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Observatory

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Low Carbon Economy
for the West Midlands:
A synthesis report
May 2009

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Low Carbon Economy in the West Midlands

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1 Introduction

1.1 Background

The West Midlands Regional Economic Strategy (WMES) 'Connecting to Success' has been recognised as the UK's first low-carbon economic strategy. The WMES recognises that:

*"The West Midlands economy needs to be at the forefront of the sustainable growth path, reducing carbon emissions while at the same time increasing economic output and realising the associated business opportunities"*¹.

The WMES defines a low-carbon economy as an economy that produces goods and services of increasing value while reducing the associated greenhouse gases in their production, use and disposal².

Moving towards a low carbon economy provides the unique opportunity to improve the region's productivity whilst reducing the carbon emissions and tackling climate change.

*"The key task of a low carbon strategy is to accelerate current progress on addressing the productivity gap while reducing our overall carbon emissions from the biggest sources and responding successfully to future challenges such as climate impacts and globalisation"*³.

Producing the WMES -the first low carbon strategy within the UK- was a significant achievement; however it represents only the beginning of the journey towards a low carbon economy. Developing an integrated and robust evidence base is critical.

Since summer 2008, Advantage West Midlands (AWM) and West Midlands Regional Observatory have been working together on a three year programme that will enable the region to develop a stronger and more coherent evidence base around the low carbon economy.

¹ 'Connecting to Success' West Midlands Economic Strategy, Advantage West Midlands, 2007, p. 7

² Ibid, p. 89

³ Ibid. p. 39

1.2 About the programme

The programme of work between AWM and the Observatory is designed to: monitor the region's performance as it tries to develop a low carbon economy; identify the opportunities that a low carbon economy can offer; and consider the impact that policy interventions will have in the region. The WMES has the aim of achieving a low carbon economy and this programme of work will provide evidence of progress against that aim⁴.

The aim of this report is to present a synthesis of the work produced during the first year of the programme. The research documents delivered during the first year of the programme include:

- Understanding the West Midlands' carbon gap
- Decoupling into a low carbon economy
- West Midlands climate change action plan, targets & monitoring (TM1)
- Measuring the scale of the challenge: sustainable development indicators
- Analysis of the Regional Index of Sustainable Economic Well-being

This report will present a short summary of the research findings from the first year of the programme and deliver an integrated view of the evidence developed during that first year about the low carbon economy within the region.

The key messages section provides an overview of the various strands of work, identifying the common themes and highlighting the most important messages from the first year of the work programme.

The low carbon evidence base section provides individual summaries of the reports produced in year one.

The next steps chapter highlights some of the work that the Observatory will be producing for AWM during year two of the programme.

⁴ 'Low Carbon Economy Work Plan' West Midlands Regional Observatory, 2008, p.6

2 Overall key messages

The first year's findings highlight that even though the region has made progress in delivering a low carbon economy, with improvement shown against several low carbon indicators, more still needs to be done. When comparing the region with the rest of the English regions, the West Midlands' ranking typically places it between fourth and sixth position amongst all regions.

After taking account of current international, national and regional policies, including those in the WMES and RSS, the West Midlands faces a **1.75 million tonnes carbon gap** to achieve the targets in place for 2020. This amounts to 330kg per person, the equivalent of driving 1250 miles in a Ford Fiesta or one return flight from Birmingham to Rome for every West Midlands resident.

The region has already had some success in decoupling economic growth and its environmental impacts. In recent years, regional output has grown steadily, whilst carbon emissions and energy use have been stable or declined slightly. However, we still lag well behind the best performing regions. To improve further, the region will need to become more efficient in delivering current activities as well as developing new technologies and processes which are low carbon.

Moving into a low carbon economy will bring challenges that the region must overcome. Individual and corporate behavioural change will be needed to reduce emissions from businesses, homes and transport. However, there are also opportunities available. Investing in new environmental technologies can support the low carbon economy while also providing an opportunity to reduce the current productivity gap of the region.

2.1 Performance indicators

West Midlands' performance on the majority of the indicators used to measure performance on developing a low carbon economy has improved in recent years. For example:

- The percentage of household waste recycled improved by 66.3% between 2004 and 2008;
- Total fuel consumption for road transport per head of population decreased by 12.1% between 2002 and 2006;
- Total industrial and commercial energy consumption per £bn of GVA decreased by 9.2% between 2003 and 2006.

