

Developing A Low Carbon Economy



West Somerset Community Climate Change Strategy 2008-2012

July 2008



WSSP Foreword



The West Somerset Sustainable Community Strategy produced by the WSSP states a vision – ‘By 2020 West Somerset will be noted for its rapid progress in introducing a low carbon economy, minimising damaging emissions, where we all leave a more ecological footprint’. The WSSP welcomes the publication of this draft document, as a first step on the road to the delivery of this vision.

The WSSP consists of 17 partners from the statutory, voluntary and business sectors covering the whole of West Somerset, from Hinkley point, through the Quantocks encompassing Exmoor to the Devon border.

Coastal erosion due to climate change is visible to both our residents and the 4 million visitors on whom the area relies. It is essential that West Somerset remains a tourist destination and one that is environmentally sustainable to both its residents and visitors.

WSSP is committed to reducing the consequences of climate change and raising awareness of the need to reduce CO₂ emissions in West Somerset. Our sustainable Community Strategy has nine strategic aims, which include the environment and transport. 20 actions have been identified as specifically addressing climate change issues.

We are pleased to have been able to provide funding for the development of this important document. Every single person has a responsibility to reduce their CO₂ emissions and this report is the beginning of a consultation process which we hope will lead to the production of a practical guide enabling us all to better understand the contribution we can each make in our daily lives to reduce our carbon footprint. Let us ensure that the tide can wash away our footprints but not our lands. We owe this much to our future generations.

Loretta Whetlor, Chair, West Somerset Strategic Partnership

Carol Pearce (Cert Ed, PG Dip Ed.), Vice Chair, West Somerset Strategic Partnership

West Somerset Council



Climate change is happening. We need to take it seriously, and this excellent Strategy shows how we *can* make a real difference, for the benefit of our Local Environment, for the benefit of our Local Economy, and for the benefit of our overall Health and Wellbeing.

In West Somerset, we produce nearly 30% more carbon per head than the regional average – this sounds like bad news, but the Strategy identifies why this is, and what we can realistically do about it. We *can* reduce our 'carbon footprint', and we *can* do so in ways that also provide opportunities to boost our local economy by providing opportunity for local businesses, and by reducing the flow of money out of our local economy into the coffers of the multi-national energy companies.

This Strategy is a blueprint for action. Working *together* as a community, it is within our power to turn the problems of climate change into opportunities for West Somerset – so let's get on with it.

A handwritten signature in black ink that reads "Jon Freeman".

Councillor Jon Freeman
Portfolio Holder, Environment

A handwritten signature in black ink that reads "Michael Downes".

Councillor Michael Downes
Portfolio Holder, Economic Development & Tourism

A handwritten signature in black ink that reads "Kate Kravis".

Councillor Kate Kravis
Portfolio Holder, Health and Wellbeing

ENPA



Exmoor National Park Authority welcomes this robust strategy to focus our attention and bring us together to respond to the critical challenges of the changing climate.

The people of West Somerset have already shown leadership by approving the 2007-2012 plan to *enhance the qualities that make Exmoor special*. This plan lays out numerous collective tasks we must do together to reduce our use of fossil fuels and ensure an affordable supply of energy for our homes and businesses, whilst enhancing the landscape, cultural and biodiversity assets and heritage of this stunning National Park.

Amongst a portfolio of activity, the Authority is

- leading partners to conserve the carbon store in the Exmoor peatlands;
- now accounting for and managing our business carbon emissions with the same rigour as the pounds and pence;
- increasing our renewable energy installations, adding to our wind turbine, solar panels and wood heating systems.

The Exmoor Sustainable Development Fund is financing local organisations who are demonstrating that there are sufficient trees and power in the streams to substantially increase affordable heat and electricity supplies for our villages – so let's get on with it.

Mr John Dyke
Chairman
Exmoor National Park Authority

Forum 21



Climate change, and our response to it, will clearly dominate the twenty first century, with probabilities finely balanced at present between climate chaos on the one hand or, alternatively, a new, sustainable society with human well-being and a thriving ecology. The issue can seem overwhelming, but this straightforward, practical and thoroughly researched strategy sets out what needs to be done locally and can be achieved.

We have the opportunity here to transform West Somerset to a low carbon economy that is best placed to navigate the changes ahead and emerge more fit for purpose. The strategy shows how barriers to improvement need to be cleared and the seeds of resurgence fostered. The public sector must act here. Then entrepreneurial action is needed to develop and roll out new energy supplies and resource efficient businesses. The private sector, focused on well-being rather than profit, must act here. Finally, human ingenuity and resourcefulness, with effective community action, will be needed in abundance. West Somerset people will respond, shaping the new economy to local needs and in harmony with our special natural environment.

The challenge is probably unparalleled in human history; the opportunity beckons. Forum 21 is proud to be in the vanguard.

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About This Strategy

About This Strategy

This is a draft climate change strategy for consultation.

In 2007, in the Sustainable Community Strategy, the West Somerset Strategic Partnership (WSSP) committed to deliver a climate change strategy for the district¹. In response to this 'Developing a Low Carbon Economy' has been written as a community climate change strategy that proposes a set of commitments to tackle climate change. The production of this strategy has been led by Forum 21, West Somerset Council and Exmoor National Park Authority who are all members of the WSSP.

About the WSSP

The West Somerset Strategic Partnership is a 'partnership' of statutory, voluntary and business sectors working together to improve the economic, social and environmental well being of the area and improve the quality of life for everyone who lives, works and visits West Somerset, now and in the future. For membership refer to Appendix 4

The strategy aims to:

- understand and present how much CO₂ we are emitting from West Somerset activities
- identify how we can reduce our emissions and present proposals for community action
- understand the cost of our current CO₂ profile and the cost impacts of reducing our CO₂
- present an overview of the impacts of climate change on West Somerset
- and how we can engage with other agencies to help prepare to adapt to those impacts.

Use of Data in the Strategy

The strategy presents the carbon dioxide (CO₂) emissions that arise from activities associated with energy use in West Somerset. This provides us with a CO₂ profile for each of the sectors and different modes of transport. The profile has been developed using government data sets². The data is based on energy use only, so does not account for other emissions that contribute to climate change like methane. Methane arises from agricultural practice, livestock and landfill sites. At the time of assessment the latest data available was 2004 data.

¹ Refer to www.westsomersetstrategicpartnership.co.uk for more information and a copy of the sustainable community strategy

² from the National Atmospheric Emissions Inventory and the DTI Digest of UK energy Statistics (DUKES)

About This Strategy

Many of our goods are manufactured or processed outside of the district and the CO₂ arising in the production of these goods is not accounted for within the strategy even though we are the final consumers of the product. Equally the CO₂ emissions arising from the transportation of goods to the district are not accounted for on the whole. This is because the data set used is based on fuel sales within the district and will not capture the freight by road and air that do not purchase fuel locally.

One other omission from the carbon profile is waste. Waste also contributes to climate change; if it is sent to landfill it produces methane which is a greenhouse gas; if waste is recycled it requires energy to process which in turn produces more CO₂. The dataset used does not provide information on methane or CO₂ from waste.

For the above reasons we recognise that this is not a complete assessment of our absolute emissions that contribute to climate change. But the reasons for continuing to use the dataset are;

1. that it has been developed for use at a local authority level
2. it is readily available, credible and will provide us with a consistent dataset going forward so that we can continue to monitor our performance.
3. It is comparable with other local authority areas which is useful because it will identify areas where our emissions are higher and provide a potential focus for action

Consequently, this strategy is intended to be the beginning. We recognise that our consumption patterns and waste practices also contribute to climate change. Although not accounted for in this CO₂ profile, future assessments may take this into account as the credible datasets develop. In the meantime we will continue to lead the community in taking action to encourage a reduction in emissions through the way we address waste. We will also find ways to promote locally sourced sustainable products that contribute to our local economy and reduce CO₂ overall.

The strategy has presented the estimated costs of using electricity, gas and transport fuel. Some of the data used is based on figures from the Energy Savings Trust and where different this is referenced. It is not a full economic impact assessment but provides some scale of the costs associated with energy and fuel use and the potential cost savings associated with energy efficiency and other actions designed to reduce our reliance on carbon³ intensive fuels.

Adaptation

This climate change strategy does not present a strategy for adapting to climate change. It gives an overview of the impacts and has identified that

³ Fossil fuels contain carbon which when combusted emit CO₂. The terms CO₂, carbon dioxide and carbon are often interchanged throughout this document.

About This Strategy

West Somerset is not sufficiently engaged with adaptation forums within the region. This strategy is the first step in engagement and we recognise that future adaptation strategies will need to be developed to prepare us for the changes to come.

A Community Climate Change Strategy

This climate change strategy has been presented as a community climate change strategy. Tackling climate change will require collective focus from every individual and organisation within our community. We have attempted to demonstrate that in tackling climate change we will not only help reduce CO₂ but we will also reduce the amount of revenue leaving the local economy. No single individual or organisation can achieve this; it will require a collaborative approach as a community for wider community benefit.

'Developing a Low Carbon Economy' is a draft community climate change strategy and is a consultation document. We have presented proposals for addressing climate change mitigation and preparing to adapt, and invite you to comment and engage. The consultation is open until the 30th of April and details of how to respond are detailed in section 7 and can be found on www.westsomersetonline.gov.uk/climatechange.

Acknowledgements

We must take the opportunity to extend our thanks to the individuals that helped to develop this strategy; Lorna Scott, Graham Boswell and Bill Butcher of Forum 21, who provided many voluntary hours in providing useful and constructive comments on the strategy. Special thanks to Angela Lamplough of West Somerset Council who kept everyone on track, and David Alford for his useful suggestions. Many thanks to Phil Cookson (ENPA) for providing pragmatism and vision and, Councillors Jon Freeman and Michael Downes for their enthusiasm and support. Many thanks to Tom Evans for peer reviewing the figures.

The Author (Wendy Stephenson) of the strategy is a member of the Forum 21 steering committee and has been engaged in climate change strategy both as a profession and volunteer. The Author was the chair of the manufacturers' climate change group based in Westminster representing UK manufacturing and specifically UK Steel on climate change issues. This experience extended to proposed policy on international engagement beyond Kyoto. She continues to provide advice to a range of organisations on climate change issues and has launched the West Somerset Carbon Reinvestment⁴ Scheme. The scheme is intended as a community initiative to raise funds to help accelerate the reduction of CO₂ through energy efficiency and the deployment of more sustainable forms of energy.

⁴ This is a declaration of interest: information about carbonreinvest.com has been included in the strategy.

About This Strategy

Thank you to Somerset County Council and ENPA for photos and Watchet Paper Mill for their comments.

Finally, without WSSP funding this document would not have been developed, so thank you to the partnership for agreeing to fund such an important document.

Introduction

It is now widely accepted that climate change is happening and that human activities are significantly if not wholly responsible. Scientists tell us that we have just 10 years to reverse the trend of rising CO₂. Beyond that and the consequences will be devastating. Communities around the world will feel the impacts of expected climate change effects and we are being urged to reduce our emissions and prepare for change.

UK reserves of oil and gas are declining and we are becoming increasingly reliant on fuels from less stable regions of the world. Meanwhile global demand for energy continues to grow and very recently we have heard about yet more price rises in energy.

CO₂ emissions and fossil fuel energy are intrinsically linked. Reduce our energy consumption, our reliance on fossil fuel energy and we will reduce our CO₂. We will prevent £millions leaving our economy every year and we will begin to develop a more sustainable low carbon economy for future generations. This strategy is the first step in responding to these challenges.

Section 1 sets out the background to climate change, presents some of the facts and the projected impacts.

Section 2 presents the West Somerset carbon profile, presenting CO₂ emissions for the domestic, business and transport sectors. It begins to explore how we might reduce our emissions.

Section 3 provides an overview of the energy consumption in West Somerset, the cost to our economy, and proposes ways in which we can reduce it. It also provides a background into the emerging carbon economy and how the costs of CO₂ will end up with each and every one of us.

Section 4 sets out the regional work on adapting to climate change and identifies that West Somerset needs to begin to engage in the process of adaptation.

Section 5 gives an overview of the recent Planning Policy Statement, Planning and Climate Change, and urges the planning authorities to respond vigorously to support the transition to a low carbon economy.

Section 6 presents the proposed targets for CO₂ reduction, breaks them down into measurable actions and details the commitments of the WSSP that will support the delivery of this strategy.

Executive Summary

Executive Summary

It is now widely accepted that climate change is happening and that human activities are significantly if not wholly responsible. Communities around the world are already experiencing the impacts of expected climate change effects and we are being urged to reduce our emissions and prepare for change. CO₂ emissions and energy are intrinsically linked and strong action to reduce our reliance on fossil fuel energy is needed to reduce our CO₂ and to help protect us from rising energy prices.

In the UK current projections of gas demand imply that the UK will need to increase gas import capacity significantly by 2020. It also projects that a further 30-35 GW of new generation capacity for electricity will be required over the next 20 years. This is equivalent to approximately 27 more Hinkley B power stations. These projections reveal just how vulnerable the UK is to security of supply and yet more price rises.

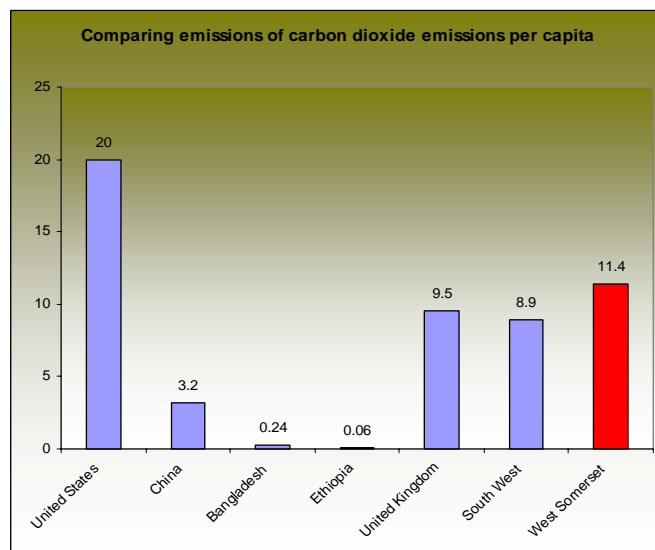
In West Somerset we spend more than £60 million on energy every year. Households alone spend more than £20 million. All of this revenue leaves the local economy year on year. The recent announcement that energy prices will rise by 20%⁵ this year will cost the domestic sector alone another £4 million. Nearly 60% of our households in West Somerset are not on mains gas for space heating and are particularly vulnerable to the rising cost of energy.

This strategy 'Developing a low Carbon Economy' sets out proposals to reduce our reliance on grid imported electricity and gas, to prevent so much money leaving the economy every year and reduce our CO₂.

In developing the strategy we have discovered that we emit more CO₂ per person than the UK and South West averages. In West Somerset we emit 11.4 tonnes of CO₂ (tCO₂) per person; the Southwest average is 8.9tCO₂ and the UK average is only (9.3 tCO₂).

Our goal is to deliver a low carbon economy across West Somerset

There are four objectives underpinning the delivery of this goal:



⁵ BBC report, January 2008 and a British Gas press release on 18th January 2008

Executive Summary

- Objective 1:** to reduce CO₂ across West Somerset;
- Objective 2:** to reduce our reliance on imported fossil fuels (electricity, gas, diesel and petrol);
- Objective 3:** to create value across our economy through integrating and developing low carbon technology and services within the district;
- Objective 4:** to prepare to adapt to climate change impacts.

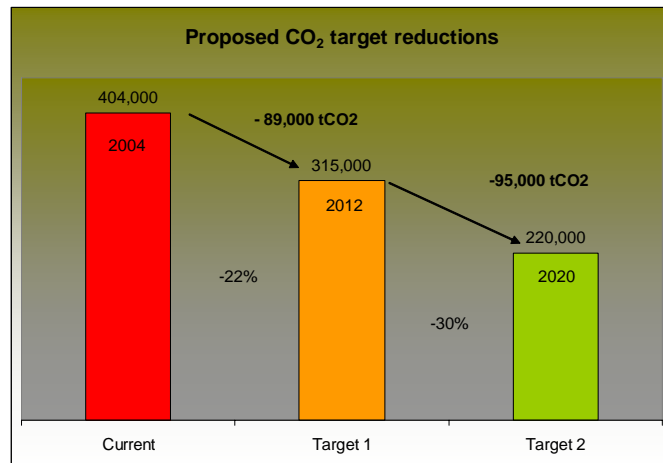
It is proposed that the first target (Target 1) for CO₂ reduction should aim to bring us back in line with the UK average by 2012. The second target should support national policy which aims to reduce emissions by 30% by 2020.

Target 1: A reduction of 88,000 tonnes of CO₂

Target 2: A reduction of 95,000 tonnes of CO₂.

The proposed commitments to support the delivery of this strategy include:

- The development of the local wood fuel supply chain including the installation and servicing of wood fuel heating systems
- Reviewing the potential for setting up a community owned company for generating energy from renewable sources
- Reviewing the potential for the supply and local distribution of bio-fuels from waste oils.
- Implementing a vigorous campaign to increase the uptake of home insulation. This is the most cost effective way to reduce CO₂ and energy consumption, saving the domestic sector at least £3 million every year.



The impacts of climate change on West Somerset will include increased risk of flooding, (impacting sewage works at Porlock Weir for example) stormier weather, the loss of some species like bluebells and snowdrops, and potentially produce longer growing seasons. How we adapt to these changes will require us to engage with regional agencies to prepare adaptation strategies and civil contingency plans.

The successful delivery of the proposed objectives of this strategy will require all of the community to respond and take action. To support the community and the delivery of this strategy a community carbon reduction implementation board (CRIB) has been established that will lead us on our journey to a low carbon economy.

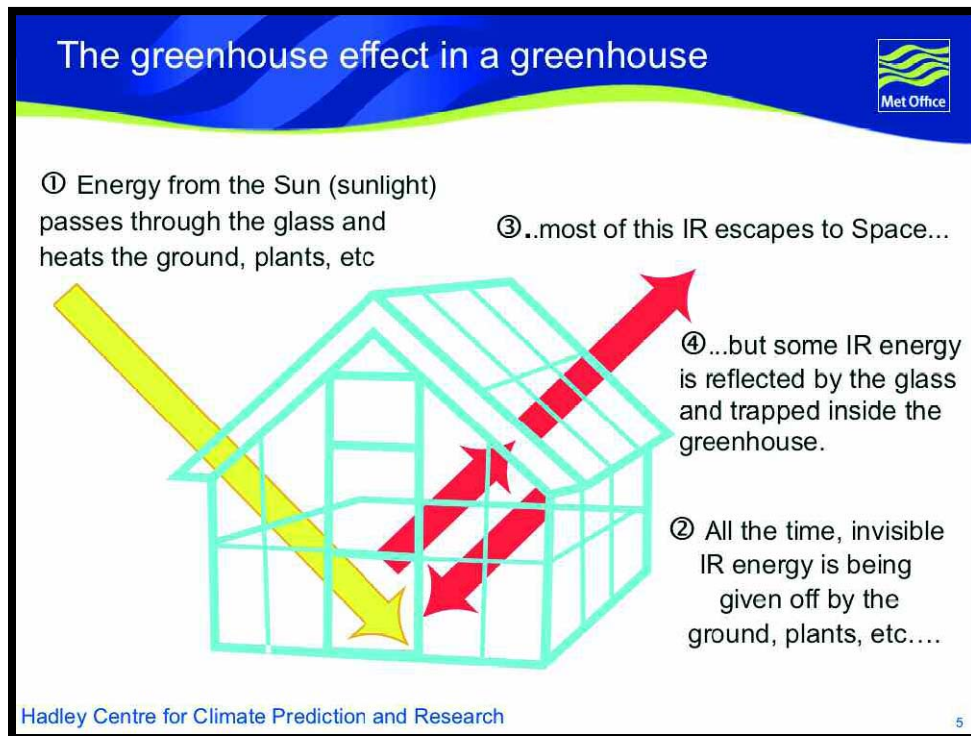
Reducing our CO₂ will require the whole community to respond. This is our chance. As the Stern Review said, *'We still have time to avoid the worst impacts of climate change, if we take strong action now'*.

Section 1: A Changing Climate

What is climate change?

Picture a single sheet of paper wrapped around a football. Now apply this to the earth's atmosphere and you will have some idea about how remarkably shallow the bulk of the world's atmosphere really is⁶. The Earth's atmosphere acts as our thermostat that controls our temperature to provide the right conditions for life to flourish. Without it the Earth's temperature would swing dramatically, soaring by day and plummeting by night. The earth would not be able to sustain life as we know it and would be little more than a hunk of rock floating in space.

The atmosphere controls our climate and climate is the primary factor that influences life on earth. Certain gases in the atmosphere play a key role in moderating the Earth's climate; these are known as **greenhouse gases (ghg)**. The greenhouse gases act like panes of glass in a greenhouse. They allow light energy from the sun to pass through the atmosphere where much of it is absorbed by the Earth's surface. Some of the energy is reflected back into space as infrared (IR) and some is absorbed by the greenhouse gases in the atmosphere, which warm the air. This heat is then radiated back to earth. The more greenhouse gases in the atmosphere the more we trap the heat from escaping into space and the warmer our climate becomes. This



⁶ Rough guide to climate change

Section 1: A Changing Climate

trapping of heat is known as the greenhouse effect. In the greenhouse we moderate that temperature by opening the windows. Our only control on Earth is to ensure that we do not significantly affect the balance of greenhouse gases in the atmosphere.

