rapidly increase the ease with which the data for a carbon footprint can be produced.

Having confidence in figures, assumptions and data sources helps ensure that:

- **High priority areas are targeted:** an accurate understanding of Grŵp Cynefin's emissions over time will enable the targeting of priority projects against hotspot areas.
- **Carbon reduction projects are accurately quantified:** this will allow Grŵp Cynefin to predict the impact a project will have on carbon emissions and how effective a portfolio of projects will be at progressing towards the target.
- **Business cases are credible and accurate:** accurate estimations of costs and savings ensures that funds are used in the most cost-effective way.
- **The effectiveness of carbon reduction projects can be measured and demonstrated:** this allows progress against Grŵp Cynefin target to be tracked and strengthens the business case for future investment.
- **Continuity and succession planning:** all activities should be well documented and referenced to ensure a smooth handover of responsibility.

Looking ahead, the introduction of advanced smart meters, Intelligent Energy Systems (IES), in Grŵp Cynefin's housing stock will see a massive increase in data volume. This presents a challenge, both in terms of organisation, storage and processing, and in terms of GDPR compliance. This data protection issue with regards to advanced monitoring is an ongoing sector-wide issue.

Table 11. Data management actions

Code	Action	Lead
M-11	Codify the data management environment around the Sustainability Strategy. A flow chart that data owners labelled can be a useful resource for other colleagues.	Sustainability Manager

Risks and Challenges

The main risks and challenges we see associated with decarbonisation are as follows:

- **Financial:** Without external additional funding streams, Grŵp Cynefin will not have adequate financial resources to fund the required retrofit improvements across its housing stock. The *Public Sector Decarbonisation Scheme* and *Wales Funding Programme* may address this.
- **Resourcing:** The planning, procurement and delivery of retrofit works, as well as a wider agenda of sustainability actions, requires dedicated resources.
- **Technical:** Poor performance of installed equipment or designed solution will require further work and budget to replace.
- **Expertise:** External and internal expertise to install and service these new technologies may not exist in the local supply chain or be in high demand.
- **Reputation / Customer Acceptance:** Tenants may refuse retrofit works due to the invasive nature of decarbonisation work, and any bad experiences will damage our reputation.
- **Clarity and Compliance:** There is currently no clear guidance from the Welsh Government regarding how decarbonisation of the housing stock will be measured and monitored to ensure compliance, and whether there will be 'acceptable' fails.

Table 12. Risk management actions

Code	Action	Lead
M-12	Climate-related risks (both in terms of physical and transition risks) as well as Strategy implementation risks to be considered as part of Grŵp Cynefin's existing risk assessment process and risk register.	Grŵp Cynefin Board

The Role of Offsetting and Greenhouse Gas Removals

Guidance from SBTi in its *Net Zero Standard* states that "when the net-zero target date is reached, companies must neutralize any residual emissions by permanently removing carbon from the atmosphere. Companies must continue to neutralize any remaining emissions."[18]

Best practice dictates that the Grŵp Cynefin Sustainability Strategy should maximise efforts to deliver action that will reduce emissions **before** implementing a credible carbon offsetting strategy. There may, after all actions have been deployed, still be residual emissions. This is more likely if Grŵp Cynefin commits to achieving a net-zero carbon target before 2050. Based on our current 4% annual reduction, we will decarbonise in 2044, however, this excludes scope 3 emissions. C40 Cities recommends that, where possible, offsets should only be used to reduce scope 3 emissions. Carbon offsets should be pursued according to environmental integrity and transparency principles[19] (real, additional, permanent, measurable, independently audited and verified, unambiguously owned, and transparent), with a strategy for identifying and managing accredited offsetting measures developed.

Offsets represent a mechanism for cancelling out residual emissions by developing, funding or financing projects that avoid or sequester GHG emissions outside Grŵp Cynefin's organisational boundary. Organisations have been using carbon credits to offset their residual GHG emissions for well over a decade. In recent years, the concept of carbon 'insetting' has developed, whereby an organisation invests in emission reduction activity within its supply chain, tackling GHG emissions to which they are directly related, either by geography, production or commodity. This may only be possible on buildings owned by Grŵp Cynefin if no significant amount of land is held.

A range of offsetting standards exist across the voluntary carbon offset market, several of which have been criticised for 'greenwashing' due to a lack of quality projects, issues around rigour and accuracy, and reports that projects are 'non-additional' (would have happened anyway). It is generally accepted that best practice for carbon offsetting requires the selection of offset providers that guarantee Gold Standard offsets. Independent accreditations (such as the Carbon Trust Carbon Neutral Certification) only recognise Gold Standard carbon credits. Gold Standard is an internationally recognised benchmark for carbon offset projects that was created by WWF and other international NGOs in 2003, and is publicly endorsed by partners such as UNFCCC, World Bank Group, UNDP and Fairtrade.

