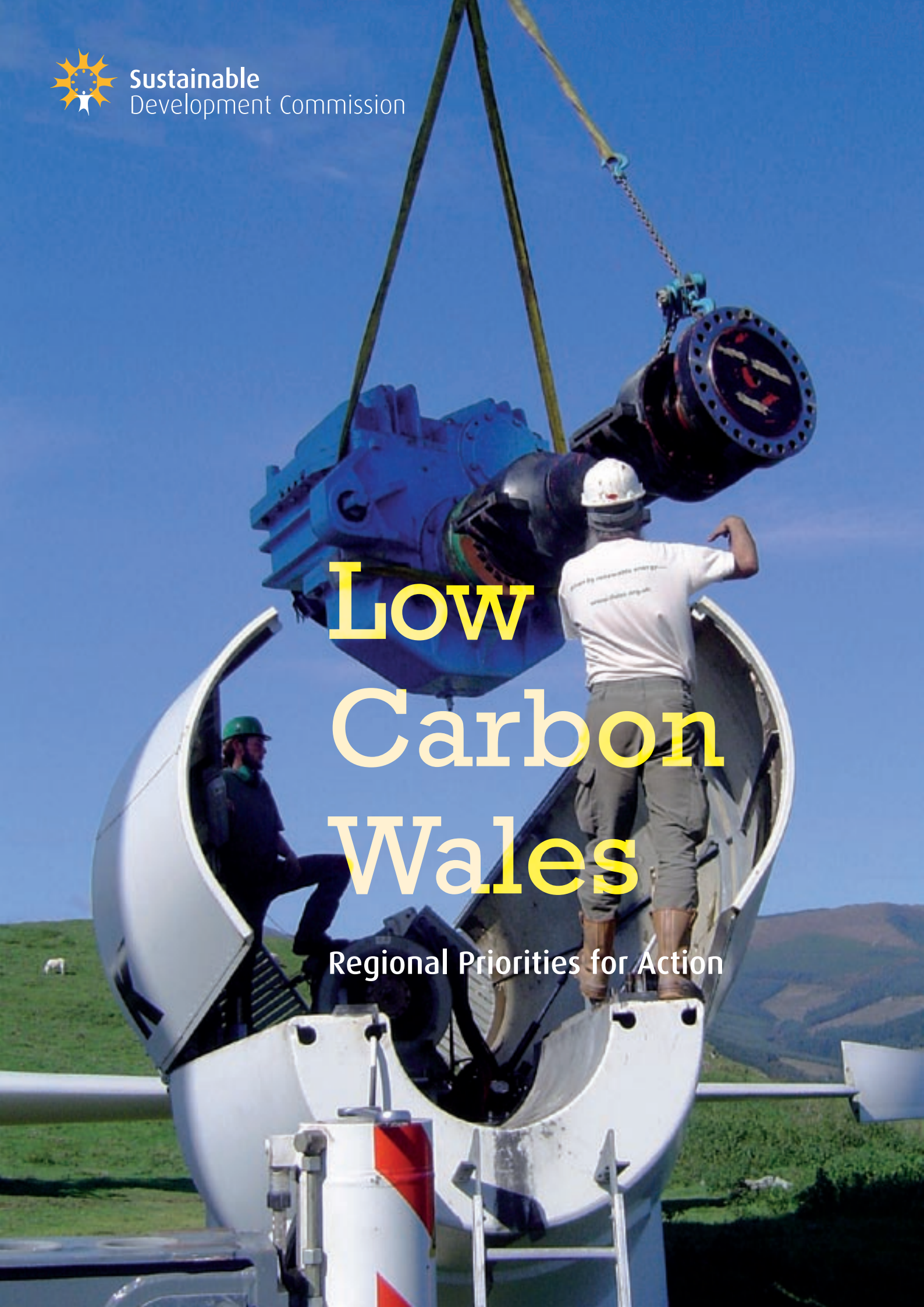




Sustainable
Development Commission

Low Carbon Wales

Regional Priorities for Action



Cover Photo

Lowering the gearbox in to the wind turbine that stands on Mynydd Glandulas. The turbine was installed by **Bro Dyfi Community Renewables**, a community-owned energy co-operative that brings power, income and funding for energy efficiency measures to the people of the Dyfi Valley.

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Low Carbon Wales

Regional Priorities for Action



Sustainable
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Prepared by

Gavin Bunting, Anna Kaye Jones, Hayley Richards, Stephen Brooks.

Foreword

The Sustainable Development Commission in Wales has been very pleased to be able to work with the Welsh Assembly Government's Wales Spatial Plan team on this transition to low carbon strategy.

The Wales Spatial Plan has a key role to play in our vision of a sustainable Wales, as set out in the new Welsh Assembly Government's One Wales One Planet sustainable development scheme.

Sustainable development is essentially about how we live our lives – how we work, eat, play and contribute to our communities. Currently our lifestyles take up an unsustainable 2.7 planets' worth of the earth's resources and generate vast amounts of carbon emissions that are causing dangerous climate change. The transition to low carbon living is now urgent if we are to avoid the worst case climate change scenarios. Yet the lack of immediate impacts and the deferred nature of the results of our lifestyles make this a challenging transition.

The challenge of transition must focus on enabling improved quality of life in our communities through making a low carbon lifestyle "citizen easy". Not all quality of life issues apply at the same spatial level and we need to apply appropriate policies that enable low carbon lifestyles at community council, local authority, national, UK, EU and international levels.

The Spatial Plan approach however recognises that we do not live our lives within administrative

boundaries nor do we exist within one sector of society. Our lives cross local authority boundaries and our roles change in our jobs, families and communities. For those like me who live in Pembrokeshire, we recognise the importance of Carmarthen as a key cross-boundary settlement even though it is beyond the administrative county boundary. What is the vision for such cross-boundary places in a low carbon future?

The Wales Spatial Plan approach recognises this dimension and provides a critical cross boundary/cross sector forum for planning a sustainable future. It recognises the key patterns of development in the regions of Wales, the roles of private, public and voluntary sectors in shaping the future. International and domestic experience of sustainable development has shown that empowering local people, local government and the private sector is a core part of any delivery strategy.

This report aims to enable those partners to develop a transition to low carbon strategy for their regions. The process has been a stimulus for action and has brought together resources and examples of action that may help partners chart a course for transition.

Peter Davies

Vice Chair and Commissioner for Wales,
Sustainable Development Commission, November 2009

The Sustainable Development Commission

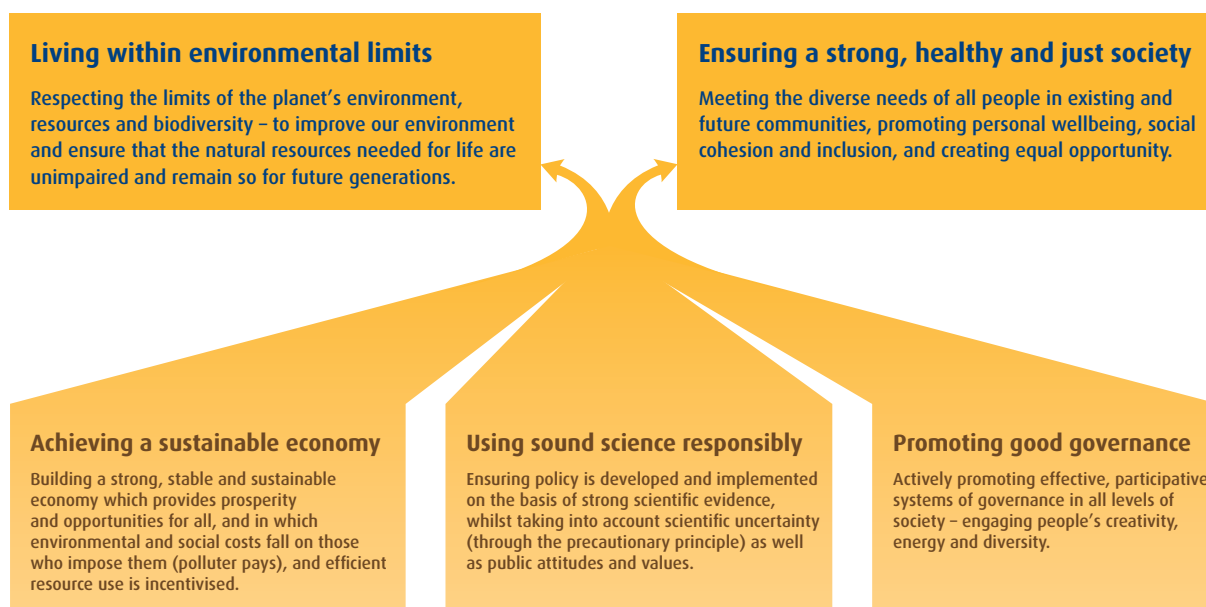
The Sustainable Development Commission is the UK government's independent adviser on sustainable development, reporting to the Prime Minister, the First Ministers of Scotland and Wales and the First Minister and Deputy First Minister of Northern Ireland. In Wales, the Sustainable Development Commission works to:

- Draw together expert opinion to provide independent advice to ministers, policy-makers and other stakeholders
- Provide an independent assessment of the Welsh Assembly Government's performance and progress on sustainable development.
- Help the Welsh Assembly Government to improve its departments' performance, understanding and internal capacity to deliver sustainable development; and

The Sustainable Development Approach

The UK Government, Welsh Assembly Government, other devolved administrations and the Sustainable Development Commission have agreed a common approach to assessing whether a policy is sustainable. This approach is based on five principles which offer a definition of sustainable development, as illustrated below.

The five principles of sustainable development¹



The goal of sustainable development is to 'enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations'. Unless progress is made toward reconciling the perceived contradictions

of environmental limits, quality of life today, and quality of life tomorrow, our future will be less certain and less secure. It is therefore in our own long-term interest to make sustainable development our way of doing business, underpinning everything we do. Sustainable development cannot occur

through trading off one principle against another. However, decision-makers need to think more comprehensively about the long term, positive and lasting gains of particular projects or programmes and not just about the short term financial costs.²

In an economic downturn, with increased constraints on public finances, 'long-termism' has never been more important: sound financial planning requires a long-term approach.

Sustainable development has been at the heart of Welsh Assembly Government thinking since

devolution. The Welsh Assembly Government was one of the first administrations in the world to have a legal duty to promote sustainable development. To meet this statutory obligation, the Welsh Assembly Government is required to publish a sustainable development scheme – an overarching policy framework providing a vision of a sustainable Wales and details on action to be taken to deliver sustainable development as a strategic aim of all Welsh Assembly Government policies and programmes, across every ministerial portfolio.³

The Wales Spatial Plan

The National Assembly for Wales originally adopted the Wales Spatial Plan, *People, Places, Futures* in November 2004 as one of its 'high-level strategic building blocks', supporting its programme of government (since 2007, the 'One Wales' agreement) and its sustainable development scheme and action plan. The Wales Spatial Plan remains one of the key delivery mechanisms for the Welsh Assembly Government's statutory duty to promote sustainable development.

Like many developed nations, Wales is living way beyond its environmental limits. If every nation on earth were to use the proportion of resources Wales does, humanity would need three planets' worth of resources simply to sustain itself. Climate change is just one stark and urgent symptom of this unsustainable development.

The Wales Spatial Plan has an important role to play in the nation's efforts to mitigate climate change and adapt to its inevitable consequences. It is important to recognise that the investment and other activities needed to cope with the challenges of climate change also present opportunities to make progress on a range of other policy objectives, from economic development and employment to regeneration, skills improvement and meeting affordable housing needs. Effective deployment of the Wales Spatial Plan is essential to ensure that these opportunities are identified and pursued.

The Wales Spatial Plan 2008 update *People, Places, Futures* continues to be a strategic framework for the development of Wales over the next 20 years. Its purpose is:

To ensure that what is done in the public, private and third sectors in Wales is integrated and sustainable, and that actions within an area support each other and jointly move towards a shared vision for Wales and for the different parts of Wales.

It achieves this through collaborative working and the vertical and horizontal integration of policies nationally and regionally. It sets out cross-cutting national spatial priorities. These provide the context for the application of national and regional policies for specific sectors, such as health, education, housing and the economy, reflecting the distinctive characteristics of different sub-regions of Wales and their cross-border relationships. It identifies six sub-regions in Wales without defining hard boundaries, reflecting the different linkages involved in daily activities. In each of these Areas, local authorities, the private and third sectors, and the Welsh Assembly Government and its agencies are working together in Spatial Plan Area Groups to achieve the strategic vision for that area. These agreed visions and the actions required to achieve them set out an important regional context, both for citizen-centred service delivery and land use.⁴

The six Spatial Plan Areas (regions) of Wales are:

Central Wales

North East Wales – Border and Coast

North West Wales – Eryri a Môn

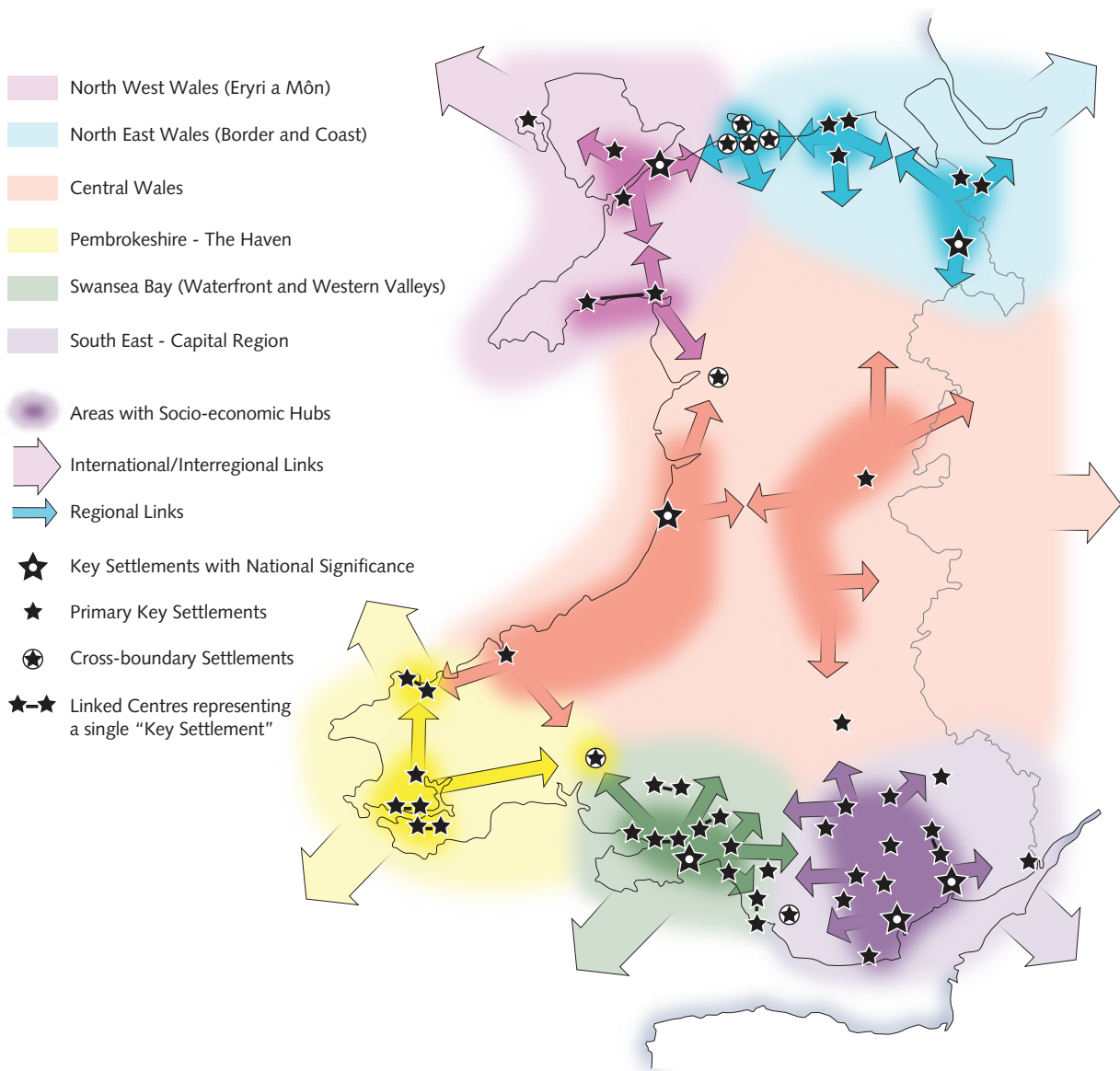
Pembrokeshire – The Haven

South East Wales – Capital Region

Swansea Bay – Waterfront and Western Valleys

Each Spatial Plan Area Group produces and works to an **Area Delivery Framework** which sets out priority outcomes and actions for the Area, and the partnerships required to deliver them.

Wales Spatial Plan Areas⁵



Executive Summary

The Wales Spatial Plan (WSP), as one of the Welsh Assembly Government's 'high-level strategic building blocks', supporting the delivery of the 'One Wales' agreement and the sustainable development scheme and action plan, has a key role to play in the transition to a low carbon Wales. Successfully utilising the cross boundary/cross sector forum provided by the WSP and its Area Groups will be key to the ability of each region of Wales to play its part in meeting government targets for emission reductions. In recognition of this, the Wales Spatial Plan Update 2008 set out that each Area Group will 'develop practical plans to move towards becoming a low-carbon region.'

This report serves two functions – it sets out the

process through which the WSP and its Groups can serve as a vehicle for transition; and it provides background information and suggestions to enable each region to select carbon reduction priorities for action.

Chapter 1 describes the importance of the Wales Spatial Plan in enabling the 'low carbon transition' in Wales. The existing Spatial Plan framework and delivery structure present significant opportunities for action on emission reductions. The framework has five operational functions which have been used to inform the recommendations for action within this report to ensure WSP Groups centrally and regionally are well placed to deliver.

Towards Low Carbon – A Framework for Action

Designed to fit with the established WSP framework, Chapter 2 sets out the Sustainable Development Commission's (SDC) definition of a Low Carbon Region in Wales and a two-phase systematic and consistent approach for the WSP Groups to follow to put the regions of Wales on a path 'Towards Low Carbon'.

"A Low Carbon Region can be defined as a Region which has cut its CO₂ emissions by 80% against a 1990 baseline."

The first 'Towards Low Carbon' phase – the Preparatory Phase – includes the establishment of a network of stakeholders and a dedicated Low Carbon Working Group to coordinate and drive emissions reductions whilst ensuring that the existing delivery mechanisms, policies and projects of each WSP Area – and indeed the messages in the Wales Spatial Plan as a whole – are compatible with a low carbon future. This also includes producing a low carbon vision for the region where low carbon lifestyles are possible through the infrastructure and services provided, and aligning the regions' Area Delivery Frameworks with a low carbon future.

The subsequent Delivery Phase requires the network of stakeholders to take ownership of the development and delivery of low carbon initiatives within their region.

This includes:

- Maintaining a strategic overview of low carbon activity within the region to guide and coordinate projects, identify gaps, opportunities, synergies and potential for collaborative working
- Advocating the need to embed the target of becoming a Low Carbon Region into all relevant strategies
- Sharing and scaling up best practice
- Identifying and developing new carbon reduction activities within each region
- Engaging with Wales wide initiatives to ensure local and Regional issues are addressed
- Partnership(s) with other regions in the UK and EU with similar characteristics that enable learning to be shared and fast and effective knowledge transfer
- Developing a target setting, monitoring and review process.

Importantly, each of the Low Carbon Working Groups will take the lead in the development, coordination and delivery of a low carbon strategy.

All-Wales Low Carbon Solutions

Supporting the selection and development of new carbon reduction activities within each region, Chapter 3 recommends that each Low Carbon Working Group should give early consideration to eight sectoral actions. These are:

- 1 Developing and implementing a programme of action for the refurbishment of all existing housing stock within the region
- 2 Significantly increasing the region's energy generation capacity from community and large scale renewables
- 3 Providing the infrastructure and information needed to enable smarter choices
- 4 Significantly increasing the use of low carbon transport fuels and electric vehicles
- 5 Identifying and implementing a programme of action to protect all significant soil carbon stores
- 6 Implementing a programme of measures to enable and significantly increase community and individual food growing
- 7 Identifying sites for and developing anaerobic digestion facilities linked to significant sources of biomass waste
- 8 Significantly progressing sustainable production and consumption for waste prevention and minimisation.

For each region, **developing its potential to generate low carbon electricity** to feed into the national grid, and contribute to a low carbon UK will be a key element of transition. It is recommended that Low Carbon Working Groups work with renewable energy developers, communities and landowners to ensure renewable energy projects are developed according to sustainable development principles, whilst ensuring community benefit.

This chapter also identifies some crucial mechanisms for delivery of the carbon reduction actions, cutting across all sectors. These include using public sector procurement as a tool to help drive and establish markets for the products and services required to become a Low Carbon Region; ensure land use planning delivers on carbon reduction objectives such as green urban infrastructure, the co-location of homes, jobs and services; and adopting a zoned/ area based approach when seeking to implement measures to reduce emissions.

Making a Start in the Regions

Informed by dialogue with regional stakeholders and regional characteristics, Chapter 4 suggests priority actions for each region. These include recommendations which recognise each individual region's carbon reduction strengths such as:

- Central Wales – maximising renewable energy production and protecting the Region's significant soil carbon stores
- North East Wales Border and Coast – improving energy efficiency within homes, businesses and industry given the high population densities and significant industrial and manufacturing employment base
- North West Wales Eryri a Môn – protecting soil carbon stores and utilising the Region's significant tidal current and wind resource for renewable energy
- Pembrokeshire the Haven – development of the Region's three strategic hubs to provide low carbon infrastructure and services, and building on the opportunities provided by the LNG terminal to enable the diversification of the economy towards the sustainable technologies sector
- South East Wales Capital Region – tackling transport emissions and ensuring economic development plans associated with potential tidal power technologies in the Severn Estuary adhere to sustainability principles and enable the transition to a low carbon future
- Swansea Bay Waterfront and Western Valleys – further developing the Region's knowledge economy through a focus on low carbon skills and technologies.

To summarise, the SDC believes that WSP and its Area Groups have a crucial role to play in the transition to low carbon in Wales. The WSP is a mechanism to not only provide the infrastructure and services needed to enable low carbon lifestyles across administrative boundaries, but also to convene key stakeholders for action across sectors. This report provides tools and guidance to support the WSP Groups and their network of stakeholders to realise this potential, and recommends a framework to facilitate the journey towards a low carbon Wales.

Resource Bank

A technical annex, downloadable from the SDC website

A Resource Bank underpins the guidance set out in the main body of this report and provides a source of reference material to inform the work of the WSP Area Groups as they establish their strategies for the transition to low carbon. Based on extensive desk research and expert contributions from both wider stakeholders and across the SDC, the Resource Bank contains detailed information on low carbon solutions, case studies, tips for replication and pointers

to further sources of information in the built environment and energy, transport, rural land use and food and waste sectors. Various mechanisms are suggested for progressing or delivering solutions at a regional level, and possible measures of success are also listed. These measures may be used as indicators as part of the monitoring process for regional low carbon strategies.