Chief of the greenhouse gases is carbon dioxide (CO₂). CO₂ is naturally present in the atmosphere and helps moderate our climate. But through burning fossil fuels we are increasing the amount of CO₂ in the atmosphere which is trapping more heat and increasing the average temperature. Methane is also a greenhouse gas which we are increasing through emissions from landfill, agricultural practices, belching livestock and vehicles. Although methane is 23 times more potent⁷ than CO₂, its lifetime in the atmosphere is limited to around a decade compared to a century which is the lifetime of CO₂.

Other greenhouse gases exist that influence global warming. The 'basket' of greenhouse gases often referred to includes methane and CO₂ as well as other gases (see diagram⁸ below) emitted by human activity. This 'basket' of greenhouse gases is being monitored and is part of the reduction targets set under the Kyoto Protocol. CO₂ is still the most prevalent and influential of all the ghg's that we emit. For a full list of process ghg's please refer to appendix 1.

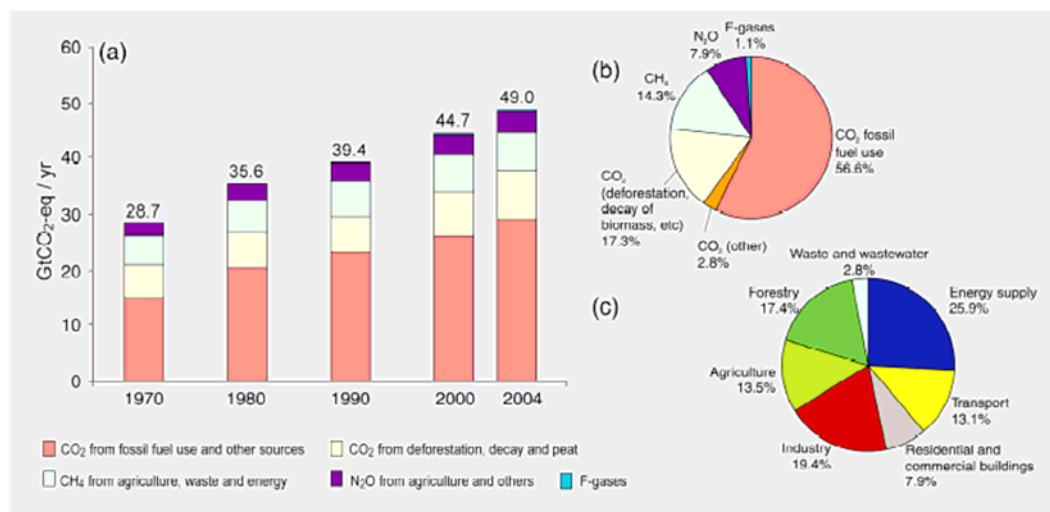


Figure SPM.3. (a) Global annual emissions of anthropogenic GHGs from 1970 to 2004.⁵ (b) Share of different anthropogenic GHGs in total emissions in 2004 in terms of CO₂-eq. (c) Share of different sectors in total anthropogenic GHG emissions in 2004 in terms of CO₂-eq. (Forestry includes deforestation). {Figure 2.1}

Ozone and water vapour also play a role in contributing to the greenhouse effect and further explanation is given in appendix 2.

⁷ Refer to appendix 1 for a full list of process ghg emissions and their relative potency.

⁸ Source: IPCC Fourth Assessment Report; Climate Change 2007; Synthesis Report

Section 1: A Changing Climate

The Scale of the Problem

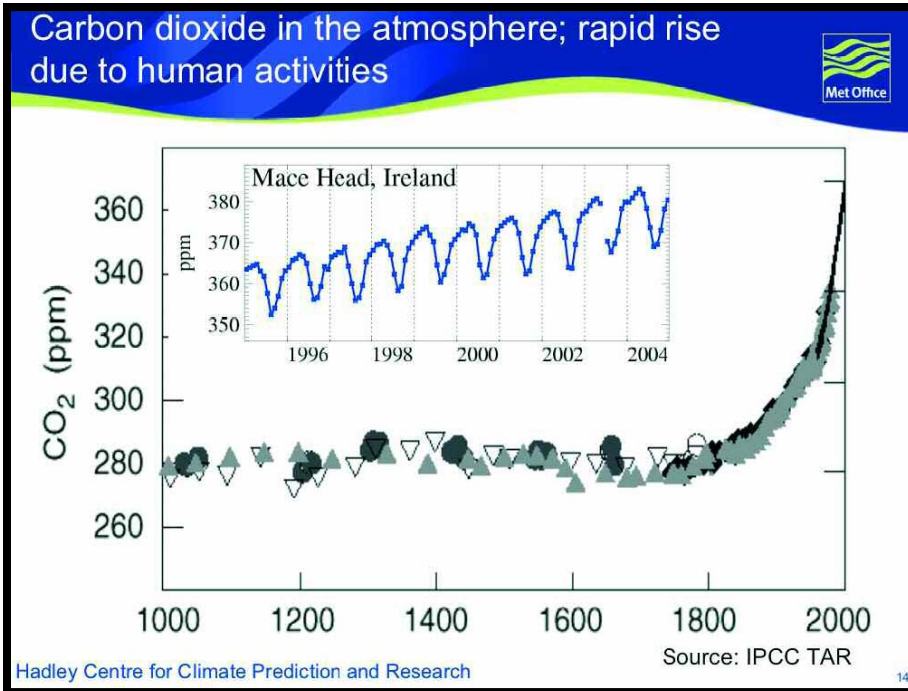
When Krakatoa erupted in 1883 it threw enough material into the atmosphere to cool the global climate by more than 1°C for over a year. This one single, natural event influenced our global climate. The climate has changed many times throughout the earth's history and in the sixteenth century Europe was experiencing a little ice age. The temperature was 1-1.5°C cooler than it is today. But the scale of the problem we now face is quite different. Firstly it is different because it is influenced by human activity and we have the ability to prevent it. Secondly, the scale of the problem is so great that unless we act now we will reach a point beyond which we cannot return and the impacts will be devastating.

The world's scientific community has shown that recent climate change is due to the increases in emissions of greenhouse gases from human activity. There are some that still debate and resist that global warming is due to human activity and present many arguments to support their theory. Appendix 3 presents these myths and explains why they are incorrect. What is certain is that if a single volcanic eruption can affect global temperature for a year then it is not so difficult to imagine that 150 years of emitting additional greenhouse gases into the atmosphere will also have an effect on the global climate.

Picture a hot air balloon about 10 metres in diameter and this will give you some appreciation of what 1 tonne of CO₂ looks like in the air. Now imagine 26 billion being released into the air which is how many tonnes of carbon dioxide we globally emit into the atmosphere every year. Each tonne of CO₂ will sit around in the atmosphere for about a century and every year we emit more. Each tonne will absorb more of the heat that should be escaping into space, trapping it and warming the Earth's climate.

The following diagram from the Hadley Centre shows that the concentration of carbon dioxide in the atmosphere was roughly constant at about 280 parts per million (ppm) for 800 years before the start of the industrial revolution. We know this from analysis of air trapped in bubbles in ancient ice cores in Antarctica and Greenland. These ice-core samples then show a gradual rise from about 1800, accelerating with time. Direct measurements of CO₂ in the atmosphere have been made since the late 1950s, notably by Keeling on Mauna Loa in Hawaii. These measurements have shown a steady rise up to a current annual-average value of 378 ppm⁹. This rise in CO₂ coincides with the industrial revolution and the increased burning of fossil fuels which emit carbon dioxide on combustion.

⁹ Hadley Centre for climate change prediction



Carbon dioxide and methane in the atmosphere are higher than they have been for 650,000 years. Carbon dioxide in the atmosphere has risen more over the last century than over the whole of the last 20,000 years.

The concentration of gases has been closely tracked by global temperatures. Most of the growth has taken place over the last fifty years and as a result the average global temperature has climbed by 0.8 °C. Scientists believe that to avoid major impacts of climate change the global rise in average temperature must be kept to below 2°C.

To prevent this rise of 2°C the IPCC¹⁰ has stated that 'if carbon dioxide concentrations in the atmosphere can be kept below 450 ppm carbon dioxide equivalent, the average global temperature rise can be kept below 2°C. Beyond this and the earth will experience major impacts with catastrophic results.

Because we have already increased the greenhouse gas concentrations in the atmosphere we are already experiencing some impacts of climate change and are expecting worse to come which we can do little about. We now present the experts' view about the unavoidable impacts that we will experience and those which we have just 10 years to do something about so that we avoid the point of no return.

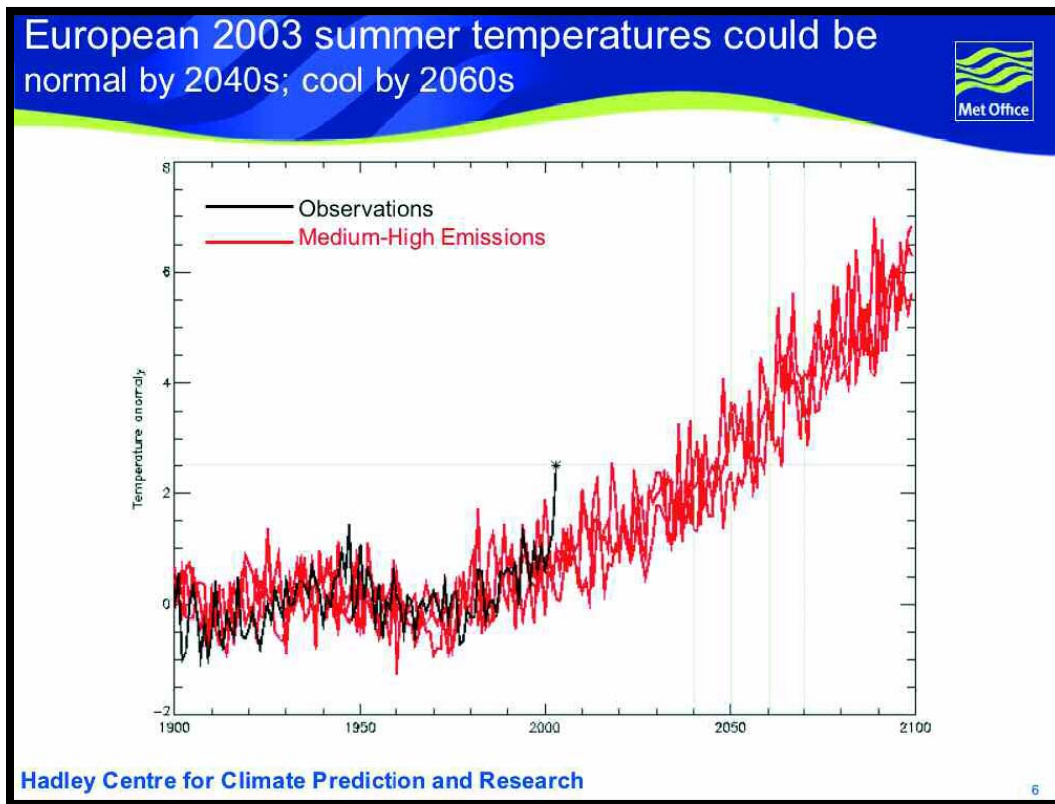
¹⁰ The Inter Governmental panel on Climate Change www.ipcc.org

The impacts of climate change

It is widely accepted that the impacts of climate change are already with us. The world health organization for example, estimates that 150,000 people are dying every year due to climate change, as diseases spread faster in higher temperatures.

In England there is evidence that wildlife has already begun to react to a changing climate. Little egrets and wasp spiders are spreading north, mountain ringlets are declining, and warm-water marine wildlife such as sea turtles and sun fish are turning up in greater numbers. Sea level rise and increased storminess have caused the loss of large areas of coastal saltmarsh in south east England: 40 hectares a year in Essex alone¹¹.

11 of the last 13 years have experienced the highest temperatures on record. This is a clear trend that our atmosphere is warming.



In August 2003 Europe sizzled in unprecedented temperatures that are thought to have claimed 50,000 lives across the continent. No heat wave in global history has produced so many documented deaths¹².

¹¹ Natural England web-site Sept 2007

¹² The Rough Guide to Climate Change

Section 1: A Changing Climate

The black 'blip' on the above diagram shows the 2003 record temperatures experienced in Europe. The graph reflects that global temperatures have closely tracked the increase in greenhouse gas emissions (the red line). The Hadley Centre predicts that if this remains the case then the searing heat experienced in 2003 could be 'normal' by the 2040's and seen as cool by 2060.

As the earth warms so the sea level rises partly because of the thermal expansion and partly because of the melting of ice sheets. This will inevitably increase the risk of flooding around the world including vulnerable areas in Bangladesh displacing millions of people. Flooding is also a real threat to some parts of Somerset¹³.



Source: nasa.gov

Some of the impacts of climate change have been identified as positive opportunities; for example, longer growing seasons, potential for quicker growth of plants due to the increase of CO₂ in the atmosphere and al-fresco type dining. However, faced with the potential of catastrophic change in other parts of the world these positive opportunities will be rendered meaningless in a world that will struggle to survive.

'Warming to the idea' is the most up-to-date assessment of the potential impacts that we face in the South West. Developed by South West Climate Change Impact Programme (SWCCIP) and the United Kingdom Climate Impacts Programme (UKCIP) it tables the predicted impacts based on a range of emission scenarios up to 2050.

Using UKCIP data the Somerset Climate Change Strategy has presented projected sea level rises for the SW Region.

In summary, 'Warming to the Idea' has predicted that we will experience milder and wetter winters, warmer and drier summers and an increased number of extreme weather events. Increased flooding, winds and storms will feature in West Somerset. Characteristic English landscapes face significant change in the decades ahead and familiar and well-loved features such as beech trees and bluebells, are likely to diminish or disappear.

These impacts are not necessarily catastrophic but because climate change is a global problem the impacts felt elsewhere will be more devastating. For

¹³ Refer to Somerset Climate Change Strategy for more information

Section 1: A Changing Climate

example, according to the Intergovernmental Panel on Climate Change (IPCC)¹⁴ billions of people face shortages of food and water and increased risk of flooding. The cumulative effect around the world will put greater pressures on the earth's capacity to meet the demand of so many needs. The UK Treasury takes this threat very seriously and has been assessing the potential impact on the UK economy given the impacts of climate change elsewhere in the world. The advice is that we must anticipate and plan for the changes ahead.

The West Somerset community will need to respond to this advice if it is to adapt to these changes. The direct impacts that will be felt by the community will have implications for services including: emergency planning, waste collection and disposal, planning, estates management, provision of leisure facilities and social services as well as changes in the farming community and the business sector. Adapting to the changes is a necessity, and a coherent, well-planned process needs to be developed to ensure that we can adapt. This is explored more in section 4, Planning for a Low Carbon Economy

The Stern Review

The Stern review was a study commissioned by the UK Treasury to assess the economic impacts of climate change. The Review¹⁵ concluded that:

- There is still time to avoid the worst impacts of climate change, if we take strong action now
- Climate change will affect the basic elements of life for people around the world – access to water, food production, health and the environment. Hundreds of millions of people could suffer hunger, water shortages and coastal flooding as the world warms
- The Review estimates that if we don't act the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20% of GDP and more.
- In contrast, the costs of action – reducing greenhouse gas emissions to avoid the worst impacts of climate change – can be limited to around 1% of global GDP each year.
- The investment that takes place in the next 10-20 years will have a profound effect on the climate in the second half of this century and in the next. Our action now and over the coming decades could create risks of major disruption to economic and social activity, on a scale similar to those associated with the great wars and economic depression of the first half of the 20th century. And it will be difficult or impossible to reverse these changes.

¹⁴ IPCC; Working Group III report "Mitigation of Climate Change" to the Fourth Assessment Report. The second report, on impacts, adaptation and vulnerability released April 2007.

¹⁵ Stern Review: Summary of Conclusions.

Section 1: A Changing Climate

- So prompt and strong action is clearly warranted.

This strategy establishes a basis for action to respond to climate change. It proposes mitigation measures to reduce our greenhouse gases and begins to explore how we prepare to adapt to the changes.

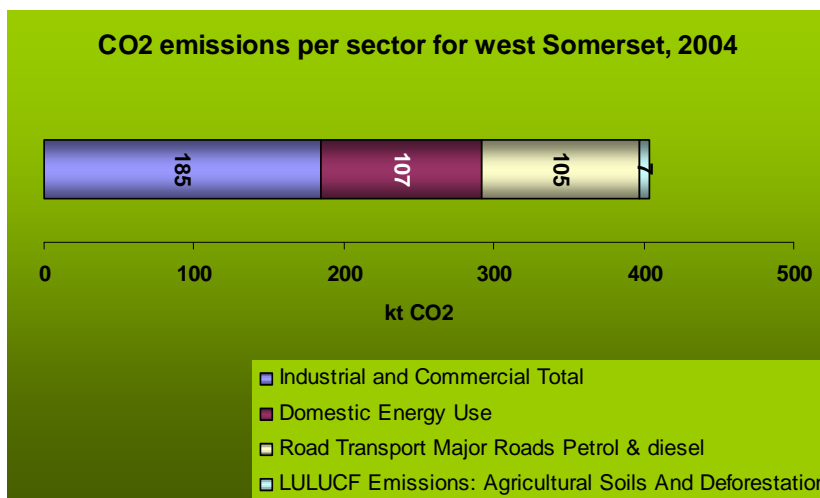
Polar bears will be extinct by 2050. This is according to a series of U.S Government studies released in September 2007. Polar bears depend on sea ice which makes them particularly vulnerable to the warming climate that is melting the Arctic sea ice. U.S. Geological Survey (USGS) conducted the studies to help the U.S. Fish and Wildlife Service determine whether polar bears warrant protection under the U.S. Endangered Species Act. That decision is due in January 2008

Section 2: Our Community Carbon Profile

Overview

Understanding the amount of CO₂¹⁶ we emit and the source of our emissions will help us focus effort to reduce CO₂ where it will be most effective. This section gives a brief overview of the amount and source of CO₂ emissions in West Somerset and how we compare with other regions and economies.

In 2004 West Somerset emitted just over 404,000 tonnes of CO₂, from the use of fossil fuel energy in our buildings, processes and transport.



The industrial and Commercial sector was responsible for 45% of these emissions followed by the domestic and transport sector at close to 26% each.

LULUCF emissions refer to those emission from Land Use, Land Use Change and Forestry (LULUCF).

Change and Forestry (LULUCF).

In West Somerset we emit 11.4 tonnes of CO₂ per person (per capita). This is more than the Southwest and UK averages.

Factors influencing our CO₂ footprint

In West Somerset there a number of contributing factors that drive our CO₂ emissions per person higher than the UK and regional average. These include:

- The lack of mains gas for space and water heating to nearly 60% of our homes. This is a major disadvantage in terms of CO₂, fuel poverty and the local economy.
- Nearly 50% of the CO₂ emissions from the domestic sector come from the use of electricity. Grid imported electricity emits nearly 2.5 times more

¹⁶. All measurements in this section are reported as CO₂ (carbon dioxide) only and do not include other greenhouse gases unless stipulated as CO_{2e} (CO₂ equivalent)

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CO₂ per kWh than gas and with the exception of solid fuel is the least efficient way to heat a home.

- A relatively low population living in the district which is home to a paper mill in Watchet. The paper mill is an energy intensive process.

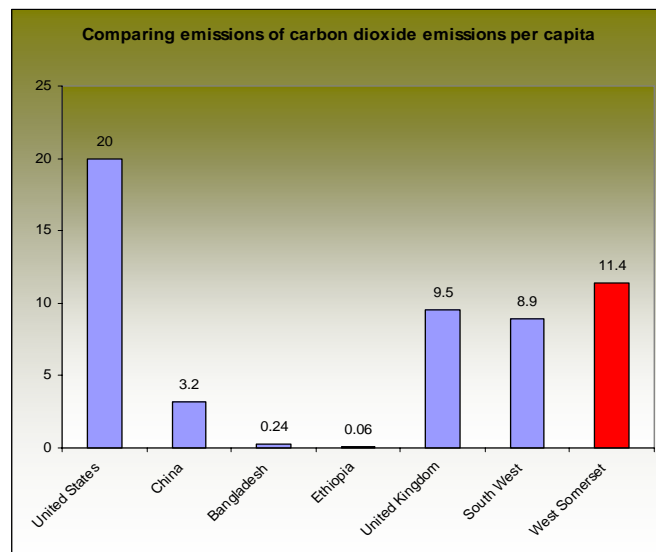
We must see these factors as reasons and not excuses. These reasons are costing our economy millions of pounds each year in unnecessary energy costs, pushing more of our households into fuel poverty with associated health impacts on the most vulnerable and contributing to the global climate change problem.

Measuring up to the rest of the world

To set these emission figures into context we need to compare our performance with our neighbours. One method for measuring performance is to work out the emissions per person (referred to as 'per capita') and then compare this with other regions and countries. Some believe that this is the most equitable way to set emission levels for each country.

In West Somerset we emit 11.4 tonnes of CO₂ per person. This is more than the Southwest and UK averages. The Southwest regional average is 8.9tCO₂. We emit 2.5tCO₂ more than this and nearly 2tCO₂ more than the UK national average of 9.3 tonnes.