Offsets can be divided into three main classifications:

1. **Avoided natural depletion** (e.g. avoided deforestation);
2. **Avoided emissions** (e.g. renewable energy projects); and
3. **Greenhouse Gas Removal (GGR)**, including:
    i. Natural (e.g. Mineral carbonation, ocean alkalinity, enhanced terrestrial weathering)
    ii. Engineered (e.g. Direct air capture, low carbon concrete)

[18] SBTi (2021), *SBTi Corporate Net-Zero Standard*.
[19] University of Oxford (2020), *The Oxford Principles for Net Zero Aligned Carbon Offsetting*.

iii. Increasing biological update (e.g. Forestation, peatland; bioenergy with carbon capture and storage (BECCS))

GGRs require that CO_2 (or other GHGs) is permanently removed from the atmosphere and sequestered. It is critical to ensure the permanence of such measures; the Carbon Capture and Sequestration (CCS) Protocol states that CO_2 must be removed for a minimum of 100 years.

By developing an Offsetting and GGR Strategy from 2030, Grŵp Cynefin will be ready to execute high-quality, planned offsetting or removals of any residual emissions from very hard-to-decarbonise areas (following the delivery of all actions) in 2044. This will ensure we only purchase offsets following concerted action, reduce the amount of offsets purchased, and ensure that any offsets are of the highest quality, preferably delivering co-benefits to the local region.

Appendix

A - Summary of BAU Assumptions

Table 13. Summary of BAU assumptions

Assumption	Value	Explanation	Source
Grid decarbonisation	4.7gCO_2e/kWh by 2050	Steady Progression scenario, CO_2 intensity of electricity generation excluding negative emissions from BECCS.	Net Zero and the Future Energy Scenarios | National Grid ESO
House building	120 new houses per annum	This target was flagged during a strategy working group session. However, this ia a conservative assumption, as new-builds are not currently being constructed at this rate.	Grŵp Cynefin strategy working group

B - Additional Business Case Data

Energy saving, carbon saving and cost data drawn together from a range of sources for use by Grŵp Cynefin managers developing business cases for sustainability interventions and looking to include high-level cost-impact estimates.

Table 14. Additional business case data

Measure	Installation cost (£)	Annual carbon saving (kg)	Lifetime (years)	Lifetime carbon saving (tonnes)	Cost of carbon saving (£/tonne)
Cavity wall insulation (CWI) (low cost)	595	577	42	24.2	25
Cavity wall insulation (high cost)	3,500	577	42	24.2	144
Internal solid wall insulation (SWI)	5,300	1,187	36	42.7	124
External solid wall insulation	8,100	1,187	36	42.7	190
Loft insulation	300	108	42	4.5	66
Double glazing (old single to A)	4,500	492	20	9.8	457
Flat roof insulation	1,050	594	20	11.9	88
Draught-proofing	100	140	10	1.4	71
New or replacement storage heaters	350	562	20	11.2	31
Solar water heating (~3kW)	4,615	289	20	5.8	800
Solar PV (~2kW)	3,365	828	25	20.7	163
Whole house retrofit (SWI)	14,400	1,672	30	50.7	284
Whole house retrofit (high cost CWI)	9,800	1,215	30	36.8	266

Whole house retrofit (low cost CWI)	6,895	1,215	30	36.8	187

Source: *Study for the Greater London Authority (GLA) to recommend suitable carbon prices for offsetting in London.*

Table 15. Additional business case data (ii)

Measure	Cost of measure (£)			Average annual energy saving (kWh)		
	Small mid-terrace (<76m^2)	Large semi-detached or end terrace (>80m^2)	Small detached (<117 m^2)	Small mid-terrace (<76m^2)	Large semi-detached or end terrace (>80m^2)	Small detached (<117 m^2)
Cavity wall insulation	460	660	680	600	1,300	1,800
Loft insulation (joists)	350	470	510	600	500	900
Loft insulation (rafters)	1,600	2,300	2,300	600	500	900
Underfloor insulation	550	750	900	1,212	1,818	2,424
Draught-stripping	85	180	275	-	-	-
Double glazing	3,900	6,400	5,900	1,515	2,272	3,030
Secondary glazing	3,800	5,700	4,500	1,136	1,704	2,272
LEDs*	84	112	140	72	96	120
Air Source Heat Pump**	5,500	8,000	8,500	5,779	6,493	9,052

* 1 halogen bulb uses ~31 kWh/year, 1 LED bulb uses ~6 kWh/year.
** Energy savings estimated by combining the average electricity and gas consumption figures for each house type (taken from BEIS NEED actual use data) before dividing them by a factor of 2.2 to reflect the co-efficient of performance (CoP).