1 Introduction

1.1 This Report

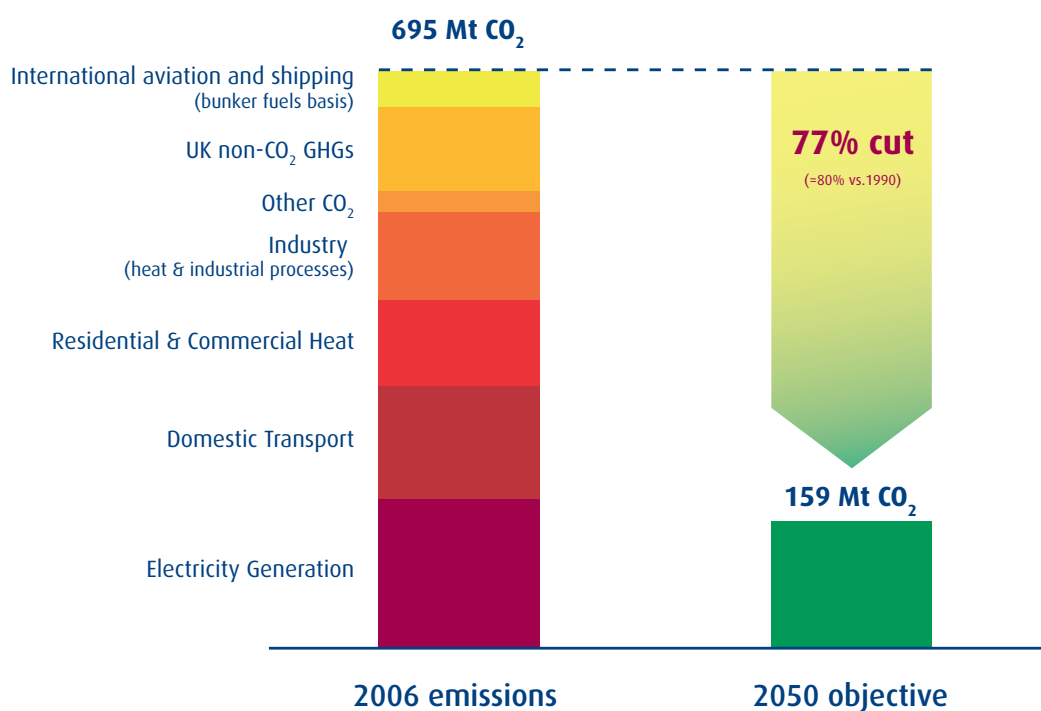
Climate change poses a real and significant threat to the people, places and future of Wales, but it also presents opportunities. Having been at the forefront of the first industrial revolution, Wales – with the right investment and appropriate action – can be in the vanguard of the next revolution – the transition to a low carbon economy. This report outlines a process for moving towards ‘low carbon Wales’, focusing on the actions that can be taken in different localities, according to their particular challenges and strengths. It has been prepared by the Sustainable Development Commission (SDC) in response to the commitment in the Wales Spatial Plan (WSP) 2008 Update that “each Area Group will develop practical plans to move towards becoming a Low-Carbon Region”.⁶ The rest of this chapter outlines the challenge of climate change, the current policy context and the role of the Wales Spatial Plan in framing the transition to low carbon across Wales.

1.2 Climate Change – the Science

Over the last one hundred years average global surface temperatures have reportedly increased by 0.74°C, whilst global sea levels have risen at an average rate of 1.8mm a year from 1961 to 2003. In its fourth assessment report, the Intergovernmental Panel on Climate Change stated that ‘most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas (GHG) concentrations’.⁷

UK Climate Projections 2009⁸ is the latest set of climate change projections for the UK. Amongst the climate changes projected for Wales by 2050 are an average increase in annual temperatures of 2.3°C, an average increase in winter rainfall of 14 per cent, an average decrease in summer rainfall of 16 per cent and a projected sea level rise of approximately 20cm around Wales.⁹ Reducing our GHG emissions now will reduce the rate and magnitude of climate change. Figure 1.1 graphically illustrates the size of the task.

Figure 1.1 The scale of the challenge in reducing UK GHG emissions by 80 per cent against a 1990 baseline.¹⁰



1.3 Climate Change – the Policy Imperative

In response to the now irrefutable scientific evidence, there have been significant developments in policy and legislation at European, UK and Welsh Assembly Government levels, all impacting upon the work of Wales Spatial Plan teams.

The European Union's climate action and renewable energy package commits the EU to reducing overall emissions to at least 20 per cent below 1990 levels by 2020. The UK government has gone beyond EU targets in passing the 2008 UK Climate Change Act – the world's first long term legally binding framework to tackle climate change. The Act introduces legally binding targets to reduce carbon dioxide (CO₂) emissions by 26 per cent by 2020 and GHG emissions by 80 per cent by 2050 against a 1990 baseline. It also establishes a system of five-yearly carbon budgets as a key mechanism for implementation.

In July 2009 the UK Government published its *Low Carbon Transition Plan*, a draft national strategy for climate change and energy, which sets out how the UK Government will meet its statutory targets. This is one of a suite of documents, including a *Renewable Energy Strategy*, *Low Carbon Industrial Strategy*, *Low Carbon Transport – A Greener Future*, the *UK Low Carbon Transition Plan Emissions Projections*, a consultation on *Renewable Electricity Financial Incentives* and a response to the Phase 1 consultation on the Severn Tidal Power published on the same day.¹¹

These documents reinforce the importance of a spatial approach to low carbon transition, for example, the *Low Carbon Industrial Strategy* states that 'each nation, region and locality has a particular set of low carbon challenges and capabilities of its own. Understanding these is critical to effective policy delivery'.¹²

These recent policy initiatives will have implications for work in Wales. For the moment the Welsh Assembly Government is in dialogue with the UK Government on how reserved and devolved

matters contained within the UK Low Carbon Transition Plan are to be implemented. Using its devolved powers the Welsh Assembly Government has already set a number of demanding targets which will contribute to delivery of the overall requirements for the UK. They include:

- reductions in carbon emissions of three per cent per year in areas of devolved competence from 2011
- living within our 'fair share' of the earth's resources within a generation (so called 'One Planet living')
- self sufficiency in renewable electricity within 20 years
- all new buildings in Wales to be zero carbon in use from 2011; and
- 70 per cent of all municipal waste to be recycled by 2025.

The Welsh Assembly Government's Climate Change Strategy – *Programme of Action* consultation establishes a vision of a sustainable, low-carbon Wales. It also details existing and new initiatives designed to reduce emissions and adapt to unavoidable change across a range of policy areas, including transport, economy and business, housing and residential energy, agriculture and land management and waste. The *Programme of Action* also stresses the importance of leadership and the exemplar role that public sector organisations can play.

Successful implementation of these initiatives across Wales requires collaborative action on the part of the public, private and third sectors, at every level and across geographic, sectoral and organisational boundaries. The Wales Spatial Plan provides a powerful framework for the collaborative and integrated effort needed to meet policy targets and ensure compliance with the requirements of legislation.

1.4 The Role of the Wales Spatial Plan in the Low Carbon Transition

Whilst the low carbon transition must be driven through collaboration across Assembly Government departments, the WSP has a key role to play given its remit for the sustainable development of services, land use and investment. The existing Spatial Plan

framework and delivery structure present significant opportunities for action on emission reductions. The framework has five operational functions which have been used to inform the recommendations for action within this report to ensure WSP Groups centrally

and regionally are well placed to deliver. Each of the five functions can be used to demonstrate how the Wales Spatial Plan can progress the transition to low carbon:

1 Produces evidence: Uses a broad range of evidence to understand the different needs of different people and places, and to inform policy.

Commissioning research, gathering research from independent sources and utilising statistical information from the Welsh Assembly will all be necessary to ensure transition to low carbon grounded in sound science. Collating soil carbon maps and commissioning renewable energy resource maps are amongst the evidence requirements for low carbon spatial planning.

2 Shapes policy: Ensures government policies are sensitive to place, and responsive to the needs of citizens, communities and businesses in different parts of Wales.

The Wales Spatial Plan plays an important role as a conduit between the national and local level. It provides a mechanism to disseminate Welsh Assembly Government policy to the regions, helping coordinate action to deliver on policy objectives. It also provides a process to deliver feedback on actions and issues to the Welsh Assembly Government. The WSP should have a strategic overview of low carbon activity within the regions, enabling informed advice to the Welsh Assembly Government. This process can help inform Welsh Assembly Government policy, and ensure that investment is aligned to the services and places where it is needed the most. SDC believes that this function should also be more widely used in relation to seeking regional views on the climate change related policy.

3 Ensures better engagement and governance: Provides a framework within which public, private and third sector service providers can work together to prioritise action and design optimum solutions.

Many measures to reduce emissions will require cross boundary, and cross portfolio working, to ensure successful delivery. The WSP is uniquely placed to facilitate this process as not only is it able to take a strategic view,

(identifying gaps and opportunities), but it also possess the ability to convene the relevant decision makers in the regions to make collaborative working a reality.

This convening power of the Spatial Plan is a significant tool to enable coordinated action on issues such as climate change. The WSP does not necessarily provide the tools to take action; rather it can bring the “right people” together. These are the key influencers and decision makers from the public, private and third sectors, who can collaborate and solve the problems facing the regions. This approach could support a coordination of effort, limiting duplication, and combining resources, so that delivery is stronger and more effective than could be achieved by any of the organisations represented acting alone.

4 Informs plans: Ensures that the plans through which solutions are delivered, have regard to regional and national spatial priorities.

Through its role in informing plans the WSP and its Area Groups can embed the target of becoming a Low Carbon Region into all relevant strategies in the region, and identify synergies between strategies. Area Groups can facilitate Local Authority Local Development Plans and Local Service Boards’ local delivery agreements, taking account of the WSP. Area Groups can play a vital co-ordination role between regional strategies and plans, within and across sectors to avoid duplication of effort and resource use.

5 Aligns investment: Ensures public investment is made in the places and services where it is most needed.

As alluded to above, with their unique strategic overview, it is possible that the WSP Area Groups could advise upon the prioritisation of resources between various local plans and actions, in order to make the most progress towards becoming a Low Carbon Region. The WSP structures have an important role to play in helping to identify relevant funding. Through the ability to feed back issues to the Welsh Assembly Government, they can help align national investment towards regional low carbon services and infrastructure, and away from short-lived, high carbon services and infrastructure.

The Importance of Addressing Climate Change at a Regional Level

The regional approach to delivery provided by the WSP is crucial to enable low carbon lifestyles. People live their lives and access services across administrative boundaries. For example 75,000 people commute every day into Cardiff city from surrounding local authorities.¹³ As a result, housing development in a neighbouring local authority

will impact upon transport requirements within Cardiff City centre. The transition to low carbon will therefore need to enable the integration of infrastructure and services at a regional level. The Spatial Plan can play a crucial role here in facilitating and coordinating this cross boundary collaborative working and investment.

SDC's Observations

As highlighted above, the WSP framework provides a strong base to allow it to progress the transition to low carbon. SDC's dialogue with stakeholders has however, highlighted where there is some room for improvement in the WSP process. Firstly, it was highlighted that **each WSP Area Group should consider and clarify the role of their identified primary key settlements, hubs and cross boundary settlements (all definitions of places used in the WSP) in providing the services and infrastructure for their region in the transition to low carbon.**

Secondly, there appeared to be a varied amount of strategic engagement by important stakeholders in the Wales Spatial Plan process. A prominent example is the preparation of some local authorities' Local Development Plans in isolation to the WSP process. As highlighted above, the WSP can play a central role in coordinating relevant strategies in the regions. Therefore the SDC believes that there **needs to be a dialogue between relevant departments within the Assembly Government and local authorities on how the Spatial Plan can further fulfil this essential strategic, coordinating role.**

The Role of the Wales Spatial Plan – Key Actions

WSP Central Team and Area Groups:

- Maintain a strategic overview of low carbon activity within the regions, enabling informed feedback to the Welsh Assembly Government.
- Work with relevant Assembly Government departments to seek regional views on climate change related policy.

WSP Central Team

- Initiate a dialogue between relevant departments within the Assembly Government and local authorities on how the Spatial Plan can further fulfil its essential strategic, coordinating role.

WSP Area Groups:

- Each WSP Area Group should consider and clarify the role of their identified primary key settlements, hubs and cross boundary settlements (all terminologies used in the WSP) in providing the services and infrastructure for their Region in the transition to low carbon.

1.5 The Structure of this Report

The WSP 2008 Update provided a commitment that “each Area Group will develop practical plans to move towards becoming a Low-Carbon Region.” This report provides guidance to support this action planning.

Chapter 2, which follows, provides a working definition of a Low Carbon Region and outlines the steps needed to set the different Spatial Plan regions of Wales on a path towards low carbon. It will be essential to construct and implement a low carbon strategy/strategic plan of action for each region, ‘carbon proofing’ the existing Area Delivery Frameworks as part of this process. As well as providing a two phased approach for this activity, the report suggests initial priorities for action which Area Groups can consider as they develop their strategies. **Chapter 3** gives an overview of actions which need to be considered across the whole of Wales, identifying measures which are particularly appropriate for rural or for urban areas, highlighting actions relevant for different sectors and pointing to some essential cross-cutting mechanisms for delivery. **Chapter 4** identifies some specific priorities for each of the six Wales Spatial Plan regions, based on both SDC’s research and the informed opinion of participants at a series of regional workshops held during the preparation of this report. **Chapter 5** summarises the recommendations within the report and highlights proposals for taking this work forward.

1.6 The Definition of a Low Carbon Region

The SDC defines a Low Carbon Region of Wales as one which has cut its CO₂ emissions by 80 per cent against a 1990 baseline. This definition was informed by a consultation with stakeholders including expert members from across the UK of the SDC’s SD Panel, and with board members, staff and the Transformation Nation Partners of Cynnal Cymru – Sustain Wales.¹⁴ They were specifically asked: ‘When can a region say that it is on track to become a Low Carbon Region?’ and ‘When can a region call itself a Low Carbon Region?’.

“A Low Carbon Region can be defined as a Region which has cut its CO₂ emissions by 80% against a 1990 baseline.”

Supporting **Appendices** set out the methodology for this study and provide a record of the consultations and research undertaken, including a summary of the regional workshops in Appendix A.

A **Resource Bank** underpins the guidance set out in the main body of this report and provides a source of reference material to inform the work of the WSP Area Groups as they establish their strategies for the transition to low carbon.

Based on extensive desk research and inputs from across the SDC, the Resource Bank contains detailed information on policy, low carbon solutions, case studies, tips for replication and pointers to further sources of information in the built environment and energy, transport, rural land use and food and waste sectors. Various mechanisms are suggested for progressing or delivering solutions at a regional level, and possible measures of success are also listed. These measures may be used as indicators as part of the monitoring process for regional low carbon strategies.

Whilst carrying out the research for this report there have been rapid developments in policy and legislation along with many low carbon initiatives now being undertaken – not only elsewhere in the UK but also across Europe and internationally – to tackle climate change. Practitioners in Wales are not alone in searching for solutions appropriate to their localities and regions. In this fast-moving field this report cannot be comprehensive, but we hope it will support steps in the right direction.

This definition maintains consistency with the UK Climate Change Act and ensures clarity of message to organisations and individuals tasked with action within the WSP Areas. The target date of 2050 has been omitted from the definition so as to reflect concerns that providing a rigid ‘end-point’ might restrict or inhibit rapid progress. However, it is implicit that each Area must become a Low Carbon Region by 2050.

A WSP Area cannot be designated as a Low Carbon Region until this target has been met, thus recognising the significant progress needed to achieve this status. Prior to this, the Areas working towards the target should be described as being, on a path ‘Towards Low Carbon’. Chapter 2 sets out what this means in practice for the Spatial Plan Areas of Wales.

References for Chapter 1

- 1 Sustainable Development Commission (Undated) www.sd-commission.org.uk/pages/our-principles.html
- 2 Sustainable Development Commission (2008) Local Decision Making and Sustainable Development. www.sd-commission.org.uk/publications/downloads/SDC_Localgov_SD_report.pdf
- 3 Welsh Assembly Government (2009) *One Wales: One Planet* The Sustainable Development Scheme of the Welsh Assembly Government. <http://wales.gov.uk/topics/sustainabledevelopment/publications/onewalesoneplanet/;jsessionid=HLsKGDkpvCfCm2tcjb95zhjBCpvDw65gvf81Td2RjX1sSvXj6yB!1922798813?lang=en>
- 4 Welsh Assembly Government (2008) *People, Places, Futures – The Wales Spatial Plan 2008*. <http://wales.gov.uk/location/spatial/documents/wsp2008update/?lang=en> p 3-4.
- 5 Welsh Assembly Government (2008) *People, Places, Futures – The Wales Spatial Plan 2008*. Reproduced under the terms of the Click-Use Licence.
- 6 Welsh Assembly Government (2008) *People, Places, Futures – The Wales Spatial Plan 2008*. <http://wales.gov.uk/location/spatial/documents/wsp2008update/?lang=en> p 28.
- 7 Intergovernmental Panel on Climate Change (2007) *Climate Change 2007: Synthesis Report*. An Assessment of the Intergovernmental Panel on Climate Change. www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf
- 8 UK Climate Change Projections (2009) <http://ukcp09.defra.gov.uk/>
- 9 Welsh Assembly Government (2009) UKCP09 Key Messages and Findings for Wales. http://wales.gov.uk/topics/environmentcountryside/climate_change/tacklingchange/strategy/adaptation/scenarios/;jsessionid=J5YyKD7bMTBrcSRjThLP55QpLNxjnlPqLmdT8kjdvvflrH9HY9v!1981341735?lang=en
- 10 Committee on Climate Change (2008) *Building a low-carbon economy – the UK’s contribution to tackling climate change*. www.theccc.org.uk/pdf/TSO-ClimateChange.pdf Reproduced under the terms of the Click-Use Licence.
- 11 See www.decc.gov.uk/en/content/cms/publications/lc_trans_plan/lc_trans_plan.aspx
- 12 Department for Business, Innovation and Skills and the Department of Energy and Climate Change (2009) The UK Low Carbon Industrial Strategy. www.berr.gov.uk/whatwedo/sectors/lowcarbon/lowcarbonstrategy/page50105.html p 51.
- 13 Cardiff Council (2009) The Welsh Assembly Government’s *Sustainable Travel City Initiative: A Proposal for the Capital Region*.
- 14 Cynnal Cymru-Sustain Wales is an independent, not-for-profit organisation that promotes sustainable development and provides practical information to help people live sustainably. www.sustainwales.com/home/en/default.aspx



Towards Low Carbon Regions: a Framework for Action

Dyffryn Trannon school has been fitted with solar photovoltaic panels, which generate up to 6400kWh of electricity and save 2688kg of CO₂ a year.

The installation has also become part of the curriculum; a visual display in the reception shows pupils how much electricity has been generated and carbon dioxide saved.

Photo: Dulas

2.1 Aims of this Chapter

Every region of Wales needs to play its part in meeting the challenging targets set by governments for the low carbon transition. Within the broader framework of the Wales Spatial Plan, each WSP Area needs to determine how the Area will be managed and what action will be taken, given its particular challenges and strengths. To enable the WSP Area Groups to take a systematic and consistent approach to this work the SDC has developed a definition of a Low Carbon Region and, in consultation with the Welsh Assembly Government and the WSP Area Groups, a phased approach for putting the different regions of Wales on a path '**Towards Low Carbon**'.

2.2 A Two-Phase Approach

The phased approach described in this section has been developed and tailored according to the operational strengths of the WSP and is consistent with the five-part Wales Spatial Plan framework noted earlier. It has been informed by the series of regional workshops, along with ongoing discussions with the WSP team and wider stakeholders. Importantly it capitalises upon the ability of the existing Area Groups to bring appropriate stakeholders together.

In many of the actions the role of the Area Groups is one of facilitation and coordination: to ensure that relevant stakeholders take ownership for delivery of actions most suited to their expertise, remit and area of influence.

Two phases of action are envisaged.

The **Preparatory Phase** focuses on the establishment of a network of stakeholders and a dedicated Low Carbon Working Group to coordinate and drive emissions reductions whilst ensuring that the existing delivery mechanisms, policies and projects of each WSP Area – and indeed the messages in the Wales Spatial Plan as a whole – are compatible with a low carbon future.

Each WSP Area already has an Area Group supported by a broader stakeholder partnership. Rather than creating completely new structures we envisage the co-option of additional stakeholders

This chapter describes the approach we recommend. Early sections explain the importance of establishing appropriate stakeholder and working groups and the need for a methodology to assess the 'carbon impact' of activities and developments. It is essential to determine whether current Area Delivery Frameworks are positive or negative for the path towards low carbon. New work needs to be undertaken to map existing low carbon activities and to identify new initiatives. Later sections focus on ways of keeping each Area's activities under 'low carbon' review. Specific actions are set out in each section of the chapter.

whose remits are particularly relevant for the transition to low carbon onto existing partnerships. The Low Carbon Working Group should usually be a sub-group of the existing Area Group, to which additional members with particular expertise (such as representatives of energy agencies) can be co-opted.

During the subsequent **Delivery Phase** the network of stakeholders will take ownership of the development and delivery of low carbon initiatives within their region, with the Low Carbon Working Groups maintaining a strategic overview.

To give the label **Towards Low Carbon** credibility and status, it is recommended that the different Areas of Wales be required to demonstrate significant progress towards reducing emissions on an annual basis. For the moment a consistent methodology for quantifying and monitoring emissions reduction at a spatial level is lacking. It is important to remember, however, that performance monitoring on climate-related measures is already in place for UK local authorities, so that broad assessments for the different WSP Areas could be derived by pooling this more local information. Methodological issues surrounding monitoring are further explored later in this chapter, in Section 2.5.

Low Carbon Strategy Development

Throughout the two phase process it is expected that each of the Low Carbon Working Groups will take responsibility for the development, coordination and delivery of a **low carbon strategy**. This strategy will provide a framework to plan projects and initiatives within each of the Regions, providing stakeholders with a clear direction of travel so that they can play an integral part in delivery. The actions proposed within the two phases will significantly contribute towards

and enable this strategy to be developed.

The wider network of stakeholders will be essential to success. They should be fully engaged in strategy development, and all stakeholders should be asked to sign up to strategy delivery. Carbon reduction strategies already in place in other UK regions provide an ideal source of reference. Some good examples are listed in Appendix B.

Low Carbon Region Strategy

Phase 1

Preparation

- 1 Convening stakeholders
- 2 Establishing a Low Carbon Working Group
- 3 Planning and visioning what infrastructure and services are needed within the region to enable low carbon lives
- 4 Aligning Area Delivery Frameworks with low carbon
- 5 Initiating carbon impact appraisals for all new policies, projects and services
- 6 Mapping programme

Phase 2

Delivery

- 1 Maintaining a strategic overview- guiding and coordinating projects and policy
- 2 Sharing and learning from/scaling up best practice
- 3 Developing new activity, selecting priority actions
- 4 Engaging with Wales-Wide Initiatives
- 5 Selecting an emissions baseline to enable target setting, monitoring and review

2.3 The Preparatory Phase

2.3.1 Convening Stakeholders

The WSP process is uniquely placed to provide a framework for transition to low carbon, acting as a mechanism to convene the relevant stakeholders to enable cross boundary, cross portfolio working. The SDC recommends that Area Groups utilise their existing connections and seek new working relationships to convene a network of low carbon stakeholders. Developing this network should allow for the creation of a core Low Carbon Working Group to take ownership of and guide work, and a supporting pool of interested/advisory and delivery parties, willing to sign up to the delivery of the low carbon strategy for the region.

As is the case with sustainable development work more generally, it is not always possible to rely on traditional approaches to decision-making to bring about the understanding, mandate and mobilisation required amongst stakeholders to address the low carbon transition.

Effective engagement of stakeholders in the formulation and delivery of the low carbon strategy

will be crucial for success. 'Engagement' here means a 'real commitment to a deliberative process', involving key stakeholders on their own terms in the changes each region is planning to make, rather than simply giving them information on what is happening.

Effective engagement will help to ensure that the WSP Area Groups learn from practice within the region (and from further afield) and build understanding amongst those tasked with implementation as to the reasons and means for action. It can help to generate a commitment amongst stakeholders to the implementation of the Low Carbon Region strategy and inform ongoing planning and evaluation.

