

Get Serious About CO₂ media briefing

Background

Friends of the Earth has commissioned new research from Carbon Descent which analyses the manpower required to insulate homes and businesses, fit renewable energy to buildings and install low carbon district heating systems – which are some of the key ways in which councils could achieve a reduction in their emissions of at least 40 per cent by 2020.

New jobs could be available as loft ladders, architects, plumbers, builders, electricians, plasterers and insulation specialists – with new admin, transit and warehouse positions also created to support the installation of insulation and renewable energy.

The latest science tells us that rich countries like the UK have to cut their emissions by at least 40 per cent by 2020. Otherwise, climate change will make a billion of the poorest people in the world homeless – and people in the UK will be affected too by increased flooding and droughts, rising food prices and economic instability.

How was the research conducted?

Friends of the Earth has commissioned independent research from Carbon Descent to support our Get Serious About CO₂ campaign, which is calling for councils to make serious cuts in their carbon dioxide emissions.

Carbon Descent is an independent social enterprise and environmental trust working to measurably reduce carbon footprints. Carbon Descent has worked in the key areas of energy, resource use, transport, the built environment and renewables for over 10 years, partnering with local authorities, private business, charities and communities.

www.carbondescent.org.uk

This briefing explains two models that Carbon Descent built, which enabled Friends of the Earth to calculate:

1. How many jobs could be created within a local authority area if the council insulated buildings and fitted renewable energy
2. Whether it is technically feasible for local authorities to cut emissions in their area by 40 per cent by 2020

1. Job creation

What did we want to know?

We wanted to know how many jobs could be created if the council insulated buildings and fitted renewable energy in each of the local authority areas that we are running our Get Serious About CO₂ campaign.

How were the results calculated?

Carbon Descent's model for Friends of the Earth has been built on the basis of "how many people does it take to change a light bulb".

For a range of energy efficiency and renewable technology measures, the model assumes a set amount of hours that it would take for a person to install them.

The spreadsheet is then tailored to any local authority by entering in specific information about that area – for example the amount of homes that have cavity walls that could potentially be filled.

The spreadsheet then aggregates the figures and adds in factors for leave, sickness, administration and other back-up to the front-line installers.

The figures do not include jobs created in manufacturing the equipment and materials, nor in the construction of large new combined heat and power district heating installations nor in additional public transport required. They are therefore likely to be a conservative estimate.

Which insulation and green energy measures was the computer model based on?

The number of jobs created in each area is calculated based on insulating cavity walls of homes, insulating lofts of homes, insulating external and internal walls of homes, fitting solar photovoltaic installations and solar hot water installations to homes and commercial premises, fitting heat pumps to homes, upgrading existing district heating schemes so they run as combined heat and power and installing commercial combined heat and power schemes in office buildings.

How long did Carbon Descent assume it would take people to fit each measure?

Carbon Descent surveyed businesses currently undertaking exactly this type of labour to find out how long different insulation and green energy measures take to install – in homes and commercial properties.

For example, this survey showed that:

- two people would take a third of a day to insulate the cavity walls in a home
- two people would take up to ten days to fit external insulation to a house
- two people would take three days to fit internal insulation to a terraced house, or 6 days for a detached house
- two people can do five loft installations per day
- two people take two days to fit solar photovoltaic to a house, and it takes a day to erect the scaffolding for the job
- two people take between 2 and 3 days to fit a house with solar hot water, and it takes half a day to erect the scaffolding
- two people take three days to fit heat pumps to a house

Time for administration for each task was also then taken into account.

For each local authority, what figures did we input into the model?

We obtained data specific to each local authority, some from recent surveys by the authorities themselves, but mainly from the Energy Saving Trust Home Energy Efficiency

Database. From this, we inputted the number of homes with cavity walls but without cavity wall insulation; the number of homes without good loft insulation; and the number of existing district heating schemes that could be converted to combined heat and power schemes.

For the other measures, we entered estimates of how many energy efficiency and renewable energy measures should be installed in order for that local authority to cut its emissions by 40 per cent by 2020. We obtained this data from a study by Carbon Descent on Hampshire, Tower Hamlets and Middlesbrough. We assessed which of these three councils each local authority was most similar to, and extrapolated figures for that local authority according to its population size.

How long does the model assume these jobs would last?

The jobs created would last for ten years.

The model factors this in by assuming that the energy efficiency and renewable energy installations will be fitted over a period of ten years. So the number of potential installations in each area is divided by ten as part of the calculation.

This piece of research doesn't look at work required beyond the next ten years. But in the Climate Change Act the Government is legally obliged to reduce the UK's emissions by 80 per cent by 2050 – so obviously work would have to continue beyond a ten year period to continue to reduce emissions.

Would all the people be employed by the local authority itself?

The local authority has the power to make decisions that would lead to the creation of these jobs. But the local authority is unlikely to be the direct employer of these positions.

The exact situation will vary from one local authority to another. People would be employed by private companies who specialise in insulation and renewable energy either in new businesses, or through the expansion of existing businesses. Social or community-owned enterprises may also play a role.

