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Understanding the West Midlands' Carbon Gap

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1 Introduction

1.1 Background

There are a multitude of policies from international to local level that focus on trying to mitigate against the impacts of climate change. The theme of climate change is firmly embedded in the majority of the policies emerging from international, national and regional organisations. In addition businesses are gearing up to face the challenges presented by climate change but also take advantages of the opportunities it presents.

The monitoring of progress on climate change mitigation has been driven by targets to reduce the levels of CO_2 emissions and the level of greenhouse gas emissions.

There are many greenhouse gases. These include: carbon dioxide (CO_2), nitrous Oxide (N_20), methane (CH_4) and a range of synthetic (industrial) gases including perfluorocarbons (PFC), hydrofluorocarbons (HFC), sulphur hexafluoride (SF_6). All of these are covered by the Kyoto Protocol, the international agreement on climate change.

CO_2 is not the most potent greenhouse gas. However, because of the sheer volume of CO_2 that is produced, its effect dwarfs all the other greenhouse gasses combined. As a result, greenhouse gas emissions are generally reported in terms of the equivalent volume of CO_2. This is the CO_2e, or 'carbon dioxide equivalent' and is the internationally recognised measure of greenhouse gas emissions.

1.2 Why was this report commissioned?

This report aims to help policy makers in the West Midlands understand how implementing the key international, national and regional policies will affect CO_2 emissions in the region. More importantly we will outline the scale of the challenge for the region to meet its targets by 2020 and how much of the reduction will need to be driven by regional policies.

"Connecting to Success", the West Midlands Economic Strategy for 2007 – 2010, is the first low carbon Regional Economic Strategy. Work was carried out to support the development by A. D. Little[1], Forum for the Future[2] and URS[3] and this report draws on their findings.

A number of recent reports have highlighted the contribution individual strategies can make in either closing the carbon gap or adversely effecting progress towards to region's target. This report aims to provide an overview of this work and also draws the findings together to pull out a simple message on the region's progress towards achieving its carbon targets.

The West Midlands Climate Change Action Plan which was published in December 2007 challenges both of the main region strategies (the Regional Spatial Strategy and the West Midlands Economic Strategy).

The Regional Spatial Strategy (RSS):

Action P1: *"Ensure that revisions to the Regional Spatial Strategy (including Transport and Waste) and Regional Housing Strategy effectively address the need to reduce emissions and adapt to unavoidable climate change impacts over the coming decades, providing a robust regional framework to support local planning authorities in developing appropriate local planning, housing, transport and waste policy."*

The West Midlands Economic Strategy (WMES):

E1: *"Ensure that revisions to Regional economic policy effectively address the need to reduce emissions and adapt to unavoidable climate change impacts over the coming decades, building on current assessment work to date, and further strengthening benchmarking work".*

The WMES sets out its intention to "encourage more efficient use of resources and promote economic growth through the secure development,, production and efficient use of our energy infrastructure". This also recognises the potential that managing the impact of climate change and the sustainable development of the region's economy can have for the region.

[1] "Pioneering the UK's first low carbon Regional Economic Strategy", A. D. Little, April 2007
[2] "Future Vision for the West Midlands: 2020", Forum for the Future, 2007
[3] "Low Carbon Evidence Base for the West Midlands Regional Economic Strategy", URS, 2007

The Regional Spatial Strategy states that "Regional Planning Guidance (RPG) has a responsibility to help meet national targets for the reduction of greenhouse gases. This will require establishing comprehensive and up to date data in order to enable the local authorities and agencies to develop coordinated and effective solutions. The use of the guiding principles in developing the Spatial Strategy has ensured that policies to assist the reduction of greenhouse gas emissions which may lead to climate change are an integral part of RPG."

As such, a clear understanding is required as to where existing policies at international, national and regional level will place the region at 2020. From this we can then understand what the region needs to do above and beyond the existing work to achieve those targets.

2 National & International Policy Context

2.1 International

The Kyoto Protocol[4] is an international agreement setting targets for industrialised countries to cut their greenhouse gas emissions. These gases are considered at least partly responsible for global warming - the rise in global temperature which may have catastrophic consequences for life on Earth. The protocol was agreed in 1997, based on principles set out in a framework convention signed in 1992.