Each Area Group has an existing set of stakeholder relationships. Members of the Group should consider who they most need to work with. Establishing and implementing a new low carbon strategy is likely to require each region to take a fresh look at ways of engaging existing partners as well as working with new contacts.

Low Carbon Stakeholders

Stakeholders must include the Welsh Assembly Government, local government (including community councils), other public bodies (such as the Countryside Council for Wales (CCW), the Environment Agency (EA), CADW and the Forestry Commission), private businesses and third sector representation from all sectors of the economy. **Government** representation will in particular ensure appropriate connection to Wales-wide strategies, statutory requirements (for example in relation to land use planning) and delivery mechanisms for many low carbon initiatives. Local authority strategies and actions will provide building blocks for Area-wide action to reduce emissions. Local and central government estates hold significant potential for emission reduction. As a dominant employer in Wales and with considerable purchasing power, the **public sector** holds the key to considerable regional impetus towards low carbon.

Businesses will provide much of the technology, services and investment needed to

enable progress towards low carbon. They must be involved at the very beginning of the journey. The transition to a low carbon economy will provide commercial opportunities. Businesses need to be encouraged and supported to take full advantage of them. The WSP Area Groups need to have good data on the low carbon and environmental goods and services businesses (and the market for their services) in their localities so as to be able to target them and work with them effectively. The Central WSP Team and Area Groups should work with the Welsh Assembly Government's Department of Economy and Transport (DE&T) to establish this information.

The WSP Area Group can also play an important role in facilitating communication between the business community and education providers in the region, to ensure access to the relevant skills and training.

Bringing **business** and **academic representatives** together will enable

identification and coordination of the skills, training, research and development needed for transition to a low carbon future. Representation from all levels of **education** is essential to ensure that the attitudes and skills needed for this transition are fostered through our educational system.

Along with local authorities, the **third sector**

often provides a direct link to communities and significant practical knowledge of delivery and funding mechanisms.

The regional transition to low carbon must also be supported by the **general public**. Public consultation and engagement will be needed to ensure support and buy-in to strategy development and delivery.

2.3.2 Establishing a Low Carbon Working Group

As highlighted previously, out of their wide network of low carbon stakeholders each of the Area Groups should establish a core working group to take forward the preparation and delivery of the low carbon strategy for their region of Wales.

Each WSP Area Group will need to consider whether they have an existing regional sub-group which could be assigned responsibility for coordinating this two phase process before establishing a new group.

While an existing environment sub-group may appear to be the 'obvious' choice for this role, strong consideration should be given to the name applied to the group taking this work forward. Climate change is as much a social or economic problem as it is environmental and assigning responsibility for preparing and delivering a Low Carbon Region strategy to an environment group may convey the impression to some stakeholders that the strategy is purely environmental in scope and intention. Where an environment sub-group is the best means of taking this forward, consideration should be given to renaming as a Low Carbon Working Group to more effectively reflect its new priorities.

Each Spatial Plan region will need to adopt an architecture that best suits existing regional structures, but for the remaining of this document the term 'Low Carbon Working Group' will be used to refer to that group at regional level which has

responsibility for preparing and implementing a Low Carbon Region strategy.

The Low Carbon Working Group should be made up of committed senior representatives from a range of sectors, selected from amongst the stakeholders according to the knowledge, influence, initiative, skills and commitment they can bring to the work. For implementation of particular low carbon initiatives it may be necessary to form delivery groups. These would be headed by a member (or members) of the Low Carbon Working Group, bringing in relevant members of the wider stakeholder network. It may be that individual stakeholder organisations can offer financial or staff resources to enable delivery. Other stakeholders may take responsibility for leading a particular action.

Maintaining channels of communication with the wider stakeholders in the region will be a critical function of a region's Low Carbon Working Group. The group should be a conduit for information, a facilitator/convenor and a coordinator. It should maintain a strategic overview, enabling the prioritisation of resources and the identification of gaps and interventions. It will also be crucial for the Low Carbon Working Group to engage and work with existing delivery bodies such as Local Service Boards (LSBs) and Regional Transport Consortia (RTCs), to ensure concerted co-ordinated action on carbon reduction.

Convening Stakeholders/Establishing a Low Carbon Working Group – Key Actions

WSP Area Managers

- Convene a network of low carbon stakeholders within each Region.
- Create a core Regional Low Carbon Working Group to take ownership of and guide work, and a supporting pool of interested/ advisory and delivery parties, willing to sign up to the delivery of the low carbon strategy for the Region.
- Facilitate communication between the low carbon stakeholders.

WSP Central Team

- Work with DE&T to establish good data on the low carbon and environmental goods and services businesses and market within the Regions.

2.3.3 Planning, Visioning and Infrastructure Requirements

The Wales Spatial Plan provides the broad framework for considering where in Wales development can and should happen. It is the ideal framework for deciding what infrastructure and services are needed in different localities to enable them to become Low Carbon Regions in which citizens can lead low-impact lifestyles and businesses can minimise their carbon footprints.

The outcome of implementing spatial plans is directly related to individuals' experience of living in the area. It is therefore important for spatial plans to recognise the lives that people have within the spatial plan area. This is especially important when addressing the transformation of lifestyles required if Wales is to flourish in a low carbon economy. Thus, Inclusion of "low carbon lifestyle" information in the spatial plans would help in engaging a wider range of people in the spatial planning process than is usually possible.

The regional Low Carbon Working Groups should undertake a visioning process with stakeholders to ascertain what they want their region to look like when an 80% reduction in carbon emissions has been achieved. This process was initiated with the participants at the regional workshops, with the results for each region illustrated in chapter 4 along with SDC's analysis of each region's low carbon priorities and opportunities. The visioning process will shape a shared aim, from which the region can look back and identify the essential delivery steps along the way. It should therefore be a starting point for planning the infrastructure, services and behavioural change stimuli needed to enable low

carbon lifestyles.

To enable the regional Low Carbon Working Groups to build upon and add value to the output of the workshops, the following elements are suggested for inclusion within Low Carbon Region visions:

- Low carbon zones that deliver focused action on the energy efficient refurbishment of existing buildings and on local microgeneration
- Low carbon energy generated at individual, community and large scales for local use
- Low carbon electricity that feeds into the national grid as part of the region's contribution to a low carbon UK
- Accessible hubs that deliver local services and economic facilities
- Low carbon regional economic centres or gateways with higher education facilities, clusters of low carbon business innovation and rail links to key economic centres
- Recharge, battery exchange and refill points for electric and biofuel vehicles including private cars, public transport, light and heavy goods vehicles
- Transport infrastructure that provides pedestrian and public transport orientated routes including cycling and walking networks and reallocated road space
- Ubiquitous high speed broadband coverage and access alongside a strategy that maximises its capacity to enable low carbon working

- Protected soil carbon stores
- A variety of local food products that supply local needs
- Minimal waste and capitalisation upon the remainder through energy from waste e.g. anaerobic digestion and industrial symbiosis
- Provision of information, advice and support to engage and encourage people to live low carbon lives
- A skills base which enables transition to low carbon, developed through the education and training systems, prioritising key sectors such as sustainable construction and microgeneration
- Reduced carbon leakage through strong resource efficient local enterprises backed by local purchasing
- Partnership(s) with other regions in the UK and EU with similar characteristics that enable learning to be shared with fast and effective knowledge transfer.

Building on SDC's observations highlighted in section 1.4, this visioning process needs to be considered in context of the role of primary key settlements, hubs and cross boundary settlements (all terminologies for places highlighted in the WSP) in providing the services and infrastructure for a Low Carbon Region. It is recommended, for example, that the 'key settlements of national importance' identified in the WSP 2008 Update should include video conference and home working hubs (thus improving the regions' international connectivity), recharging hubs for electric vehicles and public transport interchanges.

Planning, Visioning and Infrastructure Requirements – Key Actions

WSP Area Managers and Low Carbon Working Group

- Convene the Low Carbon Region stakeholders to develop a vision for what they want their region to look like when a reduction in carbon emissions by 80% has been achieved, building on the vision developed at the Low Carbon Region workshops.
- Using the vision to facilitate a process to look back and identify the essential delivery steps to achieve the vision.
- Plan the infrastructure requirements of the Low Carbon Region, including for key settlements, zones and hubs (places) to facilitate low carbon lifestyles.

2.3.4 Aligning Area Delivery Frameworks with Low Carbon

The Low Carbon Working Groups and stakeholder partnerships need to ensure that the objective to become a Low Carbon Region is embedded into all relevant strategies and that these strategies provide for actions which will help to meet this objective rather than acting as barriers to its achievement. Setting the precedent at a regional level, it is important that all current and planned WSP work streams are conducive to a low carbon future. A crucial action on the path "**Towards Low Carbon**" is therefore, to align the regions' Area Delivery Frameworks with a low carbon future.

Once developed, the Carbon Impact Appraisal tool can be used in this process. In the interim the SDC recommends that the Assembly's Spatial Plan Team instigates a process to enable a rapid review of Area Delivery Frameworks, using a common methodology so as to achieve a consistent approach

across all regions of Wales (the use of Strategic Environmental Assessment (SEA)¹⁵ guidance in this process should be considered).

This review should enable each region to identify whether each of the actions within the current Area Delivery Frameworks are locking the region into a high or low carbon future. The result of which should be to direct resources away from short-lived, high carbon services and infrastructure towards those which enable low carbon living. It is however recognised that it will not always be easy to define whether specific actions are conducive to a low carbon future, with further evidence needed to make an informed decision. We realise that as the Area Groups own the Area Delivery Frameworks, only they can amend them. This highlights the importance of getting the buy in of the stakeholders represented on the Area Groups.

Aligning the Area Delivery Frameworks with Low Carbon – Key Actions

WSP Central Team

- Provide the WSP Area Managers with a process to enable a high-level rapid review of Area Delivery Frameworks.

WSP Area Managers and Groups

- Short Term – Using the process provided by the WSP Central Team to identify whether each of the actions within the current Area Delivery Framework are locking the Region into a high or low carbon future.
- Align the Area Delivery Framework with a low carbon future.
- Medium Term – When the Carbon Impact Appraisal Tool has been developed, use it to complete these recommended actions.

2.3.5 Carbon Impact Appraisals

To enable the evaluation of the carbon impact of existing and planned infrastructure and service provision within the regions, as currently set out in the Area Delivery Frameworks, SDC recommends that the Welsh Assembly Government initiates carbon impact appraisals for all new policies, projects and services.

The Climate Change Strategy – *Programme of Action* consultation¹⁶ states that the Welsh Assembly Government will ‘identify and disseminate standard tools and guidance to enable assessment of the carbon impact of policies and programmes and an

assessment of implications of the impact of climate change’ and ‘will mainstream the use of these tools into [the] policy and programme development process’. The Welsh Assembly Government needs to ensure that, if this tool is developed, it meets the requirements of the regions and that it is subsequently used in all regional policies, projects and services.

It should be noted that in view of the urgent need to make progress it is important that low carbon initiatives are not delayed until this tool is developed and implemented.

Carbon Impact Appraisals – Key Actions

Welsh Assembly Government

- The WSP Central Team and the Department of Environment, Sustainability and Housing (DESH) ensure that the carbon impact tools and guidance match the requirements of the WSP Regions.

WSP Area Managers

- Supported regionally by DESH, advocate and facilitate the use of the carbon impact appraisal tool provided by DESH in all Regional policies, projects and services.

2.3.6 Mapping Existing Low Carbon Initiatives

The SDC’s research and dialogue with stakeholders has identified the need for good quality information so as to prioritise low carbon actions and resources effectively. There is a need both to gather information on existing low carbon actions – discussed in this section – and to identify opportunities for new

measures (opportunity mapping) – discussed in section 2.3.7.

To inform the selection of targeted actions for emissions reductions, working groups and other stakeholders must understand the current low carbon landscape within the region, through

mapping existing low carbon activity.

Many of the measures which can reduce carbon emissions (detailed in Chapters 3 and 4 and in the Resource Bank) are not new. Existing community strategies, dedicated local authority climate change strategies, Local Development Plan (LDP) work and regional transport plans are already progressing the shift towards low carbon.

Some particularly innovative projects have been successfully implemented in isolated pockets throughout Wales. Examples include Local Food Talks in Central Wales, the Deeside Shuttle bus in the North East, the Llŷn/Môn fenland restoration project in the North West, PLANED sustainable rural tourism work in Pembrokeshire, Cardiff Council Carbon Lite work in the South East and the Sustainable Swansea Initiative in Swansea Bay. Other case studies of successful carbon reduction initiatives in Wales are given throughout the resource bank. The lessons learnt from past projects are vital to ensure these isolated examples are scaled up and replicated

throughout Wales, informing project selection and development at a regional level.

This mapping phase should also include identification of large infrastructure projects planned or under development within each WSP Area. A source of this information will be the LDPs which are being prepared in each Local Authority. Examples are the £13bn¹⁷ Liquefied Natural Gas (LNG) terminal at Milford Haven, the potential construction of a new nuclear power station at Wylfa and an LNG terminal on Anglesey.

The Low Carbon Working Groups should seek to engage with the businesses involved in these projects. Such engagement may be valuable in assisting the developers involved to meet planning requirements. [This engagement should be sought with a view to helping them progress in the most sustainable, low carbon way possible, bringing maximum benefits to the community and possibly providing a route to financing low carbon projects in the region.]

Mapping Existing Low Carbon Activity – Key Actions

WSP Central and Area Teams and DESH

- Work with stakeholders in the regions to map existing low carbon activity
- Work with stakeholders to identify large infrastructure projects planned or under development within the region where the significant investment could help progress sustainable low carbon activities.

2.3.7 Mapping Further Low Carbon Opportunities

Opportunity mapping is seen as an essential element of spatial planning for Low Carbon Regions. It can be used to create multi layered maps to enable the coordination and prioritisation of projects and to guide resource allocation

At the regional workshops held during this study, participants identified the following information as essential in this regard:

- Energy efficiency of the existing housing stock (see resource bank – Built Environment and Energy section 5.2)
- Soil carbon stores (see resource bank – Rural Land Use and Food section 4.4)
- Arable land

- Areas most suitable for renewable energy generation (see resource bank – Built Environment and Energy section 6)
- Land potential for food growing
- Waste heat resources (see resource bank – Waste section 4.3.1).

The process of opportunity mapping may be outside the scope and resources of the WSP Area Groups, but much of this evidence-gathering activity is already taking place through initiatives at a national and local level, such as the Networked Environmental Regions project.¹⁸ The Low Carbon Working Groups and the WSP Area Groups, with their extensive cross portfolio network of contacts, are ideally placed to collate this evidence from

stakeholders. They can use it to guide and coordinate projects, and to promote and disseminate relevant information within the regions. This opportunity mapping phase may have a low direct impact

on carbon emissions; however, it is an essential preparatory phase before high impact projects are implemented.

Opportunity Mapping – Key Actions

WSP Central and Area Teams, Low Carbon Working Groups and DESH

- Work with stakeholders in the regions to ascertain the evidence needed to guide and coordinate projects, for example:
 - Energy efficiency of the existing housing stock
 - Soil carbon stores
 - Arable land
 - Areas most suitable for renewable energy generation
 - Land potential for food growing
 - Waste heat resources
- Work with stakeholders to collate and disseminate the information highlighted above
- Use the information generated to guide and coordinate low carbon projects in the regions.

2.4 The Delivery Phase – Detailed Guidance

Following the **Preparatory Phase**, the WSP Area Groups should progress to selecting and initiating targeted actions to reduce emissions. The creation of a **low carbon strategy** for the region will provide

a framework to plan new projects and initiatives. The Delivery Phase, managed by the Low Carbon Working Group, focuses on the formulation and delivery of the strategy.

2.4.1 A Strategic Overview

It is envisaged that the information gathered through the mapping programme will enable the Welsh Assembly Government and the Low Carbon Working Groups in the different regions to maintain a strategic view of current and planned low carbon activity across Wales. This should enable them to play an important role in guiding and coordinating low carbon activities, identifying gaps, opportunities, synergies, the potential for collaborative working, and ensuring that public investment is aligned to the services and places that need it the most.

The Low Carbon Working Groups and wider stakeholders should use their influence to advocate for the Low Carbon Region target to be embedded into all relevant strategies (e.g. LDPs, Community Strategies, Regional Transport Plans etc.) prepared

by organisations within the WSP regions. This should help to ensure that the infrastructure and the services provided within the WSP Areas enable low carbon living. Appendix C demonstrates how carbon reduction opportunities can synergise with and help to deliver on other priorities.

Bearing in mind the role of the Wales Spatial Plan as a conduit for information between the Welsh Assembly Government and the different regions of Wales, it is important to keep abreast of low carbon activity within the regions, enabling informed feedback to the Welsh Assembly Government, especially on requirements for public investment. Greater use should be made of the WSP Area Groups in seeking regional views on policy relating to climate change.

Guiding and Coordinating Projects and Policy – Key Actions

Welsh Assembly Government and Low Carbon Working Groups

- Maintain a strategic overview of current and planned low carbon activity within the WSP Areas
- Guide and coordinate low carbon activities, identifying gaps, opportunities, synergies and potential for collaborative working and ensuring that public investment is aligned to the services and places that need it the most
- Advocate the need to embed the target of becoming a Low Carbon Region into all relevant strategies within the region, ensuring that the infrastructure and the services provided within the WSP Areas enable low carbon living.

WSP Area Teams

- Act as a conduit between the national and local level, disseminating national policy to the Regions and feeding back actions and issues to the Welsh Assembly Government.

2.4.2 Sharing and Scaling Up Good Practice

Many of the measures which can reduce carbon emissions are not new, and have been successfully implemented in isolated pockets throughout Wales. Participants at the Low Carbon Region workshops considered it important to have a process in place for sharing and disseminating good practice, and the lessons learnt from existing initiatives. Mapping current low carbon activity within a region and exploration of the case studies highlighted in the Resource Bank section of this report, are the first steps towards delivery of this low carbon information sharing process. Sharing of best practice should enable similar low carbon projects to be mainstreamed or fast tracked throughout Wales.

It is proposed that the Welsh Assembly Government sets up a formal process for sharing best practice for low carbon initiatives. This could involve a series of seminars or workshops, secondment of a representative from a successful project to the WSP team/DESH with a remit to drive through/roll out similar projects in Wales, and/or partnering with regions outside Wales which are also pursuing the low carbon agenda. Experienced delivery organisations such as the Energy Saving Trust and the Carbon Trust should be actively involved in seminars and workshops.

Disseminating/Scaling Up Good Practice – Key Actions

WSP Central, Area Teams and Department for Environment, Sustainability and Housing

- Develop a process to share and disseminate low carbon good practice, and the lessons learnt from existing low carbon initiatives through for example workshops, seminars, low carbon champions
- Second key personnel from successful low carbon projects to the WSP or DESH teams to take responsibility for driving through similar projects throughout Wales
- Seek to establish partnerships with Low Carbon Regions outside of Wales.

2.4.3 Developing New Activity: a Resource for the Selection of Priority Actions

Many of the actions already undertaken within the Preparation and Delivery phases, including back casting to identify infrastructure and services needed, mapping current carbon reduction activity and replicating or expanding existing good practice, will have identified areas for further action. Much of the remainder of this report provides supporting information to guide and inform the selection of priority emission reduction projects and initiatives.

As a source of ideas for effective activities to reduce emissions, the SDC has developed a Resource Bank of low carbon solutions, delivery mechanisms and case studies addressing the key sectors of built environment, energy, transport, rural land use, food and waste. For each sector low carbon solutions and opportunities at a regional level are summarised

in text boxes entitled 'Mechanisms to Reduce Carbon Emissions'. For easy reference, these sets of mechanisms are collated in Appendix D.

In later parts of this main text, Chapter 3 includes top priorities for action distilled from this Resource Bank. To supplement these generic priorities, Chapter 4 provides some proposals tailored to the characteristics and requirements of the different regions of Wales.

The Low Carbon Working Groups will need to establish timescales and identify lead organisations or delivery groups and the funding and skills resources needed to implement proposed actions.

Chapter 3 includes a brief consideration of a range of cross-cutting delivery mechanisms.

Developing New Activity/Selecting Priority Actions – Key Actions

Low Carbon Working Groups

- Work with stakeholders in each WSP Area to identify and deliver projects and initiatives that can reduce emissions within the region
- Stakeholders to take responsibility for delivering specific projects
- Identify funding sources to deliver the above.

2.4.4 Engaging with Wales-Wide Initiatives

National initiatives for carbon reduction are clearly relevant for progressing the low carbon agenda at a regional level. During the selection of priority actions, Low Carbon Working Groups should consider whether there are national initiatives acting in their

fields of interest and, if so, how to engage with them in order to access the experience, knowledge and possible links to funds that such a relationship could offer. An example of such a national initiative is the Low/Zero Carbon Hub Wales (see opposite).

Engaging with Wales-Wide Initiatives – Key Actions

Regional Low Carbon Working Groups

- Identify relevant Wales-wide initiatives such as the Low/Zero Carbon Hub Wales, with a view to:
 - a ensuring local and regional issues/ views are taken into account and
 - b exploring how the outcomes from the work of such initiatives can be implemented at a Regional level.

Low/Zero Carbon Hub Wales

The Low/Zero Carbon Hub Wales was set up to help coordinate progress towards the Assembly Government's zero carbon new build aspiration from 2011 and the delivery of the three per cent per annum reduction in carbon emissions from the existing housing stock.

The Hub is a private/public/voluntary sector partnership, with a Steering Group, directing the activities within the following work streams:

- Existing Homes Alliance Wales
- Skills and training
- Industry engagement
- Supply chain and innovation
- Consumer engagement
- Policy

Integral to this work has been the establishment of the 'Coalition of the Willing', a cross sector network committed to sharing knowledge, removing barriers and collaborating on research and development to take the zero carbon energy efficiency agenda forward within Wales. Over 50 organisations have now signed up to a **Green Building Charter**, signifying their commitment to support progress towards a built environment that contributes low or zero net carbon emissions as quickly as practically possible. This Charter is the first of its kind in the UK and is enabling collaborative action to tackle emissions from the built environment. The companies signing the Charter now have the confidence that they will not be acting alone or against the grain.

2.5 Target Setting, Monitoring and Review

The stakeholders in each of the WSP Areas will need to report periodically on progress against agreed targets and deadlines. It is important at the progress reporting stage to share successes and failures and identify barriers to progress so that this can inform future projects. Review of progress will enable objectives, targets and timelines to be updated as appropriate.

Whilst target setting in itself does not represent a key success factor, it is often integral to the overall

success of a project. Setting ambitious targets before ensuring that structures for monitoring and delivery are in place is unlikely to be helpful and may even be de-motivating. Setting conservative targets fails to instil a sense of purpose or demonstrate leadership and to differentiate an organisation from its competitors.

In order to set targets and monitor progress each WSP Area must work from a recorded baseline of emissions at a fixed point in time.

2.5.1 Setting the Emissions Baseline

Measuring emission reductions will be necessary to enable progress reporting against the 80 per cent Low Carbon Region reduction target. The Welsh Assembly Government should work to establish a monitoring programme for carbon emissions in the six Wales Spatial Plan Areas.

Approaches to quantifying carbon emissions can be either top-down, utilising national data and applying it regionally, or bottom-up, aggregating sector-specific and local data. It is generally accepted that the bottom-up approach provides a more accurate assessment and can be used more readily to determine the impact of individual measures. However, this approach also requires considerably

more data, often not readily available. In selecting the most appropriate evaluation procedure there is a trade-off between the degree of accuracy required and the time and resources available to collect the necessary evidence. Also, when combining information from different sectors and localities, there is a need for a common approach to ensure compatibility of the information.