Source: *BEIS, 'What does it cost to retrofit homes? (2017); BEIS, National Energy Efficiency Data-Framework (NEED): impact of measures data tables (2019).*

Table 16. Additional business case data (iii)

EPC bands	Average annual primary energy saving to next EPC band (kWh/m^2)	Average cost to next EPC band (k£)
B → A	49	9.5
C → B	81	13.8
D → C	115	9.3
E → D	112	5.7
F → E	85	4.6
G → F	90	9.0

The above figures were calculated based on a sample of EPCs, and should be treated as an indication of order of magnitude, as opposed to specific target. Three EPCs were used per band, all scoring in the middle of the band and covering small terraced, large semi-detached and small detached. The average cost of moving band was calculated based on the recommended measures in the EPC reports.

Source: *Internal Carbon Trust analysis.*

Table 17. Additional business case data (iv)

Model	Type	Test type	Electricity consumption (miles/kWh)	Maximum range (miles)
Nissan Leaf 2018 40kWh	Car	WLTP	3.0	167.5
Renault ZOE 2018 R110 ZE 40	Car	WLTP	3.5	116
Hyundai Kona electric 39kWh	Car	WLTP	4.1	179.5
Renault Zoe Van	Car-derived van	WLTP	-	245
Renault Kangoo ZE 33	Small van	WLTP	-	143
Nissan e-NV200 40kWh	Small van	WLTP	-	124
Citroen e-Berlingo	Small van	WLTP	-	174
Peugeot e-Partner	Small van	WLTP	-	174
Vauxhall Combo-e	Small van	WLTP	-	174
VW e-Transporter	Medium van	WLTP	-	82
Vauxhall Vivaro-e	Medium van	WLTP	-	143-205**
Citroen e-Dispatch	Medium van	WLTP	-	148-211**
Peugeot e-Expert	Medium van	WLTP	-	148-211**
Renault Master ZE	Large van	WLTP	-	124
LDV EV80	Large van	NEDC*	-	127
Mercedes-Benz eSprinter	Large van	WLTP	-	96

* The NEDC manufacturer test was replaced by WLTP in September 2019, the new test is more stringent and has been designed to better reflect real-world driving.
** Variation due to van and battery size options.

Source: *Parkers Electric Van Guide (2021).*

C - Recommended Fleet Electrification Process

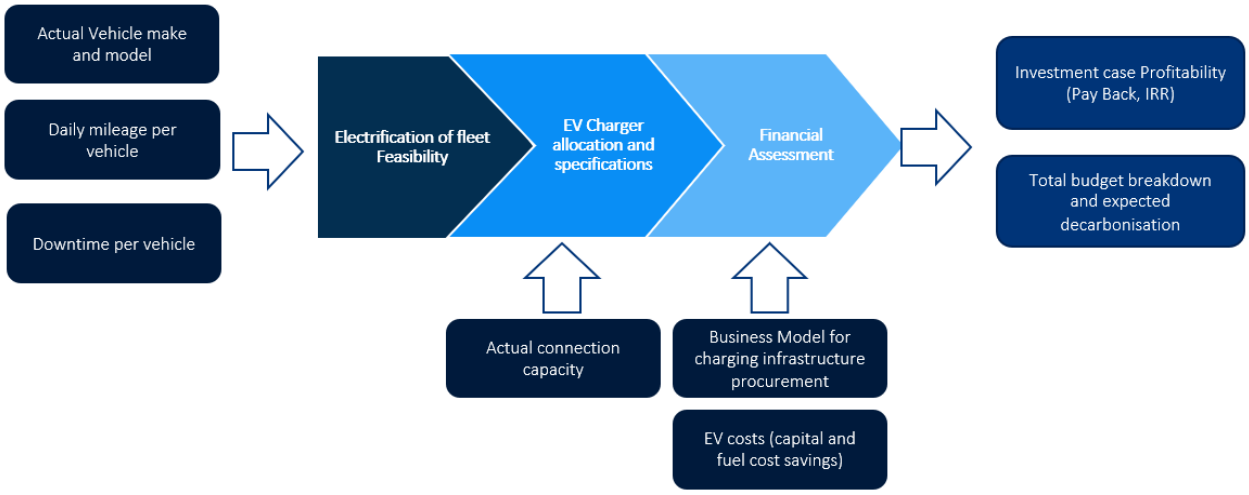


Figure 33. Recommended approach to assessing electrification

Funding details:

- **Purchasing ULEVs –** UK Government grants are available to incentivise consumers and businesses for some ULEV cars, vans and bikes. Eligible vehicles are determined by CO2 emissions (g/km) and the distance travelled with zero emissions. Grants were withdrawn for PHEVs after it was found that many did little or no mileage in EV-only mode and some were never charged. They did however benefit from purchase grants, low Vehicle Excise Duty and low company car tax. For up to date information on the ULEV vehicles available go to: hiips://w ww.gov.uk/plug-in-car-van-grants. No additional support grants or loans for the purchase of ULEVs are available in Wales.
    - Cars with CO2 emissions of less than 50g/km and a zero emission range of at least 112 km (70 miles) - **35% up to £3,500 maximum**
    - Cars with CO2 emissions of less than 50g/km and a zero emission range of at least 16km (10 miles) - **Not eligible**
    - Cars with CO2 emissions of 50 to 75g/km and a zero emission range of at least 32km (20 miles) - **Not eligible**
    - Vans with emissions below 75g/km of CO2 and a zero emissions range of at least 16 km (10 miles) - **25% up to £8,000 maximum**
- **Home Charging** – The Electric Vehicle Homecharge Scheme (EVHS) provides grant funding of up to 75% (capped at £500) towards the cost of installing electric vehicle charge points at domestic properties across the UK. No additional support is available in Wales.
- **Workplace Charging** – Any business, charity or public authority is able to claim the grant towards the installation costs of EV charging points providing they have dedicated off street parking for staff and/or fleet. Funding available up to £300 per socket up to a maximum of 20 sockets (£6,000). No additional support is available in Wales.
- **Public Access Charging –** A grant to part fund (75%) the capital costs relating to the procurement and installation (including connection and groundworks) of on-street electric vehicle charge point infrastructure in residential areas. Car parks that are owned by Local Authorities and are accessible

to residents 24/7 are eligible. Expectation is that residents can access car parks for free overnight. No additional support is available in Wales.

- OLEV will provide **up to £7,500 per charge point installation**.
- Each project should **not exceed more than £100k** in OLEV funding.
- Grants will be paid by OLEV in arrears **upon completion** of the project.

D - LETI Energy Targets and Constituent Element Targets

Ideally, retrofit should be informed by predictive modelling, against which performance can be measured post-retrofit. However, this can be impractical due to financial and time constraints, or the availability of modellers. If predictive modelling is undertaken, this should be using the Passivhaus PHPP software or CIBSE TM54 methodology. SAP is not recommended as this does not provide a reliable calculation of unregulated energy use.

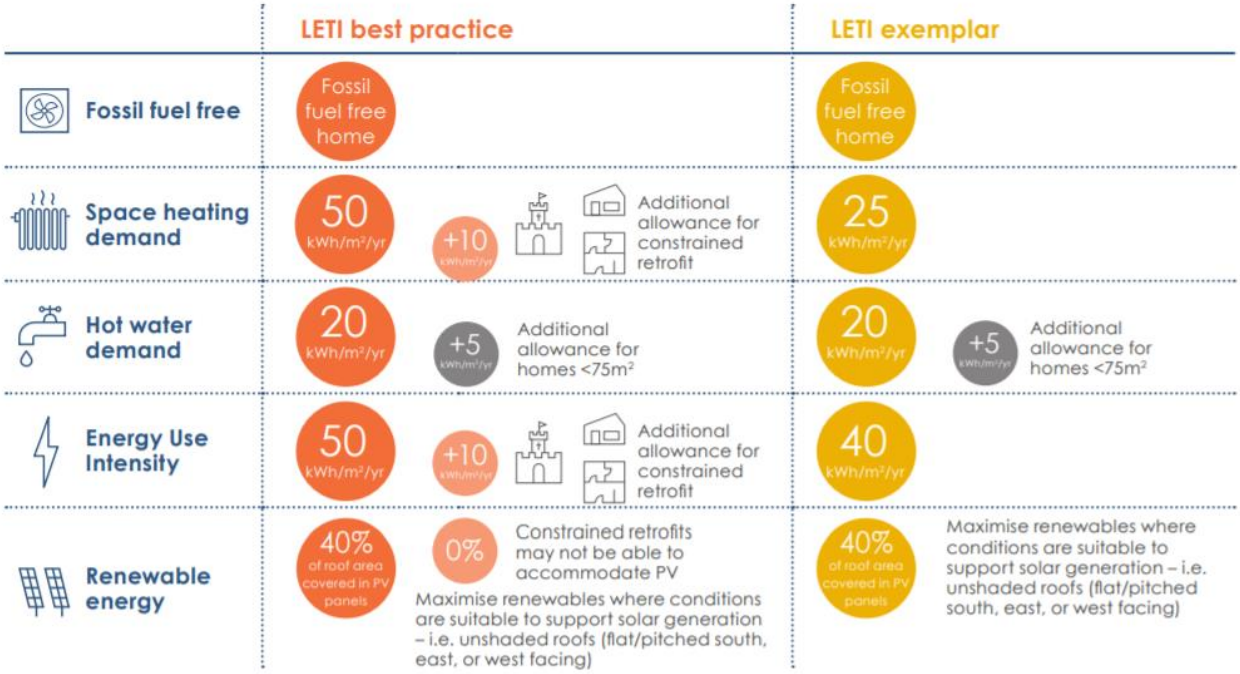


Figure 34. LETI retrofit energy targets

Alternatively, the various components of the retrofit works should achieve target parameters. These are provided in the heat transfer co-efficient – watts per squared meter kelvin (W/m^2K). This method can be used to ensure performance quality where detailed modelling is not possible, however, it is much more difficult to assess performance success post-retrofit.