The Kyoto Protocol is the first ever international treaty to set legally binding emissions reduction targets on developed countries that have ratified it. Developed countries agreed to targets that will reduce their overall emissions of a basket of six greenhouse gases (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride) by 5.2 per cent below 1990 levels over the period 2008-2012.

Under the Kyoto Protocol, the European Union and its Member States have agreed to meet a joint target of a an 8 per cent reduction in greenhouse gas emissions below 1990 levels by 2012. This 'bubble' arrangement allows the EU's target to be redistributed between member states to reflect their national circumstances, requirements for economic growth, and the scope for further emission reductions.

According to DEFRA the UK is on track to meet, and surpass, its Kyoto target. UK emissions in 2010 are predicted to be 23.6 per cent below base year levels, 11.1 per cent lower than required by Kyoto.

2.2 National

The UK introduced a Climate Change Programme in 2006. The Climate Change Programme is based on a number of principles:

- The need to take a balanced approach with all sectors and all parts of the UK playing their part;
- The need to safeguard, and where possible enhance, the UK's competitiveness, encourage technological innovation, promote social inclusion and reduce harm to health;

[4] http://unfccc.int/resource/docs/convkp/kpeng.html

- The need to focus on flexible and cost effective policy options which will work together to form an integrated package;
- The need to take a long term view, looking to targets beyond the first Kyoto commitment period and considering the need for the UK to adapt to the impacts of climate change;
- The need for the Programme to be kept under review.

The Climate Change Act 2008[5] created a new legal framework for the UK achieving, through domestic and international action, at least an 80% reduction in CO_2 emissions by 2050, and a 26-32% reduction by 2020, against a 1990 baseline. The Government will be required to set five-year carbon budgets, placing binding limits on aggregate CO_2 emissions.

The key provisions of the Act are:

Legally binding targets: Green house gas emission reductions through action in the UK and abroad of at least 80% by 2050, and reductions in CO_2 emissions of at least 26% by 2020, against a 1990 baseline. The 2020 target will be reviewed soon after Royal Assent to reflect the move to all greenhouse gases and the increase in the 2050 target to 80%.

A carbon budgeting system which caps emissions over five year periods, with three budgets set at a time, to set out our trajectory to 2050. The first three carbon budgets will run from 2008-12, 2013-17 and 2018-22, and must be set by 1 June 2009. The Government must report to Parliament its policies and proposals to meet the budgets as soon as practical after that.

The creation of the Committee on Climate Change, a new independent, expert body to advise Government on the level of carbon budgets and where cost effective savings could be made. The Committee will submit annual reports to Parliament on the UK's progress towards targets and budgets to which the Government must respond, thereby ensuring transparency and accountability on an annual basis.

The West Midlands has an aim to achieve a 30% reduction in its emissions by 2020 to be in line with the national target. The move from a 60% to 80% reduction target by 2050 has not seen this interim target change, justifiably due to the timeframe required for policy impacts to filter through and given that this was already a challenging target.

[5] http://www.opsi.gov.uk/acts/acts2008/pdf/ukpga_20080027_en.pdf

3 West Midlands' Strategies

The two key regional strategies are the West Midlands Economic Strategy (RES) and the West Midlands Spatial Strategy (RSS). Other regional strategies will be required to have an influence on the move to reduce carbon emissions but these are the key strategies.

3.1 West Midlands Economic Strategy

The Energy White Paper 2007 states:

"The Regional Development Agencies (RDA) have an important role to play in tackling climate change and contributing to other energy policy goals, within the context of their regional economic strategies. RDAs are well placed to contribute by:

- Maximizing UK business opportunities that arise through sector and supply chain support, and promoting business energy and resource efficiency;
- Supporting the deployment of essential energy infrastructure and skills at a local and regional level;
- Supporting low carbon innovation, through support for research and demonstration of new and emerging energy technologies.