Given the need for urgent action on emission reductions, it is important that the process of developing and implementing a satisfactory quantitative assessment methodology does not impede progress on the development and delivery of low carbon strategies in the regions of Wales.

In the short term, the Low Carbon Working Groups in the WSP Areas will need to find a way to monitor their own progress. Two practical options are presented here.

Option 1: Top-Down Approach

Chapter 4 includes the carbon footprint data for each WSP Area for 2003, provided by the Stockholm Environment Institute (SEI). The SEI carbon footprint data are calculated from a UK consumption perspective and disaggregated down to local level. The Spatial Plan Area figures are calculated from local authority results, using the percentage of population of each local authority located within each Spatial Plan Area. Unfortunately it is not clear whether the SEI footprinting process will be repeated. There may not be another national reporting cycle which the Areas can tie in to in order to monitor progress against their 2003 baseline.

Alternatively, from the UK GHG Inventory¹⁹ data, AEA has developed datasets of CO₂ emissions by local authority.²⁰ It is intended that this estimated dataset will continue to be produced annually.

2.5.2 A Basket of Indicators

Since it is difficult to quantify emissions reductions, alternative means of assessing progress are needed. One way to proceed involves adoption of a basket of indicators to monitor progress.

Learning from the successful approach of the London Borough of Camden's Environment and Sustainability Delivery Plan,²³ and the SDC's Local Sustainable Development Lens work,²⁴ we suggest the use of a mix of National Strategic and Core Indicators supplemented by a set of local proxy measures.

Under the Performance Management Framework, local authorities in Wales collect data on National Strategic Indicators and Core Indicators.²⁵ Although this set of indicators is currently less specific on climate change than the National Indicator set which applies in England, several of the National Strategic Indicators (NS) within Wales can help to demonstrate progress towards low carbon.

These include:

- NS 14 WMT/001 – The percentage of municipal waste i) re-used and/or recycled, and ii) Composted or treated biologically in another way

By aggregating these data according to the percentage of population of each local authority located within a region, each Spatial Plan Area Group can baseline and monitor progress on a periodic basis.

Option 2: Bottom-Up Approach

Interviews conducted with individuals associated with carbon reduction projects as part of the SDC's dCARB-UK project,²¹ highlighted the difficulty of monitoring the impacts of individual carbon reduction activities. Very few interviewees were able to offer quantified estimates of the carbon savings of the projects they were involved in. However, a number of tools are now available to help baseline and calculate emissions, such as those provided by the Carbon Trust as part of the Low Carbon Cities project.²²

Alternatively, constituent local authorities may have existing climate change strategies and carbon footprint data that could be aggregated to regional level.

- NS 15 WMT/ 002 – The percentage of biodegradable municipal waste sent to landfill
- NS 18 EEF/002 – a) Percentage reduction in carbon dioxide emissions in the non domestic public building stock, bi) Percentage reduction in energy use in the housing stock, and bii) Percentage reduction in carbon dioxide emissions in the housing stock.

Amongst the core indicator set, these additional measures may also help to demonstrate progress:

- WMT/004 – The percentage of municipal waste sent to landfill
- WMT/005 – The percentage of municipal waste used to recover heat and power
- WMT/007 – The percentage of municipal waste received at all household waste amenity sites that is reused, recycled or composted.

Although the majority of the National Strategic and Core Set indicators relevant to measuring progress on carbon emissions relate to waste, some stand out as having potential for demonstrating carbon reduction progress.

For example **PLA/002**, relating to the percentage of approved planning applications raises the question of whether there is scope to report on the percentage of approved microgeneration installations. Similarly **PLA/006**, on the number of affordable housing units as a percentage of all housing units provided during the year, could provide scope to report on the percentage of housing meeting Code for Sustainable Homes Level 3/4/5. The existence of leisure and culture – libraries indicators (**LCL/001** to **LCL/004**) shows promise for the ability of local authorities to collect data on the loan of smart meters or energy audit kits from libraries.

The Low Carbon Working Groups could explore the potential for building on existing indicators in this way with constituent local authorities, in cooperation with officials of the Welsh Assembly Government and the Welsh Local Government Association (WLGA).

Aggregating data from local authorities to regional level poses difficulties given the existence of fuzzy boundaries and cross-regional border local authorities. However, the SEI work described above has demonstrated that aggregation is feasible when the percentage of population of each local authority located within each Spatial Plan Area is used to apportion data.

A suite of supplementary indicators appropriate to the regional level may also need to be identified. The Resource Bank tabulates suggested indicators for each sector under the heading ‘Measuring Success’. For easy reference these sets of indicators are collated in Appendix E.

The London Borough of Camden’s Environment and Sustainability Delivery Plan provides a useful template for monitoring progress in this way. The national and locally-derived measures of success from the transport section of the report are highlighted in Figure 2.1 below:

Figure 2.1 LB Camden: Indicators on increasing the sustainability of transport²⁶

Indicator	Target	Measurement
NI198 Children travelling to school – modes of travel usually used.	• Set 2008/09 baseline	School Census
Local Reduction in the level of traffic in the Borough.	• 15% reduction by 2012 on 2001 baseline	Screenline surveys
Local 10% of journeys to be made by bicycle.	• 10% by 2012	Screenline surveys
Local Increase number of car club spaces in the borough.	• 100 by March 2009	Local monitoring
Local Number of schools with operational DCSF approved travel plan in place.	• All schools by 2009	Local monitoring

Low Carbon Working Groups and other stakeholders will need to collect initial baseline data on these indicators and monitor targets against them. It may be that local authorities, LSBs, RTCs and other organisations within the different WSP

Areas are already collecting data which will inform indicator development. A method of data collection on these indicators will need to be agreed amongst relevant stakeholders.

Target Setting, Monitoring and Review

WSP Central Team and Regional Low Carbon Working Groups:

- Short term – Engage with constituent local authorities and regional stakeholders who are already collecting carbon emissions or proxy data so as to develop a set of regional indicators to enable progress to be monitored and reviewed.
- Medium term – Adopt the consistent Wales-wide monitoring process developed by DESH in conjunction with the Central WSP.

WSP Central Team and DESH:

- Develop a consistent, quantitative methodology for measuring emission reductions at a regional level, ensuring that this is feasible for application by the WSP Area Groups and Low Carbon Working Groups.

2.6 Concluding Points

Chapter 1 described the importance of the Wales Spatial Plan in enabling the ‘low carbon transition’ in Wales and outlined the organisational framework associated with the Plan. This chapter has described a phased approach to the development of low carbon strategies in the different regions of Wales which has been designed to fit with this established framework. Figure 2.2 below illustrates this.

Equally important, this approach has been developed in cooperation with regional stakeholders

and the Spatial Plan Area Managers who participated in regional workshops and in meetings while the research was in progress. We have sought to tailor the guidance to the operational strengths of the Spatial Plan and its Area Groups.

Having established the approach, the following two chapters focus on the content – that is on the sorts of initiatives that are increasingly going to be needed across Wales to secure the shift towards low carbon.

Figure 2.2 How SDC's recommendations fit with the WSP framework



Key

- Wales Spatial Plan Framework Priorities
- SDC recommended action

References for Chapter 2

- 15 Strategic Environmental Assessment is a formal environmental assessment of policies, plans and programmes which are likely to have significant environmental effects. See <http://wales.gov.uk/topics/environmentcountryside/consmanagement/sea/?lang=en>
- 16 Welsh Assembly Government (2009) *Climate change strategy – Programme of action consultation*. <http://wales.gov.uk/consultations/environmentandcountryside/climatechangeaction/?lang=en> p 16.
- 17 BBC News Online, First liquid gas delivery in port, (March 2009) http://news.bbc.co.uk/1/hi/wales/south_west/7952415.stm
- 18 Welsh Assembly Government Spatial Plan Unit and the Countryside Council for Wales (2008) *Framework for the South East Wales Networked Environmental Region*.
- 19 AEA compiles the UK Greenhouse Gas Inventory on behalf of the UK Department of Energy and Climate Change. See www.ghgi.org.uk/index.html.
- 20 See www.defra.gov.uk/environment/statistics/globalatmos/galocalghg.htm for the 2005 and 2006 datasets.
- 21 See www.sd-commission.org.uk/publications.php?cats=yes&cat_id=2 for d-CARB-uk Project Publications.
- 22 Carbon Trust (2008) *Low Carbon Cities Baseline Tool* www.lowcarboncities.co.uk/cms/baseline-tool/
- 23 Camden Council (2008) *Delivering a Sustainable Camden*, London Borough of Camden's Environmental Sustainability Delivery Plan 2008-2012. <https://www.camden.gov.uk/ccm/content/environment/policies-reports-and-data/delivering-a-sustainable-camden-delivery-plan-2008-2012.en;jsessionid=C85BE4982ED0C46175E3F87703B1EB85.node2>
- 24 Sustainable Development Commission (2009) *Local Sustainable Development Lens: Final Proposal Overview Paper*. www.sd-commission.org.uk/publications.php?id=880
- 25 Local Government Data Unit – Wales (2009) *National Performance Indicator Guidance for Wales 2009-10*. www.dataunitwales.gov.uk/NPI.asp?cat=289
- 26 Camden Council (2008) *Delivering a Sustainable Camden*, London Borough of Camden's Environmental Sustainability Delivery Plan 2008-2012. <https://www.camden.gov.uk/ccm/content/environment/policies-reports-and-data/delivering-a-sustainable-camden-delivery-plan-2008-2012.en;jsessionid=C85BE4982ED0C46175E3F87703B1EB85.node2> p.19.

Sundance Renewables is a worker-owned co-operative that has set up the first community-based Biodiesel Production Plant in the UK. The plant recycled 75,000 litres of vegetable oil last year, which equates to a CO₂ reduction of 262.5 tonnes.

Pictured are founder Jan Cliff and Welsh Climate Champion Cerith Rhys Jones.

Photo: Sundance Renewables



3

All-Wales Low Carbon Solutions

3.1 Aims of this Chapter

The construction of this report, notably the Resource Bank, has generated a portfolio of low carbon solutions to be drawn upon by the Spatial Plan Area Groups in the development and execution of their low carbon strategies.

To facilitate the strategy building process, and in particular the identification of priorities for action in each of the regions of Wales, this chapter provides an indication – based on sound evidence and existing good practice – of the kinds of action likely to be most effective in achieving rapid reductions in CO₂ emissions.

The first section provides some background statistics on the potential for emissions reduction by sector and activity. We then briefly review some of the specific measures appropriate to the rural and then the urban areas of Wales.

At the heart of the chapter is a section setting out eight key solutions across a range of sectors – what we consider to be the high level priorities for action – distilled from the Resource Bank, in which there is much more information on each approach. The Low Carbon Working Group established in each

of the WSP Areas should consider these at an early stage in their work and establish how these lines of action can be taken forward in their own regions.

Cross cutting mechanisms for delivery – some of the essential policy tools available to stakeholders in the regions and relevant to all sectors – are then briefly reviewed. The WSP Area Groups need to ensure that all available measures are used to secure the solutions which are so necessary for progressing the low carbon agenda.

The Consultation on the Climate Change Strategy for Wales²⁷ sets out climate change objectives and actions for delivery on a national level, and further work is underway to identify actions that offer the greatest scope for cost effective emissions abatement. The high level solutions identified in this chapter are a starting point, complementing the proposals within the Climate Change Strategy for Wales; they, along with the detailed information in the Resource Bank, provide the Low Carbon Working Groups with potential high impact solutions for emissions reduction.

3.2 Emissions Reduction Potential

Data on emission reduction potential can of course help to identify what actions will potentially have the biggest impact. As chapter 2.5 indicated, however, there are significant difficulties in establishing the emissions reduction likely to result from individual projects and initiatives. Identifying potential emissions savings for each suggested carbon reducing measure is beyond the scope of this report. However, some national figures are available. These are reproduced below as an indication of where WSP Area Groups might place the greatest initial effort.

As part of its report *Building a Low Carbon Economy* – the UK's contribution to tackling climate change the Committee on Climate Change disaggregated UK data to give an estimate of emission abatement potential in each nation.

For Wales estimates of emission reduction potential in 2020 include:

- Up to 2 Million tonnes of Carbon Dioxide (MtCO₂) feasible emissions reduction from existing buildings through energy efficiency and new energy sources

- Up to 0.4 MtCO₂ emissions reduction from industry through energy efficiency and new energy sources
- Up to 1 MtCO₂ emissions reduction potential from domestic road transport through supply side measures (i.e. by improving the carbon efficiency of transport without changing either the total level of transport demand or the balance between different modes).
- Up to 0.1 MtCO₂e from livestock, up to 0.4 Mt CO₂e from crops and soils and 0.06 MtCO₂ from forestry through measures including methane reduction from livestock and increasing the number of trees
- Up to 0.3 MtCO₂e from waste through directing waste away from landfill to energy producing processes
- Approximately 0.39 MtCO₂e from industrial processes and energy related non-CO₂ emissions.²⁸

The need to tackle emissions from existing buildings stands out as a priority for action.

See Resource Bank – Built Environment and Energy section 5 for opportunities to reduce emissions within the existing building stock at a regional level.

The Consultation on the Climate Change Strategy for Wales also provides estimates on the potential carbon savings for many of the actions it is proposing. It is essential therefore that the Low Carbon Working Groups work closely with DESH when prioritising the specific carbon reduction activities for their regions.

For individuals and households the Energy Saving Trust’s Low Carbon Citizens report gives an indication of the maximum potential for emissions savings through a range of actions. The potential savings are summarised in Table 3.1.²⁹ These figures clearly suggest that an expansion of microgeneration and community scale energy generation will prove effective. See Resource Bank – Built Environment and Energy section 6 for opportunities to reduce emissions through renewable energy.

Table 3.1 Total potential emissions savings through personal actions in Wales³⁰

Action	Total savings potential
Turning heating down by 1 degree	0.22 MtCO ₂ /year
Avoiding standby	0.004 MtCO ₂ /year
Washing at 30 degrees	0.03 MtCO ₂ /year
Switching off lights	0.01 MtCO ₂ /year
Loft and cavity wall insulation	0.34 MtCO ₂ /year
Solid wall insulation	0.88 MtCO ₂ /year
Double glazing	0.12 MtCO ₂ /year
Boiler replacements	0.7 MtCO ₂ /year
Compact fluorescent light bulbs	0.16 MtCO ₂ /year
Efficient Appliances	0.19 MtCO ₂ /year
Microgeneration	2.77 MtCO ₂ /year
Community scale energy generation	5.2 MtCO ₂ /year
Energy efficient driving techniques	0.51 MtCO ₂ /year
“Best in class” cars	0.9 MtCO ₂ /year
Eliminating avoidable food waste	0.81 MtCO ₂ /year

3.3 Challenges and Opportunities in Rural and Urban Areas

3.3.1 Rural Areas

Each of the regions of Wales has extensive rural areas in which the transition to low carbon presents particular challenges and opportunities.

Key issues to consider are the presence of older, harder to treat homes which pose challenges for the energy efficient refurbishment of the existing

building stock, the difficulty of implementing sustainable transport and accessibility solutions where communities are remote or the population widely dispersed, and the presence of broadband ‘not spots’ and low speed internet connections which limit opportunities for displacing travel.

Addressing the shortcomings of rural broadband services will help to support a dispersed home workforce, in turn providing quality of life benefits and helping to sustain rural services. Improved

information and communication technology (ICT) connectivity will also allow the development of tele-health services which can improve to provide access to health services for people in remote areas.

ICT – An Example of How Transition to Low Carbon Can Deliver Economic and Social Benefit

Addressing broadband ‘not spots’ and low speed connections will support both home working and home business establishment and allow remote communication and service delivery. Whilst all of the above have the potential for travel related emission reduction; working from home can also provide quality of life benefits, increase workforce satisfaction and financial savings through reduced office space requirements. Furthermore, increased home working can help sustain local businesses and services, with home business establishment helping diversify local economies. Live/work facilities alongside hub facilities (meeting space/networking space/hot desk facilities) have greater potential than conventional home working for carbon savings. For all employers, using video and teleconferencing presents opportunities to save on travel expenses and eliminate staff down time.

It is essential that any regional strategy to improve broadband accessibility is supplemented by an action plan to maximise the potential to enable low carbon working and economic and

social benefits. This action plan should address issues such as how to communicate the economic case for ICT as a replacement for travel and the need for advice on the tax and legal implications of home business start up. Realising the potential benefit of improved broadband coverage and accessibility is particularly important in the transition of heavily rural regions to low carbon.

BT’s home working policy provides one example of how using ICT as a replacement for travel can deliver benefits on multiple objectives. 16% of BT’s UK employees are full time home workers. Amongst the benefits communicated by BT are:

- Commuter CO₂ emissions reduced by 97,000 tonnes
- Increase in staff satisfaction by 50%
- Increased staff productivity and retention
- Reduced office property requirements to the value of £500 million.³¹

See Resource Bank – Transport section 4.1.3 for further information on the benefits and implementation of ICT solutions.

The WSP Area Groups can tackle these rural challenges by collaborating with national and local stakeholders to develop tailored solutions. For example, they might engage with the Low/Zero Carbon Hub Wales and Existing Homes Alliance Wales to develop initiatives to refurbish hard to treat homes, preferably using traditional or locally-sourced materials, supporting local craftspeople and generally working closely with existing organisations active at the local level such as Care & Repair. Engagement with RTCs and Sustrans to deliver strategic demand-responsive transport from rural villages to key employment hubs such as business parks presents another opportunity. Initiatives should clearly build on the very long tradition of self-help familiar to those living and working in rural communities, and it will be essential to involve the Community Councils in these efforts.

Particular opportunities for rural areas in the transition to low carbon include the fact that many rural communities and farms are well-suited to providing local and community energy. The very rural WSP Areas should seek to capitalise upon this asset by ensuring that support and advice is available for the development of community and farm energy installations. Many rural areas also have the benefit of land availability; this could enable them to act as a core driver for region wide local, sustainable food production and consumption. Promotion of community-supported agriculture, local food procurement through the public sector and local diet programmes all present opportunities to support the rural agriculture economy.

3.3.2 Urban Areas

Urban, densely populated and industrialised areas also pose a distinct set of challenges and opportunities in the transition to low carbon. Density of population may present difficulties in terms of transport, development pressure for low cost housing and meeting demand for local food production. Within regional low carbon strategies, these challenges can be tackled through tailored approaches such as an emphasis on smarter choices travel campaigns; support for employees of businesses and public sector which are located close together to share lifts and reduce individual journeys; support for local authorities to create guidance for developers on producing homes of a high energy efficiency standard at a low cost; support for local planning authorities to require and oversee sustainable developments through e.g. ensuring co-location; support for local authorities to ensure maximum urban provision of land for food growing including allotments, community and rooftop gardens in new housing developments.

The Low Carbon Working Groups should also consider the contribution of industrial emissions within their region. Whilst tackling emissions from industry is very much the role of the Carbon Trust, it will be important for the Low Carbon Working Groups to engage with industry in their region with a view to gaining support for the development and delivery of the region's low carbon strategy. This channel of communication would also enable the Working Groups to act as a conduit to provide information to the Welsh Assembly Government on the support needed by industry to reduce emissions and increase resource efficiency. Engaging with industry in this way may enable potential opportunities to be identified such as the supply

of waste heat from industry to local communities. See chapter 2.3.1 for further information on engaging with business.

Within urban locations there are also opportunities to be seized in the transition to low carbon. Specifically: dense populations will help to ensure the viability of local services such as public transport; the co-location of homes, jobs and services; concentrated population centres present opportunities for focused area based behavioural change campaigns e.g. individualised travel marketing and travel planning; the fabric of the built environment in urban areas including high density housing and the presence of flats supports a zoned approach to energy efficient refurbishment and presents opportunities for district heating; concentrated populations will also ensure demand for re-use networks and provide volumes of clustered feedstock to support local energy from waste facilities. Solutions such as park and share facilities, freight consolidation centres, industrial symbiosis and use of waste industrial heat may also be particularly applicable to urban areas. Improving energy efficiency in homes, businesses and industry stands out as a priority for reducing emissions in urban areas, which will also deliver simultaneous benefits for the wellbeing of communities and the competitiveness of business and industry.

Low Carbon Working Groups should also recognise the importance of supporting local planning authorities to deliver green urban infrastructure. This includes not only consideration such as co-location, connection to public transport routes and nodes but also the creation of multi functional spaces e.g. green corridors for walkers and cyclists linking residential developments to services whilst also containing trees for urban carbon sequestration.

3.4 Priorities in Key Sectors

This chapter identifies two high level actions for early consideration in each of the sectors addressed within the resource bank. We suggest that these generic early considerations could provide focal action for the Low Carbon Region strategies, supplemented by region specific actions from chapter 4 and others selected from the resource bank.

It is intended that the Low Carbon Working Groups established will lead on the delivery of

these actions for early consideration, with a role ranging from simply convening the relevant stakeholders to leading the initiative. As previously stressed, collaborative action between government, the private sector and communities is essential in achieving significant change; therefore the role of each of the three should be considered in the delivery of any carbon reduction action.

3.4.1 Built Environment and Energy

The built environment, in construction and in use, is a significant contributor to UK CO₂ emissions. Domestic energy use alone contributes 27% to UK CO₂ emissions,³² whilst the Carbon Trust attributes almost another 1/5th of UK carbon emissions to non domestic buildings. Housing is responsible for 1.3 global hectares (gha³³) per capita of the 5.1 gha per capita average eco footprint across the Spatial Plan regions of Wales.³⁴

For each region, developing its potential to generate low carbon electricity to feed into the national grid and contribute to a low carbon UK, will be a key element of transition (see Resource Bank – Built Environment and Energy section 6). Decarbonising the electricity supply through large scale renewable energy installations will impact upon the emission reductions possible from all sectors, including maximising emission reduction in the transport sector through the shift to electric and hybrid vehicles. Ensuring public engagement as part of low carbon strategy development could provide an important tool for allaying objections to renewable energy developments within the region.

Low Carbon Working Groups should work with renewable energy developers, communities and landowners to ensure renewable energy projects are developed according to sustainable development principles, whilst ensuring community benefit.

Rationale for prioritisation:

- 1 The existing stock will continue to make up approximately 80% of the built environment in 2050. Of the 1.3 million homes in Wales only a small percentage are fully fitted with energy efficiency measures.³⁵
- 2 Domestic energy use alone contributes 27% to UK CO₂ emissions. The Energy Saving Trust's *Power in Numbers* report³⁶ demonstrated that distributed energy on a community scale reduces costs and increases CO₂ savings compared to individual microgeneration installation.

See Resource Bank – Built Environment and Energy for policy, background statistic, further carbon reduction opportunities and case studies.

