



SevernWye
ENERGY AGENCY

Energy Status Report for UK Communities: Stroud and Swindon

Innovative Thinking

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Report

Intelligent Energy Europe

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1 Introduction to UK Communities: Stroud District and Swindon Borough

1.1 Introduction

The UK communities partnering on the Innovative Thinking project are Stroud District and Swindon Borough.

The local councils representing these communities, **Stroud District Council** and **Swindon Borough Council**, are working in partnership with a local not-for-profit energy agency, **Severn Wye Energy Agency**, to deliver the program.

The communities of Stroud and Swindon are located on the border between the Counties of Gloucestershire and Wiltshire. Whilst Stroud District (in Gloucestershire) is a predominantly rural area, Swindon (in Wiltshire) is a mainly urban area. The town of Swindon itself is growing rapidly with several large new residential and industrial developments planned in the area. Both municipalities have recently begun work towards developing climate change or carbon management strategies and aim to develop methods to engage the wider community with this process.

1.2 Stroud District

Stroud District is a largely rural area covering 175 square miles in the south of the County of Gloucestershire, with a population of nearly 109,000 (mid-2003 estimate). Three quarters of the District's residents live in or around the area known as the 'Five Valleys' (whose focus is the town of Stroud), and in the Market Towns of Berkeley, Cam, Dursley and Wotton under Edge. The District is bordered by 42 kilometres of the Severn Estuary coastline to the West and is accessible to the open sea via Sharpness Docks. The eastern half of the District falls within a designated Area of Outstanding Natural Beauty, the Cotswolds. Historically, Stroud and the wider District were important in the textile industry. The area is home to canals and notable mill buildings from the 18th and 19th Centuries. Ebley Mill, a former cotton mill, was converted to provide offices for the Council in the 1980s.

In April 2004 there were a total of 47,172 dwellings in the Stroud District. Of these around 86% in total are owner-occupied and privately rented (around 5-7%). A further 12% are rented from the Council. On the National Index of Multiple Deprivation the District is ranked 289th out of 354, which places it as less deprived than average. However, there are significant areas of the district where jobs, training and affordable housing have been difficult to access for sometime and remain so at present. There are also several large ex-employment sites which are due to undergo re-development as a contribution to regeneration of the area, but this process is only part way through. Also the rural nature of the district and mixed social make-up of smaller geographical communities can mean that individual deprivation is masked in the general statistics. For example estimates in the 2001 House Condition Survey demonstrate that somewhere between 5000-7000 households are experiencing fuel poverty at any one time.

1.3 Swindon Borough

Swindon Borough has a wonderful blend of urban and rural landscapes including the North Wessex Downs area of outstanding natural beauty, 88 country wildlife sites and 2 nature reserves. The protection, conservation and improvement of these is vital to maintaining and improving our local biodiversity and the quality of life for all who live and work in the borough and beyond.

Population of Swindon Borough is 181,000 with a good mix of people from different cultures and countries.

There is a high projected population increase, estimated at 61,000 new residents by 2011. Demand for residential and commercial land and associated infrastructure, traffic and waste disposal could place a heavy burden on our natural environment. We therefore need to ensure we develop in a sustainable way and not be afraid to say no to short-term gains that risk irreversible damage to our environment

Swindon is a major centre of employment, shopping, leisure and community facilities thanks largely to its excellent transport links and as such the town is the UK base for the corporate headquarters of several major companies such as Honda, BMW, RWE Innogy, Nationwide Building Society and Arrival PHH

Four of the government's Research Councils and the National Monument Record Office are based in Swindon and the town enjoys lower than the national average unemployment rates.

84 schools serve the borough and Swindon has a wide range of sports and leisure facilities including two major sports centres, an indoor tennis centre and two championship golf courses.

2 Objective of the Energy Status Report

The objective is to record and display the energy status of each community by presenting the actual energy consumption (in GWh) for the baseline year of 2005. The energy consumption will be broken down into consumption by different fuel types (electricity, natural gas, non transport petroleum products, transport fuels, coal and other fuels) as well as by residential and non residential end users. Other factors that will be assessed in the report are the CO₂ emissions (in tonnes) in each of the communities and the present contribution (expressed as a percentage) from renewable energy and energy from waste.

The present energy status is a starting point for (policy) actions in the field of sustainable energy and energy saving and will form the basis for the direction of the Community Energy Action Plan that is to be compiled under Work Package 3.