The Government recognises that RDAs are the leading strategic economic and sustainable development body in the regions, and within this context will contribute to the Government's energy objectives. Working closely with the Government Offices and Regional Assemblies, RDAs will have the key role in taking forward the implementation of this White Paper at regional level."

The RES has been hailed as the first low carbon Regional Economic Strategy and has a drive to enable development in a way which minimises the region's carbon emissions.

The key findings of URS's assessment were as follows:

- It is likely that the implementation of national and international policies will not be sufficient to reach a 30% reduction of CO_2 emissions by 2020 at the regional level. This is also the case at UK level, based on the latest projections;

- If the region wishes to achieve a minimum cut of 30%, additional carbon saving measures need to be implemented at the regional level, in particular in areas that are not fully covered by national and international policies such as road traffic reduction and a shift to low carbon public transportation modes;
- The implementation of a voluntary carbon offsetting scheme, including project funding within the region, could be an efficient mechanism to achieve additional carbon savings and compensate for the small contribution of the region to the EU Emission Trading Scheme (EU ETS);

The work carried out by URS highlights the potential that the RES has to reduce carbon emissions. Potential carbon savings expected from those measures on which the RES or AWM can have a direct influence have been estimated to be in the range of 1,100 to 2,300 kt CO_2/year by 2020. This represents 18–23% of the total potential carbon savings from national policies and additional measures.

3.2 Regional Spatial Strategy

RSS Phase 2 preferred option stated that all 434,870 new houses (replacements for demolished housing and housing on new land) should meet all the energy efficiency/carbon reduction targets from the date of their introduction. If that happens then by 2026 the region's housing stock would be emitting 3.1% more CO_2 than it was in 2006, despite there being 15.7% more housing.

This preferred option has now been superseded by work carried out by Nathaniel Lichfield & Partners. Their work considered a range of options and presented three potential growth scenarios proposing between 417,100 and 445,600 housing units up to 2026. These represent housing allocations which build on and are between 51,500 and 80,000 higher than the draft West Midlands Phase 2 Regional Spatial Strategy Revision.

Work was carried out in 2008 by the Stockholm Environment Institute to assess the potential impact of the RSS Phase 2 preferred option.

The deployment of 10% renewable energy in all developments above 10 dwellings in size would further reduce CO_2 emissions, as would the introduction of other decentralised energy systems.

Other scenarios modelled by the Stockholm Environment Institute in York show that:

- If by 2015 all houses were being built to Eco-homes 'Excellent' standard (equivalent to the Code for Sustainable Homes Level 4), that by 2026 per capita emissions would fall by 7% (to 3.12 tonnes), but that total emissions would still rise by 1% (to just less than 18m tonnes)

- If by 2015, all houses were being built to Eco-homes 'Excellent' standard, 25% of their energy needs were met from renewables, that the demolition/replacement rate of existing (energy inefficient) housing stock was increased by 400%, and Buildings Regulations were enforced more effectively, that by 2026 per capita emissions would fall by 35% (to 2.19 tonnes), and that total emissions would fall by 29% (to 12.6m tonnes)

However, this 3.1% increase in CO_2 (as highlighted at the start of section 3.2) over 20 years is not going to be a sufficient rate of change to meet the Climate Change policy's requirement that a 80% reduction be delivered by 2050. The region's housing stock should be aiming to reduce its emissions by perhaps 30%. It is therefore vitally important that, alongside the rigorous application of the Sustainable Construction policy's requirements on energy efficiency, (a) renewable energy provides an increasing proportion of the region's energy requirements and (b) the energy efficiency of pre-2006 housing stock (which will account for nearly 84% of the region's total housing stock in 2026) is also addressed as a matter of urgency.

3.3 PSA targets

There are two Public Service Agreements (PSA) that relate to the carbon gap. One relates more directly than the other.

PSA 27 states that the UK will *"Lead the global effort to avoid dangerous climate change"*. Encapsulated within the overall PSA target are 6 components. These component targets are:

- Global CO_2 emissions to 2050;
- Proportion of areas with sustainable abstraction of water;
- Size of the global carbon market;
- Total UK greenhouse gas and CO_2 emissions;
- Greenhouse gas and CO_2 intensity of the UK economy;
- Proportion of emission reductions from new policies below the Shadow Price of Carbon.