SDC's top two solutions for early consideration for reducing emissions from the built environment and energy sectors at a regional level are:

Priority	Essential Preparatory Steps	Refer to Resource Bank
<p>1 Developing and implementing a programme of action for the refurbishment of all existing housing stock within the region</p> <p>See Case Study BE10 – Heads of the Valleys Low Carbon Zone</p>	<ul style="list-style-type: none"> • Regional and/or Low Carbon Working Groups to use their convening power and wider stakeholders to collate thermal maps of existing building stock, maps of fuel poor and housing types to identify priority areas for refurbishment to be convened • The refurbishment programme should not only address energy efficiency but should also minimise the carbon emissions associated with materials, water and waste as one holistic package • Low Carbon Working Groups and existing regional business sub groups to liaise with the Department for Children, Education, Lifelong Learning and Skills (DCELLS), businesses and education institutions to progress low carbon skills development. • Low Carbon Working Groups to explore funding opportunities and develop bids. 	<p>Built Environment and Energy section 5</p>

<p>2 Significantly increasing the region's energy generation capacity from community and large scale renewables</p> <p>See Case Study BE14 – Bro Dyfi Community Renewables</p>	<ul style="list-style-type: none"> • Regional and/or Low Carbon Working Groups to use their convening power and wider stakeholders to collate or explore opportunities to commission mapping of renewable energy resources • Low Carbon Working Groups and existing regional business sub groups to liaise with DCELLS, businesses and education institutions to progress low carbon skills development for renewable energy installations • Low Carbon Working Groups should work with renewable energy developers, communities and landowners to identify opportunities for large scale renewable energy development in the regions • Low Carbon Working Groups to identify suitable communities for community scale generation and match with best suited technology as set out in the Energy Saving Trust's Power in Numbers report • Low Carbon Working Groups and wider stakeholders to explore opportunities to pool resources to provide advisory and support service/development officers for community energy projects • Low Carbon Working Groups to explore funding opportunities and develop bids. 	<p>Built Environment and Energy section 6</p>
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3.4.2 Transport

Personal mobility and the transport of goods form the basis of everyday life and subsequently produce 16.2% of total CO₂ emissions in Wales.³⁷ Road transport is the principal contributor to transport emissions, with personal travel by car responsible for 63% of this.³⁸ Wales' low population density, topographical variations, and isolated rural and coastal populations pose challenges in the provision of viable, frequent and direct public transport services, and subsequently result in car dependency. The transport of goods accounts for 33.4% of Welsh road transport emissions.³⁹

The SDC recommends a hierarchical approach to achieving a sustainable transport system:

- 1** Measures to reduce demand
- 2** Measures to shift to more sustainable / more space efficient modes (e.g. cycling, walking, public transport). This may include improving facilities for cycling and walking
- 3** Measures to promote more efficient use of existing modes (e.g. car sharing, measures to increase load factors on public transport)
- 4** Measures to increase capacity for powered transport (only once 1-3 have been exhausted).

Rationale for prioritisation:

- 1&2** Whilst reducing the need to travel is at the top of the hierarchy in terms of emission reductions from transport, this must largely be addressed through planning, as demonstrated by the cross cutting priorities. It is recognised that the distance travelled per person per year is increasing, therefore encouraging more sustainable travel is essential. Experts believe that a complementary programme of both hard and soft measures is needed to change travel behaviour. Personalised travel planning has been shown to be a very cost effective way of reducing transport emissions, with the Department for Transport estimating that a 'Smarter Choices' programme would cost minus £74.20 net per tonne of CO₂ saved (where the minus indicates that it is a net benefit).⁴⁰

See Resource Bank – Transport for policy, background statistic, further carbon reduction opportunities and case studies.

SDC’s top two solutions for early consideration for reducing emissions from the transport sector at a regional level are:

Priority	Essential Preparatory Steps	Refer to Resource Bank
<p>1 Providing the infrastructure and information needed to enable smarter choices</p> <p>See Case Study T12 – Smart Trips, Portland</p>	<ul style="list-style-type: none"> • Low Carbon Working Group to liaise with the RTC • Low Carbon Working Groups and wider stakeholders to explore opportunities to pool resources to develop a dedicated smarter choices team • Area Groups and Low Carbon Working Groups to work with constituent local planning authorities and regeneration units to ensure sustainable transport provision/accessibility in new developments and regeneration projects. 	<p>Transport sections 4.2 and 4.3</p>
<p>2 Significantly increasing the use of low carbon transport fuels and electric vehicles</p> <p>See Case Study T4 – Biogas Buses in Lille</p>	<ul style="list-style-type: none"> • Low Carbon Working Group to liaise with the RTC • Low Carbon Working Group to work with relevant stakeholders such as Value Wales to provide support to local authorities and the wider public sector to ensure commitment in local government/public sector forward procurement plans • Low Carbon Working Groups to explore funding opportunities and develop bids for trial projects. 	<p>Transport section 4.2.2</p>

3.4.3 Rural Land Use and Food

In 2005 agriculture accounted for 11% of total greenhouse gas emissions in Wales.⁴¹ Agriculture is the largest contributor to greenhouse gas emissions from food consumed in the UK. Through sequestration, land use, land use change and forestry were found to be a net sink in 2005.⁴²

See Resource Bank – Rural Land Use and Food for policy, background statistic, further carbon reduction opportunities and case studies.

Rationale for prioritisation:

- 1 Soil and plant stores in Wales are estimated to hold 547 million tonnes of carbon, with over 80% stored in upland soils and grassland
- 2 Food accounts for almost 1/10th of the carbon footprint of each of the Spatial Plan regions of Wales.⁴³ Agriculture, transport and food manufacturing are the key emission contributors from food consumed in the UK – all of which can be reduced by individual and community food production and consumption. Re-connecting individuals and communities with the land is also believed to help to deliver progress on wider behavioural change for carbon reduction.

SDC’s top two solutions for early consideration for reducing emissions from the rural land use and food sectors at a regional level are:

Priority	Essential Preparatory Steps	Refer to Resource Bank
<p>1 Identifying and implementing a programme of action to protect all significant soil carbon stores</p> <p>See Case Study RLU5 – Rhaglen Tir Eryri Blanket Bog Restoration and Case Study RLU6 – National Trust Ditch Blocking on the Migneint</p>	<ul style="list-style-type: none"> • Low Carbon Working Groups to use their convening power and wider stakeholders to collate or explore opportunities to commission soil carbon maps to identify priority sites for protection and restoration • Low Carbon Working Groups, in conjunction with relevant stakeholders such as CCW, assess the need for action beyond the soil carbon conservation expected to be delivered under the new Glastir agri-environment scheme • Low Carbon Working Groups, in conjunction with relevant stakeholders such as Farming Connect and farming unions to engage with landowners • Area Groups and Low Carbon Working Groups to work with constituent local planning authorities to provide support to ensure soil carbon maps informs local planning. 	<p>Rural Land Use and Food section 4.4</p>
<p>2 Implementing a comprehensive programme of measures to enable and significantly increase community and individual food growing</p> <p>See Case Study RLU4 – Swansea Community Farm</p>	<ul style="list-style-type: none"> • Low Carbon Working Groups to work with constituent local authorities and the public sector to audit the wider public sector estate (incl. hospitals and schools) to identify and develop opportunities for community gardens and allotments • Area Groups and Low Carbon Working Groups to work with constituent local planning authorities to develop supplementary planning guidance on the provision of food growing land in all new developments • Low Carbon Working Groups and wider stakeholders to initiate an awareness raising campaign. 	<p>Rural Land Use and Food section 4.3.3</p>

3.4.4 Waste

In 2004 the waste sector in Wales contributed 0.9 MtCO₂ equivalent (or 2%) of the total emissions (41.8 MtCO₂ equivalent) for Wales.⁴⁴ In comparison, for the same year, methane emissions from the waste sector in Wales contributed 18.8% of the national total; 95% of waste sector methane emissions were from landfill.

Rationale for prioritisation:

- 1 Research suggests that it would be feasible to reduce emissions in the waste sector by at least 80% by 2050, with anaerobic digestion and mechanical biological treatment accounting for 75% of this total.⁴⁵

- 2 The average UK household purchases over 2.5 tonnes of materials each year.⁴⁶ The prevention of waste has the highest potential for GHG emissions reductions from the waste sector.

See Resource Bank – Waste for policy, background statistic, further carbon reduction opportunities and case studies.

SDC’s top solutions for early consideration for reducing emissions from the waste sector at a regional level are:

Priority	Essential Preparatory Steps	Refer to Resource Bank
<p>1 Identifying sites for and developing anaerobic digestion facilities linked to significant sources of biomass waste</p> <p>See Case Study W2 – BiogenGreenfinch Anaerobic Digestion Plant</p>	<ul style="list-style-type: none"> • Low Carbon Working Groups to engage with the waste groups established under the regional waste plans e.g. North Wales Waste Treatment Project • Low Carbon Working Group in conjunction with the above groups to identify sources of food and farm waste as feedstock, users for heat/power or biogas produced and local use for digestate • Low Carbon Working Group in conjunction with the above groups to explore funding opportunities and bid for funds for projects 	<p>Waste section 4.3.1</p>
<p>2 Significantly progressing sustainable production and consumption for waste prevention and minimisation</p> <p>See Case Study W1 – Waste Minimisation in UK Department for Work and Pensions</p>	<ul style="list-style-type: none"> • Low Carbon Working Group to engage with the waste groups established under the regional waste plans e.g. North Wales Waste Treatment Project • Area Groups and Low Carbon Working Groups in conjunction with the above groups to set a framework at the regional level to reflect the need for the sustainable use of natural resources • Low Carbon Working Groups to engage across sectors including manufacturing, food, construction • Low Carbon Working Group to work with relevant stakeholders such as Value Wales to provide support to local authorities and the wider public sector to progress waste minimisation through procurement • Low Carbon Working Groups and wider stakeholders to initiate a food waste minimisation campaign. 	<p>Waste section 4.1</p>

3.5 Cross Cutting Mechanisms for Delivery

The SDC has identified four mechanisms which are key to delivery of emission reductions; cutting across the sectors of built environment and energy, transport, rural land use and food, and waste. These should underpin the delivery of sector

specific actions. The SDC recognises that some of these mechanisms are already utilised and acted upon through the Wales Spatial Plan framework, but stresses the importance of expanding existing practice to deliver carbon reduction.

3.5.1 Procurement/Leading by Example

The public sector possesses the important role of leading by example, demonstrating the benefits of adopting many of the measures outline in the resource bank and providing the infrastructure to enable the transition to a low carbon economy.

The £4bn plus⁴⁷ procurement budget of the public sector in Wales, is a powerful tool to help drive and establish markets for the products and services required to become a Low Carbon Region. Procurement must be undertaken based

upon lifecycle costs, recognising that the long term environmental, economic and social gains of procuring low carbon products and services outweigh the upfront costs. The WSP Area Groups and Low Carbon Working Groups should therefore consider lifecycle costs when developing low carbon

strategies for the regions and also when guiding the location of and investment in key infrastructure within the regions. See resource bank – Waste section 4.9 and Rural Land Use and Food section 4.3.1 for further information on sustainable procurement.

3.5.2 Land Use Planning

The SDC stresses that the land use planning system is central to the successful transition to a low carbon future. The crucial role of planning has also been strongly emphasised throughout the workshop process and is a recurring theme in the resource bank.

There is both a legislative obligation (through the Planning & Compulsory Purchase Act 2004 (section 60) that LDPs have regard to; and a policy requirement (through ‘Planning Policy Wales’, the Welsh Assembly Government’s principal statement of national policy) that requires LDPs to reflect the policy goals of the Wales Spatial Plan.

While the specific levers involved in the planning process rest with local authorities, WSP Area Groups do have important powers to both influence and support constituent local authorities; ensuring that LDPs and local regeneration programmes incorporate

low carbon principles is essential. Any working group established to take forward the creation and implementation of a regional low carbon strategy should respond to LDP consultations and ensure that their regional Ministerial group is using its high level influence to ensure the sustainability of local regeneration programmes, such as the recently announced regeneration programme along the North Wales coast. Critical considerations for new development and regeneration are the ease of access between homes, jobs, services and retail which can be addressed by co-location, mixed development and public transport accessibility. The importance of this approach to planning is highlighted in the Wales Spatial Plan update, and as such, WSP Area Groups are critical in ensuring this is echoed at a local authority level.

3.5.3 Zoned Approach

A zoned approach involves tackling an area at a time when seeking to implement measures to reduce carbon emission in the regions. For example, refurbishing thousands of homes within fuel poor parts of a local authority to improve energy efficiency would constitute a zoned approach. The size of the zone will depend upon the scale at which the widest benefits are achieved for

the measures to be implemented. Adopting this zoned approach can enable economies of scale, businesses to gear up, diversify their operations and train staff to meet the demand created. The Heads of the Valleys low carbon programme currently under development, is an example of the potential benefits of a zoned approach to carbon reduction:

Heads of the Valleys (HoV) Low Carbon Programme.

Europe's first low carbon zone is set to be established under the Heads of the Valleys Low Carbon Programme. The HoV programme is a regeneration strategy developed through a partnership between the local authorities of Rhondda Cynon Taf, Merthyr Tydfil, Caerphilly, Blaenau-Gwent and Torfaen and local stakeholders. The low carbon zone project has secured many million pounds worth of funding including £10 million from HoV, £12 million from Welsh Assembly Government's Strategic Capital Investment Fund, £8 million through CERT and £8 to £10 million from registered social landlords. Further funding has been secured through the second phase of the Low Carbon Buildings Programme with match funding hoped for through an EU Convergence bid. Key deliverables of the low carbon zone will be:

- 40,000 microgeneration units or their equivalent installed
- 65,000 homes assessed for energy efficiency
- 39,000 energy reduction measures implemented

- The largest concentration of microgeneration in the EU
- Reduced domestic energy bills of at least £1.7m
- Reduced emissions of at least 139,200 tonnes CO₂ a year.

Alongside the low carbon zone a Centre for Regeneration Excellence is to be established in the HoV area. This will provide renewable energy and energy efficiency related training opportunities, support and participate in research and development linked to Universities, and further links to green jobs and businesses within Wales. It is hoped that the establishment of the Centre for Regeneration Excellence and the development of the low carbon zone will stimulate the creation and growth of an innovation park in its vicinity, attracting businesses and organisations with expertise in renewable energy and energy efficiency. These joint initiatives will create markets for, develop skills in and cluster knowledge and expertise relating to, low carbon technologies and initiatives, radiating impetus towards a low carbon economy in Wales.

The SDC believes that a zoned approach should involve action on reducing emissions from all sectors i.e. considering reducing emissions in the built environment, transport, waste, land use and food as one holistic package, enabling synergies between them to be identified. For example, the work undertaken within Cardiff to become a sustainable travel city could be complemented by energy efficient housing refurbishments, increased provision of community food growing land and a waste minimisation campaign to maximise public awareness and momentum towards low carbon.

The ability of a zone based approach to carbon reduction to showcase best practice and catalyse sustainable projects and initiatives elsewhere has been demonstrated through the transition towns movement and the Heads of the Valleys refurbishment work. Building upon SDC's observations in chapters 1.4 and 2.3.3, the creation of low carbon zones in each region should be considered in context of the role of primary key settlements, hubs and cross boundary settlements, (all terminologies used in the

WSP), in providing the services and infrastructure for a Low Carbon Region. The creation of low carbon zones within these key settlements, or upon localities with existing successful sustainability initiatives, would serve to raise awareness and lead progress towards regional carbon reductions. Suggested possible examples include: the Dyfi Biosphere in Central Wales – where low carbon initiatives such as community renewable energy and sustainable tourism are already proliferating; and as discussed, expanding upon Cardiff's sustainable travel town status.

In the recent UK Low Carbon Industrial Strategy⁴⁸ the UK government committed to developing Low Carbon Economic Areas (LCEAs). These will be created to take advantage of and build upon the low carbon economic strengths of selected geographic areas. Within these areas local and regional partnerships will be created across agencies to increase learning and develop supply chains for low carbon technologies. The first LCEA will be located in the South West where focus will be on developing

marine energy technology through measures such as investment in a demonstration large scale wave energy farm, development of a world centre of excellence in marine science and energy research and creation of an industry forum. The low carbon economic strengths of each of the regions of Wales should be identified to inform the location and focus of low carbon zones to be developed. The Heads

of the Valleys case study demonstrates a similar approach, clustering renewable energy and energy efficiency focused businesses, research bodies and expertise. Any low carbon zones developed in the regions should have a joint focus on reducing emissions and maximising the economic contribution of the transition.

3.5.4 Skills, Training and R&D

Organisations must be able to access the relevant skills base and knowledge to make informed decisions and implement low carbon measures. In order to meet overall requirements for one planet living and stay competitive on an international scale, it will be essential to be innovative and realise that, for many innovations, more information will be required. For example, research and development (R&D) is needed to identify more efficient technologies,

methods or practices, as well as maximising the commercial viability and minimising the environmental impact of current technologies.⁴⁹ It is therefore important for the WSP Area Group to analyse, in partnership with the DCELLS and other relevant stakeholders, the skills, training and technology needs to enable them to meet the objectives set out in their low carbon strategies/plans.

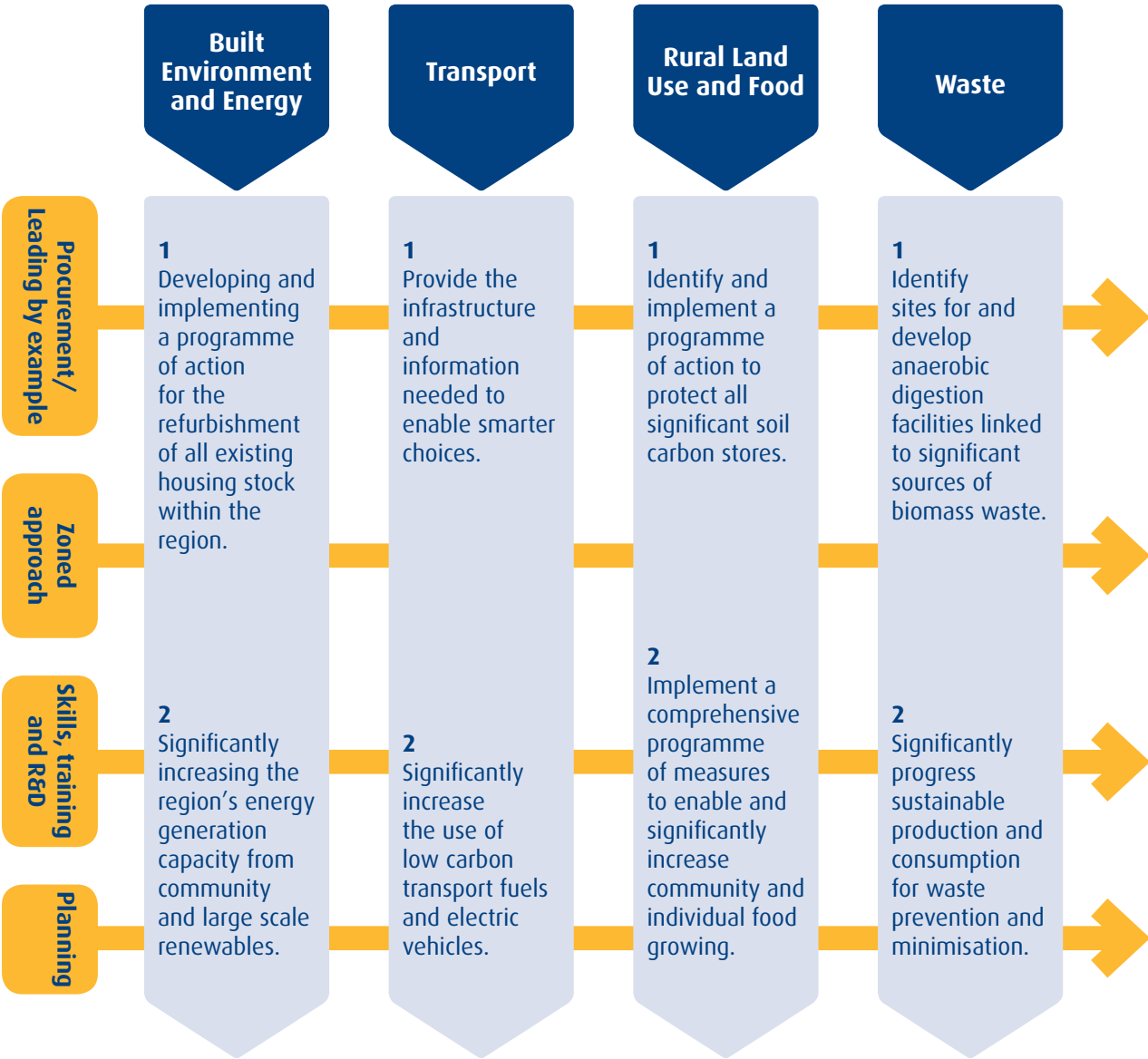
3.6 Concluding Points

This chapter has highlighted some key solutions for reducing emissions at a regional level, along with cross cutting mechanisms for delivery which are key to driving through low carbon projects in any sector or region. The cross cutting mechanisms and all available policy tools (such as compliance with existing legal instruments and fiscal measures) must

be used in a complimentary way to achieve effective outcomes. Figure 3.1, overleaf, illustrates the cross cutting mechanisms and the sector priorities.

Supplementing these Wales wide priorities and opportunities, the next chapter provides some suggested priority areas for action specific to each region.

Figure 3.1 Schematic summarising the cross cutting mechanisms and sector priorities



References for Chapter 3

- 27** Welsh Assembly Government (2009) *Climate change strategy – Programme of action consultation*. <http://wales.gov.uk/consultations/environmentandcountryside/climatechangeaction/?lang=en>
- 28** Committee on Climate Change (2008) *Building a low-carbon economy – the UK’s contribution to tackling climate change*. www.theccc.org.uk/reports/building-a-low-carbon-economy p 442 - 449. See the full report for underlying assumptions and discussion on the capacity to deliver.
- 29** Please see the report for the underlying assumptions that shaped these estimated savings potential figures.
- 30** Source: Compiled using data from the Energy Saving Trust (2009) *Low carbon citizens*. A step by step guide to meeting the 3% target for personal emissions in Wales. www.energysavingtrust.org.uk/corporate/Global-Data/Publications/Low-Carbon-Citizens-Wales p 26-28.
- 31** Smith Institute (various authors) (2008) *Can Homeworking Save the Planet?* The Smith Institute: London.
- 32** Energy Saving Trust (2006) *Integrating renewable energy into existing housing – case studies*. EST: London.
- 33** The Stockholm Environment Institute defines the ecological footprint as “an indicator of the total environmental burden that we place on the planet. It represents the area of land needed to provide raw materials, energy and food, as well as absorb pollution and waste created – in this case by the Welsh population.” The ecological footprint is expressed in global hectares per capita (gha/ capita). See Stockholm Environmental Institute (2008) *Wales’ Ecological Footprint – Scenarios to 2020*. www.sei.se/publications.html?task=view&catid=6&id=1055
- 34** Stockholm Environment Institute. Footprint Data. <http://resource-accounting.org.uk/downloads/wales/wales>
- 35** Stockholm Environmental Institute (2008) *Wales’ Ecological Footprint – Scenarios to 2020*. www.sei.se/publications.html?task=view&catid=6&id=1055
- 36** Energy Saving Trust (2008) *Power in numbers. The benefits and potential of distributed energy at the small community scale*. Full Report. Energy Saving Trust: London.
- 37** Welsh Assembly Government (2008) Stats Wales, State of the Environment – Indicator 7a. www.statswales.wales.gov.uk/tableviewer/document.aspx?FileId=1610
- 38** Welsh Assembly Government (2008) *One Wales: Connecting the Nation, The Wales Transport Strategy*. <http://wales.gov.uk/topics/transport/publications/transportstrategy/;jsessionid=2RKHJ2TTnJZXnNlt5VsxjMfh12lNBj6L1kQy4YlLxgvNX5YN2nnB!1116311810?lang=en>
- 39** Welsh Assembly Government (2008) Stats Wales, State of the Environment - Indicator 7a. www.statswales.wales.gov.uk/tableviewer/document.aspx?FileId=1610
- 40** Department for Transport (2009) *Impact Assessment of the Carbon Reduction Strategy for Transport, Low Carbon Transport: A Greener Future*. www.dft.gov.uk/pgr/sustainable/carbonreduction/ia.pdf
- 41** AEA Energy and Environment (2007) *Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland: 1990 – 2005*. AEA Group: Didcot.
- 42** Energy and Environment (2008) *Policy Options Development & Appraisal for Reducing GHG Emissions in Wales*. AEA Group: Didcot.
- 43** See each region’s carbon footprint in chapter 4.
- 44** Department for Environment, Food and Rural Affairs (2006) *Greenhouse Gas Inventories for England, Scotland, Wales and Northern Ireland: 1990-2004*. CESA Division Research Programme.
- 45** Committee on Climate Change (2008): *Building a low carbon economy – the UKs contribution to tackling climate change*. The First Report of the Committee on Climate Change.
- 46** World Wildlife Fund (2006): *Ecological budget UK. Counting Consumption Report*. www.wwf.org.uk/filelibrary/pdf/countingconsumption.pdf

- 47** Welsh Assembly Government (2009) Update Paper for the Fifth Economic Summit <http://wales.gov.uk/topics/businessandconomy/recession/response/summit/fifthupdate/?lang=en>
- 48** Department for Business, Innovation and Skills and the Department of Energy and Climate Change (2009) *The UK Low Carbon Industrial Strategy*. www.berr.gov.uk/whatwedo/sectors/lowcarbon/lowcarbonstrategy/page50105.html
- 49** Expert Panel on Resource Management for Wales (2007) *Low Carbon Wales to improve resource efficiency in Wales*. www.swansea.ac.uk/businessandcareers/Technium/EPRM/

The new nursery at Brecon Road Infants School in Merthyr uses locally sourced sheep's wool as insulation. The Thermafleece, produced by Brecon-based company Ty-Mawr, is naturally breathable so absorbs and releases water vapour to keep the building cool in summer and warm in winter.