The energy status report will show the activities and sectors that are consuming the most energy and which are responsible for the highest carbon dioxide emissions. This research will help to direct the actions in the action plan and target the areas which need most urgent attention. The status report is designed to be a 'one stop shop' where the wider community energy usage and CO₂ emissions are recorded and presented in an accessible format.

The status report can also be used a 'baseline' position against which energy consumption, CO₂ emissions and renewable energy generation data for future years can be compared.

The status report has been compiled with reference to the 'Energy Barometer' developed by the Dutch partner 'SRE Milieudienst'.

3 Data Sources

3.1 DBERR Regional Energy Statistics

The main data source used for the energy status report is the Regional Energy Statistics produced by the Department of Business, Enterprise and Regulatory Reform (DBERR). The data is compiled annually and gives total final energy consumption for each Local Authority area in the UK. The dataset combines natural gas consumption, electricity consumption, use of other fuels (solid fuels, renewables, industrial petroleum and coal) and use of transport fuels for each area.

The data currently takes around 3 years to become available hence the latest figures used in this report are for 2005.

According to DBERR 'the data is produced to emphasise the importance of local and regional decision-making for energy policy in delivering a number of national energy policy objectives'

The statistics are available at

<http://www.berr.gov.uk/energy/statistics/regional/index.html>

3.2 DEFRA CO₂ Emissions

The report will also use the experimental statistics of carbon dioxide emissions for local authority areas produced by AEA Technology on behalf of DEFRA for years 2003, 2004 and 2005 – see

<http://www.defra.gov.uk/environment/statistics/globalatmos/galocalghg.htm>

The CO₂ emissions data used in this report is for 2005* only and will serve as a baseline position for future years.

*The data compilation process is still classed as experimental and is still improving; according to DEFRA 'because there have been improvements in both the raw data and in the modeling methods used, the 2005 estimates are not comparable with those for 2004'. 'It is expected that further developments in the next year will enable consistent comparisons over time to be possible from the 2006 dataset onwards. Users of the data should note that when the 2006 dataset is published in 2008, it is also intended to review and revise the 2005 dataset in line with the changes in the underlying data and methodology, so as to also enable comparisons between these two years. The publication of all future years' datasets will then also be accompanied by an update to previous years' datasets from 2005 onwards, to ensure a consistent time series is maintained'.

3.3 Renewable Energy

The renewable energy data for the report has been sourced from the *REGENSW Renewable Energy Projects in the South West* April 2007 document available at <http://www.surveys.energysw.com/> and the DBERR Regional Energy Statistics referenced above.

3.4 Population Data

Population data has been sourced from The Office for National Statistics England and Wales:
http://www.statistics.gov.uk/downloads/census2001/KS_LA_E&W_part1.pdf

4 Results

This section provides a graphical representation of the data and gives a brief analysis of the information provided. The section has been split by Local Authority area to provide a simple reference document for use by each community.

4.1 Stroud District

4.1.1 Total Energy Consumption and Population (2005)

Population	108,000
Total Energy Consumption (GWh)	3,642.1
Per Capita Energy Consumption (MWh)	20

4.1.2 Energy Consumption Trends 2003 -2005

The following graph displays the energy consumption trends in Stroud District over the three most recent years for which data is available – 2003, 2004 and 2005.

The graph shows the energy consumption broken down by fuel type – electricity, coal, natural gas, petroleum products (excluding transport fuels) and transport fuels.