PSA 28 aims to *"Secure a healthy natural environment for today and the future".* As with PSA 27 there is a sub set of targets to this PSA:

- Water quality;
- Biodiversity;
- Air Quality;
- Marine health;
- Land management: positive and negative impact of farming.

These PSA targets are not specific policies that will impact on the region but provide the context in which DEFRA as the lead department will be expecting to see policy developed. Targeting the region's carbon gap is more likely to fall under the remit of PSA 27 but improving performance on the components of PSA 28 would also have a positive impact.

4 The Carbon Gap

4.1 What do we mean by the Carbon Gap?

Work has been carried out to assess the potential of the region to reduce its emissions by regional implementation of the principle national and international reduction measures. The difference between this potential reduction and the UK target range of 26-32% reduction has been labelled the regional Carbon Gap i.e. the shortfall in emission reduction at a regional level that needs to be tackled by regional led policies.

4.2 What is the West Midlands' Carbon Gap?

In order to try and estimate the size of the challenge facing the region we looked at the impact of the various international, national and regional policies. In order to understand the existing progress towards the 2020 we used the Regional Energy Strategy monitoring report[6] to provide a baseline for the regional emissions. Using this baseline we used the Regional Economy-Environment Input-Output (REEIO)[7] model to provide a forecast of progress.

REEIO is a computer tool for regional strategy and policy appraisal. This model links economic policy and environmental impacts. No model can create a complete picture of any region, or its economy or environment, but the REEIO aims to provide a technical foundation for any regional toolkit, especially when linked to other technical models and information systems.

The REEIO is based on a detailed model of each regional economy, based on the widely used Local Economy Forecasting Model (LEFM). REEIO has been updated in 2007 to include the most recent data available.

Using this forecast we had an overall assessment of the gap, following implementation of national and international policy, to the target in 2020. This forecast predicted the gap as being 3 million tonnes of CO_2e to the aim of a 30% reduction in emissions, which would need to be tackled by regional policies.

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[6] Regional Energy Strategy Monitoring Report 2006, WMRO, 2006 http://www.wmro.org/standardTemplate.aspx/Home/OurResearch/BusinessEconomy/EnergyStrategyMonitoringReport2006

[7] http://www.wwflearning.org.uk/scpnet/tools/reeio/

We then used the work carried put within the region to assess the contribution of the key regional strategies. At this stage URS's assessment of the policies in the RES estimates them of being capable of reducing emissions by a maximum of 2.3 million tonnes by 2020.

While this represents a positive impact, the demand to increase the region's housing stock has a negative impact of emissions. Using the Resources and Energy Analysis Programme (REAP), the Stockholm Environment Institute (SEI) at the University of York estimated that the RSS preferred option for housing would see a 1.05 million tonnes increase (as discussed in Chapter 3).

Overall this would leave a potential gap of 1.75mT of carbon emissions to the regional target in 2020.

Key to making a difference to the gap at regional level will be the additional savings that could be made from areas not covered by some of the main national policies. Examples of this include road traffic reduction, behaviour change, a shift to low carbon public transport, waste reduction and decentralised energy.

These policy areas could be targeted at a regional level to try and close the gap that the existing policies are not able fill.

4.3 The key message

The region needs to meet the goal of reducing CO_2 emissions by between 26 and 32% by 2020. The implementation of existing national and international policies at regional level would leave a gap of 3 million tonnes of CO_2 per annum between the actual levels and the required levels.

Existing regional strategies will make an impact on this. The WMES and the WMRSS will both have an effect and work to understand their impact has been carried out. When the assessments of their impact are brought together it gives a best case scenario of a further reduction by 1.25 million tonnes.

This still leaves **a gap of 1.75 million tonnes CO_2 per annum** that needs to be addressed by other policies in the region.

I.75 million tonnes is a slightly abstract concept. In order to try and help simplify the message we have equated this to a value per person for the region. The 1.75 million tonnes gap is equivalent to a reduction of approximately 330kg of CO_2 per person per year[8].