However, there are still indicators which show more needs to be done, such as:

- Total CO₂ emissions per capita, which increased by 1.8% between 2005 and 2006
- Number of car trips per person per year, which increased by 6% between 2003 and 2006;
- Households in fuel poverty, which increased by 5.3% between 2005 and 2006.

The relative performance with other regions is also important. One example is the percentage of people working from home or travelling to work using a sustainable means of transport. In the region, this indicator improved by 4.6% between 2005 and 2007. However when compared to the rest of the regions, the West Midlands is the worst performing region overall.

The ranking achieved for most indicators falls between fourth and sixth best performing region. The West Midlands was not the top ranked region on any of the indicators. In terms of comparisons with other regions the West Midlands' best performance is on:

- Domestic CO₂ emissions per capita (2nd place);
- Industrial CO₂ emissions (3rd place).

2.2 Challenges and Opportunities

Some challenges have been identified for achieving a low carbon economy within the West Midlands. Work by Arthur D Little Ltd highlighted requirements for the success of the WMES as a low carbon economic strategy⁵. Amongst those were targets that had regional support, helping businesses recognise the value of reducing emissions, educating them to change their energy consumption behaviour and helping to support changes to the transport infrastructure and fuels (such as bio fuels).

There is the concern that implementing a low carbon economy will bring additional barriers to the region's businesses. URS evaluated the impact that regulation would have on different business sectors⁶. The findings were mainly positive for the West Midlands:

- No sectors with a high-GVA contribution in the region are subject to high regulatory constraints
- Several sectors with a medium or high GVA contribution will have medium or high regulatory constraints on their operations or on their products and services

⁵ 'Pioneering the UK's first low carbon Regional Economic Strategy', A. D. Little, April 2007

⁶ 'Low Carbon Evidence Base for the West Midlands Regional Economic Strategy', URS, 2007

- Other sectors with high regulatory constraints have a low contribution to the region's GVA.

This evidence suggests that the policies to reduce emissions are unlikely to have a significant negative effect on the region's GVA.

Other challenges include the fact that the household sector within the West Midlands represents 30% of the total regional CO₂ emissions. The region's housing stock should be aiming to reduce its emissions by around 30% in line with the overall regional aim by 2020. To achieve this, it will be important to ensure that the existing housing stock is retro-fitted for energy efficiency. Work has been produced for the West Midlands Regional Assembly and AWM that considers the impact that retro-fitting could have within the region⁷.

Amongst the report's findings was the fact that the West Midlands will need to spend an additional £189.1 million per year on installing energy efficiency measures into homes, which equates to an additional 68,000 tonnes of CO₂ a year, if it is to meet its CO₂ emissions target.

Key to the reduction challenge is the simple fact that, even with the planned levels of house building, 80 per cent of the homes that will be standing in 2050 have already been built. With the planned new homes needing to be built to far more exacting energy efficiency standards it is clear that our existing homes have a significant role to play in ensuring these climate change targets are met.

The report provides an evidence base to support work to address energy efficiency at household level. It helps understand the impact that individuals can make but throws up a number of important questions for policy makers.

Road transport is one of the largest CO₂ emitters and has the potential to achieve significant carbon savings. Since international and national policies are likely to have limited impact, regional policies must play a key role in the achievement of carbon savings for this sector.

The current economic climate can incentivise the development of new environmental technologies in sectors such as agriculture, transport manufacturing, transport services, electricity supply, waste management and recycling sector. Even though the current crisis has affected the environmental technologies sector, its impact has not been as severe as for many other sectors. 38% of "green" companies saw a turnover increase in the first quarter of 2009, while 34% reported a decrease - a positive balance of 4%. This compares to a negative balance of nearly fifty 50% across the wider manufacturing sector.

⁷ 'Low Carbon Housing: developing a baseline for refurbishment in the West Midlands', WMRA, March 2009

The UK environmental technologies market is predicted to grow to £10 billion within the next three years⁸. If the West Midlands can capture a significant share of this sector, it could contribute to closing the region's output gap.

⁸ 'Evidence of Success: developing the UK's first low-carbon regional economic strategy', Advantage West Midlands, 2008

3 Low Carbon Economy evidence base

This section presents a summary of the findings from the five main low-carbon economy reports completed as part of the Scale of the Challenge programme during the year. A wide range of indicators have been used in the monitoring and explanations of these can be found in Appendix A. In some instances the nature of the monitoring has required that the same indicator has been presented using different units in order to provide the right evidence for monitoring.