E - LETI Housing Archetype – Semi-Detached

Further archetype specifications can be found in LETI Retrofit Guide - Chapter 4, as well as the Decarbonising Welsh Homes: Stage 2 Report.

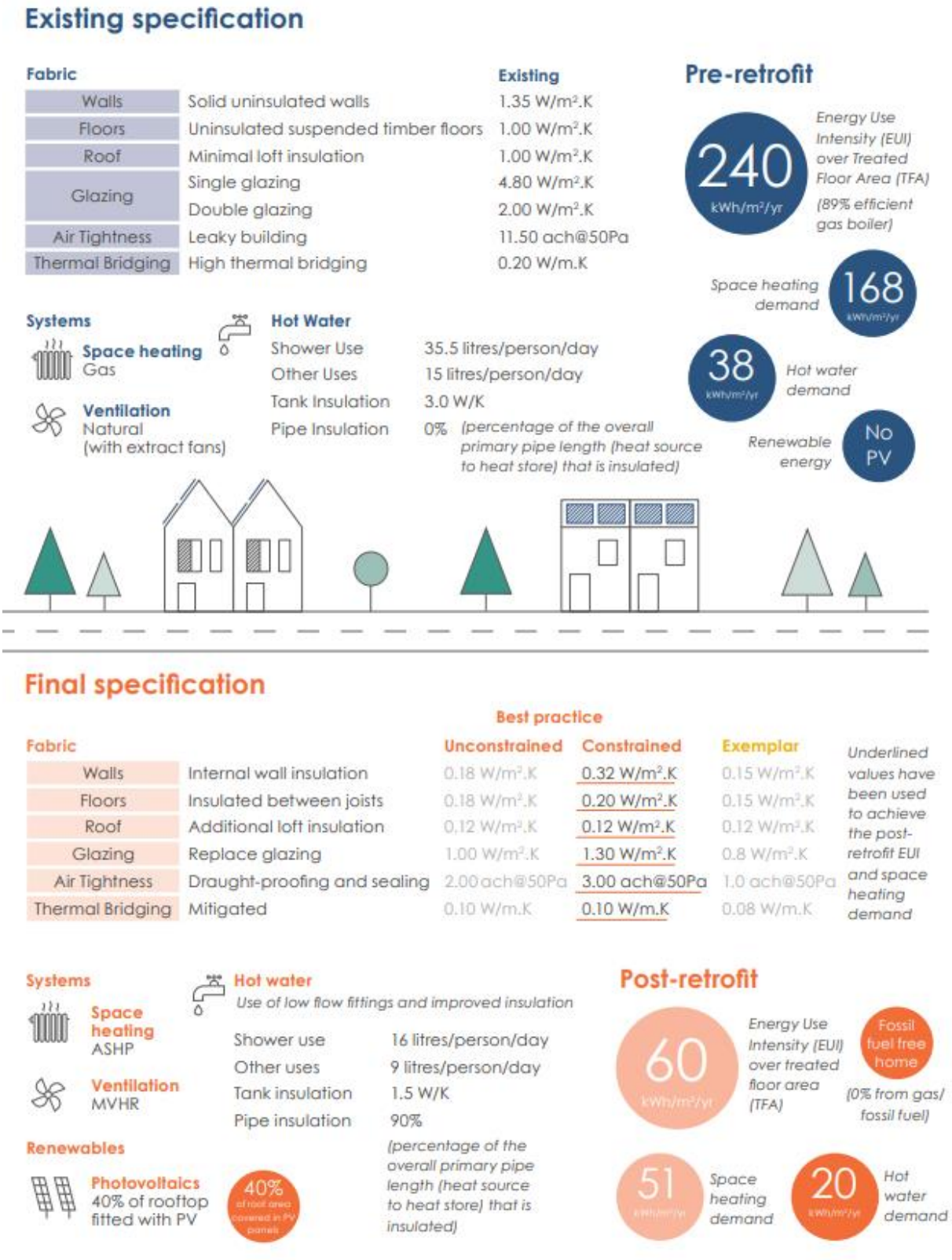
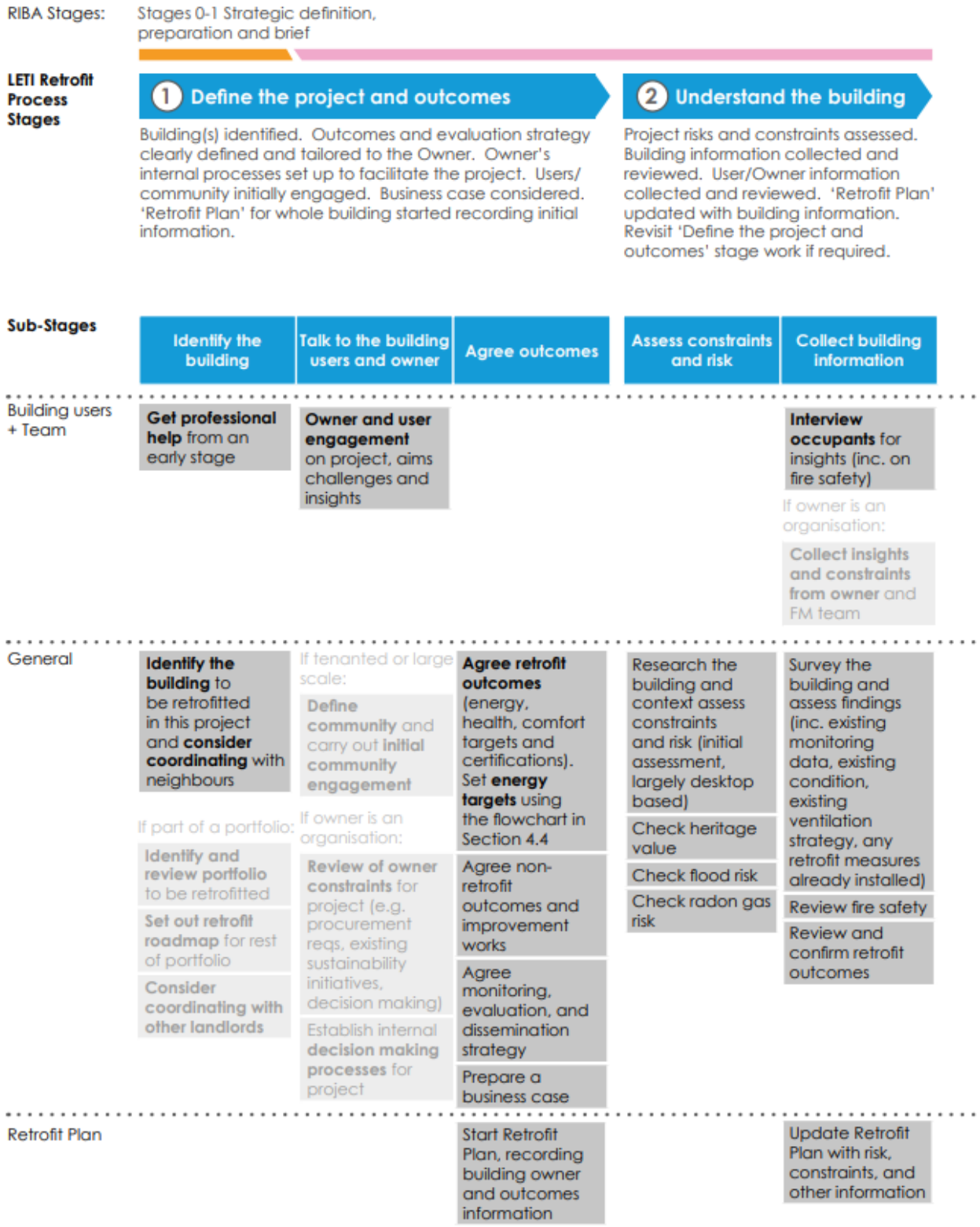