330kg of CO2 per person is equivalent to:

[8] Based on a West Midlands population of 5.3 million people

- 1,250 miles in a Ford Fiesta[9];
- 5 Fluorescent light bulbs[10];
- One economy return flight from Birmingham to Rome[11];
- 21 computer monitors left on stand by overnight for a year[12];

This gap will need to be addressed within the region. The existing Regional Energy Strategy[13] sets out an aim to have 10% of the region's energy consumption[14] supplied by renewable energy by 2020. Work for AWM by Halcrow[15] into the viability of Combined Heat and Power (CHP) solutions as a renewable energy source for the region. That study estimated that there is the potential to treble the uptake of CHP across the region.

One of the biggest areas of potential impact on the region's carbon gap will come from behavioural change. This applies to the individual and also to business practice. Some simple policy options to help drive this behavioural change exist. The WMES includes a focus on increasing the number of home workers, looking at the percentage of waste which is recycled or composted and driving up the use of ICT to improve efficiency in business practice.

The Regional Spatial Strategy published in January 2008 includes a number of mechanisms for tackling climate change. These range from promoting a more sustainable pattern of development which reduces the need to travel and encouraging the use of more sustainable forms of transport to encouraging the use of sustainable drainage systems, increasing tree cover , promoting the reuse of materials, supporting new industries and technologies that address climate change, and encouraging renewable energy and energy conservation.

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[9] 1250 miles in a UK 2008 FORD Fiesta, 2008 Model Year Onwards 1.25 Duratec (75PS), M5, www.carbonfootprint.com
[10] Scampini, A (2007) A comparison of compact fluorescent light bulbs to incandescent light bulbs using life cycle assessment, University of Illinois, Chicago
[11] 0.33 tonnes: Economy class direct return flight from BHX to ROM, www.carbonfootprint.com
[12] www.byebyestandby.co.uk
[13] West Midlands Regional Energy Strategy, November 2004
[14] The Government's renewables target is based on the percentage of electricity generated, while the target proposed in the Regional Energy Strategy is based on the percentage of electricity used. This is because the region consumes more electricity than it generates.
[15] Heat Mapping and Decentralised Energy Feasibility Study, Halcrow Group Ltd, April 2008

5 Policy Implications

5.1 The economy

A key challenge in developing a low carbon economy and a low carbon economic strategy is that the economic strategy has to help business. Therefore understanding how the business base is affected by environmental policies is of real importance.

URS's work assessed the potential impact and to try and understand whether these policies would place "carbon constraints" on the region's businesses. URS looked at the value of the businesses in terms of GVA and their vulnerability to regulation on carbon. Their findings are summarised as:

- No high-GVA contribution sectors subject to high regulatory constraints have been identified in the region;
- Several sectors have a medium or high GVA contribution coupled with medium or high regulatory constraints on their operations or on their products and services:
    - The transport sector (main carbon constraints: possible extension of the EU ETS and Renewable Fuel Transport Obligation);
    - The education & health sector (main carbon constraints: EU ETS (due to large scale energy production facilities within universities and hospitals), proposed Carbon Reduction Commitment and Government's carbon neutrality target);
    - The retail trade and distribution sector (main carbon constraints: proposed Carbon Reduction Commitment);
    - The construction sector (carbon constraints related to low carbon buildings regulations).
- Other sectors with high regulatory constraints but low financial contribution include:
    - Transport equipment manufacture, for which carbon regulations apply both to operations (there are a number of sites subject to the EU ETS in the region) and products manufactured (EU fuel efficiency agreements);
    - Food & drink manufacture, mineral products manufacture, chemicals manufacture and electricity supply (main carbon constraints: EU ETS).

Economic restructuring within the region will potentially impact on the scale of the carbon gap. The direction any restructuring takes will determine the nature of the impact. Moves towards developing a low carbon economy should see positive restructuring that helps close the gap.

The West Midlands Regional Observatory has worked with regional partners to develop an Integrated Policy Model (IPM) that will allow us to forecast the potential impact of policy interventions. The model is an interactive tool which allows policy makers and analysts to explore in detail the potential impacts of specific policy interventions. It has the facility to help understand how might new developments impact on CO_2 emissions?