3.1 Understanding the West Midlands' Carbon Gap

The aim of this report is to illustrate the impact that implementing the key international⁹, national¹⁰ and regional¹¹ policies will have on CO₂ emissions in the region. In addition it 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.

The 'Carbon Gap' is the difference between the potential CO₂ reduction achieved by implementing the international and national policies and the UK target of CO₂ emissions. This differential (or carbon gap) is expected to be tackled by regional led policies.

The West Midlands' target is to reduce CO₂ emissions by 26-32% by 2020. The Observatory used The West Midlands Energy Strategy monitoring report¹² and the Regional Economy-Environment Input-Output (REEIO) model¹³ to identify that after the implementation of the international and national policies the region will still face a carbon gap of 3 million tonnes of CO₂ per annum. The existing regional policies (WMES and WMRSS) will deliver a further reduction of 1.25 million tonnes. However, this means that there will be still a gap of 1.75 million tonnes CO₂ per annum that needs to be tackled by other policies in the region.

The carbon gap per person in the West Midlands measures 330kg of CO₂, a figure that is equivalent to:

- Driving 1250 miles in a Ford Fiesta
- Whole lifetime of 5 fluorescent light bulbs

⁹ Kyoto Protocol, 1997

¹⁰ Climate Change Programme (2006), Energy White Paper (2007) and Climate Change Act (2008)

¹¹ Regional Economic Strategy (WMES), Regional Spatial Strategy (WMRSS), PSA targets

¹² Regional Energy Strategy Monitoring Report 2006, WMRO, 2006

- One economy return flight from Birmingham to Rome
- 21 computer monitors left on standby overnight for a year

Behavioural change (from both individuals and businesses) is one of the greatest opportunities to reduce the carbon gap in the region. Some policy options are already included in the WMES such as home working, waste recycling, and more efficient use of ICT.

The WMRSS also includes policy recommendations to tackle climate change. These include the use of more sustainable forms of transport, use of sustainable drainage systems, increase of tree cover, reuse of materials, supporting new industries and technologies that address climate change and encouraging energy conservation and renewable energy.

This final mechanism is also included in the existing Regional Energy Strategy, which sets out an aim to have 10% of the region's energy consumption supplied by renewable energy by 2020.

3.2 Decoupling into a low carbon economy

The aim of this report is to identify how economic growth can be achieved in the West Midlands without a similar growth in environmental impacts, particularly carbon emissions. Decoupling in its simplest form would see GVA increase as the economy grows and carbon emissions reduce as policies designed to mitigate climate change take effect.

It is not expected to completely separate economic growth and carbon emissions; however the goal is to move towards a low carbon economy in which businesses can improve their efficiency to reduce emissions.

The following are two approaches to decoupling into a low carbon economy, both offering solutions to the environmental challenge:

1. Increase the efficiency of existing production thereby reducing the emissions from the current activity
2. Develop new technologies and processes which are low carbon from the start









In order to assess the progress of the region in decoupling into a low carbon economy, the analysis included the following six indicators defined in the WMES:

¹³ <http://www.wwflearning.org.uk/scpnet/tools/reeio/>




- **Carbon emissions per £10,000 GVA (headline WMES indicator)** - This indicator demonstrates how efficient, in terms of carbon dioxide emissions, the region's output is. The lower the rate the better.
- **Total industry and commercial energy consumption GWh per £billion GVA** - The lower the rate of energy consumption per pound of GVA the more efficient the economic growth is.
- **Total fuel consumption for road transport per head of population (kg per person)** - A reduction in this indicator would suggest that people were using more efficient means of transport.
- **Carbon dioxide emissions per resident** - The lower the CO₂ emissions per resident, the lower the environmental impact for the region.
- **Percentage of people working from home or travelling to work using a sustainable means of transport** - Home working and sustainable travel are components of reducing the emissions that come from commuting and road transport. The higher the percentage the better
- **Percentage of household waste recycled** - An increase on the recycled waste levels will be beneficial for the environment

This first analysis is valuable because it offers a baseline reference; however since the majority of the data analysed is related to 2006, it is too early to assess the impact of the WMES. Table 1 summarises the results from the analysis.