Photo: Ty-Mawr Lime Ltd. and Brecon Road Infant School.

4

Making a Start in the Regions



4.1 Aims of this chapter

This chapter provides information tailored to each region which should supplement the common information given in chapter 3 to enable the construction of regional low carbon strategies. For each region, this chapter contains:

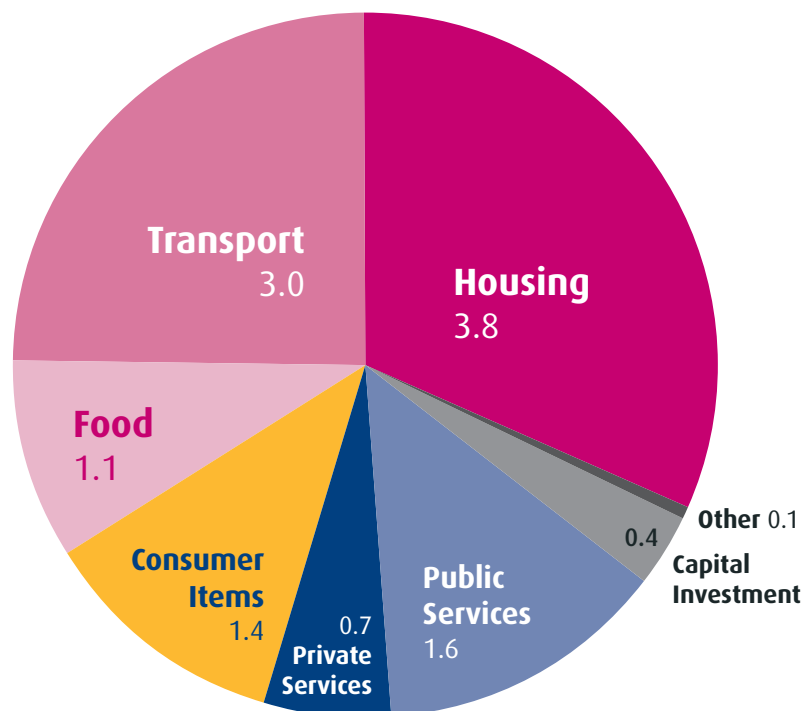
- **Carbon Footprint** – compiled using 2003 data by Spatial Plan Area provided by the SEI.
- **Visioning** – a summary of recurring words and themes from the low carbon visioning session held in the regional workshops. This is a first step towards developing a low carbon vision for the region. The visioning section in chapter 2.3.3 will help to add value to this exercise through giving consideration to infrastructure requirements and how sectoral visions can complement each other.
- **Analysis of the region’s Priorities and Opportunities** – a commentary on priority low carbon solutions and opportunities based on the region’s unique attributes and characteristics. This was developed through dialogue with stakeholders from the region, through the research which led to the

development of the Resource Bank and was informed by the characteristics of the region as detailed in the WSP 2008 Update. This analysis also includes the solutions prioritised as being high impact during the regional workshop, based on the local knowledge of individuals present. It should be recognised that these priorities reflect the opinions of those present at the workshop and should not be taken as definitive but rather used as an informative guide in the regional prioritisation of low carbon solutions. Appendix C demonstrates how carbon reduction opportunities can synergise with and help to deliver on the regions’ other priorities (as set out in the WSP 2008 Update), helping to enable cross strategy working.

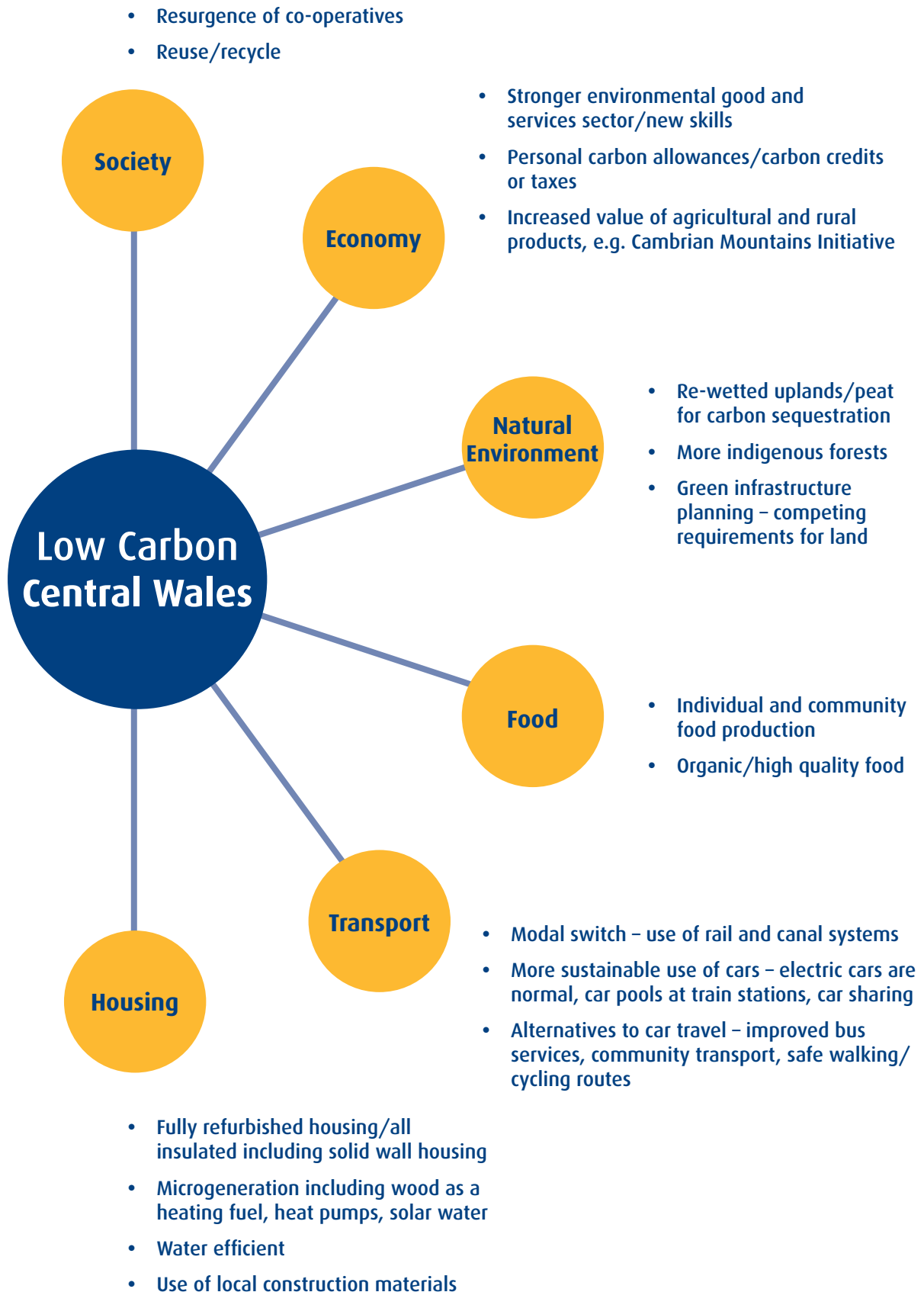
See Appendix A for a full account of the workshop sessions.

4.2 Central Wales

Carbon Footprint (tonnes per capita)



Visioning – A Low Carbon Central Wales



Analysis of the Region's Priorities and Opportunities

The prize for Central Wales will be a low carbon transition that provides a high quality of life and provides employment opportunities, within a superb environment. The SDC believes that the key to this transition lies in building on the Region's rural and environmental strengths, specifically the protection of soil carbon stores (the Region has some of the highest carbon density soils in Wales⁵⁰) and the generation of low carbon electricity (three of the eight strategic search areas for onshore wind, identified by the Welsh Assembly Government's Technical Advisory Note (TAN) 8 are wholly within the Region⁵¹).

The dispersed nature of the population continues to be a major challenge within the Region (especially

for reducing transport emissions) and a relative low level of new build implies a focus on enhancing the sustainability of the existing built environment (see resource bank – Built Environment and Energy section 5). The availability of land is seen as a key strength for promoting “grow your own” and enabling local food production and consumption (see resource bank Rural Land Use and Food section 4.3).

The protection of soil carbon stores and the generation of low carbon electricity are not new to the Central Wales Region, indeed the Wales Spatial Plan Update 2008 provides a commitment to manage and develop both of these respectively.

The SDC recommends early consideration is given to:

Protection of Soil Carbon Stores

(Resource bank – Rural Land Use and Food section 4.4.1)

- a) Collating accurate maps on soil carbon stores is an essential first step to identifying priority areas for protection. This exercise will enable stakeholders to be brought together and should draw upon existing expertise within the Region such as the Institute of Biological, Environmental and Rural Sciences (IBERS) at Aberystwyth University
- b) Convening landowners and relevant stakeholders for the protection of soil carbon is a crucial function for the Low Carbon Working Group or delivery group. Joint development of funding bids and projects for protection of soil carbon should provide opportunities to support the existing rural economy, whilst providing opportunities for the development of sustainable tourism.

Generation of Low Carbon Electricity

(Resource bank – Built Environment and Energy section 6)

- c) Supporting the research, development and deployment of both carbon sink and renewable technologies within research institutions and businesses in the Region such as the Centre for Alternative Technology and Aberystwyth University. This could attract inward investment, generating knowledge based business clusters.
- d) Working with business and higher and further education institutions within the Region will enable the renewable technology related skills requirement to be identified and delivered. This approach will also help to tackle the Region's challenge of linking vocational options with current and future opportunities within the local economy, meeting the needs of business.

- e) Working with renewable energy developers, communities and landowners to ensure renewable energy projects are developed according to sustainable development principles and the benefit to existing rural economies and communities is maximised.
- f) Support for community renewable energy projects would enable existing successes within the Region such as Bro Dyfi Community Renewables' work to be replicated or expanded. Opportunities for support could be the provision of development officers and/or advice on e.g. licensing and planning issues. In line with the Region's priorities, this will empower local communities to enhance their level of sustainability. Supporting community scale energy installations on farms will enhance the sustainability of existing rural economic sectors.

Cross Border Working

- g) With its central location, the Region should utilise its potential for cross border partnerships with other Spatial Plan regions. This could present opportunities to pool resources and skills to deliver on carbon reduction projects. Utilising existing linkages with the West Midlands, North West England and Ireland present further opportunities for cross border partnering which could enable shared learning and fast and effective knowledge transfer on carbon reduction strategies.

In addition, the Region's Low Carbon Working Group may also wish to consider the priorities which arose from the Regional workshop:

1 ICT connectivity and low carbon vehicles

(Resource bank – Transport sections 4.1.3 and 4.2.2)

- ICT connectivity was a recurring theme amongst solutions deemed high impact including the provision of ICT connectivity as standard in new developments; expansion of broadband connectivity; and ICT support.
- Both biogas fuelled public transport and procurement of hybrid or electric vehicles (initially by the public sector to stimulate demand) were deemed high impact given the need for travel between dispersed populations and services in Central Wales.

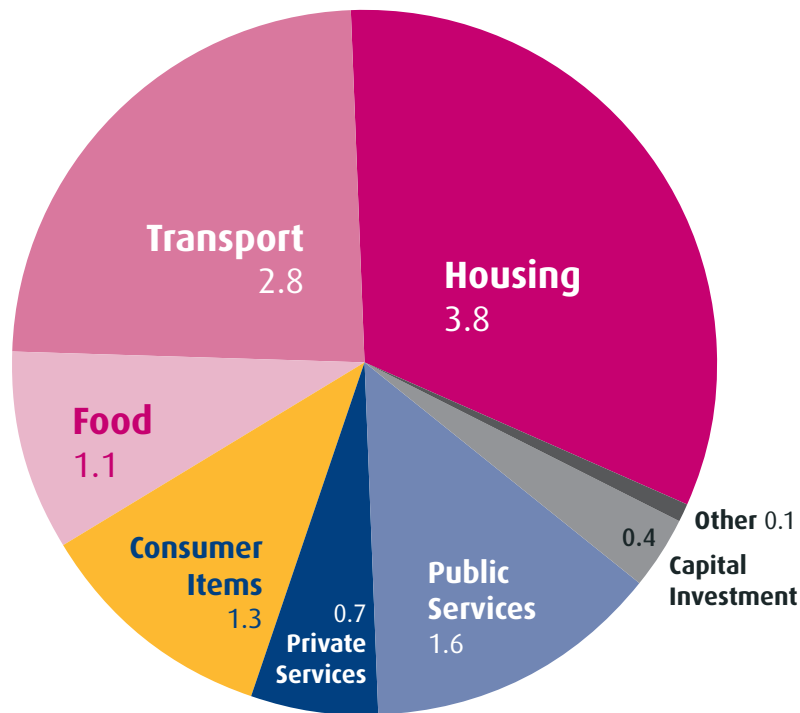
2 Land use mapping

(Resource bank – Rural Land Use and Food section 4.4)

- The group expanded discussion on the mapping of soil carbon, expressing the need for a multi layered Regional land use map incorporating renewable energy potential, soil carbon, areas likely to flood, areas with highest food growing potential etc. to provide an integrated and comprehensive guide for land use in Central Wales.
- The Area Group was felt to have an important role in the collation of these layers and ensuring their use in influencing the delivery of projects and developments.

4.3 North East Wales – Border and Coast

Carbon Footprint (tonnes per capita)



Analysis of the Region’s Priorities and Opportunities

As a Region that seeks to harness economic opportunities on both sides of the border, while reducing inequalities and improving the quality of its natural and physical assets, a low carbon transition in North East Wales will need to take a multi-faceted or mixed approach, paying particular attention to the differing needs of its rural and urban areas.

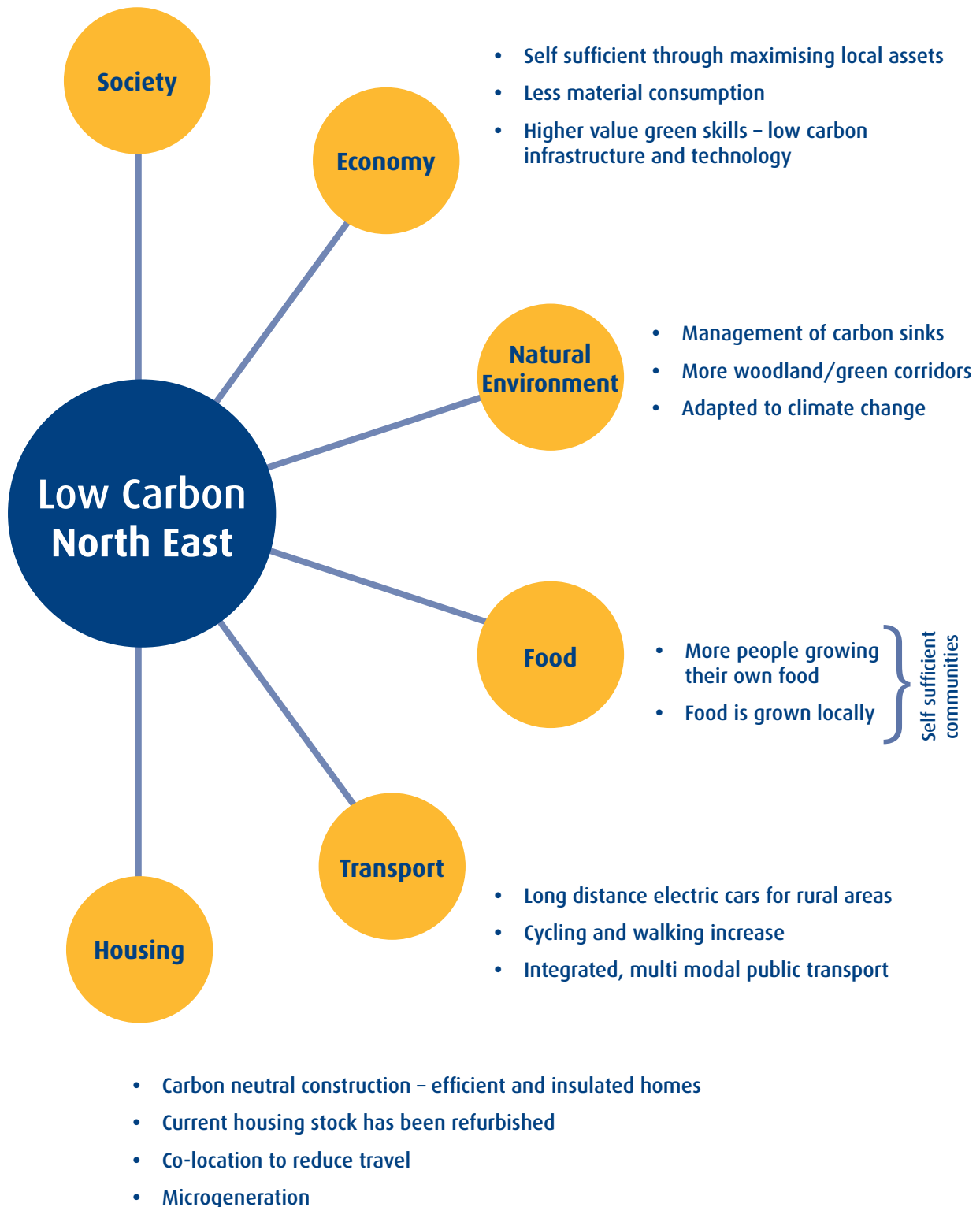
With its large industrial and manufacturing employment base, improving energy efficiency within homes, businesses and industries represent significant opportunities for the Region to contribute towards a low carbon Wales (see resource

bank – Built Environment and Energy section 5). Delivering energy efficiency improvements presents simultaneous opportunities for reducing CO₂ emissions, improving the wellbeing of communities and maintaining the competitiveness of business and industry.

For rural parts of the Region in particular, action on transport will deliver benefits; with a combination of measures that firstly aims to reduce demand, and secondly provide a modal shift into more sustainable, low-carbon modes of transport (see resource bank – Transport sections 4.1 and 4.2).

Visioning – A Low Carbon North East Wales

- Local community action and co-operation
- Full awareness of sustainability and low carbon, incorporation into everyday life
- Changed attitudes to materialism and new values



The SDC recommends early consideration is given to:

- a) Mapping or collating information on the energy efficiency of the building stock within the Region as an essential first step to identify priority areas to target for refurbishment and/or through energy efficiency campaigns. This exercise should draw upon existing expertise within the Region such as representation from Wrexham County Borough Council and Warm Wales' county wide energy efficiency and fuel poverty targeted project.
- b) Engaging with the Low/Zero Carbon Hub Wales to provide access to experienced and knowledgeable practitioners.
- c) Working with the construction sector and higher and further education institutions to ensure that the skills and training needed to deliver energy efficiency refurbishment are developed and available. This will also deliver on the Region's aim to develop and update the skills of the current and potential workforce.
- d) Completing a) to c) above and thereby collating the stakeholders and background information needed to progress a zoned approach to the refurbishment. Undertaking a zoned refurbishment of housing will provide an opportunity to cluster renewable energy and energy efficiency businesses within the Region, improving the diversity and quality of the economy.
- e) Convening stakeholders to enable progression of initiatives to engage businesses and industry in energy efficiency improvements. Potential opportunities from the resource bank include ecotricity's merchant wind power scheme on industrial estates or business parks, energy efficiency competitions between offices, and smart meter roll out on industrial estates. Further to this, engagement with industry may present opportunities for funding carbon reduction projects within the locality or a source of waste heat to be used in district heating or greenhouses.
- f) The Low Carbon Working Group working with and supporting constituent local authorities to ensure the sustainability of the significant new housing provision required within the Region.
- g) Cross border engagement and working partnerships to provide access to further skills and expertise to enable the Region to progress energy efficiency aspirations. Developing simultaneous low carbon refurbishment zones on both sides of the border would provide economies of scale and allow sharing of experience and skills. The existing, successful Mersey Dee Alliance could serve as a platform for this.

In addition, the Region's Low Carbon Working Group may also wish to consider the priorities which arose from the Regional workshop:

1 Increasing the energy efficiency of the existing housing stock

(Resource bank – Built Environment and Energy section 5)

- Although perceived to be very difficult to achieve some essential, easier preparatory measures were identified including thermal mapping and energy auditing of the existing stock, mapping of fuel poor households and incentivising the use of existing efficient buildings as “open house” educational tools
- Within this, upgrading public sector buildings, university and NHS buildings was deemed to be high impact due to the large number of public sector buildings in the North.

2 Emphasis on a combination of transport measures

(Resource bank – Transport section 4)

- The group felt that a combination of the solutions put forward in the transport chapter of the resource bank is needed to ensure progress on carbon reductions from transport; amongst the highest impact solutions was an overall emphasis on reducing the need to travel i.e. Box T1 from the resource bank.

3 Local food procurement in the public sector

(Resource bank – Rural Land Use and Food section 4.3.1)

- The public sector could provide a significant market for local food in North Wales but the ability of suppliers to meet demand was questioned. The group suggested that a mapping exercise of current supply and what is currently exported should be undertaken as a preparatory step.

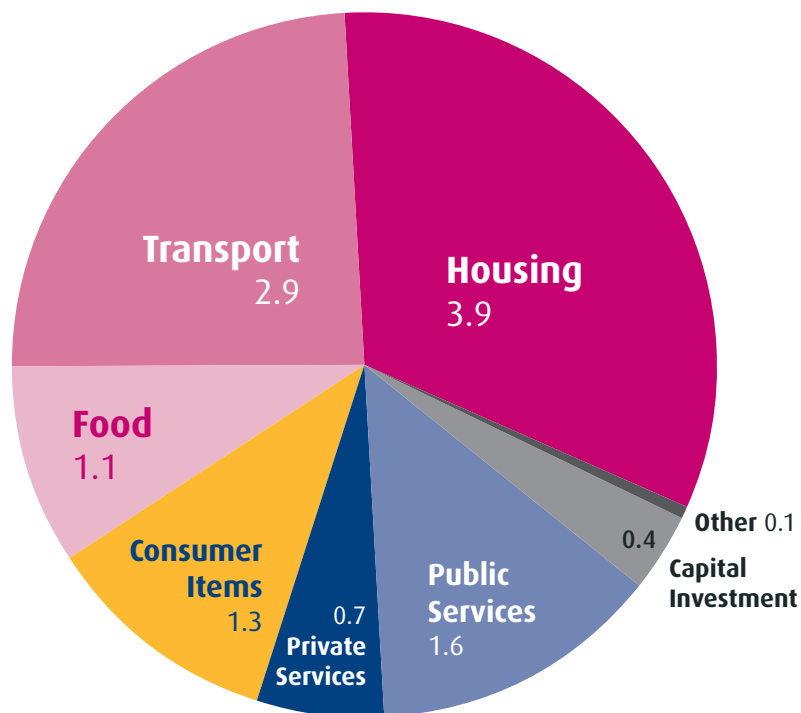
4 Tackle construction waste

(Resource bank – Waste section 4.1.2)

- A large proportion of waste in North Wales was identified as construction waste. Amongst the high impact solutions that may help to alleviate this were trade waste recycling centres and targets for waste reduction and recycled content in public sector funded construction projects.