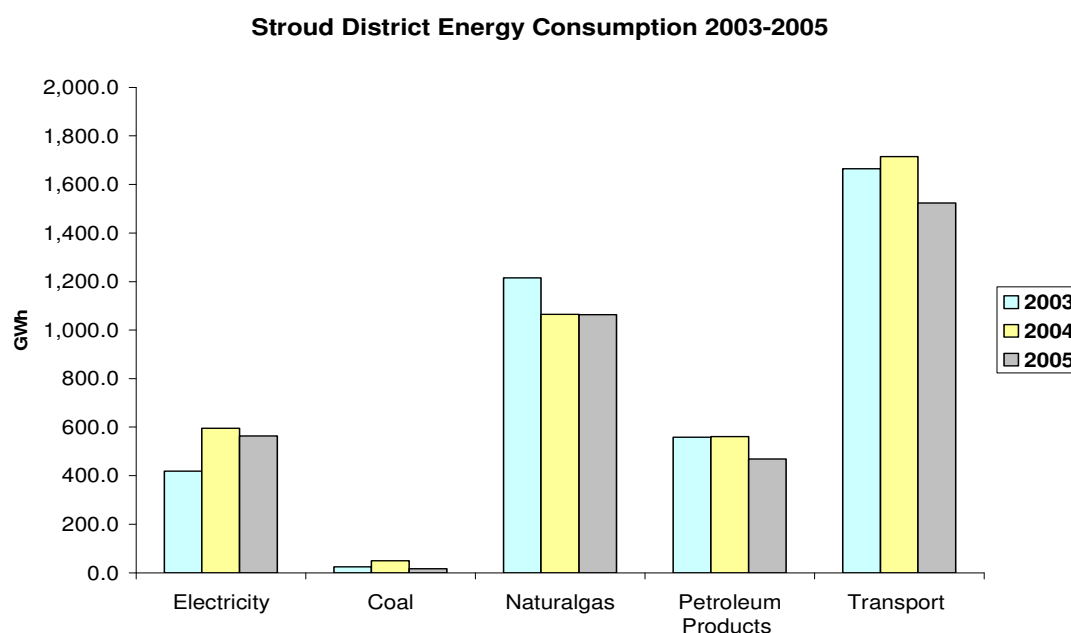


Figure 1: Energy Consumption Trends in Stroud District by Fuel Type 2003 – 2005

Electricity

Electricity consumption increased significantly between 2003 and 2004 before falling slightly in 2005 – consumption in 2005 remained 144.6GWh higher than in 2003.

Natural Gas

Natural gas usage has declined year on year throughout the period.

Petroleum Products

Non transport petroleum product consumption remained steady 2003 – 2004 before dropping in 2005.

Transport Fuels

Consumption of transport fuels increased between 2003 and 2004 and then declined again in 2005.

Coal and Other Fuels

Consumption of coal and other fuels peaked slightly in 2004 but makes up a very small percentage of overall use.

Total Energy Consumption

Overall energy consumption in Stroud District mirrors this general trend with overall energy consumption (in GWh) for 2003 at 3894.2 rising to 3,996.2 in 2004 and then dropping to 3,642.1 in 2005.

4.1.3 Energy Consumption by Fuel Type

The following pie chart shows total energy consumption by fuel type for 2005 in Stroud District:

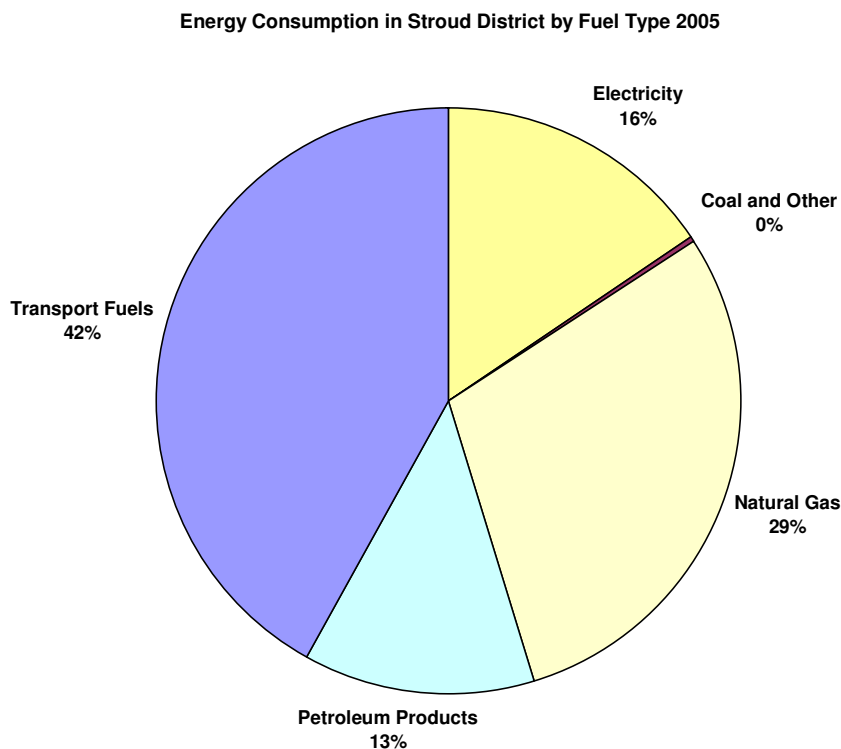


Figure 2: Energy Consumption in Stroud District by Fuel Type 2005

Transport fuels clearly accounts for the largest amount of energy consumed – 42% of total consumption in 2005 – followed by the use of natural gas - 29% of total in 2005. Electricity, although the only fuel with consumption levels higher in 2005 than 2003 (see Fig. 1), accounts for only a small percentage (16%) of total energy use.