By comparison, China's emissions are rapidly rising but with more than a billion citizens the CO₂ per person is still relatively low compared with the US and UK. The poorest countries in the world emit far less than the richest countries as shown in the diagram¹⁷.



To stabilise emissions globally and fairly politicians are considering an allocation of CO₂ per person across the globe. This would mean that our average CO₂ would need to come down significantly to around 2tCO₂ per person or even as low as 0.8tCO₂ per person. The UK government has been considering the introduction of personal carbon allowances to help drive down our personal carbon emissions.

¹⁷ For more detailed information on CO₂ data across the globe visit www.gci.org.uk and the Pew Centre report, 'Climate Data: Insights and Observation; The IPCC at www.ipcc.org

Section 2: Our Community Carbon Profile

Understanding our local CO₂ emissions profile is necessary so that we can assess the potential impact across our community economy and identify how best to intervene to bring about reductions to deliver a low carbon future in West Somerset.

But very importantly, delivering a low carbon economy brings with it opportunities to reduce the amount of revenue leaving West Somerset to pay for grid imported energy. By investing in solutions that can be locally developed and delivered we will prevent revenue leaving the economy, mitigate against future hikes in energy prices and create jobs in a growing environmental sector.

We now present a closer look at the domestic, business and transport sectors to understand the reasons behind the emissions and identify opportunities for cost effective reductions and economic diversification.

Spotlight on Business and Services¹⁸

An increasing number of business organisations are publicly declaring their commitment to tackle climate change. Some business organisations, for example Walkers crisps, are tackling this by developing carbon labels for their products as a benchmark to measure and target improvements. Others like the HSBC bank have declared their intentions to become carbon neutral which is largely achieved through offsetting. Regulation, public and market pressures as well as the rising cost of energy are all driving action and greater accountability of business and public sector emissions.

The West Somerset business and service sector is already experiencing some of the drivers that require them to account for and reduce their emissions. This is expanded further, later in this section.

The industrial and commercial sector in West Somerset was responsible for emitting 45% (185,000 tCO₂) of the total CO₂ emissions¹⁹ in the district.

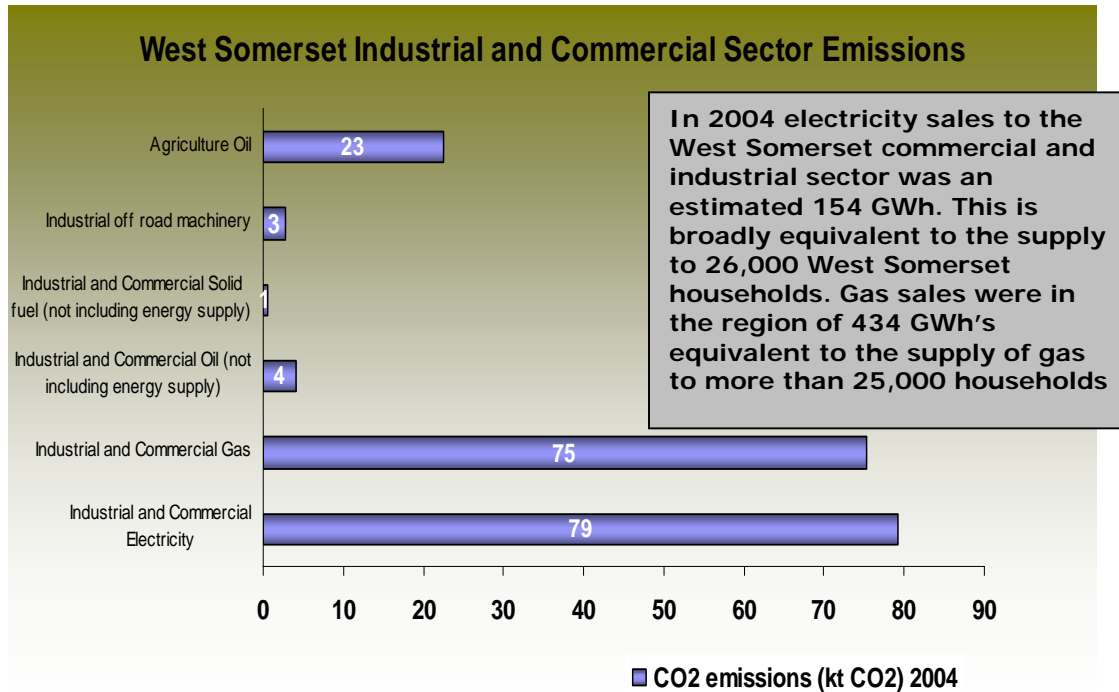
The data used for the purposes of this strategy does not allow us to differentiate the carbon dioxide emissions further for different activities. For example the services sector (including the public sector) will have a different CO₂ profile than that of the manufacturing or agricultural sectors. And any policies or actions will need to be carefully targeted to ensure they are appropriate to the nature and scale of the activity. It is recommended that this is updated with more detailed sector information in future. The data does provide us with a basis for monitoring and targeting purposes and absolute

¹⁸ Includes the public sector

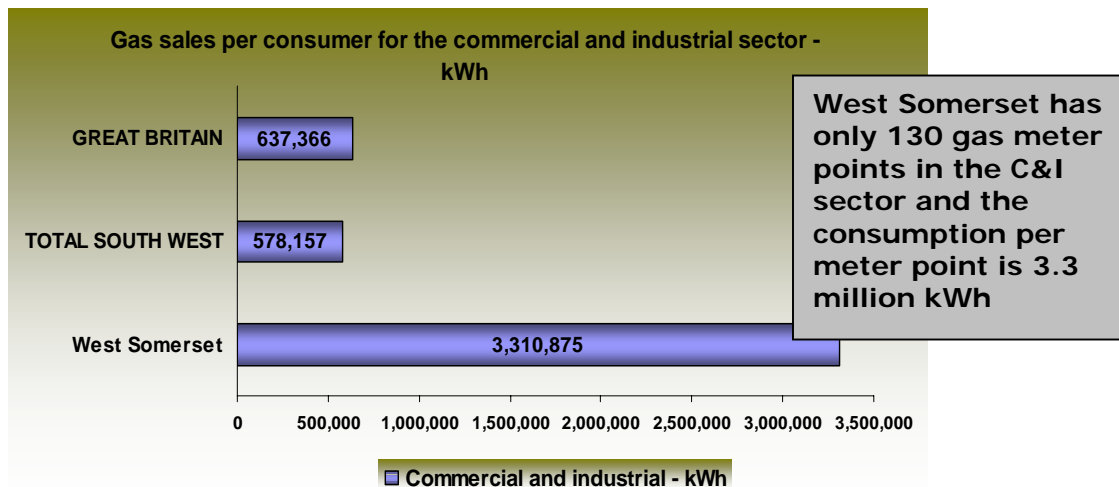
¹⁹ This does not include emissions from transport and waste which are addressed elsewhere.

Section 2: Our Community Carbon Profile

accuracy is not a barrier to implementing the strategy's actions for this sector.



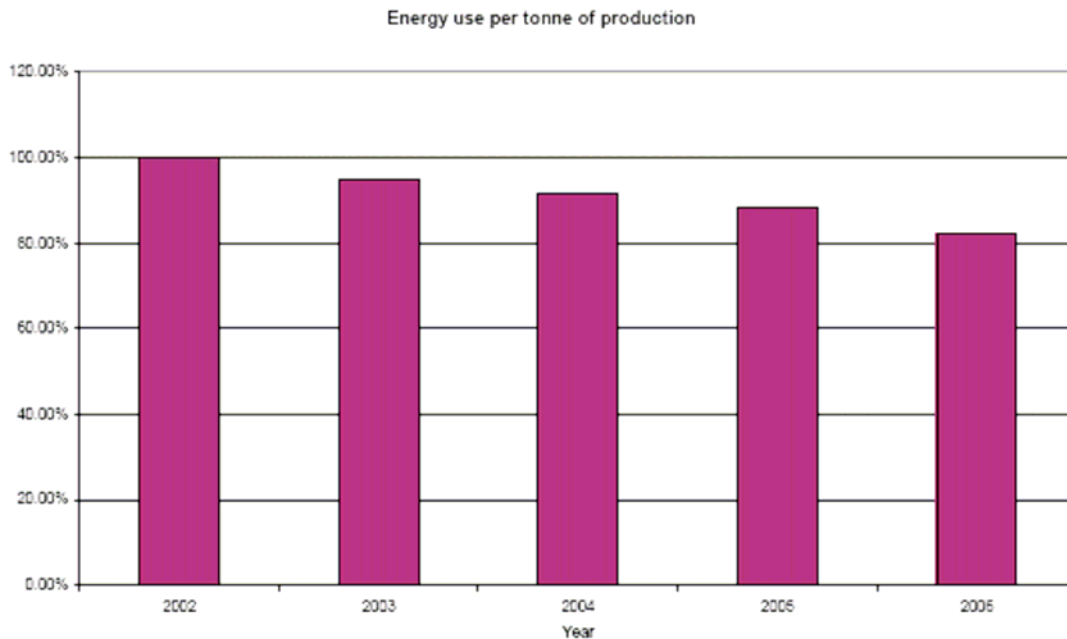
We know that the West Somerset economy is largely made up of small to medium enterprises (SME's), many with less than 10 employees. Yet assessment of the data has revealed that although the West Somerset gas sales to this sector was only 2% of the regional total the consumption per meter point is the sixth highest in Great Britain.



We are not sure about the explanation for this. West Somerset does have some energy intensive processes such as the paper mill in Watchet but we would not expect energy use to be so high.

Watchet Paper Mill and other Energy Intensive Processes

Although the process at the paper mill is energy intensive it does not necessarily follow that significant reductions in CO₂ can easily be achieved. In the first instance because energy is a significant proportion of their costs the Mill has for a number of years has been reducing the amount of energy used per tonne of product produced by investing in energy efficiency improvements as the following reflects.



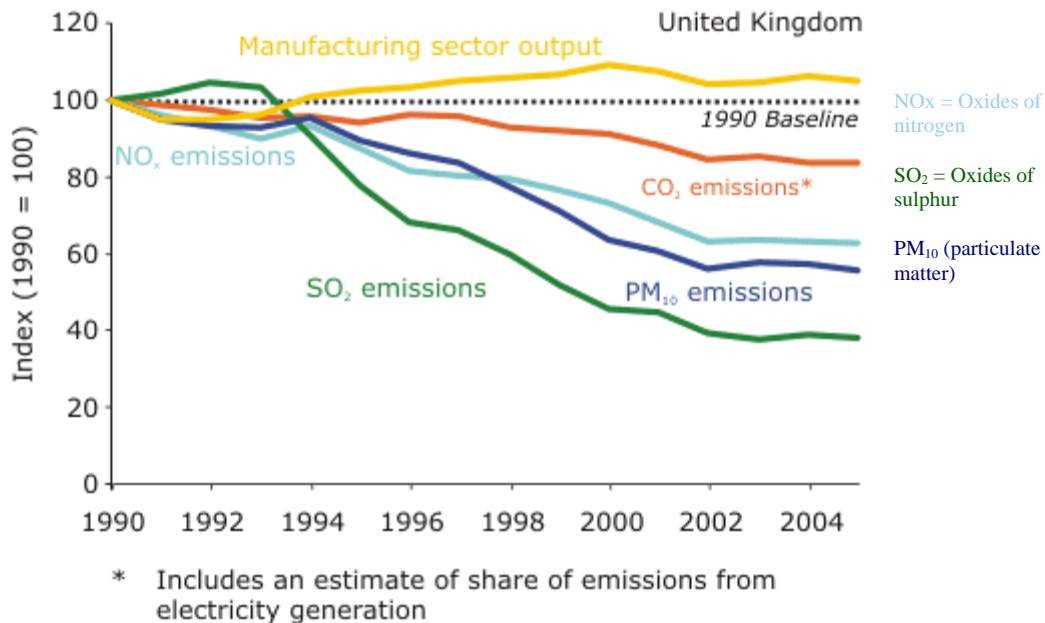
Secondly, the Mill (along with others in these industrial sectors) is committed to reducing its CO₂ through its climate change agreement (CCA), its permit to operate under the (IPPC²⁰) and as a participant in the EU Emissions Trading Scheme (EU ETS). The EU ETS is a mandatory scheme that requires organisations like the paper mill to account for their CO₂ on an annual basis. If the CO₂ they emit is more than they have been allowed they have to then purchase CO₂ allowances to meet their requirements.

Energy intensive industries like the paper mill have improved their energy efficiency over recent years. For example industrial energy consumption has fallen by 47% since 1970, yet manufacturing sector output has not declined by 47%. Part of the reduced energy consumption is explained by increases in energy efficiency. Some of it is explained by manufacturing moving overseas. The following diagram clearly shows that industry has reduced its emissions even when output has risen. This reflects the improvement in energy

²⁰ Integrated prevention pollution control

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efficiency per unit of product otherwise known as the specific energy consumption.



Source: ONS

The levelling off is thought to indicate that the industry is now finding it difficult to realise any more cost effective solutions to reducing CO₂. Technological shifts, carbon offsetting or where possible sourcing energy from renewables are some of the alternative options.

Furthermore the Mill recycles approximately 180,000 tonnes of paper per annum and although the recycling of paper is energy intensive it does provide additional CO₂ benefits when compared with landfill and reduced reliance on virgin raw materials.

The location and energy intensive requirements of the paper mill may provide an opportunity to deploy renewable heat energy that could benefit the paper mill, the wider community and reduce CO₂. Along with other stakeholders WSC and Forum 21 will seek to engage the paper mill to explore this and other potential options for reducing CO₂.

According to the Mill

'...it currently produces approximately 22% of its electrical requirement on site; although it can generate more this is currently uneconomic to do so due to the high level of gas prices. As the Mill is now approaching the limit of the opportunities for improving its energy efficiency and is facing further energy cost increases, alternative energy sources, including biomass, are currently under review.'

Mike Collins, Environment Director, St Regis/Watchet Paper Mill

Section 2: Our Community Carbon Profile

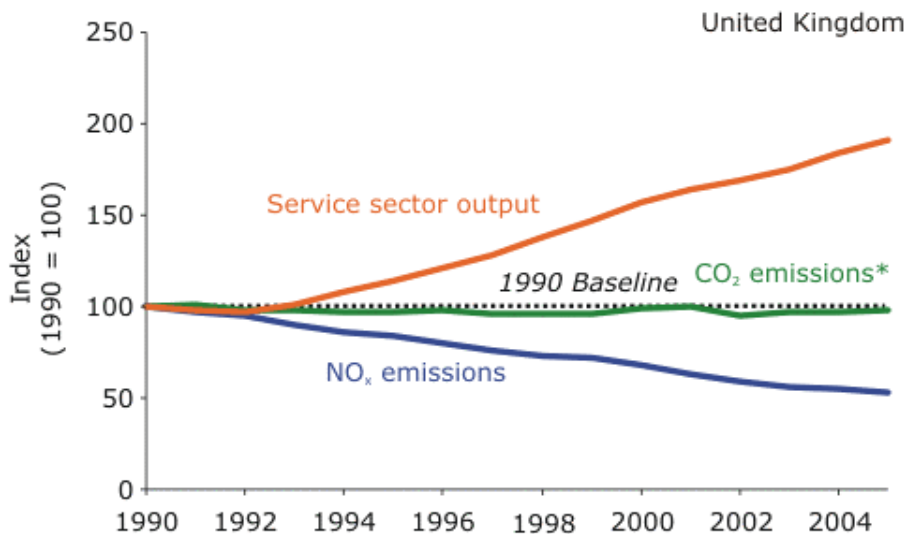
Hinkley Point Nuclear Power Station

West Somerset is home to a nuclear power station with a 1220 MW capacity, capable of delivering electricity to one million homes. The power station has been in operation since 1976 and with the recent announcement of more nuclear power build, Hinkley Point may well see another reactor.

The electricity from the reactors are exported through the grid for UK consumption and because of the data set used in this strategy, do not directly affect the CO₂ per capita of West Somerset except in the energy used by the site to operate. The data does not allow us to breakdown the use of energy by site so it is uncertain how much is used there and how efficiencies may be introduced to lower our community carbon profile.

The Public and Services Sector

By contrast to the industrial sector energy demand has increased in the services sector by about 80% since 1980. This is explained by the growth of the sector. CO₂ emissions in the services sector have seen little change in that time which could be a reflection of more energy efficient equipment and more people per m². However the worry is that they have not reduced at all over that period in a time when we need to be witnessing actual reductions.

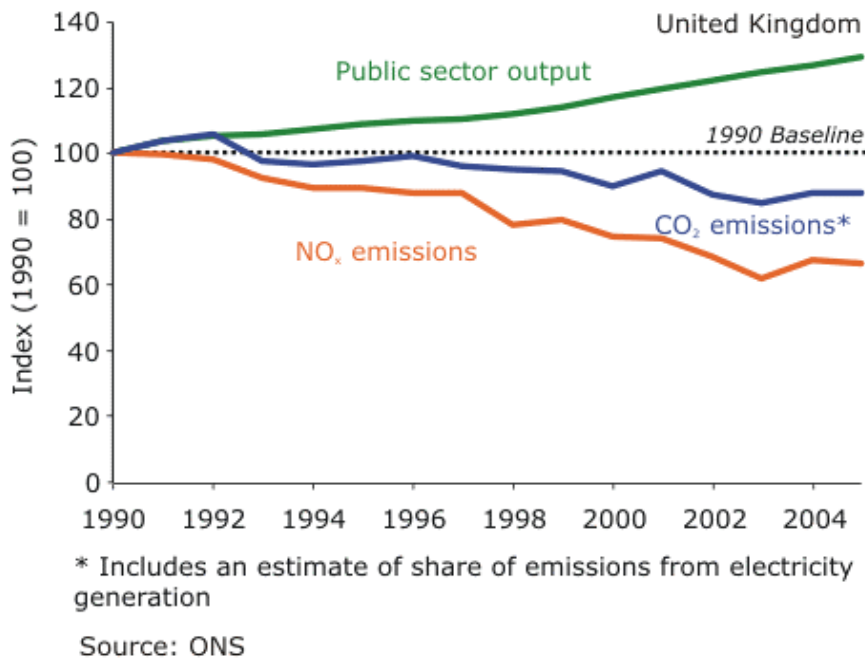


* Includes an estimate of share of emissions from electricity generation

Source: ONS

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For example, the UK public sector emissions have decreased by 14% over the same period despite a growth in output.



The national goal of reducing carbon emissions by 60% by 2050 will need a doubling of the rate of energy efficiency improvements seen in the past thirty years²¹. There is still plenty of potential for large cost effective reductions from energy efficiency measures especially in the non-industrial sectors²².

West Somerset Council and Exmoor National Park Authority

West Somerset Council and the Exmoor National Park Authority are critical to the achievement of the objectives set out in this strategy and the national targets. They are uniquely placed to deliver change through leadership, planning, and the delivery of their services.

In 2007 West Somerset Council demonstrated its commitment by signing up to the Nottingham Declaration on Climate Change. This is a voluntary pledge committing the council to ensure that tackling climate change is a cornerstone of the council's strategy.

In its management plan the Exmoor National Park Authority set an ambitious target by declaring its intention to be carbon neutral by 2025.

²¹ Energy White Paper, 2003

²² Performance and Innovation Unit, The Energy Review 2002

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To demonstrate their commitment and support to this climate change strategy WSC and ENPA have announced their intention to be 'exemplar' organisations. Each organisation will measure and monitor their carbon profile and establish targets and actions to reduce the carbon dioxide associated with their activities. Other organisations, public and private, are also invited to demonstrate their commitment to reduce CO₂ by signing up to this action.

Planning is fundamental to developing low and zero carbon communities. The planning system is evolving rapidly to ensure that planning authorities are provided with the guidance they need to ensure these objectives are met. This is discussed in more detail in the section 5, Planning for a Low Carbon Future.

Box 2.1 Example of Measures to reduce CO₂ in the Public Sector

Central Government has announced a series of measures to tackle CO₂ throughout the wider public sector including hospitals, schools etc. Examples of some measures are presented below:

- The UK Government Sustainable Procurement Action Plan sets out its goal for a low carbon, more efficient public sector. In 2008 it will publish guidelines setting out energy efficiency criteria for energy efficiency and energy savings in the public sector in its procurement procedures. This will also be promoted to the private sector.
- From April 2008 buildings greater than 1,000m² occupied by public authorities and by institutions providing public services, e.g. government offices, hospitals, schools, museums and libraries, will be required to display a certificate showing an energy rating for the building and the steps that can be taken to improve its energy performance. This will be widened to all public and private sector buildings and could extend to buildings of only 500m².
- The Carbon Reduction Commitment due to be implemented in 2010 is a mandatory scheme that will require organisations (including some local authorities and large hospitals) to purchase CO₂. Revenue will be recycled back to participants of the scheme depending on how they perform.
- Planning for a Sustainable Future and the Planning Policy Statement; Planning and Climate Change (December 2007) provide guidance on how to deliver a low carbon economy.



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Private Sector: Small to Medium Enterprises

Small to medium enterprises (SME's) are business organisations with fewer than 250 employees. When an SME organisation looks only at its own activities and impacts, any CO₂ reduction appears to be so minimal that it doesn't seem worth bothering about. This has been highlighted as one of the barriers to implementing energy efficiency by the Carbon Trust and other organisations.