4.4 North West Wales – Eryri a Môn

Carbon Footprint (tonnes per capita)



Analysis of the Region's Priorities and Opportunities

The high-quality natural and physical environment in North West Wales, together with a vision of a strong cultural and knowledge-based economy that enhances the Region's distinctive character, presents particular low-carbon opportunities.

The tapestry of community types in the Region including clusters of towns, rural settlements and tourism centres calls for a multi faceted approach to carbon reduction policies and projects. The protection of soil carbon stores and the generation of low carbon electricity stand out as being the most significant contributions the North West Region can make towards a low carbon Wales. Some of the highest carbon density soils in Wales are located in the North West.⁵² With significant tidal current and wind resource, the development of Anglesey as an energy island and expertise at Bangor University, the Region holds great potential for renewable energy development. This is echoed in the 2008 WSP update, where protecting upland habitat to ensure it can function as a significant carbon sink and developing renewable energy are highlighted as opportunities or priorities for action.

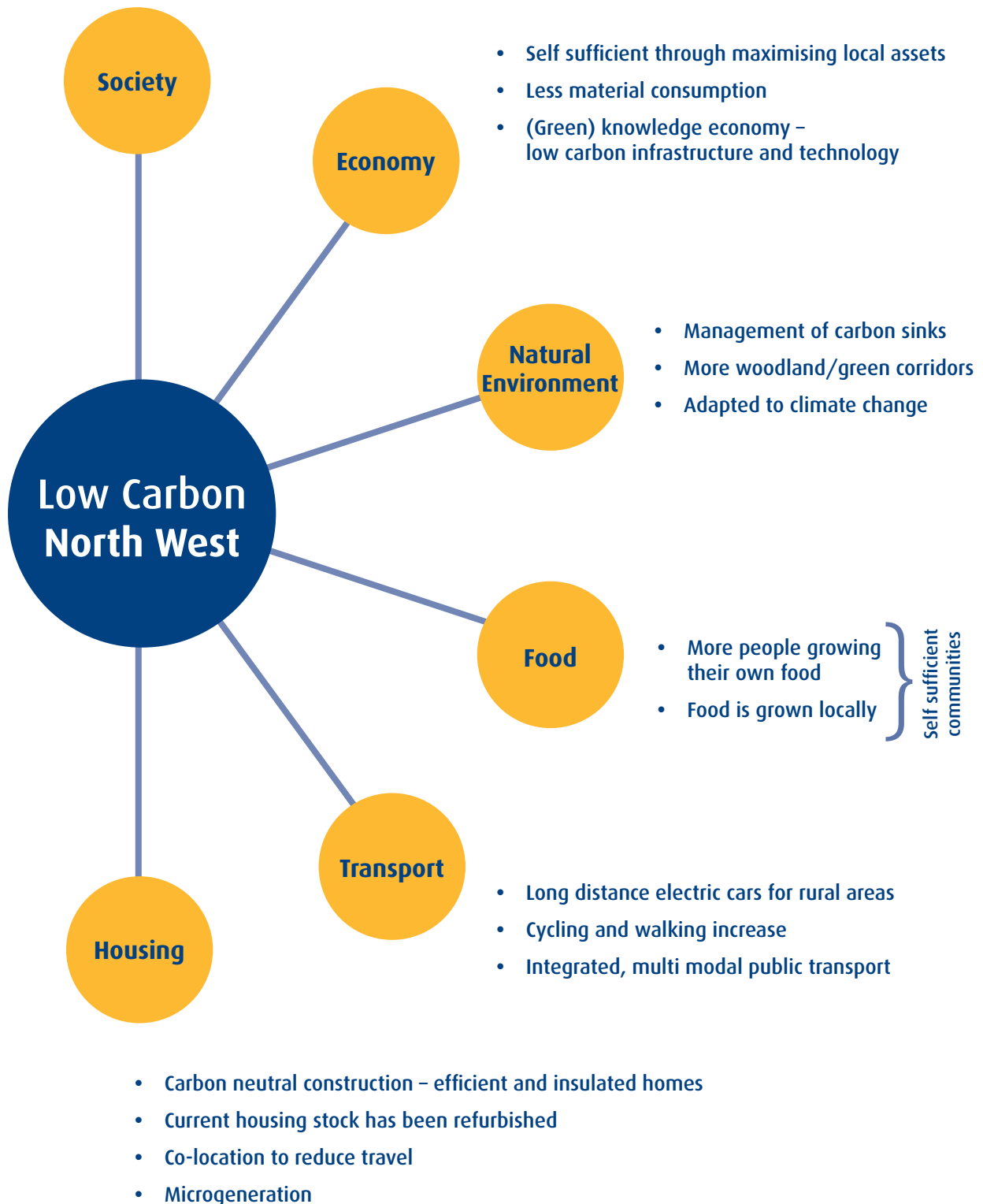
The Region does, however face a number of

practical barriers that need to be addressed and overcome. The issue of mobility, both in the Region, and to and from other regions remains a significant challenge. Low carbon solutions such as car pooling, will, in this heavily rural Region, have a very limited affect, and therefore innovative solutions, such as reducing the need to travel through improved ICT provision should be explored closely. Creating new green jobs as part of a strong environmental goods and services sector in the Region is an important opportunity for economic regeneration. A further economic opportunity lies in tackling the issue of local produce being exported from the Region with value being added elsewhere.

In compiling this report, the SDC identified numerous examples of good practice in the Region, including the work of Gwynedd LSB on carbon reduction and the numerous soil carbon restoration projects underway on Anglesey and in Snowdonia National Park. The emerging Anglesey energy island concept is seen by many stakeholders, both within and outside the Region, as an important delivery vehicle for low carbon energy generation in the North West.

Visioning – A Low Carbon North West Wales

- Local community action and co-operation
- Full awareness of sustainability and low carbon, incorporation into everyday life
- Changed attitudes to materialism and new values



The SDC recommends early consideration is given to:

Protection of Soil Carbon Stores

(Resource bank – Rural Land Use and Food section 4.4.1) through:

- a) Collating accurate maps on soil carbon stores as an essential first step to identifying priority areas for protection. This exercise will enable stakeholders to be brought together and should draw upon existing expertise within the Region such as CCW and Bangor University. This mapping process could be incorporated into the mapping exercise proposed within the planned integrated spatial environmental strategy across the North Wales and Mersey Dee Alliance area.
- b) Convening landowners and relevant stakeholders for the protection of soil carbon as a crucial function for the Low Carbon Working Group. Joint development of funding bids and projects for protection of soil carbon should provide opportunities to support sustainable development within the agricultural sector and develop the environmental service sector, as aspired to within the WSP update.
- c) Taking into account the lessons learnt from current projects such as the National Trust ditch blocking on the Migneint.

Generation of Low Carbon Electricity

(Resource bank – Built Environment and Energy section 6) through:

- d) Supporting the research, development and deployment of both carbon sink and renewable technologies within research institutions and businesses in the Region such as Bangor University and Anglesey Wind and Energy Ltd, to attract inward investment, enabling the development of the environmental goods and services sector whilst contributing towards the Region's outward-looking knowledge based economy.
- e) Working with business and higher and further education institutions within the Region to identify the renewable technology related skills requirements. This will ensure that for the renewable energy sector, the Region achieves its aim of a strong innovative network of vocational skills provision, with the capacity to respond to demand from employers.
- f) Working with renewable energy developers, communities and landowners to develop renewable energy projects within the Region. It is essential that these are developed according to sustainable development principles and the benefit to existing rural economies and communities is maximised. The benefit of supporting community energy projects should be considered, building upon the strong sense of community within the North West Region.
- g) Engaging with large infrastructure projects such as the possible new Wylfa nuclear power station to ensure maximum carbon reduction and sustainability benefit. The development of a new nuclear power station at Wylfa would create 3-4000 jobs in its construction phase over a 10 year period. Ideas were generated at the North Wales workshop about how to integrate low carbon opportunities into this project. This included; requirements for all companies involved (throughout the supply chain) in its construction and operation to demonstrate sustainability principles are embedded into their business operations, and the new houses built for the workers should be built to the highest environmental standards. Interestingly, other parts of the UK are developing plans to support low carbon clusters around new nuclear build sites.

Local Supply Chain & Procurement

(Resource Bank – Rural Land Use and Food section 4.3) through:

- h)** Convening local producers, landowners and relevant stakeholders with a view to building upon local, sustainable branded produce and maximising the opportunities for local consumption presented by the production of a diverse range of livestock and crops. Simultaneous work on expanding environmentally beneficial farming and reducing domestic energy use will maximise emission reductions from the local food chain.

In addition, the Region’s Low Carbon Working Group may also wish to consider the priorities which arose from the Regional workshop:

1 Increasing the energy efficiency of the existing housing stock

(Resource bank – Built Environment and Energy section 5)

- Although perceived to be very difficult to achieve some essential, easier preparatory measures were identified including thermal mapping and energy auditing of the existing stock, mapping of fuel poor households and incentivising the use of existing efficient buildings as “open house” educational tools.
- Within this, upgrading public sector buildings, university and NHS buildings was deemed to be high impact due to the large number of public sector buildings in the North.

2 Emphasis on a combination of transport measures

(Resource bank – Transport section 4)

- The group felt that a combination of the solutions put forward in the transport chapter of the resource bank is needed to ensure progress on carbon reductions from transport; amongst the highest impact solutions was an overall emphasis on reducing the need to travel i.e. Box T1 from the resource bank.

3 Local food procurement in the public sector

(Resource bank – Rural Land Use and Food section 4.3.1)

- The public sector could provide a significant market for local food in North Wales but the ability of suppliers to meet demand was questioned. The group suggested that a mapping exercise of current supply and what is currently exported should be undertaken as a preparatory step.

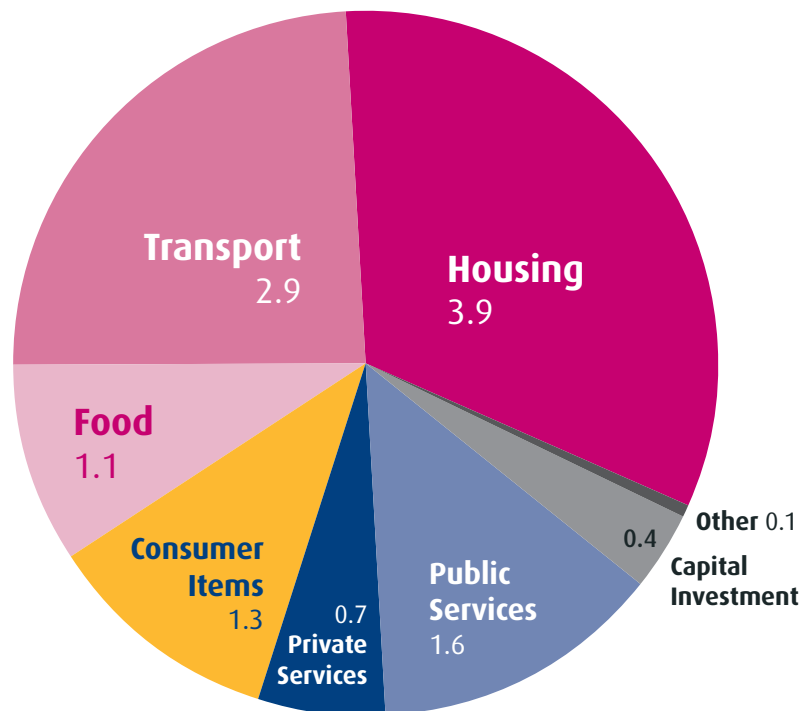
4 Tackle construction waste

(Resource bank – Waste section 4.1.2)

- A large proportion of waste in North Wales was identified as construction waste. Amongst the high impact solutions that may help to alleviate this were trade waste recycling centres and targets for waste reduction and recycled content in public sector funded construction projects.

4.5 Pembrokeshire – The Haven

Carbon Footprint (tonnes per capita)



Analysis of the Region's Priorities and Opportunities

The Region's unique environment, its maritime access, and its international importance both as a tourism destination but also a home of energy generation provide unique opportunities and challenges for the Region.

Pembrokeshire-Haven's strategy in the WSP 2008 update identified building sustainable communities as the central core around which its strategy needs to circulate. The SDC supports this view and understands how the perceived peripheral nature of the Region, together with its rural and urban deprivation, are significant factors that need to be addressed as part of this agenda. The SDC proposes that development of the Region's three strategic hubs provide the infrastructure and services needed to enable the transition of the Region to a low carbon economy, enabling both citizens of the Region and tourists to lead low carbon lives in Pembrokeshire. Allied to this is the development of a resilient economy that builds on the opportunities provided by the LNG terminal and enables the diversification of the economy towards the sustainable technologies sector which is predicted to grow by 4% per annum

up to 2014/15 (one of the few areas of the economy expected to maintain positive growth rates through the economic downturn).⁵³

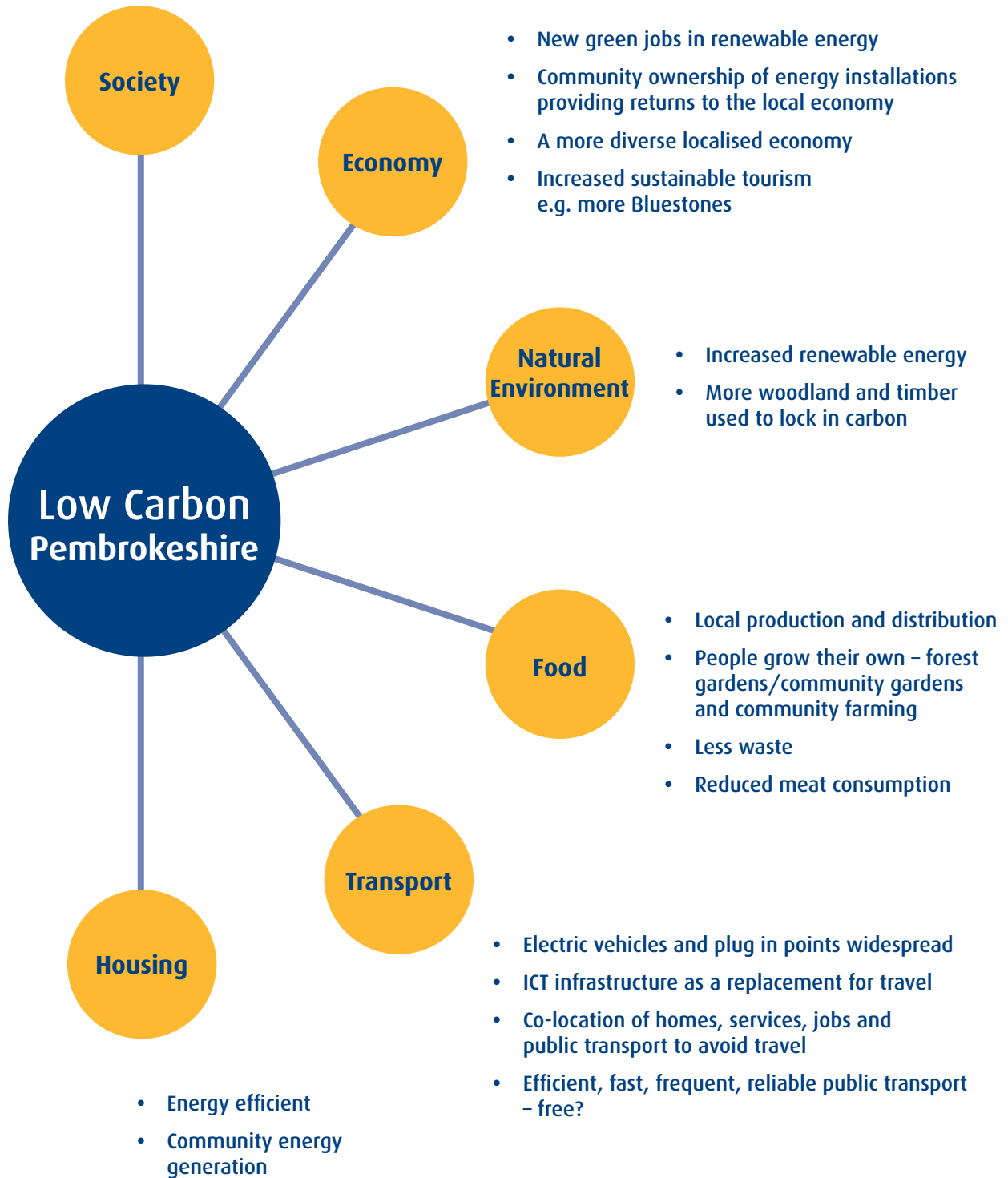
Key Regional factors that need to be addressed include the high concentration of older buildings posing challenges for refurbishment; the requirement for regular rural public transport services despite low concentrations of demand, calling for tailored and specialist service provision; and opportunities in agriculture, particularly improving local food supply and demand.

The potential importance of tidal energy, given the high tidal stream flow rates surrounding Pembrokeshire, and the skills base in the Region, are important opportunities that should be exploited.

There are some good examples of successful low carbon projects in the Region such as co-operative wind farms, district heating and the exemplar work of Carmarthenshire LSB on enhancing the sustainability of the county. It is essential that the learning from these informs future low carbon projects throughout Wales.

Visioning – A Low Carbon Pembrokeshire

- More community spirit
- Different values and attitudes – cultural change



The SDC recommends early consideration is given to:

Innovation Opportunities through:

- a) Building on Pembrokeshire's status as a UK Energy Centre and ascertaining how it can be at the forefront of renewable energy in the UK. This should include for example, investigating how the deep water harbour could be used as a facility for the offshore wind turbines, marine energy infrastructure and biomass imports. This work should be undertaken in close collaboration with the private sector to ascertain what infrastructure and skills would be needed to create a renewable energy cluster within Pembrokeshire.
- b) Working with the oil and gas industry in Pembrokeshire to ensure they are part of the low carbon solution for the Region. Opportunities could include: innovative collaborative partnerships with small and medium enterprises (SMEs), encouraging low carbon spin out ventures from the corporates to be based in Pembrokeshire and maximising the potential for low carbon projects tying in with the companies' corporate social responsibility policies. Technium Pembrokeshire is ideally suited to facilitate the development of these innovative, high-tech partnerships.

Regeneration Opportunities through:

- c) Working with stakeholders to ascertain the infrastructure needed within each of the three strategic hubs to enable low carbon lifestyles. SDC recommends that these hubs should include video conference and home working hubs (thus improving the Region's international connectivity), recharging hubs for electric vehicles, public transport interchanges, and public service provision.
- d) Work with DE&T and National Rail to introduce a high speed rail service to Cardiff, hence helping address the Region's peripheral location.
- e) Regeneration should include an (zoned) area based approach to refurbishment of the existing housing stock to the highest energy efficiency standards, thus tackling fuel poverty and hence deprivation issues. Mapping or collating information on the energy efficiency of the building stock within the Region is an essential first step to identify priority areas to target for refurbishment.
- f) Undertaking a zoned refurbishment of the built environment which will also provide an opportunity to cluster renewable energy and energy efficiency businesses within the Region, improving the diversity and quality of the economy.
- g) Working with the construction sector and higher and further education institutions to ensure the skills and training needed to deliver energy efficiency refurbishment are developed and available. This will also deliver on the Region's aim to develop and update the skills of the current and potential workforce.

In addition, the Region's Low Carbon Working Group may also wish to consider the priorities which arose from the Regional workshop:

1 Renewable energy at a large and community scale (Resource bank – Built Environment and Energy section 6)

- It was felt that renewable energy has the highest potential impact on emissions but poses the greatest difficulty for implementation. At a Regional level, potential suggested actions included facilitating the development of cooperative wind farms and replication of a "Heads of the Valley Low Carbon Zone" energy efficiency and microgeneration programme.

2 Rural public transport provision (Resource bank – Transport section 4.2.3)

- The group emphasised the need for public transport services tailored for a largely rural Region. Proposed high impact solutions included demand responsive transport such as "Country Cars" and community transport such as public minibuses.

3 Soil carbon mapping (Resource bank – Rural Land Use and Food section 4.4)

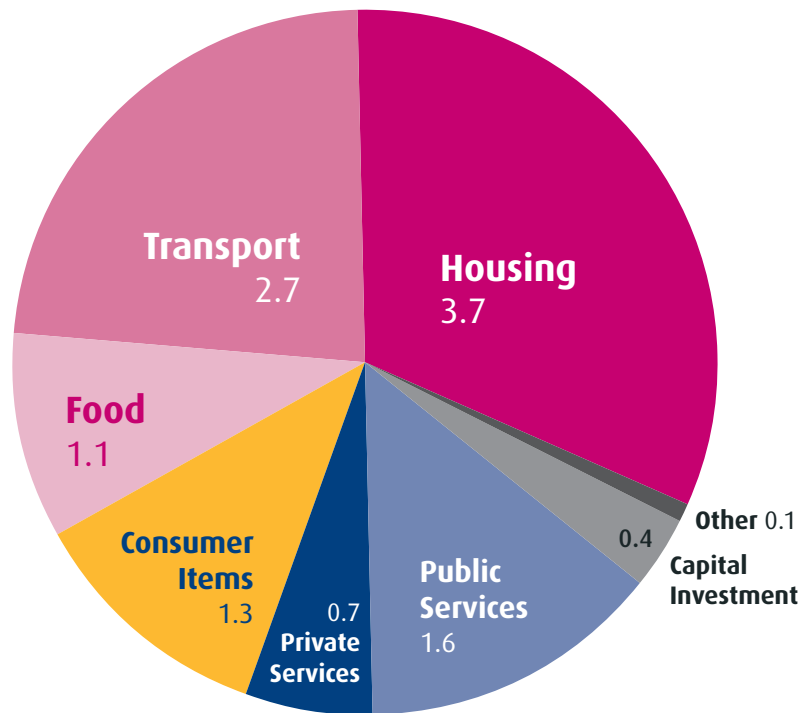
- Whilst this was deemed to have the highest potential impact at Regional level, it was felt that priority areas for protection and restoration should be mapped at a national level. Using this map the Area Group could co-ordinate soil carbon projects and monitor progress against the mapped baseline.

4 Agricultural anaerobic digestion and the provision of reuse facilities at household waste sites (Resource bank – Waste sections 4.3.1 and 4.1.3)

- No single solution was identified as having the highest potential impact. Agricultural anaerobic digestion was deemed to be high impact but difficult to deliver, whereas provision of reuse facilities at household waste sites was deemed to have a similar impact but be easier to implement. This would need to be well publicised to ensure use.

4.6 South East Wales – Capital Region

Carbon Footprint (tonnes per capita)



Analysis of the Region's Priorities and Opportunities

The vision of South East Wales is a one of a living city Region that provides a high quality natural and built environment, complemented by high quality green space, promoting, healthy, strong communities and a strong civic culture. Within this, the need to develop South East Wales as a networked city Region via investment in fully integrated high quality, high capacity public transport systems linking key settlements to the cities of Cardiff and Newport, is seen as a key factor towards successful delivery.