As more detailed understanding of the economic restructuring in the region is developed the IPM will allow us to see the potential impact of the restructuring and identify which sectors will either close or widen the carbon gap.

5.2 Housing provision

The West Midlands has around 2.3 million homes and the household sector represents 30% of total regional CO_2 emissions. Household energy consumption is increasing, even with the gradual improvement in the energy performance standard of the housing stock, due to a larger number of households, a trend for smaller household sizes, an increase in use of electrical goods and the levels of comfort demanded.

The region's housing stock should be aiming to reduce its emissions by perhaps 30% in line with the overall regional aim by 2020. It is therefore vitally important that, alongside the rigorous application of the Sustainable Construction policy's requirements on energy efficiency, (a) renewable energy provides an increasing proportion of the region's energy requirements and (b) the energy efficiency of pre-2006 housing stock (which will still account for nearly 84% of the region's total housing stock in 2026) is also addressed as a matter of urgency.

Given that nearly 84% of the region's housing stock will be pre-2006 in 2026, it is recommended that more specific and detailed proposals are developed to ensure that old housing stock is retro-fitted for energy efficiency.

Work is being developed by the West Midlands Regional Assembly and Advantage West Midlands *"Retrofitting for the Future: Low carbon housing – developing a baseline for refurbishment in the West Midlands"* which will consider the impact that retro fitting can have on reducing CO_2 emissions and also how to take this agenda forward.

Early findings from the report showed that the estimated total CO_2 savings in 2007-2008 was 26,824 tonnes CO_2. This figure is based on the average carbon saving from the reported measures. Based on 1990 levels this saving represents a 0.6% improvement per year. To reach the 80% reduction targets by 2050 the region will need to reduce emissions from housing by 2.3% per annum.

5.3 PSA Targets

Coordinated regional work by partners to try and achieve the region's contribution to the PSA targets 27 & 28 will help to deliver a reduction in emissions however there are no specific existing policies that are designed solely to take this issue.

It is more likely that a combination of the policies in the WMES, WMRSS, West Midlands Climate Change Action Plan and the fourteen Local Area Agreements (LAAs) that are in place in the region will drive the progress against the two PSAs.

5.4 Challenges for the new regional strategy?

If the region wishes to achieve a minimum cut of 30%, additional carbon saving measures need to be implemented, in particular in areas that are not fully covered by national and international policies such as road traffic reduction and a shift to low carbon public transportation modes.

The sectors where the greatest carbon savings are likely to be achieved, in terms of absolute CO_2 emissions saved by 2020, are: domestic sector, road transport, electricity/gas/water supply and mineral products manufacture.

These sectors were also identified as the largest CO_2 emitters. Among these sectors, the road transport sector is the one for which national carbon reduction policies are expected to have the least impact on baseline emission projections for 2020; as this sector is a major contributor to regional CO_2 emissions, there is a potential gap that could be addressed by additional regional measures.

5.5 Opportunities for growth

Much of the focus of this work, and others that try and quantify the impact on the region of carbon reduction policies, is on the potential to constrain. However the challenges that are to be faced also offer real opportunities for business development.

Both adaptation and mitigation policies will provide opportunities for new technologies. Obvious areas for development are:

- agriculture (biofuels production);
- transport manufacturing (fuel efficiency innovation);
- transport services (development of low carbon transport solutions);
- electricity supply (renewable/decentralised energy production);
- waste management and recycling sector;

6 Carbon Gap & the Productivity Gap

Can reducing the region's carbon gap help to reduce the productivity gap?

The West Midlands Economic Strategy (WMES) launched in December 2007 identified a £10 billion 'output gap' in the region (compared to what GVA would be in the region if it produced wealth at the current national average per head of population).

It is estimated that some 80% of this gap is attributable to industrial productivity and the structure of businesses in the region's economy, while the remaining 20% is attributed to worklessness and low rates of employment.

The question when considering policies to close the region's carbon gap is what impact will these policies have on the productivity gap? Will activity designed to reduce carbon emissions hinder productivity or will the move open up new opportunities that help narrow the productivity gap?