4.1.4 Energy Consumption by End User

The non-transport energy consumption was analysed by end user showing the use of each fuel type in the domestic and non domestic sectors – the bar chart shown in Fig 3 shows the results:

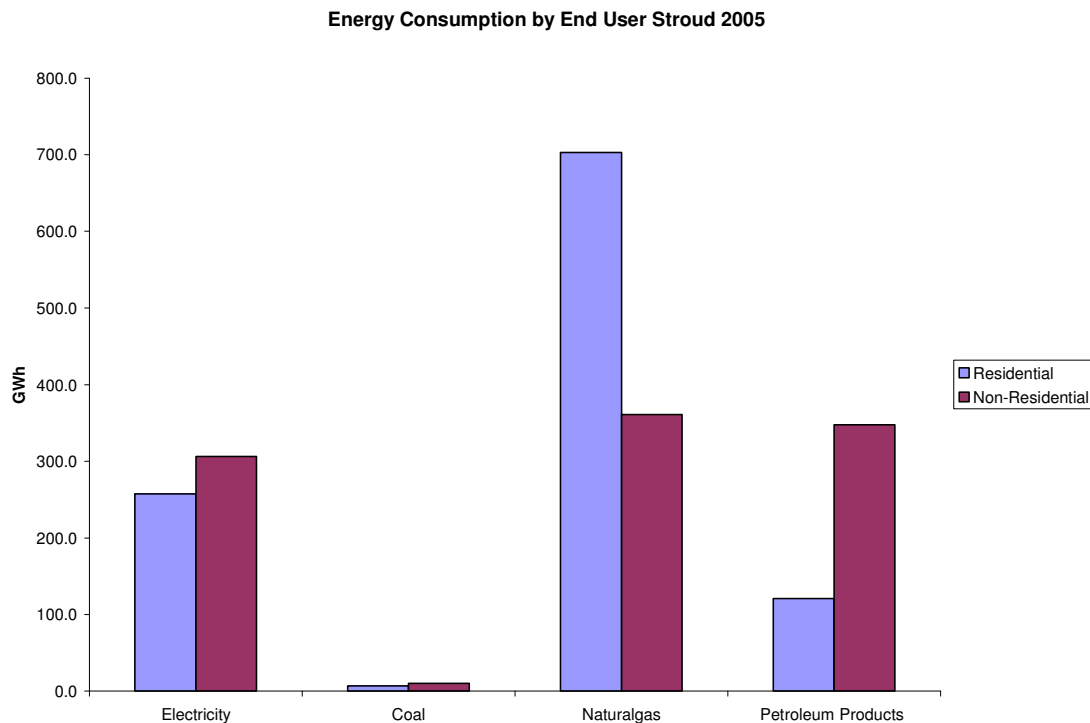


Figure 3: Non Transport Energy Consumption by End User

The graph clearly shows that the single greatest use of non transport energy use is natural gas in the domestic sector. In 2005 domestic use of natural gas accounts for 66% of all natural gas usage in the district and 33.3% of all non transport energy use.

Consumption of natural gas, electricity and petroleum products is fairly even across the non domestic sector.

4.1.5 CO₂ Emissions

Although it is important to identify the distribution of energy use in the District it is also necessary to examine the sources of carbon dioxide emissions.

The DEFRA study gives two figures for CO₂ emission from each community, the first is overall CO₂ emissions from each area and the second is an adjusted figure that takes out motorway travel, all diesel rail travel and the very largest emitters such as power stations. This adjusted figures aims to give a better account of carbon emissions from each area as it seems unfair for a community to be held responsible for emissions from a motorway or high speed train line that passes through the area or for large industry and power station located in the district. The second adjusted figure is important as it will be used as one of the National Indicator set (NI 186) that has been introduced by central government and will be reported on by each Local Authority.

The first pie chart (Figure 4) shows all emissions from Stroud District:

Stroud District CO2 Emissions by Sector 2005

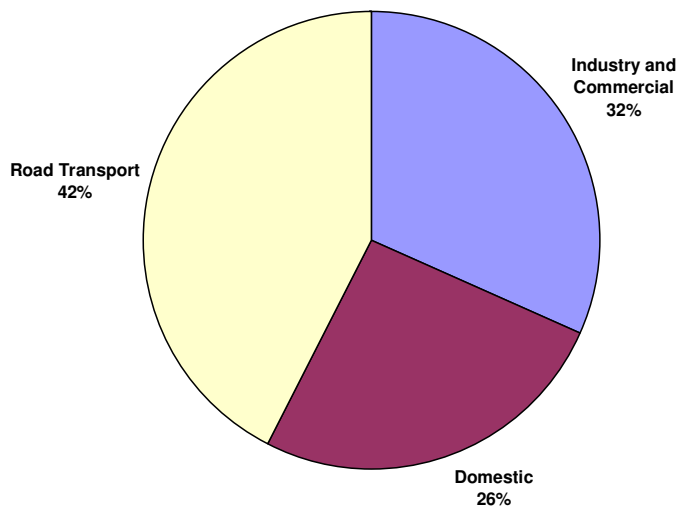


Figure 4: Overall CO2 Emissions from Stroud District 2005

Figure 5 shows the breakdown of emissions after the adjustments have been made for the NI 186:

CO2 Emissions Stroud District for National Indicator

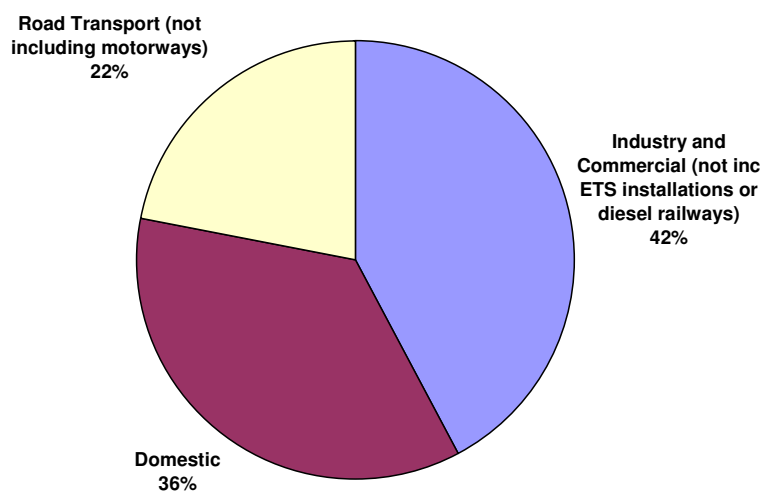


Figure 5: CO2 Emissions for Stroud District with NI186 Adjustments

The most obvious change is the reduction in the percentage share from transport emissions (they drop from 42% to 22%) once the motorway travel has been removed.

The DEFRA study also gives figures for Per Capita CO₂ Emissions from each local authority area -

Per Capita CO₂ Emissions (for NI 186) for Stroud District 2005 = 7.6 tonnes

4.1.6 Renewable Energy

Total Energy Consumption	3,642.1 GWh
Renewables and Energy from Waste	5.9 GW
Percentage Contribution of Renewables and Waste	0.16 %

4.1.7 Breakdown of Renewable Energy Contribution

Grid connected non domestic renewable electricity projects	10
Installed Capacity	2.61MW
Renewable Heat Projects	2
Installed Capacity	0.01MW

4.1.8 Stroud District Council Activities

Stroud District Council has recently begun to assess its own carbon footprint. An initial estimate for the period 2006-07 is as follows:

Fleet and other business mileage	= 180.8 tonnes
Gas and oil consumption for heating (across all sites managed directly by the council)	= 360.9 tonnes
Total Emissions (CO ₂)	= 541.7 tonnes

This estimate does not include business mileage for modes other than cars, or emissions from electricity which is currently purchased via a renewable tariff. 1,422,310 kWh was consumed across all sites managed directly by the council in 2006/07.

This estimate also does not currently include emissions from energy use at the leisure centre and two swimming pools in the main town of Stroud. The buildings are leased by the council to the current operator, Parkwood Leisure, and energy bills are not paid by the council. The council is about to join the Carbon Trust Carbon Management Programme for local authorities. This ten month programme will allow the council to carry out a much more detailed audit of its emissions during 2008/09. First steps have included a site energy survey of the leisure centre to identify the potential for cutting emissions.

4.2 Swindon Borough

4.2.1 Total Energy Consumption and Population (2005)

Population	180,000
Total Energy Consumption (2005)	5,134.4 GWh
Per Capita Energy Consumption (MWh)	30