The 75,000 people that commute everyday into Cardiff⁵⁴ highlights the importance of developing a sustainable travel infrastructure to not only enable the Region to reduce its carbon emissions but to also maintain the competitiveness of businesses based within the Region and spread economic development beyond the Capital. For this reason the SDC proposes that tackling transport emissions should be a key strand for the Region to address, to enable progress towards a low carbon Wales. This is not new to the South East Wales Region and the sustainable transport measures highlighted within the WSP 2008 update and the good work being led by Cardiff council to make the city a 'Sustainable Travel City' are welcome. The engagement and collaboration with businesses within the Region

will be an essential building block to enable this. This would also present an opportunity to promote the benefits of resource efficiency in general to the Region's businesses. The potential development of tidal power technology in the Severn Estuary presents significant economic development opportunities for the Region. This economic development must adhere to sustainability principles and enable the transition to a low carbon future.

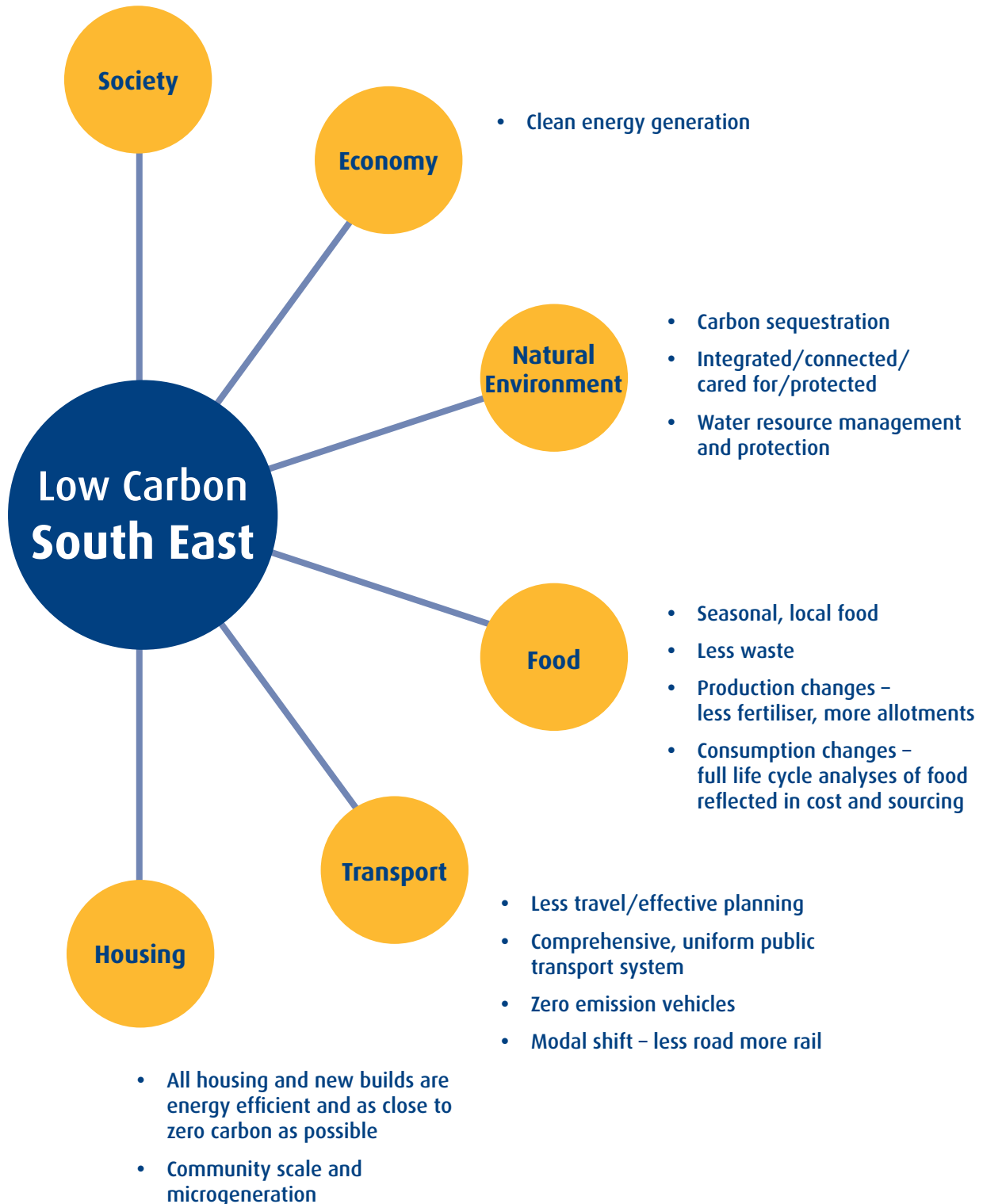
Workshop discussions highlighted the importance of addressing the carbon and sustainability implications of proposed and planned new developments within the Region, whether this is new housing, commercial property or large scale developments such as tidal energy from the Severn Estuary.

Public sector procurement is seen as a significant opportunity for progressing the low carbon agenda in the South East. Good progress is being made in the Region on refurbishing and upgrading public sector buildings, Cardiff Carbon Lite project being one such example.

Importantly there is a high degree of commitment and enthusiasm for furthering the low carbon agenda within the Region, which can be used to motivate action across the board.

Visioning – A Low Carbon South East

- Changes in values – it is acceptable to price carbon
- Education for sustainable development and global citizenship as core parts of the curriculum
- Local



The SDC recommends early consideration is given to:

- a) In the first instance identifying ways in which to minimise the demand for travel, such as through the promotion of teleworking and facilities for 'work hubs' across the Region so that people don't have to commute into Cardiff every day.
- b) Developing "area wide travel plans" so that employees of businesses which are located close together can share lifts and reduce individual journeys. The use of 'transport brokerages' to co-ordinate the transport needs of commuters can further promote the use of public transport for employees at business parks.
- c) Working with the businesses community to enable their employees to minimise the need for travel, and utilising sustainable transport modes to promote resource efficiency more generally. Encouraging the use of audio and video conferencing to replace face to face meetings can not only reduce congestion but reduce business costs and increase employee satisfaction.
- d) Developing and rolling out a large scale sustainable transport marketing/communications strategy with a Smarter Choices campaign (including personalised travel planning) at its core. [Personalised travel planning has been shown to be a very cost effective way of reducing transport emissions, with the Department for Transport estimating that a 'Smarter Choices' programme would cost minus £74.20 net per tonne of CO₂ saved (where the minus indicates that it is a net benefit)].⁵⁵
- e) Integrating public transport with cycling and walking and ensuring that all public transport services interconnect as seamlessly and conveniently as possible. Park and ride facilities should be designed with cyclists in mind and should be accessible by high quality, safe cycle routes.
- f) Ensuring that new business developments such as the International Business Park enable employees to travel to work via sustainable means, i.e. cycling, walking and public transport.
- g) Economic development plans associated with potential tidal power technologies in the Severn Estuary to adhere to sustainability principles and enable the transition to a low carbon future.

In addition, the Region's Low Carbon Working Group may also wish to consider the priorities which arose from the Regional workshop:

1 Proliferating renewable energy

(Resource bank – Built Environment and Energy section 6)

- This was deemed to have a high impact, with identifying suitable locations for implementing district heating schemes, wind turbine installation at business parks, and facilitating impartial communication on the pros and cons of renewable energy developments, all deemed to be important parts of this overall goal despite being difficult to achieve.

2 Disincentivise car use

(Resource bank – Transport 4.2.4)

- No solution was singled out as having the highest potential impact but a number of suggested high impact solutions collectively serve to disincentivise car use including: introducing a tax on workplace car parking spaces, limiting car park space numbers in new builds alongside the mandatory provision of cycle parking and congestion charging in city centres.

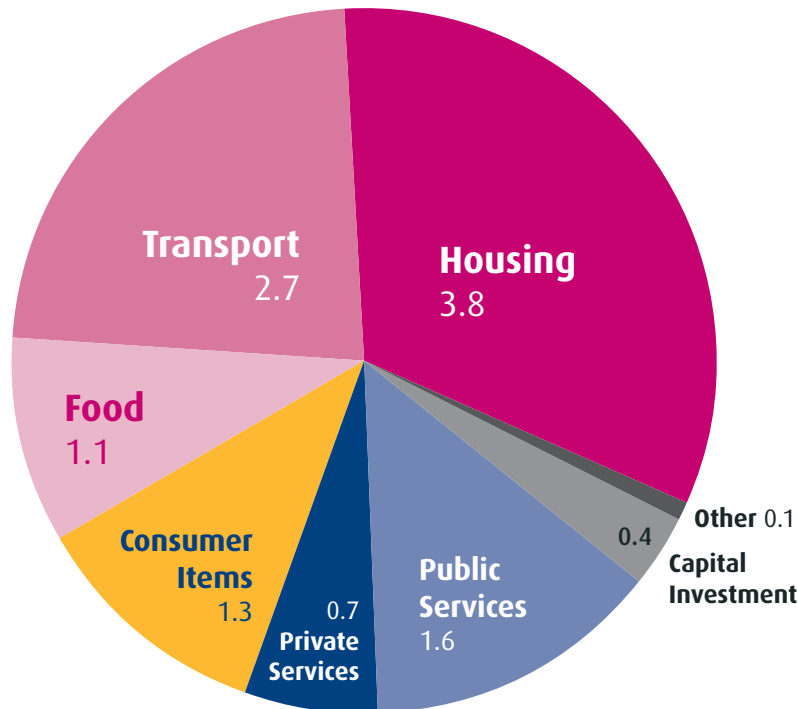
3 Promoting behavioural change on a low environmental impact diet and food waste

(Resource bank – Rural Land Use and Food section 4.3 and Waste section 4.8)

- A number of the solutions deemed to be high impact dealt with behavioural change. These included the need for promotion of a low environmental impact diet and a subsequent change in eating habits, behavioural change on food waste and increasing land provision for community food growing as a behavioural change tool.

4.7 Swansea Bay – Waterfront and Western Valleys

Carbon Footprint (tonnes per capita)



Analysis of the Region's Priorities and Opportunities

The importance of further developing the knowledge economy stands out as a key strand of the plans for the Region. The knowledge economy will play a critical role in developing innovative solutions, both technological and institutional, in dealing with the challenges that climate change poses for society. The Swansea Bay Region therefore has a unique opportunity not only to be at the forefront of this endeavour through utilising the expertise within its research-led universities and high-tech knowledge based companies, but also to provide the infrastructure and services to enable sustainable, low carbon living for its citizens.

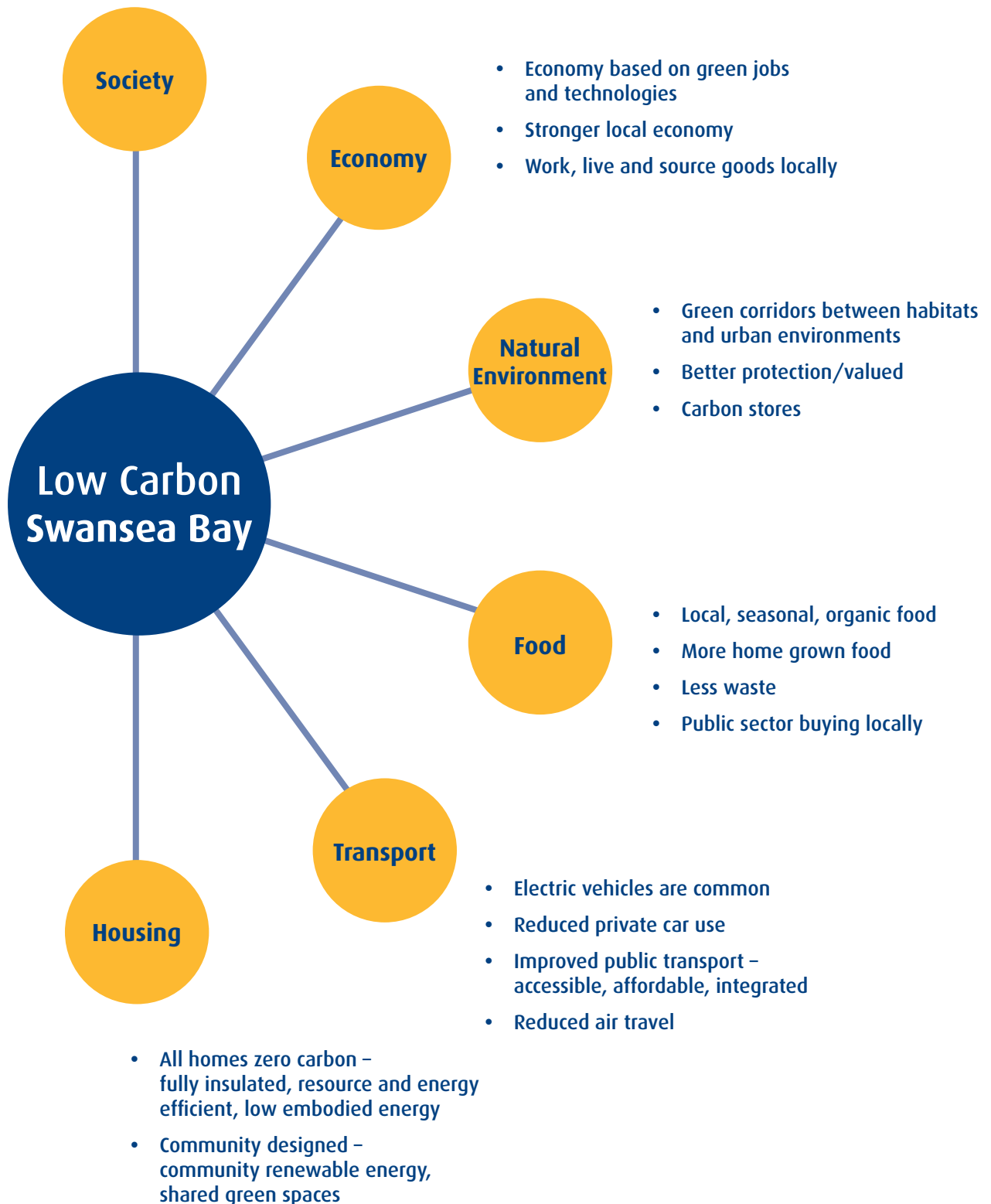
As outlined in the UK Low Carbon Industrial Strategy, the low carbon innovations that drive

sustainable economic growth will be those that develop a low carbon concept into a commercial product or service.⁵⁶ This highlights the importance of initiatives such as the Technium network and the proposed Science Park in enabling the journey from concept through to successful commercialisation.

The contention surrounding potential high impact projects such as the Swansea Bay tidal lagoon and the biomass plant in SA1 highlight the importance of a considered process of engagement with communities and other stakeholders in the transitions to a low carbon future. The commitment of Carmarthenshire LSB to sustainability has been highlighted as an exemplar project within the Region.

Visioning – A Low Carbon Swansea Bay

- Awareness and acceptance of sustainability/low carbon and how to get there
- More community action and involvement
- Less materialistic, placing a higher value on quality of life



The SDC recommends early consideration is given to:

- a) Supporting the research, development and demonstration of low carbon technologies, both within the research institutions and businesses within the Region. This support should seek to identify infrastructure requirements that could enable this.
- b) The development of the innovation park to lead by example, with the park built to the highest sustainability standards, enabling the research institutions and businesses located there to operate in a way consistent with a low carbon future.
- c) The Region seeking to identify how the knowledge economy skills such as law, business, finance, marketing communications, creative industries and management can be developed to integrate sustainable development principles and how they can be used to develop a low carbon economy. For example innovative, evidenced based communication techniques will be needed to encourage the citizens of Wales to move towards a low carbon, sustainable lifestyle.
- d) The ICT infrastructure to enhance the Region's national and international connectivity through the use of state of the art video-conference hubs available to all businesses, and flexible home working hubs (incorporating meeting space and hot desk facilities).

In addition, the Region's Low Carbon Working Group may also wish to consider the priorities which arose from the Regional workshop:

1 A network of energy efficiency advisors

- Discussions within the group repeatedly highlighted the potential high impact of the creation of a network of volunteer energy efficiency advisors. These advisors would provide advice at a local level, encouraging individual householders to implement energy efficiency measures. The group suggested that this could be expanded to sustainability advisors – championing energy efficiency, renewable energy, growing your own food, etc. The Home Energy Service active in Mid Wales was proposed as a replicable model.

2 Reducing the need to travel

(Resource Bank – Transport section 4.1)

- The majority of the solutions deemed high impact by the group fell into the category of reducing the need to travel. Notably, these included measures to use ICT as a replacement for travel and measures to decrease travel through the planning of new developments. It was felt that good progress on ICT is already being made within the Region. Coed Darcy was given as a potential best practice example of co-location.

3 Mapping soil carbon and woodland planting on mineral soils

(Resource bank – Rural Land Use and Food sections 4.4 and 4.4.2)

- Although deemed to have the highest potential impact the group felt that the WSP Area Group should be asking for soil carbon mapping to be delivered at a national level and be made available to the WSP to guide planning and direct projects
- It was felt that the WSP Area Group should identify its sphere of influence over landowners and play a facilitation role in bringing landowners together to discuss and deliver woodland planting on mineral soils; this would be informed by the soil carbon map.

4 Behavioural change campaign

(Resource bank – Waste section 4.8)

- A recurring message throughout discussions was around the difficulty of implementing high impact solutions due to a lack of public awareness and the need for attitude change, for example, on the use of recycled furniture, reusable nappies, biomass plants, energy from waste plants etc. Although not explicitly discussed, this highlighted the importance of a behavioural change/awareness raising campaign.

References for Chapter 4

- 47** See “Soil Carbon Density per 1km in Wales” map in Bradley, R.I., Milne, R., Bell, J., Lilly, A., Jordan, C. and Higgins, A. (2005) *A Soil Carbon and Land Use Database for the United Kingdom*. Soil Use and Management, 21 (4), 363-9.
- 48** Welsh Assembly Government (2005) *Planning Policy Wales Technical Advice Note 8: Planning for Renewable Energy*. <http://wales.gov.uk/topics/planning/policy/tans/tan8/?lang=en>
- 49** See “Soil Carbon Density per 1km in Wales” map in Bradley, R.I., Milne, R., Bell, J., Lilly, A., Jordan, C. and Higgins, A. (2005) *A Soil Carbon and Land Use Database for the United Kingdom*. Soil Use and Management, 21 (4), 363-9.
- 50** Department for Business, Innovation and Skills and the Department of Energy and Climate Change (2009) *The UK Low Carbon Industrial Strategy*. www.berr.gov.uk/whatwedo/sectors/lowcarbon/lowcarbonstrategy/page50105.html
- 51** Cardiff Council (2009) The Welsh Assembly Government’s Sustainable Travel City Initiative: *A Proposal for the Capital Region*.
- 52** Department for Transport (2009) Impact Assessment of the Carbon Reduction Strategy for Transport, *Low Carbon Transport: A Greener Future*. www.dft.gov.uk/pgr/sustainable/carbonreduction/ia.pdf
- 53** Department for Business, Innovation and Skills and the Department of Energy and Climate Change (2009) *The UK Low Carbon Industrial Strategy*. www.berr.gov.uk/whatwedo/sectors/lowcarbon/lowcarbonstrategy/page50105.html
- 54** Cardiff Council (2009) The Welsh Assembly Government’s Sustainable Travel City Initiative: *A Proposal for the Capital Region*.
- 55** Department for Transport (2009) Impact Assessment of the Carbon Reduction Strategy for Transport, *Low Carbon Transport: A Greener Future*. www.dft.gov.uk/pgr/sustainable/carbonreduction/ia.pdf
- 56** Department for Business, Innovation and Skills and the Department of Energy and Climate Change (2009) *The UK Low Carbon Industrial Strategy*. www.berr.gov.uk/whatwedo/sectors/lowcarbon/lowcarbonstrategy/page50105.html

5 Conclusion and Next Steps

Each region, hub or settlement within it, has its own set of unique challenges to overcome and opportunities on which to capitalise, in striving to become a Low Carbon Region. Spatial planning which is sensitive to these regional and local dimensions is critical in a carbon constrained world. This will set out how we manage space and land use in order

to enable low carbon living by reducing the need to travel and consume energy, by increasing the capacity to generate renewable energy, to source food locally and through coordinating the re-use of waste products. For each region, its capacity to make the transition to low carbon will depend upon its ability to:

- Harness its low carbon strengths such as renewable energy resources and existing expertise
- Establish low carbon zones that can deliver focused action on the energy efficient refurbishment of existing buildings and on local microgeneration
- Generate low carbon energy at individual, community and large scales for local use
- Develop its potential to generate low carbon electricity to feed into the national grid as part of the region's contribution to a low carbon UK
- Ensure accessible hubs to deliver local services and economic facilities
- Develop low carbon regional economic centres or gateways with higher education facilities, clusters of low carbon business innovation and rail links to key economic centres
- Provide recharge, battery exchange and refill points for electric and biofuelled vehicles including private cars, public transport, light and heavy goods vehicles
- Design and renew transport infrastructure to provide pedestrian and public transport orientated routes including cycle and walking networks and reallocated road space
- Provide ubiquitous high speed broadband coverage and access alongside a strategy to maximise its capacity to enable low carbon working
- Protect soil carbon stores
- Produce a variety of local food products to supply local needs
- Minimise waste and capitalise upon the remainder through energy from waste e.g. anaerobic digestion and industrial symbiosis
- Provide the information, advice and support needed to engage and encourage people to live low carbon lives
- Build the skills base needed for transition to low carbon through the education and training systems, prioritising key sectors such as sustainable construction and microgeneration
- Reduce carbon leakage through strong resource efficient local enterprises backed by local purchasing
- Partner with other regions in the UK and EU with similar characteristics to share learning and enable fast and effective knowledge transfer.

Whilst low carbon transition must be driven through collaboration across Assembly Government departments, successfully utilising the cross boundary/cross sector forum provided by the WSP and its Area Groups will be key to the ability of each region to deliver on these actions.

Through following the recommended two-phase approach the Spatial Plan teams can capitalise upon the potential of the WSP to drive transition at a regional level. This approach will ensure that the Spatial Plan itself becomes more carbon reduction focused, through actions such as assessing the carbon implications of existing Area Delivery Frameworks and collating the evidence needed for low carbon

spatial planning such as renewable energy resource maps. The two-phase approach will also capitalise upon the ability of the WSP teams and framework to provide a vehicle for new action, such as using the WSP's cross-sectoral convening power to establish a Low Carbon Working Group which will subsequently lead on identifying and developing new carbon reduction activities.

Selected carbon reduction activities should include some of those suggested for early consideration throughout all of Wales by the SDC, those which will tackle regional challenges and those which will harness the region's carbon reduction strengths and opportunities.

Next Steps

This report provides the guidance and tools needed to enable the WSP teams to develop and deliver carbon reduction strategies for the six WSP regions of Wales. The workshops held as part of the process of developing this report were the first step for concerted action by government, the private, public and third sectors at a regional level. The SDC will support the WSP and its groups in taking forward this process. Following the launch of this report, SDC plans to hold a briefing for Area Managers, followed by separate launch events coinciding with

each of the Ministerial Area Group meetings in each region. The aim of these launch events will be to generate local interest and activity, recognising the unique attributes and opportunities for each region. Capitalising upon this impetus and following the process set out in the report, the WSP Groups centrally and regionally must now capture the enthusiasm, expertise and commitment of their wider stakeholders to set the regions on a path '**Towards Low Carbon**'.



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