Yet SME's make up more than 99% of all business organisations in the UK. Collectively they emitted more than 10 million tonnes of carbon in one year²³ compared with the public sector which emits 6 million tonnes. The collective impact of their activities is lost because of the disparate nature of SME organisations.

A number of barriers exist that prevent action by the SME to implement energy efficiency and carbon management plans. Chief among them is lack of resource and time. But a number of influences are now driving them to tackle this issue including rising energy prices and market and supply chain pressure. Resistance to this change will cost an organisation in potential loss of income because they cannot fulfil client needs. Many clients are now choosing to work with organisations in their supply chain that have environmental policies and can demonstrate reductions in CO₂.

Unless SME organisations evolve with the market there is a real risk that they will loose out to competitors. Evolving with the market may also bring opportunities for further business development extending the range of their market and products and services. In 2006 ethical consumerism in the UK was worth more than £32 billion²⁴. This is more than beer and cigarettes.

Recognising the need to support organisations to help them reduce their



Who are envision?

Envision is a partnership of not-for-profit Independent environmental support organisations in the South West, offering business cost saving and new markets support. We have a proven track record in a wide range of sustainability areas including waste, water, transport, energy and building, as well as offering training, workshops and funding advice. In the South West Objective 1 and 2 areas, our service is part funded by EU ERDF, South West of England Regional Development Agency and Devon County Council monies.

Envision – where environment means business... savings growth sustainability

envision
where environment means business

0845 456 9350
develop@envisionsw.org.uk
www.envisionsw.org.uk

²³ 2002: from The UK Climate Change Programme: Potential evolution for business and the public sector: Carbon Trust; November 2005

²⁴ Ethical consumerism Report, CO OP, 2007.

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energy costs and respond to market pressure for CO₂ accountability, the Community Sustainability Strategy has committed to a high profile campaign to promote energy efficiency across all sectors of the economy including domestic, public sector and local businesses.

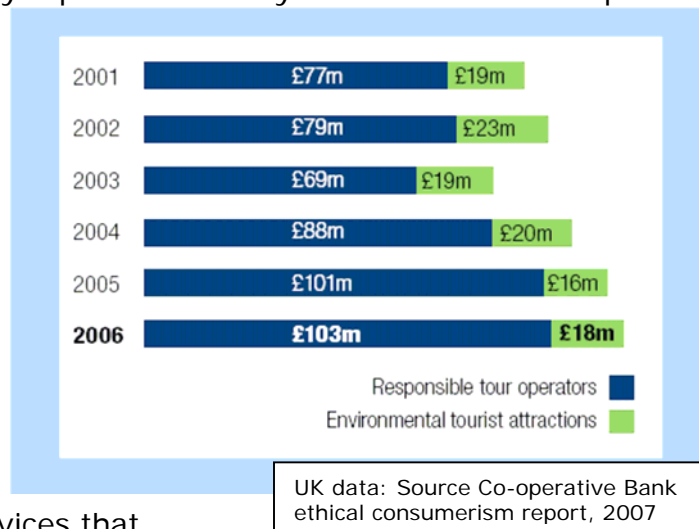
Support is also provided by the Envision programme. The Government Office South West and the Regional Development Agency fund the programme. It provides tailored subsidised support to improve the environmental management of the SME and can include carbon management and energy efficiency.²⁵

Private Sector: Tourism

The West Somerset Economy relies heavily on tourism and attracts more than 4 million visitors a year. Many visitors arrive using private transport and make a significant contribution to the 105,000 tonnes of CO₂ attributed to transport in the district. Attracting more tourists to the area to support the local economy also presents a challenge in minimising the environmental impacts associated with more visitors.

There are opportunities to increase the value of the tourism trade while at the same time reducing the CO₂ and other environmental impacts. Schemes like the Green Tourism Business Scheme provides green grading awarded to tourism businesses that demonstrate environmental management. This is already being rolled out across Exmoor supported by the ENPA's sustainable development fund.

The Co-operative bank recently reported a rise by 25% since 1991 in spend with responsible tour operators and environmental tourist attractions. The diagram opposite is taken from the Co-op's ethical consumerism report, and reflects the growth in the market for more environmental tourist attractions and the use of responsible tour operators. As a society we are becoming more ethically conscious and choosing to purchase those goods and services that



²⁵ Consultancy support starts from as little as £10/day at the time of writing.

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provide us with some assurance that ethical issues including environmental issues are being addressed.

Branding the area as a low carbon destination is ambitious but could provide the economy with much needed high value business whilst helping drive a low carbon economy. This will require the tourism industry to sign up to action that can deliver such a brand. In addition the ENPA management plan also identifies that there is scope to work with other protected landscapes to promote Exmoor and West Somerset as a first class destination for environmental tourism.

Working together a coherent strategy will need to be developed by the industry and key agencies to explore how these objectives might be achieved.

Private Sector: Agriculture

Agricultural oil accounted for 23,000 tonnes of carbon dioxide in West Somerset. But oil is not the only player in the carbon profile of agriculture. Land use and forestry also influence the amount of CO₂ absorbed or emitted and can play a key role in helping reducing CO₂ from the atmosphere. Methane is another greenhouse gas that is more potent than CO₂ and is emitted from belching livestock as well as landfill and slurries.

Agriculture emits about 7% of UK green house gas emissions. As climate patterns change farmers and other land managers will be one of the first to feel the effects.

According to the ENPA, future public funding support for agriculture will shift towards a greater emphasis on public benefits achieved through high quality landscapes, increased biodiversity and improving public access. Maintenance of high quality landscapes that help capture and store CO₂ are increasingly seen as an asset. In the future, carbon capture and storage through the management of natural assets will also be valued, and private and public funding may be needed to support this.

The Exmoor National Park Management Plan has detailed the challenges facing the Exmoor farming community. It also highlights some of the opportunities that present themselves to both the Exmoor and West Somerset farming communities in a shift to a low carbon economy. These options include:

- Sustainable energy systems, including the generation of energy from farm slurries and manure; making better use of wood fuel from farm wood lands and hedgerows; as well as more use of wind and solar.

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- Increased volume of quality timber woodlands to help act as a sink for carbon capture.
- Sustainable management of woodland to supply the wood fuel market.
- Organic farming and supplying niche higher value products capitalising on the increasing market for locally sourced products.

The ENPA management plan objectives to install 50 wood fuel heating systems and to implement sustainable energy plans in 6 Exmoor settlements by 2010 will help stimulate the above opportunities for the farming sector.

ICT and Flexible Working

Both the environment and business organisations would benefit from implementing flexible working policies and smarter use of information communication technology (ICT).

Flexible working with better use of ICT could mean:

- Staggering start and finish times of staff to help avoid congestion times. This will save staff personal and work time and will reduce CO₂.
- Employees could work five days in four by working longer hours on each day, reducing the need to travel by one day per week per staff member and could contribute to a more positive work life balance for employees
- Reduce the amount of journeys to meetings by using teleconferencing and or video conferencing
- Virtual mind mapping software allows all participants of IT conference meetings to share real time information as it is drawn – similar to the use of the flip chart in a meeting room

Waste

For the reasons set out in 'about this strategy' waste has not been included in the carbon profile of the district. Waste does contribute to climate change. It produces methane (which is a greenhouse gas) when it is landfilled and when it is recycled it needs energy to process the material creating more CO₂.

The UK Waste Strategy published in 2007 recognised that small business organisations need more support to help them deal with their waste materials. They are often disproportionately charged because they are charged per pick up rather than by tonnage. They also lack space for the segregation of materials which is a barrier to recycling. Larger organisations can sell their waste materials if they are recyclables but the disparate nature of small businesses makes this impossible unless some coordination is implemented.

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There is scope to work with the small to medium sized businesses across the district, working with organisations like the chambers of commerce to assess the issues and develop solutions.

Water

According to one source,²⁶ treating and distributing water for human use in the UK was responsible for just over 4m tonnes of CO₂ equivalent in 2005/6. In the 1970 the average consumption of water was around 110 litres per day, today it around 157 litres per day/per person²⁷.

The area is assessed as low-moderate in terms of water stress²⁸ (balance between consumption by water company and rainfall/resource levels). Changes need to occur in our current water management and behaviour, to reduce these stresses and threats to both to the security of our water supplies and to the health of our water environments and nature conservation sites. DEFRA (2008) suggest we need to reduce per capita consumption of water to an average of 130 litres per day by 2030, or possibly even 120 litres per day depending on new technological developments and innovation.

Risks to the water environment including private drinking water sources will need to be revised depending on predicted emission scenario. Close consultation with SWCCIP²⁹ will be sought.

We have not included the water figures per household or set targets in this strategy because of the difficulty in obtaining the data and ongoing monitoring of performance against that data. But we will keep abreast of water resource and quality affected by climate change going forward through the carbon reduction implementation board (CRIB).

Clearly, there is a need to encourage the community to consider how to save water around the home and garden and to install rainwater collection systems. Through the adaptation agenda we will need to work with planners and the built environment to implement water efficiency devices, rainwater collection and grey water recycling systems.

For more information about water savings visit www.swwater.co.uk or www.wessexwater.co.uk

²⁶ *change adaptation by design - a guide for sustainable communities*; TCPA, London (2007)

²⁷ www.swwater.co.uk

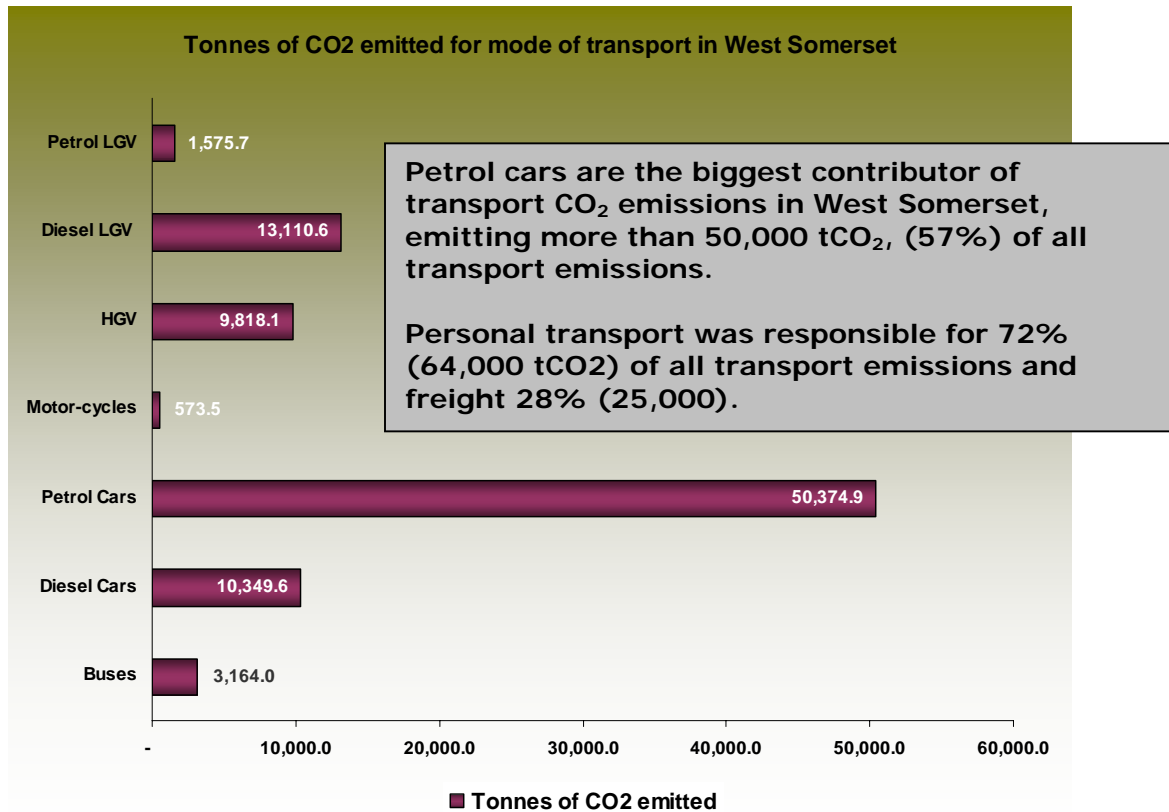
²⁸ DEFRA, 2008, Future Water – The Government’s water strategy for England

²⁹ South West Climate Change Impacts Partnership (SWCCIP), <http://www.oursouthwest.com/climate/>

Spotlight on Transport

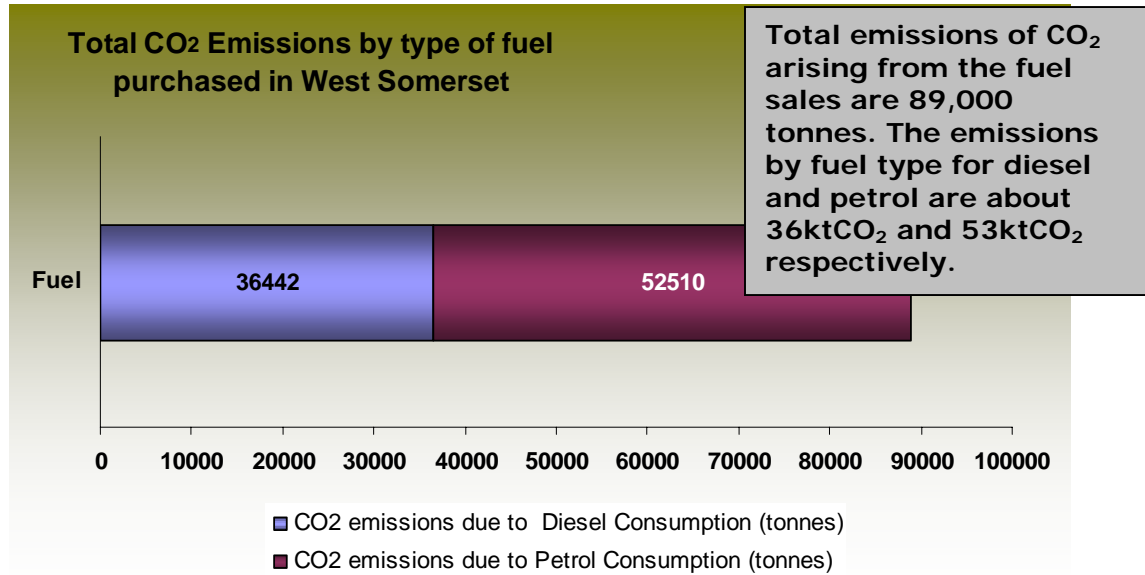
In 2004 West Somerset sold more than 28,000 tonnes of fuel. This is approximately equivalent to 33 million litres and 89,000 tonnes of CO₂. At the current cost of a £1 per litre this represents a staggering 33 million pounds.

Not all this revenue is spent by the local community. West Somerset receives tens of thousands of visitors every year, most of them using personal transport. Some of these visitors will purchase fuel locally and will account for some of the fuel sales.



Of the 33 million litres sold in West Somerset, 59% of the fuel sold was petrol and 41% diesel. In general diesel emits less CO₂ per kilometre than petrol.

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Many residents rely on the personal car as a practical means of transport especially in the more rural areas. The challenge is to provide access for all and at the same time reduce CO₂.

A recent study commissioned by the Department for Transport has found that radical behaviour change and reducing travel are needed to achieve a significant reduction in carbon emissions from transport. This is against a background in which demand for travel is forecast to increase.

Creating a modal shift from personal car use will be difficult in an area where public transport is not always available or practical and cycling is not easy because of the narrow busy roads and topography.

A shift to diesel from petrol would help to reduce CO₂ but is not sufficient as a longer term solution because the level of CO₂ reductions needed still require a significant modal shift.

In the medium term (2020s onwards) electric cars may become realistic, but recharging must be from renewable energy sources if this is to be a benefit in carbon terms.

In the meantime the community needs to implement a range of sustainable transport options including;

- Better cycling facilities to encourage more people to cycle especially over shorter distances
- A shift to bio-diesel which if locally produced, supplied and consumed will reduce CO₂ as well as stimulate the local economy; recycled waste oil could be used for transport and bio-fuel for heating
- Setting up car clubs and car sharing schemes to reduce the number of cars and one person journeys around the district

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- Better use of the local railway to provide alternative transport options to the local community
- Bus services with better frequency, reliability and journey times
- Demand responsive transport available to all in deep rural areas as a low carbon alternative to driving
- A local campaign to encourage the community to use alternatives to the car where possible. This will include public transport improvements
- Assessing the feasibility for demand responsive transport



A Department for Transport study “Smarter Choices – Changing the Way We Travel” has shown that investment in a well managed programme of so called “soft measures” can be very cost effective in purely economic terms, in addition to the benefits in reducing carbon emissions. The cost of such measures is likely to be around £100/tCO₂.

Improved Cycling facilities

Projects to improve cycling facilities have been shown to have a benefit to cost ratio far higher than other transport schemes such as road improvements – typically from 15 to 30 to 1. Benefits such as better health are important. These economic analyses do not take account of additional benefits such as carbon emissions reduction.

A number of initiatives are currently underway to encourage more cycling in and around West Somerset and includes the following:

- The Exmoor National Park Management Plan has proposed a review of the opportunities to encourage interchanges between cycles and buses by providing secure



Forum 21 proposed the idea in 2004. The proposal quickly gained support from a wide range of organisations in the area and a steering group was established to make the project a reality. Sustrans, the national sustainable transport charity, was commissioned to undertake a feasibility study and public consultation. This was completed in late 2006. The proposal has been backed by the Somerset Local Transport Plan and the West Somerset Sustainable Community Strategy.

The West Somerset Strategic Partnership has funded a Project Officer to take the project through to the first building phase in 2008.

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cycle facilities at key points on bus routes. The provision of cycle racks on buses may also increase the number of cycle journeys in the area by tourists and locals.

- The West Somerset Cycle Network is a project to develop a network of safe, mainly traffic-free, cycle routes in the coastal strip of West Somerset between Minehead and Williton/Watchet for local communities and sustainable tourism.
- Some local employers are participating in the 'cyclescheme' which is working with a network of independent bike shops to provide quality tax free bikes and equipment for work. More information about how employees and employers can benefit is available at www.cyclescheme.co.uk
- The Moving Forward campaign is a Somerset wide campaign promoting cycling as well as walking, car sharing and using public transport.

The community can continue to implement and build upon these initiatives to encourage more cycling in and around West Somerset.

Supply and use of bio-diesel

Surface transport is the second largest source of carbon dioxide emissions in the UK and emissions from it are set to continue to rise. To tackle this issue the Government uses fiscal measures to incentivise a shift from dependency on carbon intensive transport. For example the Budget 2007³⁰ announced that fuel duty rates will increase over the next three years as the UK seeks to reduce emissions. Car tax would also increase for the most polluting vehicles and would fall for the cleaner cars. The use of bio-fuels as a means of tackling rising emissions is seen as one option and is receiving much attention from the Treasury³¹.

Fuel switching to bio-fuels could make a significant contribution towards reducing our community CO₂ emissions from transport. An estimated 3600 tonnes of CO₂ per year would be avoided for just a 10% shift from using diesel to bio-fuels.

A number of measures have been implemented over the last 2 years to strengthen the market for bio-diesel. For example;

- The European Commission has set a target that a 20% share of all of transport fuels in Europe to be from biofuels by 2020.
- The Budget 2007 introduced a package of measure to support biofuels including:

³⁰ For an overview of the budget 2007 measures for the protection of the environment refer to appendix 5

³¹ Refer to Budget 2007; chapter 7

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- The introduction of the Renewable Transport Fuel Obligation (RTFO) which will require transport fuel suppliers to ensure a set percentage of their sales are from a renewable source, initially set at 2.5% for 2008 rising to 5% by 2010-11. If a supplier fails to meet its obligation then it will be required to pay a 'buy-out-price' of 15ppl in 2009-10.
- The extension of the biofuels duty differential to incentivise the take up of biofuels within the industry.
- The development of a fuel quality standard to ensure existing and new vehicles can run on biofuel blends higher than 5%.

In continental Europe bio-diesel is already mixed with mineral diesel and sold on the forecourt at a stated percentage mix.

More locally Somerset County Council has set up the Somerset Biofuel project to take a lead in introducing bio-ethanol into the market. There are aims to begin production of ethanol in Somerset by the end of 2008. The Somerset County Council Renewable Energy Strategy states that bio-ethanol can be produced from miscanthus of which there are 400 ha currently growing within a 15 mile radius of Taunton. The Taunton – Minehead corridor is seen as a future potential source of energy crops by the County Council.

The incentives by the UK Treasury in Budget 2007 send a clear signal to potential suppliers and users that this will be the government's fuel of choice over petrol and diesel in the coming years.

There are significant concerns over the associated environmental impacts with some types of bio-fuel for transport (see Box 2.3) not least of them is the take up of space to grow crops for fuel and not food. It has been reported³² that grain prices have increased in the last year partly because of the increased take up of land for fuel crops. The price increases are in the order of 50% for maize, 100% for wheat and 20% for rice. Other factors may have played a role in these increases including poor crop production because of adverse weather. The picture is complex but what is clear is that if the supply of grain to the market reduces, the inevitable result will be a rise in prices. Any policies to further this agenda need to be mindful of the economic as well as the environmental impacts of this approach.