4.2.2 Energy Consumption Trends 2003 -2005

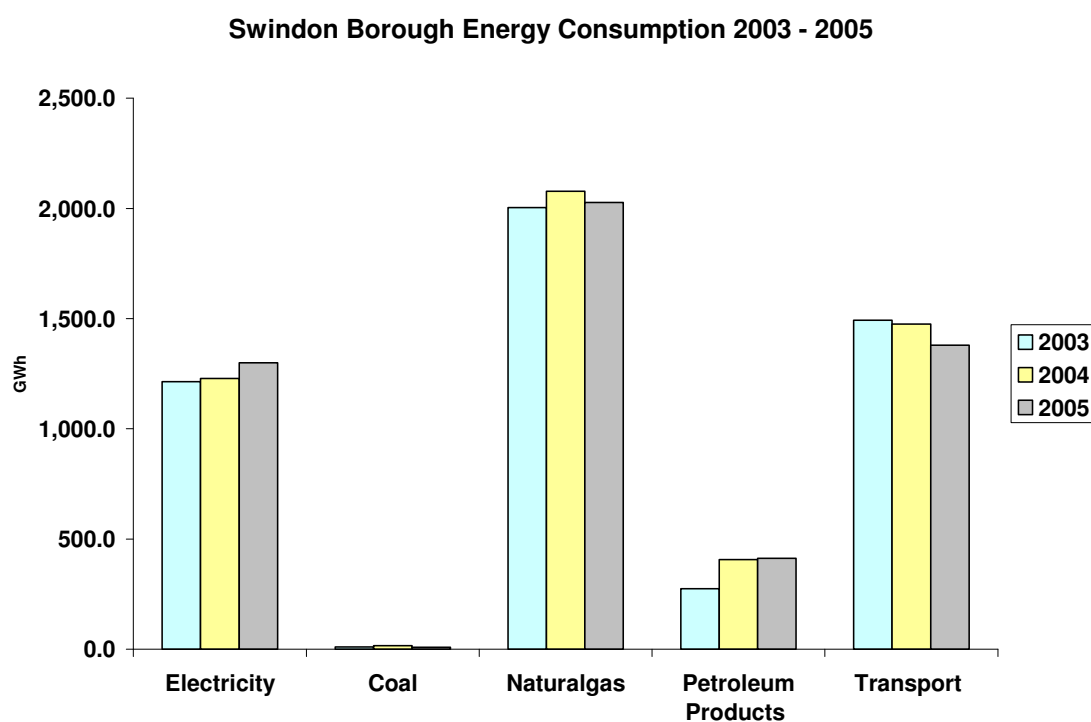


Figure 6: Energy Consumption in Swindon Borough by Fuel Type 2003 – 2005

Electricity

Electricity consumption has increased steadily year on year over the period 2003 – 2005.

Natural Gas

Consumption of natural gas increased in 2004 then dropped slightly in 2005 but to a level slightly higher than the 2003 level.

Petroleum Products

Non transport petroleum product consumption rose in 2004 and then stayed steady in 2005

Transport Fuels

Consumption of transport fuels declined year on year over the period 2003 - 2005

Coal and Other Fuels

Consumption of coal and other fuels peaked slightly in 2004 but makes up a very small percentage of overall use.

Total Energy Consumption

The total energy consumption (in GWh) by Swindon Borough reflects the overall trend with consumption growing from 5,001.2 in 2003 to 5,210.3 in 2004 and then dropping slightly to 5,134.5 in 2005.

Note that unlike Stroud District the overall level of consumption is higher in 2005 than in 2003.

4.2.3 Energy Consumption by Fuel Type

The following pie chart shows total energy consumption by fuel type for 2005 in Swindon Borough:

Energy Consumption by Fuel Type Swindon Borough 2005

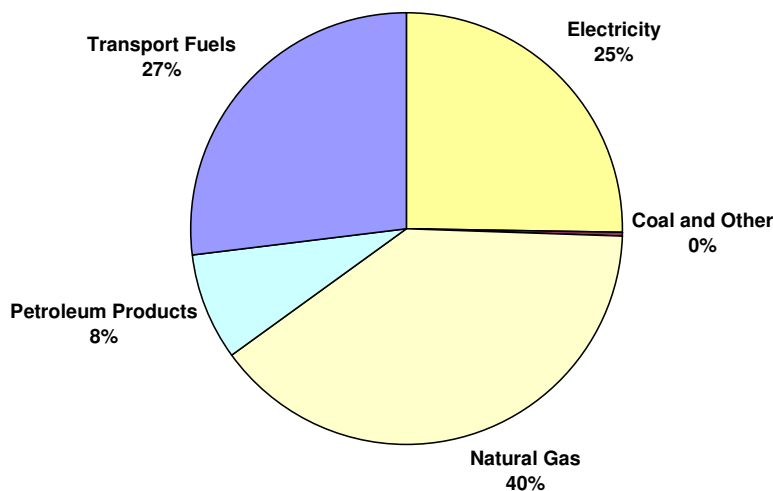


Figure 7: Energy Consumption by Fuel Type in Swindon Borough 2005

Natural gas makes up 40% of total energy consumption followed by transport fuels at 27% and electricity at 25% of consumption.