Some extra jobs would be created in councils, in policy, monitoring, quality control and handling grants but this research doesn't include these additional jobs.

How can you guarantee that these jobs would be created locally? Couldn't the kit be made anywhere in the country or even the world?

The model from which we've calculated the number of jobs doesn't assume that any of the jobs would be in manufacturing or distribution of the equipment and materials involved. All of the jobs factored relate to the installation of insulation and green energy. Installation is – by definition – done locally.

How would local authorities pay for this work?

Different local councils could fund these measures in different ways depending on their local circumstances.

Several councils are already fitting energy efficiency and renewable energy measures extensively.

Kirklees Council plans to offer free loft and cavity wall insulation to all of its 170,000 homes by 2010. Kirklees has funded this partly through central government's CERT programme. The Government's CERT scheme covers about 50 per cent of the cost of cavity wall and loft insulation. The rest of the cost is usually passed on to the householder. But in Kirklees, the council has made up the remaining costs themselves. The council has done this by borrowing against future council tax for the next 25 years. But a resident saves money over all –they pay £7 more in annual council tax but save around £150 every year on their fuel bill as a result of the extra insulation.

Local authorities have already successfully funded district heating schemes that run on green power. This is possible by encouraging private investment by setting up commercially profitable Energy Service Companies (ESCOs). For example, Southampton City Council entered into partnership with energy management company Utilicom to create an ESCO. The company has financed, built and now runs a district heating scheme that runs on geothermal and combined heat and power energy. The scheme produces £10,000 - £15,000 a year for the council and saved 11,000 tonnes of CO₂ a year.

Fitting renewable energy to homes can be funded by local authorities by offering cheap loans to householders. South Derbyshire is already running a renewable scheme like this – offering loans of up to £4,000 towards household renewable energy systems such as solar water heating, small wind turbines or ground source heat pumps.

Using existing resources and funding schemes, local authorities could make a significant start on the kind of insulation and renewable energy programme that could create these jobs. For all councils to follow the examples of South Derbyshire, Kirklees and Southampton, they will need more support from central Government.

Would other industries go bust in the area if we got these jobs?

Insulation and renewable energy businesses will receive an enormous boost. And the creation of new jobs in this industry is likely to stimulate the local economy even further, because more people have money to spend in local shops and on local services.

The Treasury assumes that for every hundred jobs created locally, another fifteen will be created as a result of this knock-on spending.

It is very unlikely that creating these jobs would lead to any negative impacts on other industries.

Would they be low-paid jobs?

The jobs created installing insulation and renewable energy will range from low-skilled and relatively low paid work like insulating lofts to extremely high-qualified work for architects and engineers.

Would people in my town need training to do all these new jobs – and where would that come from?

There is likely to be a need to train people who aren't already skilled in these trades.

There are already various apprenticeship schemes that local councils could use, and national government would need to provide further training programmes to address any skills gaps.

This is all just theoretical - but has this actually happened anywhere for real?

No local council is putting all of these measures into effect yet, but some are taking bold steps to tackle climate change and help their economy at the same time.

South Derbyshire's Renewable Scheme offers interest free loans of up to £4,000 towards household renewable energy systems such as a solar water heating system, small wind turbines or ground source heat pumps.

Kirklees Council, in Yorkshire, plans to offer free loft and cavity-wall insulation to all of its 170,000 homes by 2010. Already, 21,000 homes have been insulated, 120 jobs created, £150 a year saved from the average household's fuel bill and 18,000 tonnes of carbon been saved since 2000.

How many jobs would be created in local authority areas we studied?

Local authority area	Number of potential jobs
Anglesey	175
Birmingham	433
Bradford	211
Brent	491
Brighton & Hove	106
Bristol	179
Caerphilly	425
Calderdale	87
Camden	422
Cardiff	264
Central Beds	376
Cheltenham	51
Colchester	72
Dacorum	327
Cornwall	1,273
Darlington	46
Derby City	98
Ealing	551
East Sussex	1230
Exeter	53
Guildford	59
Hackney	389
Hampshire	3,567
Haringey	419

Harrogate	70
Harrow	388
High Peak	206
Islington	346
Lancaster	64
Leeds	301
Leicester	98
Lincoln	37
Liverpool	197
Luton	81
Manchester	200
Monmouthshire	227
Newcastle	128
N Herts	374
N Lincs	386
N Tyneside	83
Northumberland	784
Nottingham	115
Nottinghamshire	2,553
Oxford	66
Reading	62
Sheffield	215
Shropshire	751
Solihull	89
Southend	68
South Kesteven	379
Stoke	106

Surrey Heath	214
Telford	73
Warrington	89
Watford	36
West Lancs	300
Wight	360
Woking	41
Worcestershire	1,404
York	54
Total	22,249

22,249 jobs were predicted for these areas and the population of these authority areas is 16,091,400. This can be extrapolated to the population of England and Wales (50,075,000), resulting in the figure of 72,002 jobs.

2. Feasibility of 40 per cent study

What did we want to know?

We wanted to know if it was technically possible for local authorities in different parts of the country to achieve a reduction in CO₂ by 40 per cent by 2020 through local action; and if so, what mix of measures might achieve this.