The use of bio-fuels in electricity generation or combined heat and power (CHP) offers much better carbon efficiency than bio-ethanol production. If there is a strategy and a decision to continue to use crops for fuel then the preferred strategy should therefore be to focus local bio-fuel production on the heat and power generation sectors.

However there is one source of bio-fuel for transport that is entirely positive in environmental terms. Local processing and supply of good quality bio-fuels from waste catering oils will provide the community with an alternative

³² George Monbiot, Gaurdian, 6.11.07

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cleaner fuel and could help reduce CO₂ emissions. Even then the available quantities are not thought to be large but could still presents an economic opportunity for West Somerset building on an existing local supply network.

Biofuels from waste cooking oil will only ever be a niche part of the solution but one that we should nevertheless pursue locally.

Promoting other sustainable transport options

The Community Sustainability Strategy 2007³³ has committed to provide support on promoting alternative transport options to the car. The West Somerset Strategic Partnership (WSSP) also provided funding to implement those actions which include; the development of a transport guide; the promotion of car clubs and car sharing around the district; and an awareness campaign on the benefits and alternatives to using the car. These actions will be undertaken through 2008. For more information contact Forum 21 at mail@forum21.org

³³ Available on the www.wsc.gov.uk

Box 2.3: Are Biofuels a greener alternative³⁴?

The adjacent advert went out in May 2007 over concerns that large areas of rain forest were being felled in favour of palm



forest were being felled in favour of palm plantations for biofuel. This activity destroys the habitat of the orang-utan as well as other species and reduces the forests ability to absorb CO₂ as affectively. The advert has been deliberately designed to shock and similar treatment of the subject by the media has understandably raised concerns about the benefits of biofuels.

Biofuels are made from plants and the products receiving most attention at the moment are ethanol and biodiesel. The main concerns around the use of biofuels include; the demand for land which could squeeze food production; the farming of land that has been virgin, (including forest felling) which could destroy habitats and reduce the amount of CO₂ being absorbed from the atmosphere; and the amount of energy needed to process the biofuel

which reduces the overall benefit.

Ethanol is already used extensively around the world, especially in the US and Brazil where production in 2005 was about 30 billion litres between them. The University of California estimates that corn based ethanol uses about 74 units of fossil-fuel energy to produce 100 units of ethanol energy. But cellulosic ethanol found in fast growing plants like Miscanthus currently being grown in Somerset is more promising because it requires less fossil energy to produce. It is however more costly to produce because it is more difficult to break down. The Treasury has been applying to the EC to allow them to provide enhanced capital allowance scheme support to the most carbon-efficient biofuels plant. Ethanol is generally used as a petrol blend rather than diesel.

Biodiesel has increased in popularity in the UK in recent years. Some cars are running on 100% biodiesel and others on blends. Biodiesel is mostly derived from vegetable oil, either as a by-product of food crops or from waste oils used in kitchens and restaurants. Because of the little processing required it is less carbon intensive to produce than ethanol and because the biodiesel is often a waste or by-product it is considered to have less of an impact on the demand for land. Treasury incentives to increase the use of biodiesel will see the demand for it grow. As the demand for biodiesel increases the supply will need to increase which will eventually increase the demand for land. This introduces limitations to the extensive use of biodiesel, as with ethanol.

The result is that biofuels can play a role in helping to reduce CO₂ but it is limited and needs to be carefully implemented to avoid unintended consequences. It is only one of a number of measures that we need to implement to tackle climate change. Using the car unnecessarily, improving public transport and cycling facilities to encourage the alternatives will also need to make a significant contribution to reducing CO₂ and shift reliance away from depleting fossil fuels.

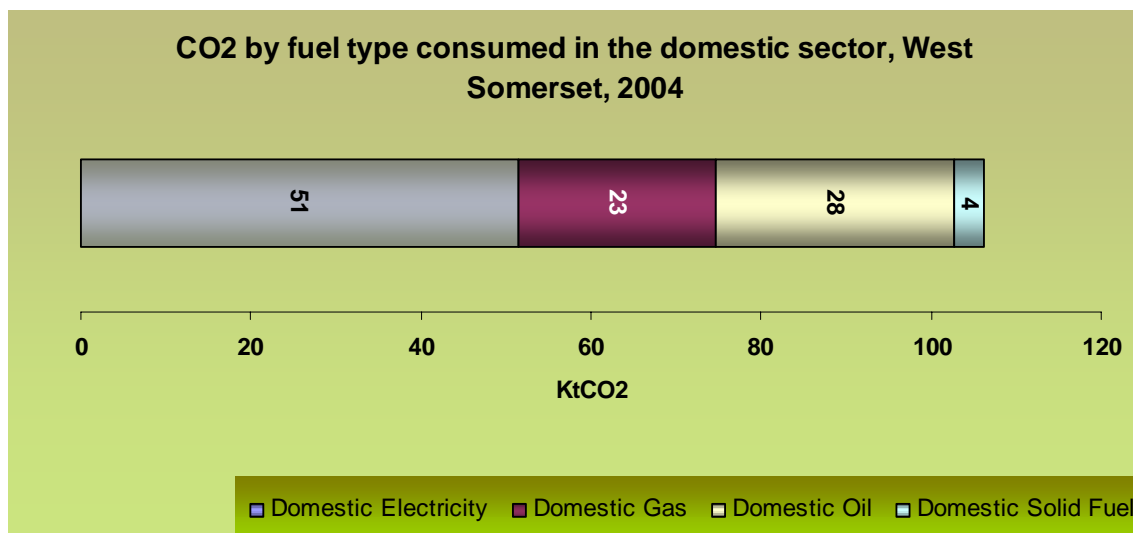
³⁴ Box information extracted from 'rough guide to climate change' and European Commission website

Spotlight on Households

In 2004 energy use in UK housing accounted for around 27% of UK carbon dioxide emissions. Government research also found that 4.4 million homes lacked effective insulation or efficient heating and approximately 2 million households in the UK could not afford to heat their homes.

In West Somerset the domestic sector was responsible for emitting around 107,000 tCO₂, 26% of our community CO₂ emissions. This is equivalent to 3.1 tonnes of CO₂ per person which is higher than the regional and national averages of 2.7 and 2.6 tonnes per person respectively.

Nearly 50% (51,000) of CO₂ emissions in the domestic sector arise from the use of grid electricity and 26% (28,000) from the use of domestic oil.

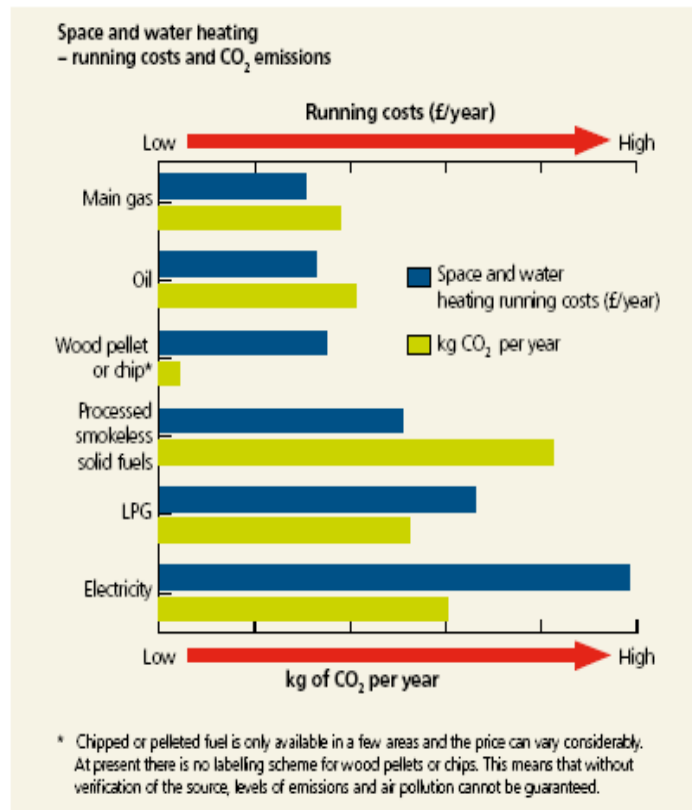


The West Somerset domestic sector spends in excess of £20 million on energy every year. This revenue is lost to our local economy because it is paid to the companies that supply us with grid imported electricity and gas. With prices set to rise by another 20% or more this year this loss will increase to £24 million and we are vulnerable to further price hikes.

Nearly 60% of our homes in West Somerset are not on mains gas. Households not on mains gas are using grid imported electricity and other fuels for space heating and cooking. Grid electricity emits more CO₂ per kWh than gas and oil and is the least efficient of all the fuels for heating a home as reflected in the following diagram³⁵:

³⁵ EST CEO 1010: www.est.org

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Source: Energy Savings Trust: Domestic Energy Efficiency

Fossil fuel energy and CO₂ are intrinsically linked: if we reduce our reliance on fossil fuel we reduce the CO₂ we are responsible for emitting.

The UK Energy Strategy warns of security of supply issues and rising energy prices in the future (see section 3 for more information). Through investing in measures to reduce our reliance on grid imported energy and other fossil fuels the community will prevent millions of pounds leaving the economy year on year, reduce CO₂ emissions and help deliver affordable warmth to the most vulnerable.

Fuel Poverty

Fuel poverty is a term used to refer to those vulnerable households that cannot afford to adequately and effectively heat their home. A person is in fuel poverty if they need to spend more than 10% of their income on adequate energy services including lighting. The consequences of fuel poverty range from discomfort to death. In the UK there are tens of thousands excess winter deaths every year and the Government has pledged to ensure that by 2016, at the latest, persons in England and Wales do not live in fuel poverty as far as reasonably practicable. As energy prices

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continue to increase more people drop into fuel poverty and this pledge becomes ever more challenging.

West Somerset is particularly prone to fuel poverty and part of the reason is the comparatively low wages and seasonal high unemployment³⁶, particularly in winter months when extra income is required to heat properties. As mentioned above, the lack of mains gas to heat a property is also a factor because electricity is more expensive and less efficient at heating the home.

Other influences include:

- An increasing number of owners let holiday homes as permanent residences, or let them through the winter months. Most of these properties are sub-standard with regard to heating and thermal efficiency.
- A higher proportion of residents live in rented accommodation than nationally.
- Landlords including estate owners are not sufficiently incentivised to implement energy efficiency measures or increase the thermal efficiency of the buildings.
- A large number of properties do not lend themselves to being easily insulated. Many properties are listed buildings with associated restrictions to altering the building

Several schemes exist to address fuel poverty in West Somerset households. These deliver 100% and partial grant assistance for cavity and wall insulation, energy efficiency advice and other measures. These include the following:

- Somerset Warm and Well grant Scheme
- Warm Front
- Heat Somerset Scheme

More information is laid out in appendix 6 'available support to insulate your home'.

West Somerset Council is committed to promoting and supporting the schemes and funds a service level agreement with the Bristol and Somerset Energy Efficiency Advice Centre and Forum 21 to promote the schemes.

West Somerset Council has in recent years committed more officer time and funding to address fuel poverty in the community and has seen significant improvements.

Between 1996 and 2004 energy efficiency improvements in West Somerset through the fuel poverty campaign were reported to be 5.57%. In 2004-2007 these improvements increased by 12.1% to give an overall total of 16.69%.

³⁶ Reasons for West Somerset Fuel poverty extracted from the WSC HECA report 2006/07.

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The result has seen a significant increase in the number of households installing cavity and loft insulation and receiving other related support.

In 2006/7 158 and 252 roof insulations were completed not including a significant number of referrals that were at the stage of being surveyed or committed at the 1st of April 2007. A further 156 households received measures under the Warm Front Scheme.

Clearly this will save the householder money and reduce CO₂. Energy efficiency is the least cost measure we have and we need to rigorously apply it at home. Doing so will bring about reductions in CO₂, help protect the most vulnerable households that suffer fuel poverty impacts and plug some of the £20 million+ leak from our local economy. More information is available from the Energy Saving Trust at www.est.co.uk

Energy Efficiency

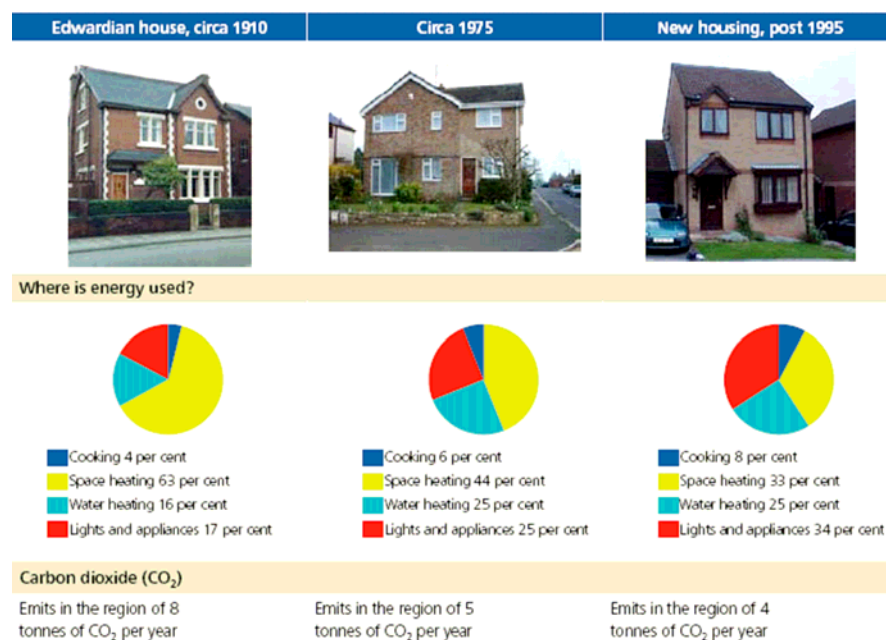
According to the Energy Savings Trust most households could save around 2 tonnes of CO₂/year through improved energy efficiency. In West Somerset this equates to 34,000tCO₂ across the district.

There are a range of energy efficiency measures available to homes and the effectiveness of those measure will be determined by a number of factors including, fuel type, size and type of house, heating and electricity requirements and behaviour.

Space heating makes up between 33% and 65% of the total energy bill of a home depending on the age and type of building.

The most cost effective solution is undoubtedly cavity wall and loft insulation. For homes in fuel poverty grants are available to insulate the home. Homes not eligible can be insulated for as little as £150. This will pay for itself in just over 6 months in a home that relies on electricity for space heating.

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Source: Energy Saving Trust: Domestic Energy Efficiency

Many homes in West Somerset do not have cavity walls or lofts that can be easily insulated. Grants are available for external and internal wall insulation and the CO₂ reduction is very effective. Again the primary source of information for the domestic sector is the Energy Saving Trust who can give information on grants and other support available for the householder.

Appendix 7 'comparison of domestic energy efficiency measures' presents some analysis of the CO₂ returns for different types of insulation as well as other measures.

If 5,500 (electrically heated homes) or 12,500 (gas centrally heated homes) were to be insulated this would save our community economy at least £3.5m³⁷ per annum and 20,000tCO₂ year on year. Without grant assistance this would cost between £1.4m to £3.7m and would pay for itself in one year. Given the high incidence of fuel poverty in West Somerset the internal investment required is even less because of grant assistance and hence the rate of return to the local economy more attractive.

The West Somerset fuel poverty campaign is set to continue and a more strategic approach is being developed to target geographic areas, using Fuel Poverty Indicators derived from Census and House Condition Survey data to identify areas where there is higher risk of fuel poverty.

The West Somerset Strategic Partnership has funded Forum 21 to deliver an energy efficiency campaign aimed at tackling the wider community and

³⁷ Refer to appendix 7 for assumptions.

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promoting the benefits of insulation and other energy efficiency measures. This is one of a number of actions currently being funded by the WSSP to deliver its action plan under the West Somerset Sustainable Community Strategy 2007-2010.

Clearly it is in the community interest to widen and deliver a vigorous campaign to incentivise and encourage all households to insulate their homes. It will not only benefit the local economy but will help reduce fuel poverty and CO₂.

West Somerset Council is committed³⁸ to continuing to promote the take up of energy efficiency measures, including insulation, by householders. It is clearly the most cost effective solution and support already exists in the form of national and regional grants. Although figures do not exist that tell us how many households are still to be insulated we believe that there is a significant portion that are not and would benefit from some form of insulation.

Micro-generation

Micro-generation is a technology that can generate heat or electricity from a renewable resource and whose capacity is less than 50kW of electricity and 45kW of heat.

Examples include solar thermal for heating water, solar photovoltaics which generate electricity, biomass such as wood burners, wind, biofuels, combined heat and power and water (wave, tidal, hydro).

Some simple analysis has been undertaken to understand which micro-generation technology would be the better option in terms of the CO₂ saving potential as well as the cost effectiveness and the benefits to the local economy as a whole (refer to appendix 8). Wood fuel boilers appear to be the most suitable option both in terms of cost effectiveness and potential CO₂ reduction. Given the rural nature of West Somerset, the number of off-gas wards and the presence of some activity in this sector, wood fuel and biomass technology also present wider economic benefits to the community. For these reasons the deployment of wood fuel technology is discussed in more detail.

Other micro-generation technologies exist that should not be dismissed, and the community would benefit from a further study to closely examine the potential for the deployment of a range of technologies. In particular micro-hydro technology in and around the Porlock area has been the subject of some attention by the local community. Given the restrictions on wind

³⁸ Refer to appendix 6 for more information on support and grants available from WSC and elsewhere for home insulation

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turbines in the Exmoor National Park Authority area, small scale hydro could provide a suitable alternative.

Solar thermal would be a suitable choice to support the installation of wood fuel boilers and will optimise the efficiency benefits. Wave or tidal potential has never really been assessed locally and there may be opportunities for some innovative approaches similar to that off the coast of Lynmouth. Ground and air source heat pumps are a technology that is enjoying increases in sales and deployment across the region.

The Government and the Southwest Regional Development Agency (RDA) recognise the longer term benefits of developing the environmental technology sector. West Somerset could benefit from future potential support to develop and grow this sector locally and further work is needed to understand how best to draw down support for the potential development and deployment of micro-generation locally.

The Renewable Energy for Devon (RE4D) programme funded the delivery of independent renewable energy assessments to small business organisations in some parts of Devon. The programme was sponsored by Devon County Council and also provided funds toward the deployment of renewable energy technologies including biomass boilers. Learning from the RE4D example West Somerset would benefit from delivering a similar programme to the local community and perhaps extend it to households. Building on local knowledge and business organisations in the area the programme could help up-skill and develop the environmental technology and services sector locally.



Wood Fuelled Boilers

Wood fuelled boilers are proving to be the most cost effective renewable technology providing heat energy. A typical 15kW (average household size) woodfuel pellet boiler will save around 8 Tonnes of CO₂ per year³⁹ and save between 30 and 70% of a householders heating bill. The main fuel options available for central heating with wood are logs, pellets or woodchip.

Utilising wood energy in off-gas wards would provide many of our households with a renewable heat option and reduce the overall energy costs for those relying on electricity or oil for heat.

³⁹ Figures from the energy savings trust

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Developing and strengthening the wood fuel supply chain will bring increased economic benefit to the West Somerset economy through the displacement of imported grid electricity or oil. The costs savings will benefit the householder directly and the cost for wood fuel will benefit the local wood fuel supply chain.

For example, if 5% of West Somerset householders using electricity for heating switched to wood fuel pellet boilers, this would displace around 3GWh of grid imported electricity. This would potentially release around £0.3 million back into the local economy every year and save around 1300tCO₂. More optimistic figures calculate the CO₂ saving to be closer to 6800tCO₂ per year.

The renewable energy strategy for the Southwest sets a target of 47MW by 2010 from woodfuel heating and 247MW by 2020.



Photo: Source Energy Savings Trust

It also recommended that:

- Wards with the highest off-gas heat loads should be targeted with support programmes for renewable heat, including grants.
- An assessment should be undertaken that looks at the development needs for the pellet sector in the South West, in particular looking at how easy it is to stimulate increased uptake of retro-fit domestic pellet boilers in off-gas areas.



Vigas boiler under stairs at home in Washford

West Somerset is ideally placed to develop this sector and an assessment to understand the local potential uptake, the level of investment required and the potential benefit to the economy needs to be undertaken.

The ENPA commissioned the New Economics Foundation report which highlighted an action to work with local suppliers to develop a reliable supply chain for wood fuel, capturing the ability of the woodlands to offer economic, environmental and social benefit.

Funding for wood fuel systems:

The South West bioheat programme has been launched providing capital grants to help offset the installation costs of some projects. To register your interest in project support visit www.regensw.co.uk/bioheat

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The sustainable development fund administered by ENPA has also offered financial support for the installation of wood fuel boilers. A case study is presented in appendix 9 'installation of a wood fuelled boiler'.

Funding is available from the low carbon buildings programme⁴⁰ but there is a high demand for this limited pot of funding and applicants are advised to be 'quick off the mark' and seek some help with the application.

ENPA and WSC are committed to working together with other community groups such as Forum 21 to help facilitate access to and identify further funding and support programmes to develop the wood fuel supply chain and encourage the deployment of the technology across the community.

Through the Forum 21 climate change campaign over the last year it is evident that there is a lot of community interest in villages and hamlets taking ownership of their own energy generation. This could take the form of a community raising funds to set up a community wind turbine or collection of solar panels for example. Forum 21 will be organising a seminar on this subject in 2008 to explore the potential options open to a village or hamlet.