Petroleum products (non transport) and coal/other fuels make up the remaining 8%.

4.2.4 Energy Consumption by End User

The non-transport energy consumption was analysed by end user showing the use of each fuel type in the domestic and non domestic sectors – the bar chart shown in Fig 8 shows the results:

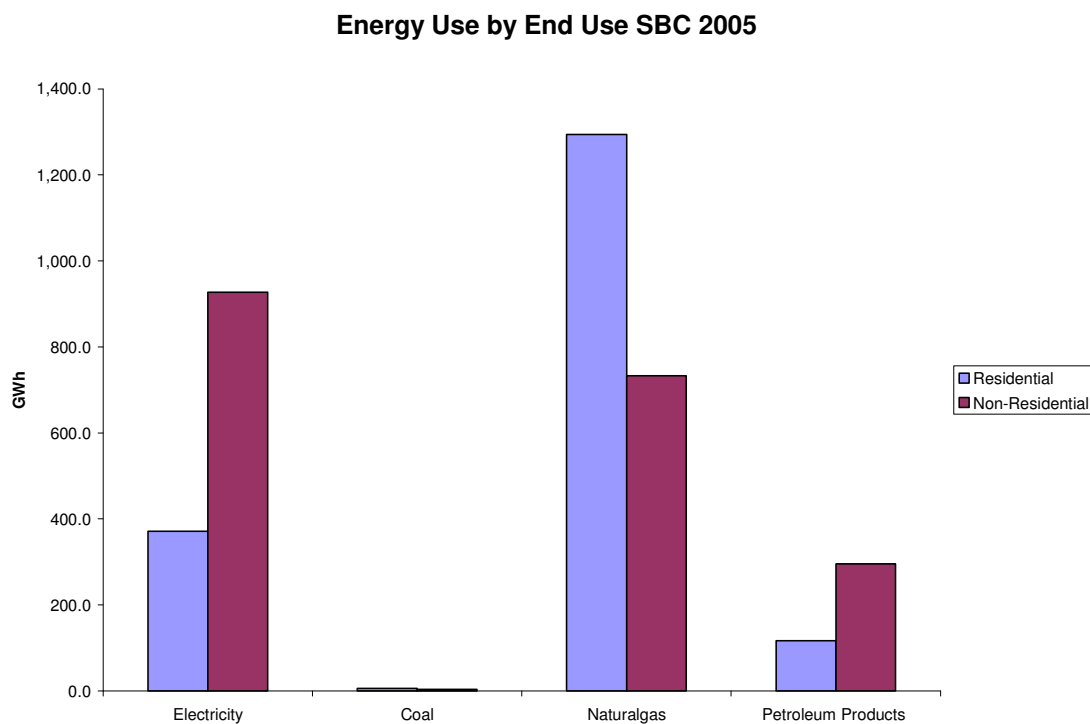


Figure 8: Non transport Energy Use by End User Swindon Borough 2005

As in Stroud District the highest non transport energy consumption is from the use of natural gas, and again the highest proportion of consumption is in the domestic sector. In 2005 domestic use of natural gas accounts for 64% of all natural gas usage in the district and 34% of all non transport energy use.

The graph shows high energy consumption of electricity in particular, but also natural gas and non transport petroleum products in the non residential sector in Swindon Borough. This trend reflects the highly industrialised nature of Swindon Borough with the town being the headquarters for several large companies as described in Section 1.3.

4.2.5 CO₂ Emissions

As for Stroud District the CO₂ emissions from the DEFRA data have been studied for Swindon Borough. The following pie charts show the total CO₂ emissions and the adjusted figures for the National Indicator 186.