Figure 35. LETI semi-detached housing archetype specification

F - LETI Retrofit Process



Actions in grey show additional actions for certain projects. E.g. if the owner is an organisation or landlord, there is a stock portfolio to retrofit, the project is large or complex.

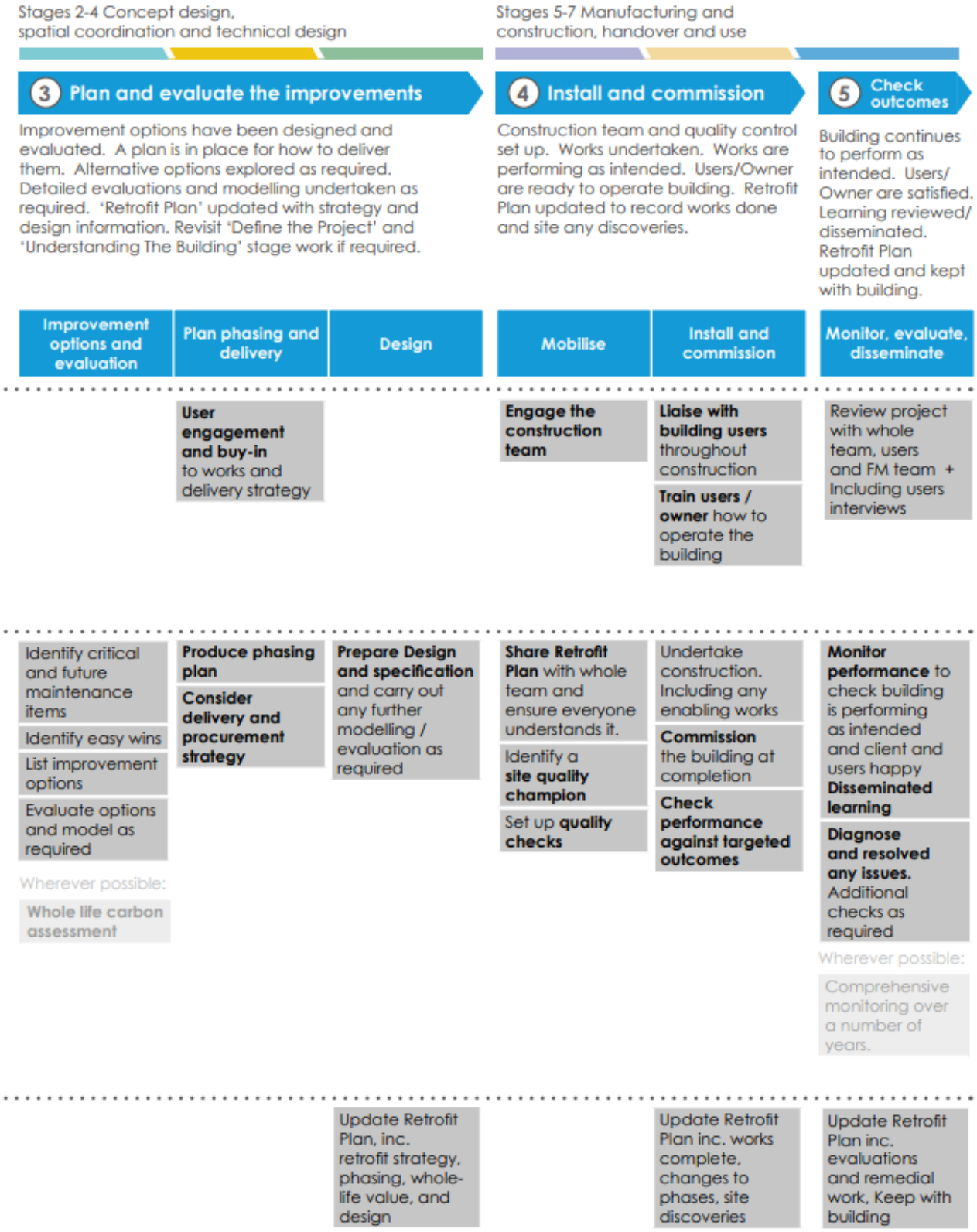


Figure 36. LETI retrofit process diagram

G - Complete List of Proposed Actions

Table 18. Complete list of proposed actions

Code	Action	Lead	Linkages
O-1*	Update Asset Management Plan and develop phased Retrofit Plan.	TBC	H-1, O-2, O-3
O-2*	Roll-out LED lighting and smart meters in all Grŵp Cynefin-operated communal areas.	TBC	O-1
O-3*	Ensuring all appropriate thermal fabric measures are installed in Extra Care Schemes, Supported Housing and Refuges.	TBC	O-1
O-4	Developing on-site renewables on land assets.	TBC	
O-5	Canllaw and Gofal a Thrwsio collectively engage Welsh Government regarding installing renewables on leased office spaces.	TBC	
O-6	Deploy a joined-up controls system across Grŵp Cynefin-operated sites.	TBC	
O-7*	Consider merging Grŵp Cynefin and subsidiary office spaces.	TBC	
O-8*	Joint procurement with other RSLs including sustainability criteria in contracts/ ITTs.	TBC	
O-9	Work with Wildlife Trust to assess estate green spaces for nature-based solutions.	TBC	
F-1*	Collect detailed data on vehicle usage.	TBC	F-6, F-5, F-4, F-2
F-2*	Partner with subsidiaries, other RSLs, public bodies and regional groups to roll-out electric vehicles and chargepoints across the North Wales region.	TBC	F-4, F-1
F-3	Updating travel expenses policy to reward use of EVs.	TBC	F-5
F-4	An EV pool car based at Denbigh and Penygroes could provide an opportunity to test feasibility in a worked example.	TBC	F-2, F-1
F-5	Introduce an EV leasing scheme for staff.	TBC	F-3, F-2, F-1
F-6*	Identify solutions for vans and commercial vehicles.	TBC	F-2, F-1
H-1*	Update Asset Management Plan and develop phased Retrofit Plan.	TBC	O-1, H-2
H-2*	Develop phased heat pump delivery plan.	TBC	H-1
H-3*	Review policy of replacing existing gas boilers with new efficient equivalents.	TBC	H-1
H-4*	Ensure all new builds are being built to a low- or zero-carbon specification, and are future-proofed.	TBC	H-1
H-5*	Complete roll-out of standard thermal fabric improvements in line with Retrofit Plan within broader Asset Management Plan.	TBC	H-1
H-6	Whole house retrofit (combining fabric, heat pumps, solar PV and battery/thermal storage).	TBC	H-1, H-2
H-7*	Develop the Energy Wardens programme.	TBC	E-8
H-8	Capacity building amongst tenant- and user-facing staff.	TBC	
G-1*	Set the Sustainability Strategy as a recurring agenda item for the Board.	Grŵp Cynefin Board	