What were the results?

In the three local authority areas that we modelled, we found that emissions cuts of 40 per cent are possible if enough homes are well insulated, enough renewable energy is installed, enough local energy is generated from combined heat and power plants, traffic is reduced and some low-carbon vehicles are introduced.

For example, in a local authority like Tower Hamlets in London, cavity wall and loft insulation alone could achieve a reduction of 3-5 per cent, reducing traffic could achieve a 4 per cent reduction and combined heat and power could achieve a reduction in emissions of up to 15 per cent.

On top of that, the Government has committed to generating 15 per cent of our energy from renewable sources by 2020, which will itself deliver a big chunk of the 40 per cent.

How does Carbon Descent's methodology work?

Carbon Descent has developed a software system called VantagePoint, which uses data about CO₂ emissions from domestic and commercial buildings and land transport in every

local authority area, alongside a list of possible carbon reduction measures and technologies (including energy efficiency, renewable energy and traffic reduction), figures for how much carbon these measures would save, the cost of these measures, and the saving in fuel bills over time.

To test a local authority, specific data for that area is entered:

- The number of homes, and the expected amount of population growth, demolition and new build
- The number of homes with inadequate loft insulation and unfilled cavity walls
- The amount (by m² floor space) of industry (excluding heavy industry in the European Trading Scheme), offices, retail and warehousing
- The volume and breakdown of traffic
- Any existing plans for insulation, renewable, traffic reduction
- Any existing plans for reducing emissions from the council's own estate and activities
- Assumptions about the carbon intensity of the electricity supply (if more electricity is produced renewably, then the average carbon per kilowatt hour is reduced and so the emissions attributable to local electricity consumption declines too).
- Assumptions about the price of fuel (gas, electricity, road fuel)

Carbon Descent then selects the numbers of measures that could reasonably be installed according to local circumstances. The software then calculates the CO₂ reductions that each measure will deliver and the total reduction. It also calculates the total capital cost of installation for each measure, the expected saving in energy bills, and whether the investment will pay for itself over time.

Has this methodology been used before?

This system has been used with a number of local authorities to develop a scenario of how they could reduce their emissions. The Energy Saving Trust is now working with Carbon Descent to make it available 'off the peg' to local authorities.

What local authorities did we run the model for?

We ran the model for three different local authorities: Tower Hamlets, Middlesbrough and Hampshire.

The three councils have very different characteristics so together paint a picture of local authorities across the country. Tower Hamlets is in inner London, run by Labour and is deprived. Hampshire is largely rural and controlled by Conservative, in the Home Counties and relatively wealthy. Middlesbrough is a unitary authority in the North East, also deprived, industrial, and Labour-run.

From the results from these three councils we can extrapolate the results for other councils across the country.

Which policy measures did we test?

Friends of the Earth suggests six policy measures that councils should implement in order to deliver cuts of 40 per cent by 2020.

The six policies are:

1. Providing free home insulation to all.
2. Fitting renewable energy to homes.
3. Reducing traffic levels.
4. Encouraging a shift to low-carbon vehicles.
5. Encouraging renewable energy through planning policies.
6. Setting up Energy Services Companies to invest in local low carbon energy systems such as combined heat and power.

Carbon Descent assessed what mix of the 6 policies would achieve 40 per cent with the best value for money.

What were the exact figures for the three local authorities?

	Domestic energy efficiency	Domestic renewables	Conversion of district heating schemes to CHP including biomass (e.g. through ESCOs)	Traffic reduction	Improved vehicle efficiency	Overall de-carbonisation of the electricity grid (e.g. through more local approval of renewable)	Improvements in the energy efficiency of commercial lighting	Total reduction in CO ₂ (%)
Tower Hamlets	2.9	0.15	7.5	1.7	2.5	24.3	1	40.5
Middlesbrough	5.6	0	5.3	2.9	6.5	22.2	0	42.5
Hampshire	6.2	4.7	2.7	5.6	6.6	16.5	0	42.3

Why do different measures deliver a different level of cuts in emissions in different areas?

Urban areas have denser housing, so gas consumption tends to be lower, and electricity contributes correspondingly to a higher proportion of emissions. This means that the reduction of carbon in the grid through national renewable energy programmes delivers a bigger CO₂ reduction.

In rural areas, much of the housing is made up of detached or semi-detached homes and insulation can have a greater impact on reducing emissions. In addition car journeys tend to be longer and a higher proportion of journeys are by car, so traffic reduction delivers a greater impact.

The model built by Carbon Descent is designed to assess which green measures will deliver cuts in carbon emissions in the most cost effective way. In urban areas, our data suggests that there are more cost effective ways to reduce carbon emissions by 40 per cent by 2020 than by fitting heat pumps and solar panels to homes. This is because fitting domestic small scale renewable energy measures like these is relatively expensive – and in an urban area the cuts can be made more cheaply through other measures. In reality, the economics of fitting domestic renewable energy will vary from one local authority to another – and should become more cost effective in the future. In any case, domestic renewable energy is likely

to be necessary to reduce emissions beyond 40 per cent by 2020 in both rural and urban areas.