Table 1 Results of Indicators for decoupling a low carbon economy

Indicator (Unit)	WM rank	Best Region ¹⁴	Value (year)		Change (period)	
			WM	Best Region	WM	Best Region
CO ₂ emissions per £10,000 GVA	5	SE	5.13 (06)	3.73 (06)	-2.1% (05/06) 	-4.6% (05/06) 
Total industry and commercial energy consumption (GWh per £billion GVA)	5	SE	586 (06)	417 (06)	-9.2% (03/06) 	-23.9% (03/06) 
Total fuel consumption for road transport (Kg per person)	6	NE	666 (06)	533 (06)	-12.1% (02/06) 	-8% (02/06) 
CO ₂ emissions per resident (Kg CO ₂ per resident)	5	SE	2.282 (06)	2.186 (06)	+1.2% (05/06) 	-0.5 (05/06) 

¹⁴ London was excluded to provide a more relevant reference.

People working from home or travelling to work using a sustainable means of transport (%)	9	SE	23.9 (06)	28.5 (06)	-4.6% (05/07) 	+3.0 (05/07) 
Household waste recycled (%)	6	EM	28.6 (06/07)	35.6 (06/07)	+66.3% (04/08) 	+59.3 (04/08) 

Even though the West Midlands has achieved some progress it still has some way to go to match the overall average of the English regions.

3.3 West Midlands Climate Change Action Plan - Targets & Monitoring

The West Midlands Climate Change Action Plan (CCAP) was launched in December 2007 and aimed to identify a series of key actions for regional partners to help the West Midlands region address the challenges presented by climate change.

The aim of the report is to address CCAP action TM1 - *review existing regional targets for carbon reductions, achievement of energy efficiency and for the uptake of renewable energy as expressed in the West Midlands Regional Energy Strategy.*

This report was developed in two stages. **Stage one** was a review of the existing targets in the Regional Energy Strategy and the data sources used to identify those targets. This stage also included recommendations of the most robust approach to taking the monitoring of the strategy forward.

Stage two focused on assessing the region's performance against the Regional Energy Strategy. This assessment included the findings and recommendations highlighted during stage one. The report included more detailed information on the following six sections: overall regional targets, industry, commercial and public services, households, road traffic and renewables.

Each section focuses on the relevant indicators that help provide a robust assessment of the region's performance. The following table (Table 2) summarises the West Midlands' performance against four of the six headline regional indicators (the two missing indicators have a full breakdown by fuel type used and therefore require full explanation and can be seen in the full report).

Total energy consumption per 1,000 population has fallen in recent years as has energy intensity. However total CO₂ emissions and regional electricity consumption both increased.

The West Midlands ranked in the middle of the English regions for all of the key indicators.

Table 2 Overall regional targets

Indicator (unit)	WM rank	Best Region ¹⁵	Value (year)		Change (period)	
			WM	Best Region	WM	Best Region
Total energy consumption (GWh per 1,000 population)	4	SW	27.5 (06)	25.8 (06)	-6.4% (05/06) 	-4.7% (05/06) 
Total CO ₂ emissions (T CO ₂ per capita) ¹⁶	5	SE	8.4 (06)	8.0 (06)	+1.8% (05/06) 	-0.5% (05/06) 
Energy consumption by GVA (energy intensity) (T CO ₂ / £m GVA) ¹⁷	5	SE	513 (06)	398 (06)	-5.5% (05/06) 	-5.5% (05/06) 
Regional electricity consumption (GWh per year)	-	NE	26,965 (07)	13,1342 (07)	+24.4% (03/07) 	+9.2% (03/07) 

¹⁵ London was excluded to provide a more relevant reference.

¹⁶ This measure is the BERR indicator for CO₂ emissions per capita and differs from the WMES definition which is KgCO₂ per resident. The total CO₂ emissions for the region are the same. The BERR indicators were developed after the WMES monitoring framework had been developed.

¹⁷ This measure is the BERR indicator for energy intensity and differs from the WMES definition which is T CO₂ per £10,000 GVA. The total CO₂ emissions are the same. The BERR indicators were developed after the WMES monitoring framework had been developed.

3.4 Measuring the scale of the challenge: sustainable development indicators

The aim of this report is to present, in a simple and clear way, a set of headline indicators related to sustainable development. Table 3 shows the indicators included, the West Midlands' performance and a comparison against the best performing region¹⁸.