Additionally, ENPA has set a target of implementing sustainable energy plans for 6 villages over the next 2 years.

Renewable energy has not been explored in detail in this strategy but clearly there is an opportunity to deploy a range of technologies including microgeneration and larger scale community wind turbines.

In summary

The best option available for reducing CO₂ in households is installing insulation. It is the most cost effective and has the best potential for reducing CO₂. Support programmes already exist to provide 100% and partial grants for homeowners. A vigorous campaign to incentivise and encourage further uptake should be a priority.

A range of micro-generation technologies exist that can be deployed in West Somerset but wood-fuel boilers appear to offer the best opportunity to reduce CO₂ and bring wider economic benefit to the community. WSC and ENPA with community groups such as Forum 21 are committed to drawing down support to develop the sector locally and encourage the deployment of more wood fuelled boilers across the community.

⁴⁰ For further information visit www.lowcarbonbuildingsprogramme.org.uk

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On a larger scale, community based wind turbines may also provide an opportunity to reduce CO₂ and provide less reliance on grid imported electricity.

Section 3: Energy and carbon impacts on the economy

Energy

Carbon dioxide emissions are intrinsically linked with fossil fuel use. And for the purposes of this strategy it is necessary to at least understand the basic energy profile to provide an insight into the source of emissions as well as the cost to our economy and the potential to shift to renewable energy technologies.

The climate change strategy has highlighted that no detailed energy profile exists for West Somerset. A Somerset-wide energy profile does exist which was developed in 2003 and REvision 2020⁴¹ proposed renewable electricity, heat and on-site generation targets for the South West. If the West Somerset community is to take ownership of the opportunities that exist to shift from so much reliance on imported energy an energy profile needs to be undertaken specifically for West Somerset.

A basic assessment of the 2004 energy data has been undertaken to provide a baseline of energy consumption across the community. Energy is also generated in West Somerset at Hinkley Point nuclear power station but because it does not directly influence the community CO₂ profile it is not useful to include it as part of the assessment.

An overview of the energy consumption data has been provided in this section. More sector specific information has been provided in the relevant 'Spotlight' sections elsewhere in the strategy.

Energy Consumption in West Somerset

In 2004⁴² West Somerset was sold an estimated 1399 GWh of energy. Closer assessment of the electricity and gas sales to the 'Domestic' and 'Commercial and Industrial' sectors has been provided in appendix 10 and the relevant spotlight sections. Key findings are presented in box 3.1 below.

⁴¹ Prepared on behalf of Government Office for the South West and the South West Regional Assembly, June 2005

⁴² Energy data for West Somerset 2004 is derived from the DTI experimental data.

Box 3.1 Energy Consumption in West Somerset

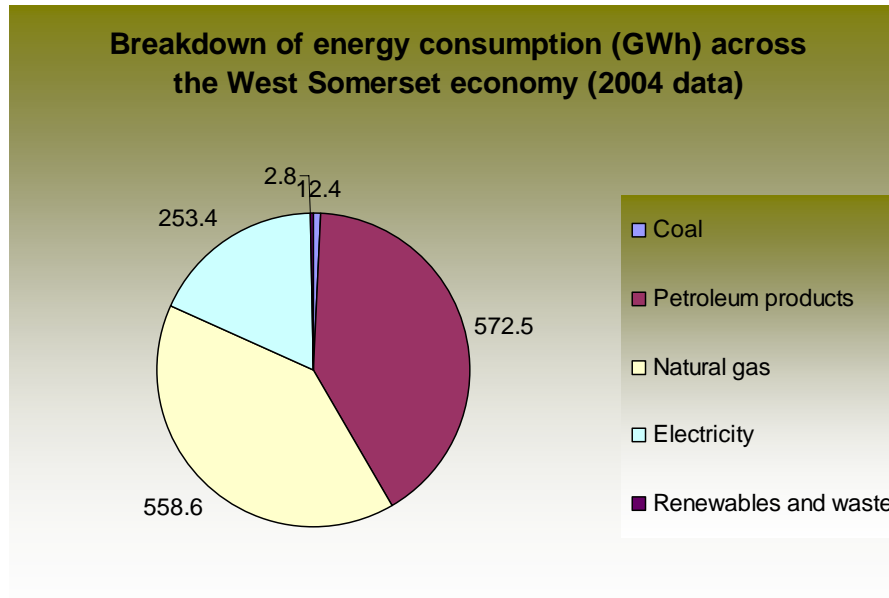
Key points:

- **Sale of electricity to the domestic sector was above the regional and national averages.** 5,875 kWh was sold to each household (or meter point) in West Somerset. By comparison the south west average was only 5019 and lower still the UK average was 4628. This is likely to be an indication that West Somerset has off-gas wards and electricity is used at least in part to deliver space heating. Electricity is the least efficient way to heat a home both in terms of cost and CO₂.
- **Gas consumed by the household was below the regional and national averages.** In West Somerset an average of 17,188 kWh of gas were consumed per household compared with 17,548 kWh for the South West and 19,325 kWh for the UK.
- **Electricity to the commercial and industrial sector was lower than average in West Somerset.** For example 59,481 kWh is below the south west average of 62,285 kWh and lower still than the national average of 77,620 kWh.
- **Gas sales per meter point to the commercial and industrial sector was the 6th highest in the country.** The average consumption per meter point was 3,310,875 kWh compared with 578,157 kWh the South West average and 637,366 kWh. This is most likely due to the activities at the Watchet Paper Mill.

Gas and electricity accounted for 812 GWh and expenditure on gas and electricity is thought to be in the region of £60 million⁴³. Due to the difficulty in retrieving data, costs have not been estimated for the remaining 587 GWh; but it is thought to be around several tens of millions of pounds per year. Almost all of this cost leaves the local economy and because of our dependency on grid imported energy our community is vulnerable to further hikes in prices. For example just a 5% hike in prices could represent a minimum £3 million. Future projections indicate that price hikes will be inevitable.

⁴³ This data is commercially sensitive and difficult to access. The costs have been estimated based on the number of kWh consumed and EST data for standard tariffs.

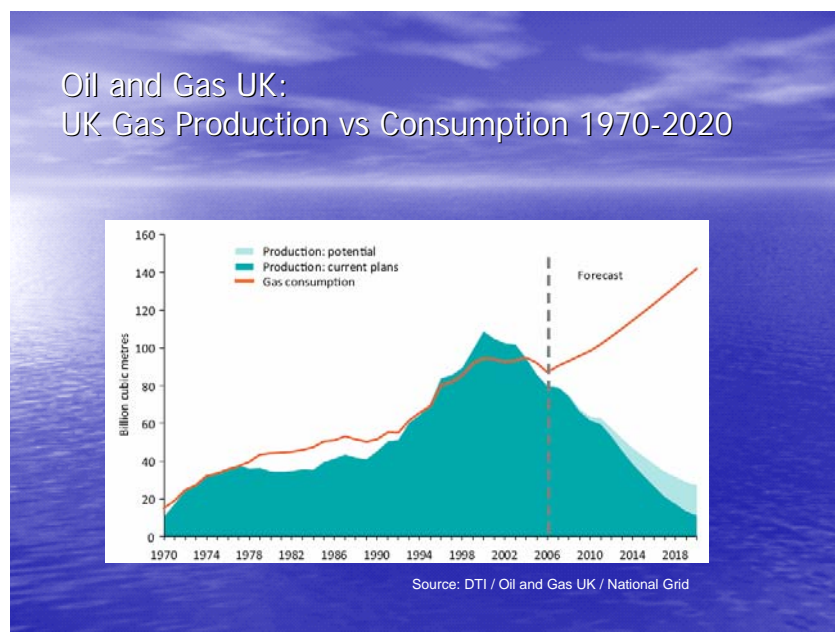
Section 3: Energy and carbon impacts on the economy



The National Picture

In May 2007, the UK Government published its Energy White Paper which is a framework to tackle climate change and ensure secure and affordable energy supplies. The white paper states that the UK reserves of oil and gas are declining and we are becoming increasingly reliant on fuels from less stable regions of the world. Meanwhile global demand for energy continues to grow.

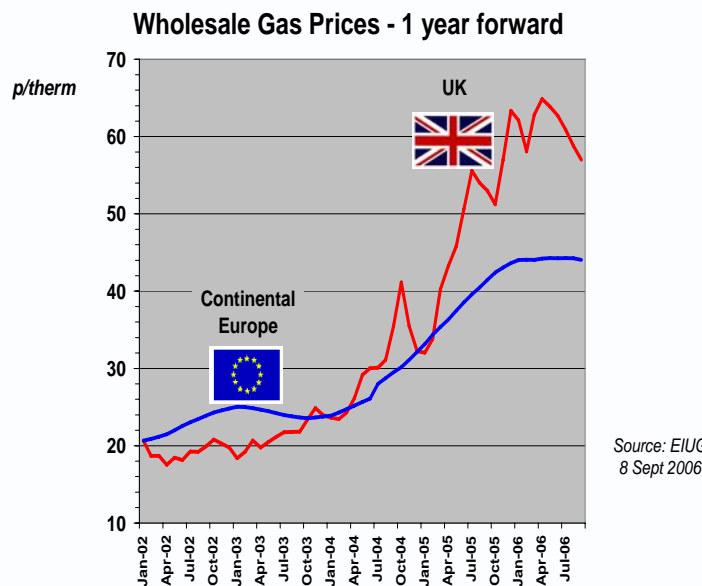
In the UK current projections of gas demand imply that the UK will need to increase gas import capacity significantly by 2020. It also projects that a



Section 3: Energy and carbon impacts on the economy

further 30-35 GW of new generation capacity for electricity will be required over the next 20 years. This is equivalent to approximately 27 more Hinkley B power stations.

These projections reveal that the UK will be vulnerable to security of supply and potential price rises. We have already seen the costs of all forms of energy rise over the last two years. The following graph reflects the vulnerability of the UK to price hikes following the 2005 winter when gas storage was very low. The reaction in the market was a hike in wholesale gas prices compared with the rest of Europe. Despite the high prices gas supplies from Europe through the inter-connector were still low.



The domestic market has also experienced price rises and will continue to feel the pinch as oil prices continue to rise and demand continues to grow. Later in this section we discuss how the price of energy will also increase because of the pass-through cost of carbon.

The salient point here is that the impacts of relying on imported energy will be felt by the community of West Somerset and in the first instance this will be seen in the form of rising energy prices. The growing global demand, climate change and security of supply will be felt by all communities across the world in one form or another. Much of the energy we will increasingly rely on is located in unstable regions of the world where there is a real risk of conflict. National policy will seek to address these issues, some of which will be outside of local control and others will directly rely on the community to implement them.

This latter is a necessity, both in terms of our contribution to reduce CO₂ and to help mitigate the future impacts of increasing costs and future security of supply. In the relevant 'Spotlight' sections this strategy has identified how

individual sectors can implement initiatives that will directly benefit them by reducing CO₂ and direct costs.

In addition to individual action the community can benefit by implementing community wide initiatives and schemes. The Energy White Paper clearly acknowledges the crucial role that local communities can play in delivering a low carbon economy less reliant on imported energy. The paper states that the Government wants to mobilise the enthusiasm and the potential of individuals and communities to generate their own energy locally and pledges to bring forward a range of measures to support more distributed forms of energy in the form of distributed generation (DG).

Distributed Generation and ESCo's.

Distributed generation (DG) refers to those decentralised technologies (i.e. local wind and solar) which generate electricity and are connected to the distribution grid. This includes combined heat and power (CHP) where the heat is distributed and used locally. Distributed generation can be utilised to support local communities and sell any excess back to the grid.

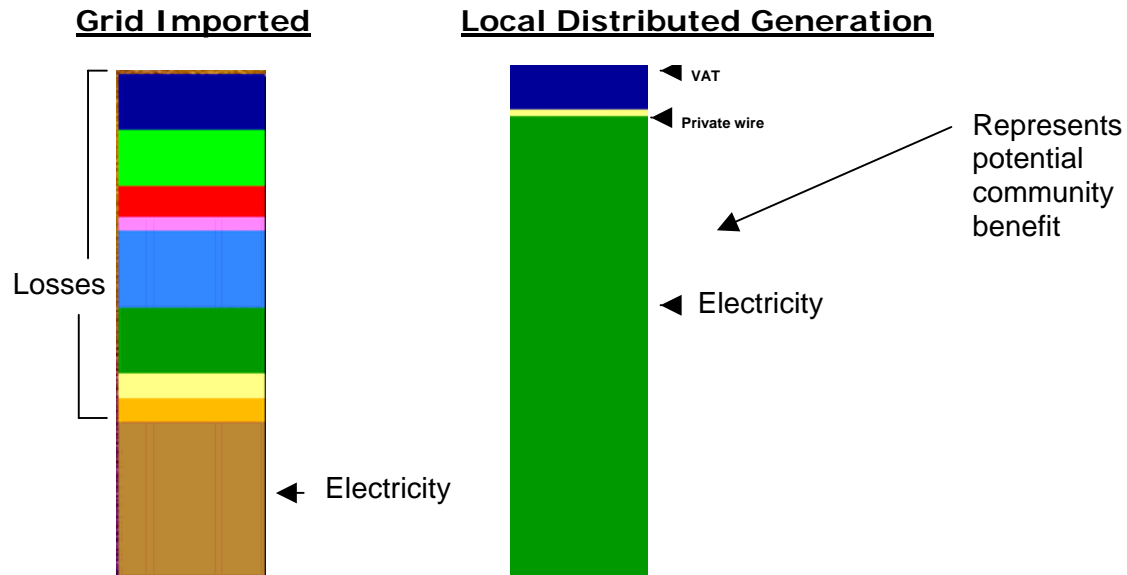
This presents an opportunity for West Somerset to develop its own sources of renewable energy for wider community benefit.

Developing a decentralised energy scheme for community benefit can be achieved through an Energy Services Company or ESCo. Woking Borough Council did just that in 1999 when the council set up an Energy and Environmental Services Company (EESCO). Woking council wanted to achieve energy savings to realise environmental benefits and cost savings. The council also recognised that fuel poverty and price hikes were problems that needed to be addressed.

Woking Council set up an ESCo with a private partner and implemented a CHP/absorption cooling district energy system distributed across 6 building complexes in the town centre. Surplus power from the scheme was distributed to sheltered housing residents and other local authority buildings. The scheme was beneficial to the community because it was able to provide residential customers with sustainable energy services at less cost than their previous suppliers. All profits except for the share owned by the private partner are recycled into the council's energy efficiency fund to develop further projects. The case study documenting the Woking Borough Council joint venture is included as appendix 11.

Central to the Woking case was the private wire approach. This is detailed in appendix 12. In summary the private wire approach reduces the losses usually associated with grid imported energy, both physical and financial.

Section 3: Energy and carbon impacts on the economy



These losses represent community benefit because the cost to the consumer can be reduced or the profits reinvested back into the local economy as in the case of Woking.

West Somerset could benefit from adopting a similar approach especially with the current proposed building projects at Watchet Quay and Minehead Horizons. Both could be ideally suited to deploying renewable heat technologies given their location and proposed activities.

Key to the delivery of a low carbon economy including distributed generation is the planning process. Planning presents a significant influence and is crucial to helping the UK meet its carbon dioxide reduction targets. In its White Paper; 'Planning for a sustainable future' the government recognised the key role of planning and states that *'Crucially, planning can help speed up the shift to renewable energy and low carbon forms of energy'*. If the community of West Somerset is to benefit from this shift then the planning authorities need to agree how best to use their powers to implement national policy appropriate to the needs of West Somerset. We discuss the role of planning in more detail in section 5, Planning for a Low Carbon Economy.

The Carbon Economy

In his last budget speech as Chancellor, Gordon Brown was quoted as saying that the UK would *'manage our carbon budgets with the same prudence and discipline as economic budgets'* and that he wanted us to *"..count the carbon like we count the pennies."*

Section 3: Energy and carbon impacts on the economy

Buying and selling carbon is already with us. The European Emissions Trading Scheme for example traded 350 million tonnes of carbon allowances in 2005 with an estimated value of 9 billion Euros. Voluntary carbon offsetting is another form of carbon trading and by 2010 this market is expected to trade £2 billion globally.

But what does this mean to the West Somerset community and how will it help reduce CO₂ and other greenhouse gases? To answer this question we first need to understand the fundamental principal behind the carbon trading mechanism.

Back to Kyoto

The Kyoto Protocol drew up a set of legally binding targets for developed countries to reduce their emissions by at least 5%, compared with 1990 levels by 2012. Each country agreed to a 'cap' on emission levels that would achieve the target reduction. Each country is then issued the amount of CO_{2e} allowances it is allowed to emit against its target. If a country is successful and reduces its CO₂ so that it has 'spare' allowances, that country can then trade those allowances. If a country exceeds its allowance by emitting more CO₂ than its agreed target then that country must 'trade' by purchasing enough emissions allowances against the CO_{2e} (CO₂ equivalent) it has emitted. This is referred to as 'cap and trade'.

The theory behind the implementation of the 'cap-and-trade' mechanism is that 'capping' allowances creates some degree of certainty that CO_{2e} emissions will not increase beyond the assigned amount within the cap. The cap can be tightened over time thus reducing the amount of CO_{2e} emissions allowed, eventually reducing them to safer levels.

To meet their emissions 'cap' a country can either cut production from the emissions source (i.e manufacturing, burning of fossil fuels), invest in new technology (renewable energy, energy efficiency) or purchase CO_{2e} allowances from another country that has 'spare' allowances.

'Trading' CO_{2e} places an independent market value on the CO_{2e}. The market value will be influenced by many factors including the scarcity of allowance which would push up the trading price of an allowance.

The crux of the theory is that cap-and-trade will incentivise the reduction of CO_{2e} at least cost. The more expensive the CO_{2e} allowance the more economically feasible it will be to introduce environmental technologies and other policies to reduce CO₂ within a given country.

The trading period between countries will begin in 2008-2012. The UK has met its Kyoto target and it will not therefore need to purchase allowances.

On the other hand many other economies are expecting to exceed their permitted allowance and will have to either purchase more allowances or begin a rigorous campaign to reduce their country's emissions over the next 4 years. This will inevitably have an impact on a country's economy. That is another reason why it is in the interests of every individual to try and reduce CO₂ wherever possible.

The trading mechanisms under the Kyoto Protocol have influenced the development of more carbon trading schemes both regulated and voluntary, in the UK and abroad. Carbon Trading is gathering momentum and presents threats and opportunities for the community of West Somerset.

CO₂e has acquired an independent market value and those companies that must purchase CO₂ as part of their costs will inevitably pass this through the supply chain to the consumer pushing up the price of goods and services. The threat is that we will face more price hikes in the future which we will have little control over. According to one source this has

Box: 3.2 How Carbon Trading affects us.

An example is the rising cost of energy. In 2005 the European Emissions Trading Scheme was introduced. This scheme applies to energy intensive installations around Europe such as power generators, steel makers and other large combustion plants. These installations are subject to a cap-and-trade scheme and must purchase allowances if they emit more than the permitted amount. In 2005 it was found that an estimated £800 million¹ was added to the cost of energy because of the apparent CO₂ cost. This cost was passed through to the consumers of energy. Every householder, business and other organisation in West Somerset absorbed some of this cost without them understanding or even knowing about the existence of a carbon trading scheme.

1: Pers cons: Director of EUIG. 2007

become evident in the 2008 wholesale price of electricity which has increased by more than 35% to account for the cost of carbon being passed through from the EU emissions trading scheme. But we can mitigate some of these hikes by reducing our reliance on imported grid electricity and gas, through the development and consumption of more locally sourced products and services and by using more sustainable transportation.

The development of the carbon trading market also brings with it opportunities. Many individuals, communities and organisations have a strong desire to do something to help combat climate change. For many the first step is to reduce CO₂ from their own activities. The second step is to 'offset' the CO₂ by paying to reduce the CO₂ through a project. Provided the project will result in actual reductions the offset mechanism provides a very cost effective way to reduce CO₂ and deploy low carbon technology.

Box 3.3 West Somerset Carbon Reinvestment Scheme

In November 2007 the West Somerset Carbon Reinvestment Scheme was launched. Its core objective is to generate carbon reductions that can be sold to individuals or companies that want to reduce CO₂. The sale of the carbon will raise funds to finance CO₂ reduction projects in our community.

Individuals and organisations in West Somerset can contribute to the development of a low carbon economy through either offsetting their own unavoidable emissions into local projects to reduce CO₂ or by donating to a carbon fund. Potential projects can apply for assessment and funding support. The scheme is also aiming to target visitors to the area to invite them to 'offset' the emissions for traveling to West Somerset. Villages, schools, organisations are invited to contact carbonreinvest.com for more information about how CarbonReinvest.com can help set up a fund for their projects.

CarbonReinvest.com is a not for profit company aimed at supporting the shift to a low carbon economy.



Through understanding how carbon trading can present opportunities the West Somerset Carbon Reinvestment Scheme can facilitate and accelerate the reduction of CO₂ through financing projects here in West Somerset.

Section 4: Preparing for Change

Adaptation

As noted in section 2, West Somerset will experience the impacts of climate change which it can only prepare for. These include wetter and milder winters, stormier weather, and more flooding. We must prepare to adapt to these changes and ensure that the emergency planning process is well developed to mitigate the impacts of sudden change. It is essential that planners and developers ensure that future developments are 'climate proofed' so that they are able to cope with the near and mid term future impacts. For example the run-off from prolonged rain will have an impact on the capacity of drainage systems to cope causing potential damage to infrastructure.