Code	Action	Lead	Linkages
G-2*	Confirm a Board Champion for sustainability.	Grŵp Cynefin Board	
G-3*	Secure the endorsement and official sign-off of the Strategy by the Board.	Grŵp Cynefin Board	G-9, M-5
G-4	Set the Sustainability Strategy as a recurring agenda item for the Leadership Team.	Leadership Team	
G-5	Within the Leadership Team, establish Sprint Groups of implementation-critical individuals around clusters of complementary actions.	Leadership Team	
G-6	Appoint a Sustainability Manager.	Grŵp Cynefin Board	
G-7	Sustainability impact assessment of all internal policies.	Grŵp Cynefin Board	G-8
G-8	Review and re-alignment of all Grŵp Cynefin Environmental Statements to take account of the Sustainability Strategy.	HSE Manager / Strategy Sponsor	G-7
G-9	Inclusion of Grŵp Cynefin's carbon reduction targets in the Business Plan and Annual Report.	Strategy Sponsor / Grŵp Cynefin Board	G-3, M-5
G-10	Development of new Board report template which integrates sustainability, accompanied by user guidance and training sessions.	Leadership Team	G-11
G-11	All business cases submitted to financial management to be appraised for carbon reduction as well as costs & payback.	Strategy Sponsor / Finance	G-10
G-12	Integrate sustainability criteria into procurement guidelines. E.g. Requiring contractors to track fuel use, declare the number of low or zero emission vehicles which will be used in delivering the service (by number of miles driven), or onboard a local apprentice.	Strategy Sponsor / Finance	
E-1	Develop a sustainability communications plan, with audience-segmented messaging.	Sustainability Manager / Communications	E-4
E-2*	Publish the Sustainability Strategy on the intranet and internet.	Sustainability Manager / Communications	
E-3*	Hold a company-wide 'Sustainability Week' to accompany the Strategy launch.	Strategy Sponsor / Sustainability Manager	
E-4*	Communication & engagement to explain to core elements of the Sustainability Strategy to Grŵp Cynefin stakeholders, including staff, tenants and service users.	Sustainability Manager / Communications	E-1
E-5	Produce a progress summary graphic on an annual basis to share with tenants and service users.	Sustainability Manager / Communications	
E-6	Include a regular energy saving or climate-related column in the Tenant Newsletter as a small but regular touch-point with the agenda for tenants.	Sustainability Manager / Communications	
E-7*	Add Sustainability Strategy as a permanent agenda item across team meetings.	Strategy Sponsor	
E-8	Review Tenant Engagement Strategy, and consider establishing a hybrid (online and in-person) Tenant Hub. This can be a focal point for input when designing specific actions. This should be aligned	Strategy Sponsor / Communications	H-7

Code	Action	Lead	Linkages
	with Community Housing Cymru's Tenant Engagement Community of Practice.		
E-9	Hold semi-regular internal knowledge sharing sessions where recent technologies, projects or approaches are presented and discussed by colleagues.	Sustainability Manager	
E-10	Reach out to local colleges regarding sustainability course offerings and apprenticeship placements.	Sustainability Manager	
E-11	Engage with external suppliers to explore options for collecting data for use in a future carbon footprint, as part of an expansion into including emissions associated with procured goods and services.	Sustainability Manager	
M-1*	Share draft KPIs with other Housing Associations, the North Wales RSL Group and Community Housing Cymru to drive a common aligned approach.	Strategy Sponsor	
M-2	Develop a KPI reporting template for the Board.	Strategy Sponsor	
M-3*	Define a shortlist of realistic 'near-term' goals based on Leadership Team implementation discussion and the outcomes of other actions. These can be revised on an ongoing basis.	Sustainability Manager / Strategy Sponsor	
M-4	Allocate a footprint lead.	Sustainability Manager	
M-5	Increase the organisation's accountability for sustainability by integrating sustainability metrics alongside financial metrics in the annual report.	Grŵp Cynefin Board	G-9, G-3
M-6	Publicly report key ESG metrics to unlock potential additional funding opportunities and position the organisation as a leader.	Grŵp Cynefin Board	
M-7	Integrate Strategy into ISO 14001 or 50001, or explore the Carbon Trust or Green Dragon Standards.	Grŵp Cynefin Board	
M-8	Input the actions into the corporate risk management software already regularly used across the company in order to support monitoring.	Sustainability Manager / Strategy Sponsor	
M-9*	Establish structured progress review format for Management Group and Board meetings.	Strategy Sponsor	
M-10*	Establish a group involving tenants, staff and Board Members to monitor and review the Sustainability Strategy.	Sustainability Manager	
M-11	Codify the data management environment around the Sustainability Strategy. A flow chart which data owners labelled can be a useful resource for other colleagues.	Sustainability Manager	
M-12	Climate-related risks (both in terms of physical and transition risks) as well as Strategy implementation risks to be considered as part of Grŵp Cynefin's existing risk assessment process and risk register.	Grŵp Cynefin Board	

* Denotes priority Key Actions for Year 1 and 2.

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