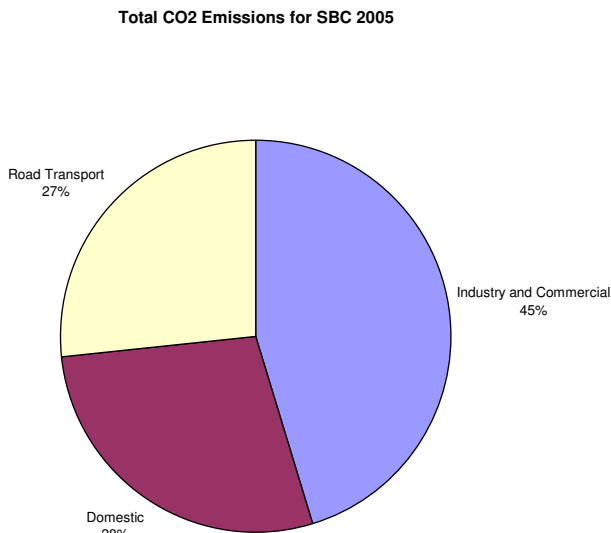


Figure 9: Total CO₂ Emissions from Swindon Borough 2005

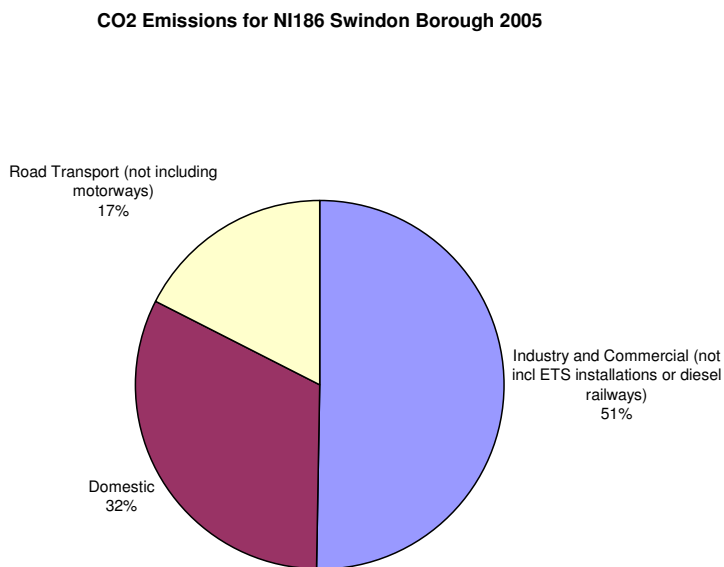


Figure 10: CO₂ Emissions Adjusted for the NI186 Swindon Borough 2005

As with the figures for Stroud District the adjustment for the NI 186 shows a decrease in emissions from road transport (27% to 17%) once the motorway travel has been removed.

Per Capita CO₂ Emissions (for NI 186) for Swindon Borough 2005 = 7.8 tonnes

4.2.6 Renewable Energy

Total Energy Consumption (2005)	5,134.4 GWh
Renewables and Waste	5.6 GWh
Percentage Contribution of Renewables and Waste	0.11%

4.2.7 Breakdown of Renewable Energy Contribution

Grid connected non domestic renewable electricity projects	6
Installed Capacity	3.55MW
Renewable Heat Projects	2
Installed Capacity	0.1 MW

5 Conclusions

5.1 Stroud District

The overall figures for 2005 are encouraging as they show a reduction from 2003 and 2004 figures.

Use of natural gas in domestic properties is clearly an area that needs to be addressed followed by use of natural gas, electricity and petroleum products in the non domestic sector.

Transport energy consumption is significantly higher than other uses but this is in part due to transport links (M5 and mainline railway) that pass through the district. As shown in Figure 5 once these factors are removed the emissions (and energy use) associated with transport drops significantly from 42% to 22% of emissions leaving roughly equal emissions of around 40% from the domestic and industrial/commercial sectors.

The Council has begun to evaluate and address the emissions from its own operations and activities.

5.2 Swindon Borough

Unlike Stroud, Swindon overall energy usage increased in 2005 from 2003 and 2004. It should be noted however that population has also increased and will continue to grow faster than most other areas in the UK.

Natural gas usage is high in Swindon Borough and around two thirds of this is in the domestic sector. Energy efficiency in households is clearly an area in which action can have a significant impact and will be a key focus for future work.

The non domestic sector shows high energy use, particularly electricity, but also natural gas and non transport petroleum products. Action to tackle industrial energy use is likely to have significant effects in the borough. Swindon Borough Council has therefore recently developed a carbon reduction programme to reduce its energy use and resulting emissions and will lead by example.

5.3 Overall Conclusions

Transport energy use and emissions are high in both communities and concerted action to tackle this sector is crucial.

The use of natural gas for heating in domestic properties makes up a significant proportion of the non transport emissions and action to improve energy efficiency, particularly in older stock, is vital.

In Swindon Borough in particular the electricity consumption in the non domestic sector is high – the opportunity for savings from business energy efficiency measures would be worth further investigation.

Use of renewable energy, both electricity and heat needs to be significantly increased in both communities, current contribution to overall energy use stands at 0.16% in Stroud District and 0.11% in Swindon Borough. These figures need to increase urgently for the communities to be contributing to both national and regional targets on renewable energy.

5.4 Contact Details

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