The reality is that both cases apply. The URS report into the Low Carbon Evidence base takes work produced by Oxford Economics at a national level and applies it the West Midlands. The work that Oxford Economics[16] produced identified the potential impact on GVA in 2015-2020 on the sectors that would be most and least affected by the imposition of a 30% CO_2 reduction target by 2020.

URS then applied this to the West Midlands based on the financial contribution of these sectors to the region in 2004 and their projected impact in 2020. URS found that:

"The sectors that represent a high proportion of the regional GVA (e.g. business services) are not likely to be much affected by a 30% carbon reduction target."

"The sectors that are likely to be the worst affected at UK level do not have a significant economic weight in the region, in terms of GVA."

This illustrates that the policies to reduce emissions are unlikely to have a significant negative effect on the region's GVA but where would the positive impacts come from?

[16] Oxford Economics, "Report on modelling the macroeconomic impacts of achieving the UK's carbon emission reduction goal", May 2007

The potential positive impacts on productivity of the drive to reduce the carbon gap would come through new opportunities for business growth and development. Some of the industries that are most likely to be affected by carbon reduction policies also have some of the best opportunities for growth. Agriculture, for example, is a high energy user and therefore vulnerable to climate change mitigation policy but also has the opportunity to diversify into the development of bio-energy.

Other sectors that are identified as having opportunities are Transport (both manufacturing and services), Construction and Energy supply.

In 2006 these sectors produced nearly a fifth of the region's GVA between them and clearly the opening up of new markets and new business opportunities gives them the opportunity to increase their contribution.

On a broader scale work for Advantage West Midlands[17] estimates that the UK market for environmental or low-carbon technologies is expected to grow to £10 billion within the next three years. At the same time the global market is expected to grow to $1 trillion over the same period. Clearly if the region can take advantage of some of this new opportunity the benefits towards closing the productivity gap could be large.

[17] Advantage West Midlands, "Evidence of Success: developing the UK's first low-carbon regional economic strategy", 2008

7 Next steps for the evidence base

This understanding of the region's carbon gap will need to be reviewed as relevant information becomes available on issues such as transport. The revised regional housing figures from NLP will need to be considered. This is unlikely to drive up emissions as the new housing stock will be required to meet the efficiency standards but will add to the understanding of the position. Perhaps most tellingly the impact of the economic downturn will need to be assessed. This will need to be monitored as there is the potential for both positive and negative impacts to be felt.

7.1 Economic downturn effects – positive or negative?

The concern is that as the economy struggles environmental concerns get pushed to one side as being 'barriers' for business. However in many instances the economic downturn provides a justification for carrying out actions that help the environment. Where money is tight the drive for efficiency in all aspects of business and life is greater.

Economically there is an opportunity for environmental technologies to become part of the solution. The development of new technologies that aid efficiency can open new markets to businesses.

There is a need for work to be carried out that identifies the region's strengths and weaknesses in terms of capitalising on the opportunities presented by environmental technologies.

Also the drive to save money can lead to more environmentally friendly actions being carried out for non-environmental reasons. As an example of this effect, in 2008 there was anecdotal evidence of people driving less when petrol prices rose to well over £1 per litre.

7.2 Transport

Clearly transport is a major contributor to carbon emissions. Transport is one of the issues that is difficult to manage from a regional perspective. It is known that 4 out of 5 vehicles on the Midlands Motorway network either begin or end their journey within the conurbation, suggesting a high proportion of relatively long distance car trips. Also it suggests that 20% of vehicles are travelling through the region, outside the influence of regional policy.

The impact of travel patterns and the potential for influence needs further study.

7.3 Revised NLP housing numbers

As mentioned earlier in the report the revised housing projections produced by NLP for the region were released in late 2008. Work was carried out to assess the potential impact of the original forecast growth and NLP are suggesting even greater numbers of new housing. The projected impact of this growth will need to be reassessed to account for these higher numbers. Whether much of this growth is in carbon neutral housing needs to be considered but reassessment will be needed.

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