Table 3: Summary of sustainable development indicators

Indicator (unit)	WM rank	Best Region	Value (most recent data)		Change  Positive  Negative	
			WM	Best Region	WM	Best Region
CO ₂ emissions (TCO ₂ / £m GVA) (2006)	5	SE	513	398	-5.5% 	-5.4% 
Regional Index for Sustainable Economic Wellbeing (R-ISEW) (£ per capita) (2006)	5	SW	10,654	12,595	+4.3% 	-0.4% 
CO ₂ emissions (TCO ₂ per capita) (2006)	5	SE	8.4	8.0	+1.8% 	-
Final energy consumption (KWh per head) (2006)	4	SW	27,500	25,800	-3.8% 	-2.2% 
Total final energy consumption (KWh / £ GVA) (2006)	5	SE	1.7	1.4	-5.5% 	-
Total industrial and commercial energy consumption (KWh per employee)	4	SW	21,600	19,400	-8.4% 	-
People working from home or using sustainable means of transport (%) (2008)	7	EE	25.5%	29.9	+4.5% 	+4.9% 
Waste recycled (%) (2007/08)	6	EM	33%	41.9	+15.3% 	+17.7% 
Difference between R-ISEW and GVA (£ per capita) (2006)	5	NW	-5,928	-4,101	+5.2% 	+12.7% 

¹⁸ London was excluded to provide a more relevant reference.

In the majority of the indicators the West Midlands is performing at least at the national average, however when compared with the rest of the English regions it tends to fall within the middle of the ranking (between fourth and seventh place)

3.5 Regional Index of Sustainable Economic Wellbeing (R-ISEW)

3.5.1 What is the R-ISEW?

The ISEW is a monetarised indicator of economic well-being and quality of life. Since it is measured in the same unit as the GDP or GVA (currency) comparisons between them are possible. The gap between them indicates how efficient a country is in translating economic growth into sustainable well-being for its citizens. The smaller the gap, the more sustainable the economic well being.

The R-ISEW is the equivalent measure for the ISEW at a regional level. It is an attempt to measure the proportion of economic activity which delivers genuine increases in quality of life across the English regions.

The 'new economic foundation (nef)' developed a common methodology that allows comparisons across regions¹⁹.

The initial basis for the R-ISEW is **personal consumption** - final household expenditure - as this is an indicator of the value which individuals assign to the goods and services which welfare is provided. **Economic adjustments** are then included such as capital investment, net international position and services - consumer durables.

Social benefits that are not accounted for in personal consumption figures are then added (such as unpaid domestic labour and voluntary work and public health and education expenditure). **Social costs** such as family breakdown, crime, income inequality, commuting, car accidents and industrial accidents are then deducted.

Finally, **environmental costs** such as climate change, loss of farmland, loss of habitats, water & air pollution, noise pollution, pollution control, resource depletion and long-term environmental damage by greenhouse gases are also deducted.

¹⁹ The 2008 R-ISEW (regional index of sustainable economic well-being) for all the English regions, NEF, October 2008

3.5.2 How is the West Midlands performing in the R-ISEW?

The index shows that between 1994 and 2006 the overall R-ISEW per capita is lower than GVA across all the English regions. The West Midlands is in the middle rank in terms of both GVA and R-ISEW. By 2006 the region was better positioned in terms of R-ISEW (fifth place as opposed to the sixth place achieved in terms of GVA). This indicates that in relative terms, the region performs slightly better in terms of well-being than GVA when compared to the other regions.

However over time the region's gap between the GVA and R-ISEW per capita has increased. The West Midlands' R-ISEW in 1994 was equivalent to 73% of the GVA while in 2006 it was only 64%. England also saw an increase in the gap, but its increase was smaller, equivalent to 2 percentage points of its GVA. In terms of the ranking over time, the story is the same. The West Midlands occupied the third position in 1994 and by 2006 it was overtaken by the North East and the East Midlands.

The ideal scenario will look like one where the region is not only reducing the gap between the GVA and R-ISEW per capita but also improving its relative position when compared to the rest of the regions.

When analysing the R-ISEW for the West Midlands by its components we found that in 2006 the region had the second lowest **consumer expenditure** and the **economic factors** adjustments within the West Midlands were lower than the England's ones.

In terms of the **social benefits**, the West Midlands has one of the highest adjustments per capita for the value of domestic labour and volunteering and the adjustment for public spending was very similar to the level presented by England as a whole. The **social costs** in the West Midlands were slightly lower than the ones incurred in England.

The environmental costs are organised in two groups. The first one is associated with 'local' environmental pollutants (air water and noise pollution), and it matches the national declining pattern. The second group includes the long-term costs of climate change, resource depletion and loss of farmlands and natural habitats and it is the second biggest component of the R-ISEW.