A review undertaken following the Gloucestershire floods reported that *'the nature of flooding is changing. In the past, considerable attention has been paid to the risks of coastal and river flooding. However, the greater intensity of rainfall and increasing urbanisation are leading to more flash floods caused by water running off the surface of the land. River, surface water and groundwater flooding all took place this summer, adding to the complications.'*

This review recommends that the Environment Agency should take strategic direction of managing inland flood risks, while **local authorities should adopt a new leadership and scrutiny role overseeing flood risk management within their local area.**

The review goes on to discuss the need for the provisions of PPS 25 and the building regulations to be enforced and strengthened to ensure that flood resistance and resilience measure are fully built into all new development where necessary.

As well as the need to deal with too much water in the wrong places, we also need to prepare to adapt to too little water. Changes to rainfall and temperature will have an impact on the supply and quality of water. As part of our engagement in the adaptation agenda the CRIB will need to ensure that water resources are addressed. See the box below.

Box 4.1 Where is the imperative for adaptation greatest?

‘Water resource and quality risks vary considerably by geographic location. Summer and winter precipitation is currently more plentiful in the north and west, and it tends to be higher in upland areas. The largest changes in precipitation in both winter and summer due to climate change will be experienced in eastern and southern parts of the UK – the changes in northwest Scotland are the smallest. The imperative for adaptation for water supply and quality risks is therefore greatest in the south and east, where water resources are in many cases already fully committed. The Environment Agency produces maps showing current indicative availability of summer and winter surface water and groundwater for England and Wales as part of the Water Resources for the Future strategy. This refers to climate change as a factor affecting future demand and supply, though it presents only current availability patterns. The Environment Agency has recently consulted on a methodology for designating ‘water-stressed’ areas. This can be used by planners to justify higher water efficiency standards in new development.’

Source: Climate change adaptation by design - a guide for sustainable communities; TCPA, London (2007)

A sustainable approach in relation to drainage is for development to follow SUDS or Sustainable Urban Development schemes. A guidance document is available⁴⁴.

The local development frameworks provide us with the opportunity to ensure that local flood risk as well as other climate change impacts are accounted for in future developments. Local development frameworks are discussed later in this section.

As well as local flooding, biodiversity will also be subject to climate change impacts. For example bluebells and snowdrops will not grow in the abundance we now find them because local conditions will change. The Biodiversity Action Plans (BAPs) are designed to protect and manage species and habitats. The south west nature map links ecological corridors between habitats throughout the southwest and is a useful tool in predicting the displacement of potential habitats. BAPs also encourage partnerships through engaging local conservation groups, statutory bodies and other interested bodies to understand the impacts and provide focus for managing those impacts. One role of the BAP might be to manage the transition of habitats as species migrate.

The South West Climate Change Impacts Partnership (SWCCIP) was established in 2001. Its initial task was to oversee the development of the scoping study ‘Warming to the Idea’. The focus of the study was on issues around adapting to climate change in the South West region.

⁴⁴http://www.ciria.org/suds/suds_projects.htm

Section 4: Preparing for Change



One of the conclusions of the report was that *'although individuals seem to be aware of climate change and the influence of global warming, this awareness does not appear to feature in the agendas of businesses and other organisations in the region'*.

Key recommendations within the report included:

- Review of regional and sub-regional arrangements for emergency planning in anticipation of extreme weather events
- Co-ordinate the development of climate change strategies within local authorities
- Undertake further research within selected sectors to better understand the significance of local impacts
- Encourage all organisations to identify appropriate policy frameworks within which to incorporate adaptation strategies.

Building on the recommendations of the report SWCCIP has facilitated the creation of a number of sector working groups that generally have a thematic or sectoral focus. The sector groups at the time of writing are:

- Agriculture and forestry
- Biodiversity
- Business and utilities
- Housing and construction
- Local government
- Tourism

The SWCCIP website also provides a number of adaptation tools and guidelines for organisations to use for integrating adaptation into policies and frameworks.



At county level Somerset County Council group managers have been requested to produce climate change adaptation action plans for their service area for completion by April 2008. The county Climate Change Strategy has outlined guidance and procedures to assist with the development of the action plans drawing from and referring extensively to the process set out in 'Warming to the Idea'. It is also intended for use by strategic partners, local communities and stakeholders in developing their own appropriate strategies and action plans.



South West Climate Change Impacts Partnership

Mission & Aims

SWCCIP is funded by the Ecclesiastical Insurance Group, Environment Agency, Government Office for the South West, South West Regional Assembly, South West Regional Development Agency and South West Water.

The partnership's mission is:

“to investigate, inform and advise on the impacts of climate change in SW England, to influence the strategies and plans of key partners and stakeholders and, through dialogue and research with priority sectors, develop and share practical adaptation strategies which respond to the challenges and opportunities presented by these impacts.”

The partnership's main aims are:

- To increase awareness and understanding of the potential impacts of climate change upon the South West;
- To initiate, sponsor, disseminate and build upon research and other projects in order to a) explore further the potential impacts of climate change on particular sectors in the South West and b) investigate effective adaptation responses to these impacts;
- To promote the inclusion of climate change adaptation into the strategies and plans of all organisations, particularly those with responsibility at a regional scale;
- To act as a regional focal point for information, initiatives and resources and to provide a link between the many regional and sub-regional organisations concerned with the issues of adaptation to climate change;
- To provide a link with national and international organisations concerned with the issues of adaptation to climate change, including UKCIP;
- To provide a link with those organisations and activities seeking to mitigate climate change and promote sustainable development across the SW region.
- The four objectives in our **2005-2007 Business Plan** are:-
 1. Raise awareness of climate change impacts in priority sectors.
 2. Develop examples of practical adaptation responses in South West.
 3. Incorporate & implement adaptation into regional strategies/plans and monitor.
 4. Secure appropriate resources to support growing regional activity.

Section 4: Preparing for Change

It is in the interest of the West Somerset community to respond to the advice to prepare for the impacts and adapt to a changing climate. Initially, we will need to engage with SCC to understand how we can support their objective of developing action plans.

Another key role will be facilitating the development of adaptation strategies through engaging with the sector groups specified above to take full advantage of the expert advice and tools on offer. These sector groups will highlight any potential threats to the sector as well as opportunities and how they may be taken forward. This will need to be integrated into the planning processes.

The community carbon reduction implementation board ((CRIB) (set up to implement this strategy)) will identify how best to engage with the regional committees and agencies to ensure the West Somerset can prepare for the changes we are expecting. It will engage for example with the civil contingencies board so that preparations can be made for emergency response to flooding and stormy weather fallout that the district will experience.

The Department for Environment, Food and Rural Affairs (Defra) has recommended that adaptation should feature in the Local Area Agreement (LAA). The Somerset LAA will be finalised early in 2008 and WSC, Forum 21 and ENPA will have an opportunity to ensure that the LAA reflects the need to address adaptation issues.

More significantly, the Local Development Frameworks (LDFs) set out the way in which the planning system will be implemented. These are the responsibility of the ENPA and WSC planning authorities and it is essential that they are 'climate proofed'. In other words, within the framework account must be taken of the impacts that we will experience. Applications for any development must reflect this and demonstrate that adaptation has been taken account of. The ENPA and WSC LDFs will be open for consultation this year and the community is urged to provide their views.

Section 5: Planning for a Low Carbon Economy

Planning

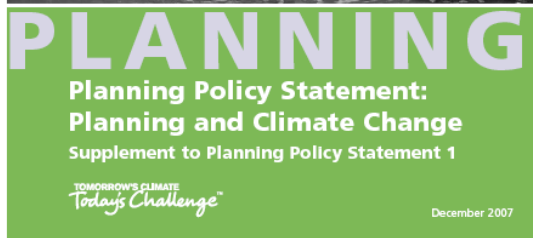
In May 2007 the UK Government published its white paper 'Planning for a Sustainable Future'. The paper states that the '*planning system needs to evolve so that it better...enables us all to meet the challenges of climate change and deliver sustainable development and economic growth.*' It proposes to introduce a new system '*that will achieve our goals for secure energy supply, [and] reduced carbon emissions.*'

This white paper is central to the delivery of low carbon economies. The Government has stated that it expects development plans to be tested on their carbon ambition, to help secure progress against the UK emissions targets – both through direct energy use and emissions and by bringing together and encouraging action by others.

Following this, Planning Policy Statement: Planning and Climate Change⁴⁵ was published in December 2007; it sets out how planning should contribute to reducing emissions, stabilising climate and take into account unavoidable consequences of climate change effects.



Planning shapes the places where people live and work and the country we live in. It plays a key role in supporting the Government's wider social, environmental and economic objectives and for sustainable communities.



Housing Minister Yvette Cooper said, "It's all about local power. If we are to reach the ambitious zero carbon standards we need a revolution in the way we heat and power our homes. We want councils to do more to back local green energy."

On renewable energy: it states that planning authorities should provide a framework that promotes renewable and low carbon energy generation. In particular planning should not preclude the supply of any type of renewable energy other than in the most exceptional circumstances. It also proposes

that planning authorities should take into account the extent to which

⁴⁵ It is a supplement to Planning Policy Statement 1: Delivering Sustainable Development

Section 5: Planning for a Low Carbon Economy

existing or planned opportunities for implementing decentralised energy could contribute to the energy supply of the building.

It also urges planning authorities to consider sustainable transport options both in the location of the development and the provision of options to the development other than the private car.

Planning Policy Statement: Planning and Climate Change, requires that planning must support the policy to achieve zero carbon in domestic and non-domestic new build as set out in 'Building a Greener Future'⁴⁶ (see below for further explanation). It also encourages planners to set expectations for sustainable developments by requiring developers to build to a specified level in the Code for Sustainable Homes.

The planning process is rapidly evolving to ensure that climate change mitigation and adaptation is embedded within the planning process. In 2007 the UK Government also consulted on the 'permitted development of microgeneration in household properties'. The intention of the proposal is to reduce planning restrictions for small scale micro-generation - including solar panels and small wind-turbines.

Developers and other applicants for planning permission are urged to consider how well their proposals contribute to the Government's ambition of a low carbon economy and how well adapted they are for the expected effects of climate change.

Both West Somerset Council and the Exmoor National Park Authority are local planning authorities and are responsible for ensuring the development plan system is implemented in West Somerset. The development plan system is designed to assist in the regulation of development in an area through a Local Development Framework (LDF). The LDF outlines how planning will be managed in our area and the significance of this to this strategy is that it could either help deliver a low carbon economy or restrict development. These will replace the old system of Local Plans that were previously responsible for providing the planning policy framework for the determination of planning applications.

The LDFs of ENPA and WSC are both being progressed over the next few years and they must take into account the government guidance for the planning system to support the delivery of a low carbon economy. The LDFs are key opportunities to help the local community prepare for a changing world, support zero carbon building development and the implementation of renewable energy technologies. By doing so, it will help develop a sustainable economy and at the same time help to protect our natural and built heritage. It must also take into account the impacts we expect and allow and encourage for preparations to adapt to these changes.

⁴⁶ Building a Greener Future: Policy statement 2007

Section 5: Planning for a Low Carbon Economy

The development of the local development framework (LDF) involves a series of consultation stages. Planners have a very responsible and challenging role to balance the requirements of a whole community and are central to the interpretation and delivery of the LDF. They are looking at the challenges of security of energy supply, rising energy prices and climate change impacts to help guide the decisions they make. This strategy urges the community to take the opportunity to get involved and help evolve the LDF that will support the delivery of a low carbon economy

The current planning policy for the ENPA for small scale renewable energy reads:

'Small scale proposals for renewable energy generation to serve the needs of individual properties or groups of properties will be permitted provided that they are compatible with the conservation of the landscape and wildlife of the National Park.' [POLICY LNC17]

Exmoor National Park does not allow the erection of wind turbines for commercial electricity generation but does allow for unobtrusive turbines serving individual properties or group of dwellings. The policies state:

Proposals for the erection of wind turbines for commercial electricity generation will not be permitted on sites where they would cause harm to the natural beauty, wildlife and cultural heritage of Exmoor or the public enjoyment of those qualities. In considering applications for such development an assessment will be made which balances the advantages to the public interest from the development of this source of renewable energy with any adverse effects on the Exmoor Landscape or qualities of the National Park that the Local Plan seeks to preserve or enhance. POLICY LNC18

Permission will be granted for unobtrusive small scale wind turbines serving individual dwellings or groups of properties where there is no adverse effect on important rural or environmental interests, and no unneighbourly impact on residential occupation. The cumulative effect of similar projects may be taken into account in assessing applications. Any permission may require the removal of approved structures if they become redundant. POLICY LNC19

For more information on the national planning system visit

www.planningportal.gov.uk

www.exmoor-nationalpark.gov.uk/index/living_in/planning.htm

www.westsomersetonline.gov.uk

The Built Environment

By 2016 all new homes must be 'zero carbon' with interim reductions in CO₂ emissions of 25% lower than 2006 Building Regulations by 2010 and 44% lower by 2013⁴⁷.

Emission Reduction	Year	Equivalent Code Level
25% of Regulated	2010	3
44% of Regulated	2013	4
100% of Total (zero carbon)	2016	6

Regulated emissions are those that are currently covered by building regulations which includes space and water heating, cooling and ventilation, pumps and fans and fixed internal lighting. Total emissions includes both the regulated and unregulated emissions for example, from cooking appliances and white goods (fridges/freezers etc).

The Code for Sustainable Homes published in December 2006 is a national standard for grading properties on its overall performance of sustainability. It is a tool to be used by developers that if implemented can climate proof the development by integrating features that will protect against climate change such as passive cooling. It also sets minimum standards for energy and water use which will help reduce emissions of carbon dioxide and the lifetime running costs. The Code supports the delivery of zero carbon homes and planning authorities will need ensure that the code is implemented and achieves a level that will deliver the zero carbon homes agenda.

The Local Development Frameworks should be incorporating this agenda and setting targets to deploy renewable energy especially on larger scale development sites.

To move this forward developers and planners need to begin accounting for the costs of reducing CO₂ and an approach could be taken similar to that of Milton Keynes Council⁴⁸. Their aim was to achieve development in Milton Keynes with zero carbon growth. The preference was to achieve this through the deployment of renewable energy but if this proved too expensive for the developer then they had to pay into a carbon offset fund. The payment was set at £200/tonne of CO₂ that would be emitted during the lifetime of the development. The carbon offset fund was used to achieve savings of CO₂ where it was more cost effective.

⁴⁷ Building a Greener Future: Policy statement 2007

⁴⁸ Supporting and Delivering Zero Carbon Development in the South West; Final Technical Report; Prepared for SWERDA and GOSW; January 2007; Faber Maunsell and Peter Capener

Another option is for the planning authorities to adopt something similar to the Merton Rule. The borough of London Borough of Merton set a policy and target that *'all new non-residential development above a threshold of 1,000 sq.m. will be expected to incorporate renewable energy production equipment to provide at least 10% of predicted energy requirements'*.⁴⁹

The intentions of the Merton Rule are good but one weakness is that it did not take into account other measures such as energy efficiency. With the right choice of materials and energy saving devices within the development in excess of 10% could be saved more cost effectively. So in theory a developer could build a development that neglected these more cost effective savings and 'bolt-on' renewable technology to satisfy the requirements of the Merton Rule.

However, the revision of the LDF provides us with an opportunity to review the examples and best practice of other planning authorities to develop our own policy that will help achieve or exceed the target of zero carbon homes by 2016.

Box 5.1 The Climate Change Bill



The climate change bill will introduce a clear, credible, long term framework for the UK to achieve its goals of reducing carbon dioxide emissions and ensure steps are taken towards adapting to the impacts of climate change. The planning system also has an important role to play in enabling the UK to meet those challenges. It can help us to meet our targets for the reduction of emissions of greenhouse gases by, for example:

- Supporting the building of zero-carbon homes and business premises that are low energy and produce lower carbon emissions
- Locating development to reduce the need to travel
- Making walking and cycling accessible, attractive and essential components of new development
- Supporting integrated public transport

Crucially, planning can help the shift to renewable and low carbon forms of energy

Source: DTI Energy White paper 2007.

⁴⁹ Needs referencing

Section 6: A Climate for Action

Key commitments to tackle climate change in West Somerset

Our goal is to deliver a low carbon economy across West Somerset

There are four objectives underpinning the delivery of this goal:

- Objective 1:** to reduce CO₂ across West Somerset;
- Objective 2:** to reduce our reliance on imported fossil fuels (electricity, gas, diesel and petrol);
- Objective 3:** to create value across our economy through integrating and developing low carbon technology and services within the district;
- Objective 4:** to prepare to adapt to climate change impacts.

How will we achieve our objectives?

The objectives of this strategy will require all of the community to respond by doing their bit where they can. We will deliver this through a Carbon Reduction Implementation Board (CRIB) made up of community stakeholders.

In 2007 West Somerset Council demonstrated its commitment by signing up to the Nottingham Declaration on Climate Change. This is a voluntary pledge committing the council to ensure that tackling climate change is a cornerstone of the council's strategy.

In its management plan the Exmoor National Park Authority set an ambitious target by declaring its intention to be carbon neutral by 2025.

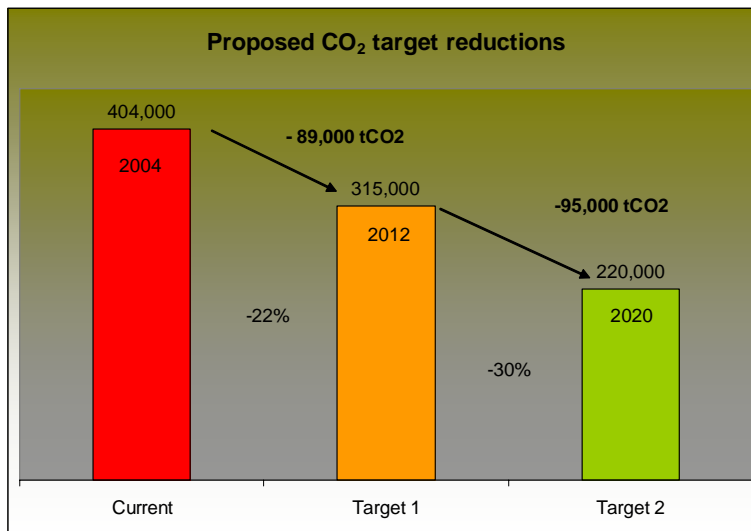
This strategy aims to support these commitments and bring together the community of West Somerset by delivering leadership and a coherent approach. To deliver this a community Carbon Reduction Implementation Board (CRIB) will be created. Membership of CRIB extends to Councillors, officers from WSC and ENPA, Forum21 and representatives from the commercial and agricultural sectors. They will be responsible for overseeing progress, directing the delivery of cost effective measures, engaging with other regional stakeholders and identifying and drawing down funding support. They will report regularly to the WSSP and the wider community.

One of the first tasks of the carbon reduction implementation board (CRIB) will be to establish a programme of strategic actions (known as the strategic programme) and set up working groups to take these forward. Each working

group will develop SMART action plans and will report regularly to the CRIB who in turn will report to the community through the West Somerset Strategic Partnership (WSSP) and other routes such as Forum 21, and the Chambers of Commerce. The Strategic programme will be reviewed annually by CRIB to reflect on performance against the targets agreed in this strategy.

Objective 1: Reducing CO₂:

We have set an initial target of reducing the community CO₂ by 88,000⁵⁰ tonnes by 2012.



Targets and progress will be monitored periodically and reported annually.

We will facilitate and implement a range of measures including:

- A vigorous campaign to incentivise and encourage householders to install cavity and loft insulation;
- A high profile campaign to promote energy efficiency across all sectors of the economy including domestic, public sector and local businesses;
- We will encourage public and private sector organisations in West Somerset to pledge their support and commit to becoming an 'exemplar organisation'. This will require the organisation to monitor and measure their CO₂ and put in place action plans against proposed target reductions. WSC and ENPA have both signed up to becoming 'exemplar organisations';

⁵⁰ These targets have been rounded. 22% reduction of 404,000 is equal to 88,880 which would leave 315,120. This has been rounded up to 89,000 and down to 315,000. A further reduction of 30% on 315,120 would give a final target of 220,584 which would mean a reduction of 94,536. For ease of presentation on the graph this has been rounded down to 220,000 and up to 95,000.

Section 6: A Climate for Action

- We will seek to ensure that opportunities for delivering reduced CO₂ and a low carbon economy are supported and reflected by the planning process;
- We will support a number of actions to reduce the number of car journeys within the district including raising awareness of car sharing and car clubs, improving cycling facilities and encouraging alternatives;
- We will seek to engage West Somerset Railway, Butlins, First Bus and other key stakeholders to help provide more sustainable transport options for tourists and the local community.

Later in this section we detail the targets for CO₂ reduction and demonstrate how the target reductions can be achieved through measurable actions.