To understand the policy implications that the R-ISEW index can provide, it is relevant to highlight that the *absolute* values of each component is what determines its level of importance within the index. By ranking the absolute figures per component (starting from the most negative ones), it is possible to easily identify the policy areas that can make the biggest difference to the index.

Table 9 shows the top 5 components of the West Midlands' index. From the table we can see that the priority for the region should be long-term costs of climate change; resource depletion; costs of income inequality; net international position and costs of commuting and car accidents.

Table 9 Components of the R-ISEW with the biggest negative values, 2006

R-ISEW Component	Component group	Impact on WM performance	Potential influence by regional policy
Long-term costs of climate change	Environmental	-£1,884	Medium
Resource depletion	Environmental	-£1,848	Medium
Cost of income inequality	Social	-£1,288	Medium
Net international position	Economic	-£703	Medium
Cost of commuting and car accidents	Social	-£525	Medium

4 Next Steps

During 2009/10 we will be developing the low carbon evidence base further. Alongside work being commissioned through consultants by colleagues at Advantage West Midlands we will be producing a number of projects including the following work.

Regional Growth into a Low Carbon Economy - This major project will consider evidence about the opportunities available to the region to develop a low-carbon economy. The first stage of this project will take existing analysis of risks and opportunities from carbon reduction by sector and update them and map them at local level across the region. This element will also include sub-regional reviews of the various WMES monitoring indicators relating to the low carbon economy.

The main stage of the project will seek to identify key areas for low carbon economic opportunities and how to monitor the growth and diversification into the relevant sectors. This will involve a combination of research work, to be undertaken by the Observatory, and policy-related work which will be contracted to an external supplier.

Once the work outlined above has been completed, a further stage will be undertaken to develop a clear understanding of the skills needs that the region will face to take advantage of the opportunities identified. Details of how this will be delivered will be agreed with the Observatory's Skills Research Team.

Once the evidence has been created, we will find approaches to presenting and disseminating the data so that it is readily accessible for local authorities, and for sub-regional and regional policy makers. As part of that process we will work with local authorities to establish how the evidence might be used within local economic assessments.

The project is likely to be ongoing throughout the majority of 2009-10. An interim report will be produced by the end of August 2009.

Regional Index of Sustainable Economic Well-being- During 2008-09, the Observatory produced an analysis of the R-ISEW, showing the latest regional position overall and for each of the components which make up the index. This also identified which components could be readily influenced by regional policy. The R-ISEW will be updated towards the end of 2009 and we will produce a report updating our earlier analysis. This will be completed by the end of January 2010.

Wider Monitoring of Agreed Indicators - In addition to the regional benchmarking indicators, the Observatory developed two further sets of monitoring indicators during 2008-09, covering the Climate Change Action Plan and Greenhouse Gas emissions. These will also be subject to ongoing monitoring and development during 2009-10 and, as with the previous set, we will seek to enhance them with a particular focus on sub-regional reporting.

We will produce a monitoring report covering both of these sets of indicators by the end of December 2009.

In addition some areas where the mainstream of sustainable development can impact on other areas of policy might include:

- The impact of sustainable communities on economic exclusion.
- What opportunities does Sustainable Development provide for enterprise and innovation?
- Can sustainable development principles make the Region's transport system more efficient?

Appendix A: Indicators

More than 25 indicators were recently updated by the Observatory in the documents summarised in this report. In some cases the same indicator was presented using different units in order to provide the right evidence to our research. The indicators can be grouped in the categories listed below:

- **CO₂ emissions:** CO₂ emissions / £mGVA; CO₂ emissions per capita; CO₂ industrial and commercial and public sector emissions (kt); domestic CO₂ emissions estimates per capita; CO₂ emissions per resident; transport CO₂ emissions
- **Energy consumption:** Final energy consumption per head (kWh); Total final energy consumption (kWh/£GVA); total energy consumption (GWh) estimates by fuel type; electricity consumption; total industry and commercial energy consumption GWh per £billion GVA; total industry and commercial energy consumption by employee (kWh); domestic energy consumption by fuel type; industry and commerce energy intensity (kWh / £GVA)
- **Households:** Percentage of waste recycled by households; average SAP rating of homes; homes not meeting decent homes standards; households in fuel poverty
- **Transport:** Total fuel consumption for road transport per head of population (kg per person); percentage of trips to work by car; number of car trips per person per year; percentage of people working from home or travelling to work using sustainable means of transport
- **Renewables:** CHP heat capacity installed; renewable electricity generation capacity; generation of electricity from renewable sources; proportion of renewable electricity capacity utilised.

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