Objective 2: Reduce our reliance on imported fossil fuels

The strategy has identified that we expend more than £60 million per year on imported fossil fuel energy. Reducing our dependency on fossil fuels will help protect our economy from rising energy prices and increased reliance on fuel from unstable regions of the world. To help achieve this we will;

- Support the ENPA objective to install 50 wood fuel heating systems by 2010. This will involve working with them to raise awareness within the community of the benefits of wood fuel heating and identifying potential funding support to increase the target;
- Support the ENPA objective to implement sustainable energy plans in 6 Exmoor settlements by 2010;
- Identify and draw down funding support to finance a programme that will undertake independent renewable energy assessments similar to the 'Renewable Energy for Devon' scheme;
- Review the potential for setting up a community Energy Services Company (ESCO) that can develop renewable energy projects, the profits of which be returned to the community through reinvestment into other projects;
- Review the potential to develop a decentralised energy scheme for community benefit. This can be delivered through a potential Energy Services Company (ESCO);
- Review the potential for the supply and local distribution of bio-fuels⁵¹.

⁵¹ Based on current diesel consumption a shift to 10% biofuel from waste catering oil will require in the region of 3.3 million litres. The feasibility of local –regional supply will need serious consideration.

Objective 3: Create value across our economy through integrating and developing low carbon technology and services within the district

The environmental technology and services sector is growing and provides an opportunity for economic diversification within West Somerset with potential for high value growth. We will seek to draw down funding to support a range of projects that will bring economic benefit to West Somerset which could include:

- The development of the local wood fuel supply chain including the installation and servicing of wood fuel heating systems;
- The provision of a local programme that will undertake independent renewable energy assessments;
- Developing the potential to produce, supply and distribute bio-fuels from local sustainable sources;
- Setting up a community Energy Services Company;
- Developing and delivering a low carbon tourist destination to increase value to the tourism sector;
- Organic farming and supplying niche higher value products capitalising on the increasing market for locally sourced products.



Objective 4: Prepare the community to adapt to the climate change impacts

This strategy has highlighted that we must anticipate and plan for the changes ahead to ensure that the West Somerset community can be as prepared as possible. Direct impacts will have implications for services including: emergency planning, waste collection and disposal, planning, estates management, provision of leisure facilities and social services as well as changes in the farming community and the business sector. To help prepare us for an uncertain future:

- We will ensure that adaptation is integrated into the planning process;



Section 6: A Climate for Action

- WSC will use the Nottingham Declaration Action Pack on climate change to identify potential impacts on climate change;
- We will support the Somerset County Council's preparation of a climate change adaptation plan where requested;
- We will engage with key agencies particularly the South West Climate Change Impacts Partnership (SWCCIP) to keep abreast of predicted impacts for West Somerset and facilitate the preparation of action plans for adaptation;
- We will use our influence to ensure that adaptation issues are featured in the development of the local area agreement (LAA) to be finalised early in 2008.

We will continue to review the progress and appropriateness of these commitments through the climate change implementation board.

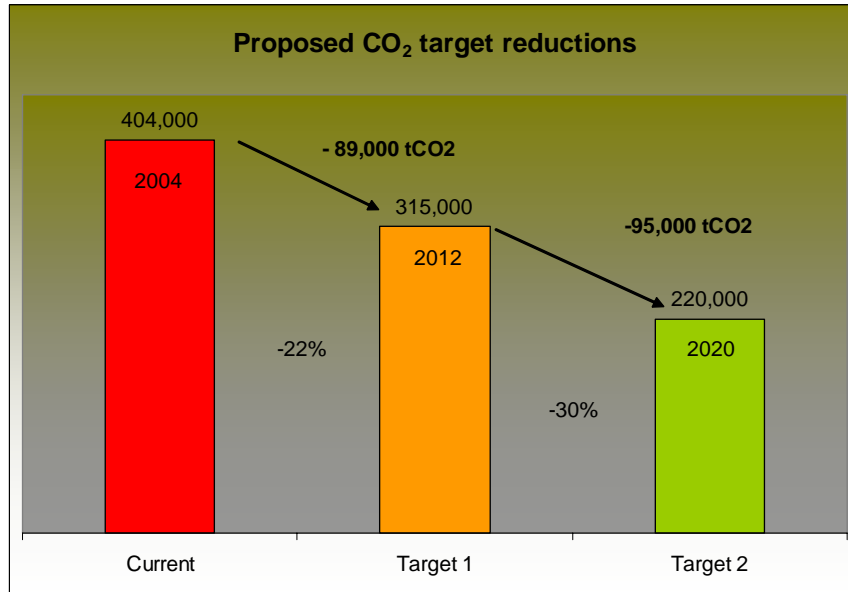
Targets for Action: Measurable Actions to Reduce CO₂

This strategy has identified that the West Somerset carbon dioxide profile is above the regional and national averages. It is proposed that the first target (Target 1) for CO₂ reduction should aim to bring us back in line with the UK average by 2012. The second target should support national policy which aims to reduce emissions by 30% by 2020.

⁵²Target 1: A reduction of 22% on our 2004 emissions of carbon dioxide which equates to around 88,000 tonnes of CO₂.

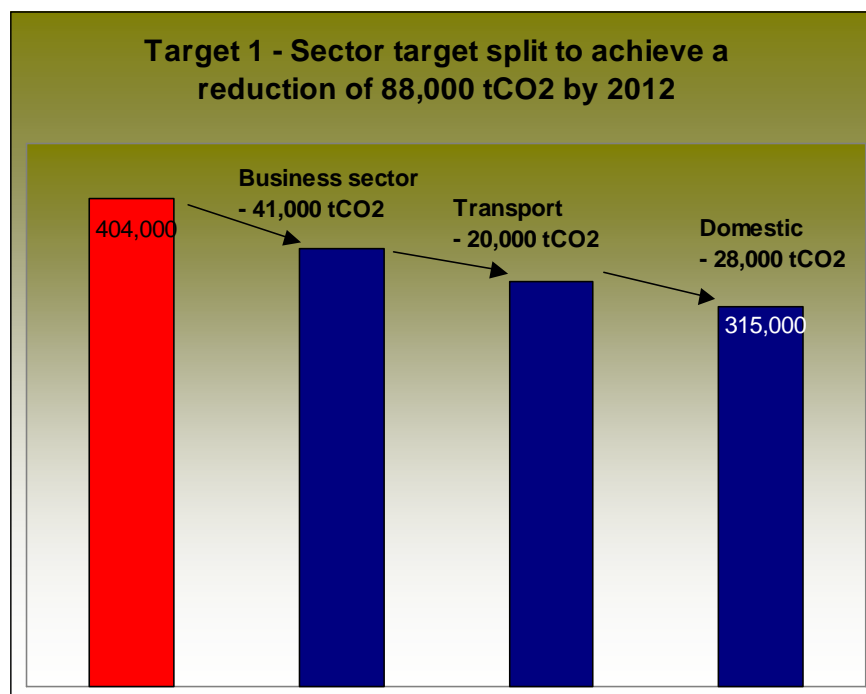
Target 2: A reduction of 30% on 2012 levels or 1990 levels whichever the greater. This would equate to around 95,000 tonnes of CO₂.

⁵² These targets have been rounded. 22% reduction of 404,000 is equal to 88,880 which would leave 315,120. This has been rounded up to 89,000 and down to 315,000. A further reduction of 30% on 315,120 would give a final target of 220,584 which would mean a reduction of 94,536. For ease of presentation on the graph this has been rounded down to 220,000 and up to 95,000.



Sector targets

To help achieve the above targets 1 and 2 each sector across the West Somerset economy needs to implement measures that will reduce CO₂. Each sector as been allocated a proposed target based on their share of emissions. However, we must also take into account the most cost effective and practical means of achieving those targets and these will need to be reviewed annually to assess progress. Where it is more cost effective to do so greater carbon reductions may be sought from sectors that will be greater than originally proposed to help achieve the overall target.



Measurable Actions

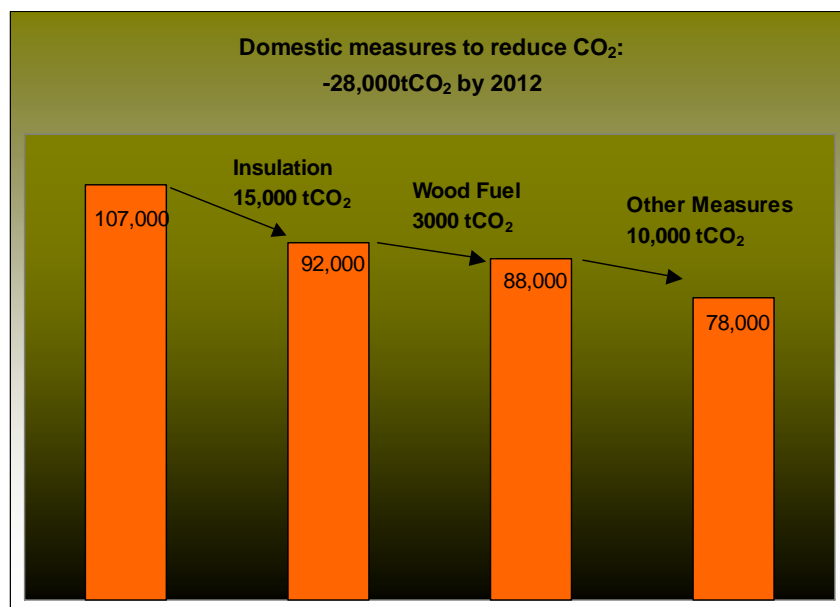
The Climate Change Strategy has identified a number of actions across the sectors to reduce CO₂. Some of the actions proposed are the most cost effective and others will bring wider benefit to the economy of West Somerset. Some of the actions have been quantified in terms of their CO₂ reduction potential and mapped against individual sector targets to provide a focus for effort. These are presented below as domestic, business and transport measurable actions.

Domestic sector: Measurable Actions

The Strategy has identified that the most cost effective measure to reduce CO₂ in the domestic sector is cavity and loft insulation. An initial target of 15,000 tonnes of CO₂ reduction from this action has been proposed. The potential for further reductions using this measure could be greater but due to a lack of local data about the housing stock and households with/without insulation we have been unable to quantify this.

There is also potential for emission reductions from solid internal and external wall insulation. This measure will bring wider community benefit where the insulation can be produced locally using locally sourced materials.

The second measurable action is the installation of wood fuel heating systems. Exmoor National Park has a target of installing 50 systems in the greater Exmoor area by 2010. This target needs to be increased with support from other sectors of the community. A combination of domestic and larger scale systems will



need to be deployed to meet significant carbon reductions. For example, optimistic projections estimate that a 15kw household system will reduce CO₂ by 8 tonnes per year. To achieve 3000 tCO₂ reduction would mean installing 375 domestic systems by 2012⁵³.

This would leave a balance of 10,000tCO₂ to be reduced from other measures. A campaign to raise awareness of the benefits of reducing energy use and CO₂ is part of the Community Sustainability Strategy. Achieving reductions of 10,000 tCO₂ would mean that every household in the district would need to reduce their CO₂ by 0.6 tonnes. This is equivalent to saving 1,400 kWh⁵⁴ of electricity per household and 23 million kWh across the district and an estimated £2.3 million⁵⁵.

Business, Service and Public Sectors: Measurable Actions

The strategy has proposed a number of measurable actions for the business, service and public sectors. These range from installation of microgeneration technologies including wood fuel to energy efficiency and behaviour change. The Exmoor National Park Authority management plan has identified sustainable energy as one of the options for supporting the wider Exmoor area and farming in particular could benefit from this. It has committed to a target of implementing sustainable energy plans for 6 Exmoor settlements by 2010. This strategy has proposed reviewing the potential options for setting up a community Energy Service Company (ESCo) that could provide micro and larger scale renewable energy technologies for wider community benefit. This option if feasible at sites like the Watchet Quay and Horizons project could make a significant contribution to reducing CO₂. A reduction of 20,000 tCO₂ has been allocated but this could only be achieved cost effectively if larger scale renewable options are implemented.

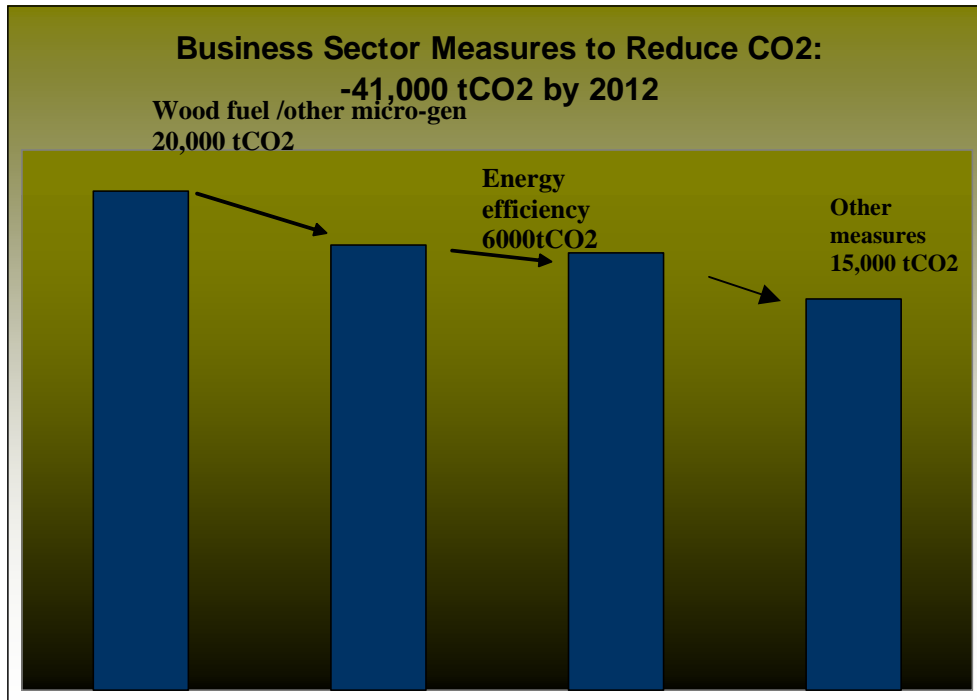
The second measurable target is a reduction of 6000tCO₂ through improved energy efficiency. WSC and ENPA have both signed up to becoming Exemplar business organisations and will monitor and measure their CO₂ against proposed target reductions. Other organisations are invited to sign up and commit to reduce CO₂ from their activities.

This leaves a balance of 15 000 tCO₂ to be reduced from other measures. These will include behaviour change, regulatory measures, especially in the built environment, and carbon reinvestment into cost effective solutions locally.

⁵³ Based on the Energy Savings Trust figures of 8 tonnes CO₂ saved. $3000\text{tCO}_2/8\text{tCO}_2=375$

⁵⁴ Defra conversion factor: $0.44\text{kg CO}_2=1\text{ kWh}$; $0.35\text{tCO}_2 = 350\text{kgCO}_2/0.44 = 795\text{kWh}$

⁵⁵ Based on 17000 households and 10p/kWh



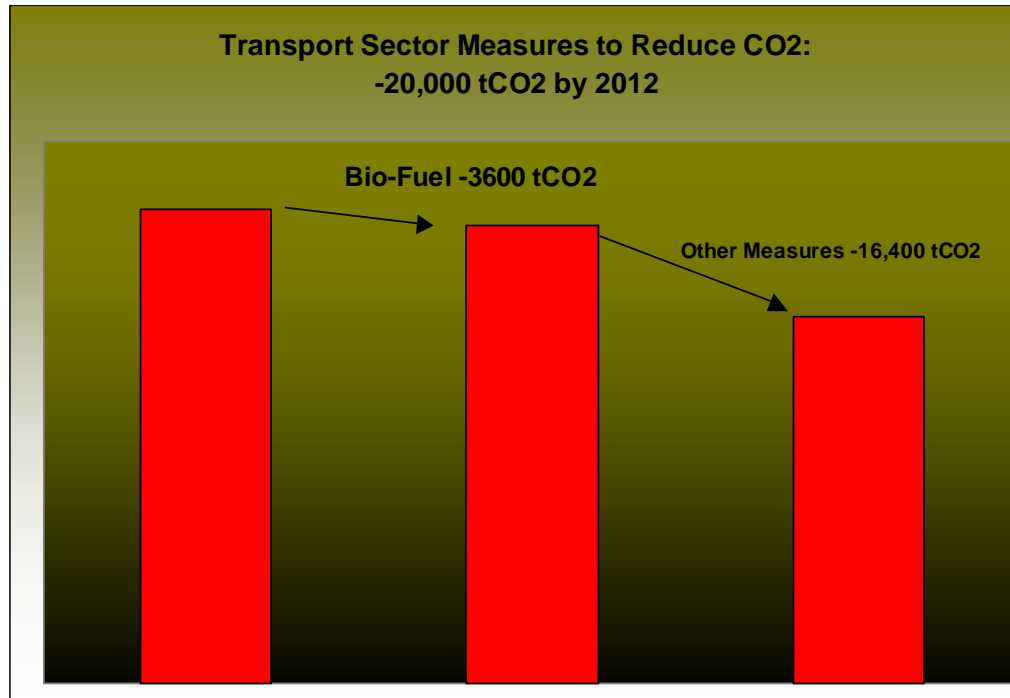
Transport: Measurable Actions

Transport poses the greatest challenge for two reasons: Firstly, the rural nature of West Somerset and the lack of public transport in some areas means that the car is the most practical option. Secondly, the number of visitors that travel to West Somerset increases the fuel sales and the CO₂ indicator for the district.

Supplying bio-diesel from waste catering oils in the first instance to local car owners will help to reduce CO₂ and provides an opportunity to benefit from a growing market. A shift of just 10% of diesel consumption to bio-diesel could reduce CO₂ by 3600tCO₂ per annum. For example the Renewable transport Fuels obligation has introduced the requirement that all forecourt sales of fuel will comprise a 5% bio-fuel mix by 2012. This alone will reduce our emissions by around 2.5% (just over 2000 tCO₂). The remaining target could be achieved through providing waste catering oil as fuel. This is subject to the quantity of catering oils available and further research would need to be undertaken through the Community Carbon Reduction Implementation Board.

Section 6: A Climate for Action

This leaves a balance of more than 16,000 tonnes of CO₂ to be reduced from other measures. Chief of these must be behaviour change, reducing unnecessary car journeys and encouraging car sharing, cycling and use of public transport where practical.



What we can all do as individuals

This strategy has identified that a collaborative approach is needed to achieve significant CO₂ reductions, prepare to adapt to anticipated changes and support the delivery of low carbon future to sustain our community.

What we do as individuals may seem insignificant and not worth doing in the face of a problem with global magnitude. But if we do not act as individuals we will not reverse the trend of increasing CO₂ emissions. We must act as individuals at home, at school, in the workplace and in our pursuit of leisure so that together we act collectively as a community. The sum of the parts will be greater than the whole and we can achieve great things if we believe that individual action can and will make a difference.

We have set out our commitments to facilitate action within the community but we are aware that there are many in the community that want to act but do not know how. Below we have listed a few simple actions that each individual can take to make a difference. If you are willing to do more then please respond to this consultation and let us know how and what you would

Section 6: A Climate for Action

like to be involved with. Forum 21 has also been running a community climate change campaign and facilitating action groups within West Somerset. Find out more from mail@forum21.org.uk

Actions we can all take to make that difference

- Insulate your home. It's cost effective, pays for itself within about a year and can save around 1.2 tonnes of CO₂ every year. It will also save you money.
- Leave the car at home. Reduce or stop those unnecessary journeys in the car. Walking and cycling is good for health, will save you money and reduce CO₂.
- Introduce the walking bus to your school. Work out a scheme that will provide supervised walking to and from school. Forum 21 may be able to help.
- Shop locally and buy local produce when you can to reduce food miles and support local business.
- Introduce the 'loan for a bike' scheme to your employees.
- Become an exemplar organisation, begin monitoring your energy consumption and find ways to reduce it.
- Rethink, Reduce, Reuse, Recycle your waste.

Other simple no-cost actions around the home that will make that difference.

- ⌚ Turn down your heating thermostat by 1°C to save £30 and 0.3tCO₂ per year.
- ⌚ Close your curtain at dusk, saving £15 per year.
- ⌚ Wash your clothes at 30°C instead of 40°C using up to 30% less electricity, and make sure the washing machine is full.
- ⌚ Use low energy lightbulbs. They can last 12 times longer and save £78 over the lifetime of the bulb.
- ⌚ Only boil as much as you need in a kettle – a kettle can use as much as 15% of all the electricity used in our homes.
- ⌚ Keep the lid on saucepans to reduce condensation and shorten cooking times.
- ⌚ Don't leave your electrical appliances on standby – up to 85% of the electricity they use is while they are on standby.
- ⌚ Do some simple draught proofing round windows, letterboxes, keyholes and floorboards. Maximum cost £25, saving £5-10 a year.
- ⌚ When you buy new white goods (fridges, freezers, washer, cooker) buy one that is energy efficient.

Source: Forum 21 top 10 energy saving tips



WEST SOMERSET FARMERS' MARKET

**Buying local food reduces food miles and CO₂,
and contributes to the local economy.**

The West Somerset Farmers' Market is a prime example of a project that supports the objectives of this strategy. The market is vital to the local economy reinvesting local revenue back into local businesses. In addition to this it reduces the food miles incurred by importing produce from elsewhere and reduces CO₂.

Buying local has never been more important. Knowing where food comes from and how it is produced makes people more conscious of what they are buying. The market builds upon a sense of community by bringing people together which in turn benefits other local businesses.

Appendices

Available as a separate document at
www.westsomersetonline.gov.uk/climatechange