



Leicester
City Council

FORWARD TIMETABLE OF CONSULTATION AND MEETINGS:

Overview and Scrutiny Management Board
Cabinet

22 March 2010
29 March 2010

Leicester City Council Carbon Baselines and Reduction Targets

Report of the Environment Team

1. PURPOSE OF REPORT

- 1.1 During the 2008 EMAS verifiers visit they raised a non-conformity (0806CER05) about the validity of the 1990 baseline and whether LCC could justify its level. Therefore this report introduces why it has been necessary to align the baseline with the data collected for National Indicator 185.
- 1.2 The report addresses the nonconformity and explores possibilities for the way forward.

2. SUMMARY

- 2.1 The Institute of Energy and Sustainable Development at De Montfort University carried out research in the 1990's using the DREAM data modeling system. The primary purpose of DREAM was to calculate a 1990 baseline for the *city* of Leicester.
- 2.2 At the same time DMU also produced a 1990 baseline for Leicester City Council using data sourced from old energy audits. This led to the adoption of an EMAS target to reduce the Councils carbon emissions by 50% by 2025 based on this 1990 baseline.
- 2.3 In 2009 Leicester City Council had to report on National Indication 185 for the first time. The data required for this included building energy use for all Council owned buildings including schools and outsourced services and transport emissions including fleet, grey fleet, business travel and outsourced services.
- 2.4 This report explores whether the data sets produced by DMU for 1990, 1999 and 2006 are comparable with the NI185 data, whether the 1990 baseline was accurate and what the best path forward would be.

3. RECOMMENDATIONS (OR OPTIONS)

- 3.1 That Cabinet agrees a new baseline, using the 2008/9 data, should replace the original 1990 unverifiable baseline. Given that any progress made on the original 1990 baseline has been reversed over the past few years, a new baseline on 2009 figures should be used. The baseline will tie with NI185 and should include street lighting, energy in buildings, fleet vehicles, grey fleet, business travel, schools and outsourced contractors but exclude district heating and those emissions related to providing the housing service (although these will still be recorded and reported).
- 3.2 That Cabinet agreed that from this point forward NI185 data should be used to report on EMAS target 1.1. Through NI185 the data will still allow us to separate our each emissions sector (schools, buildings, lighting etc).
- 3.3 That Cabinet agrees for ease of internal communication EMAS target 1.1 should be broken down into sub-targets. The 50% reduction target is very large and long term, which often makes it difficult to manage. The following sub-targets are proposed.
- 25% reduction between 2009/10 and 2014/15 based on 2009 baseline (17,000 tonnes)
 - 15% reduction between 2014/15 and 2019/20 based on 2009 baseline (10,000 tonnes)
 - 10% reduction between 2019/20 and 2025/26 based on 2009 baseline (7,000 tonnes)
- 3.4 That Cabinet agrees to set a new target for schools reduction to ensure it is comparable with other LCC targets. Change from “reduce schools energy use by an average of 1.43% per year between 2008/9 and 2025/26” to “reduce schools energy consumption by 50% by 2025/26 based on a 2008/09 baseline”
- 3.5 That Cabinet agrees to adopt two new targets for Council owned homes to ensure continued improvement of environmental performance. As the Council is landlord to approximately 25,000 properties we have a responsibility to ensure those properties are increasing their environmental performance. Therefore to ensure that the performance in social housing continues to improve by setting sub-targets under EMAS target 2.1 (“reduce city-wide carbon dioxide emissions by 50% on a 1990 baseline”). These new sub-targets should concentrate on key energy saving activities:
- Continue to increase loft insulation installation at a minimum of 300 homes per annum in the social housing sector
 - Continue to install heating controls at a minimum rate of 1000 per annum in the social housing sector.

4. REPORT

- 4.1 When the EMAS verifiers visited earlier in 2009 a non-conformity was raised about the validity of 1990 baseline against which we are measuring EMAS objective 1.1 (Reduce the Council’s Carbon Dioxide Emissions to 50% of the 1990 level by 2025/26).
- 4.2 We have been unable to access the energy figures used to collate the 1990 baseline data to be able to address this non-conformity.

- 4.3 There are a number of questions that should be addressed to rectify this issue:
1. How was the 1990 baseline calculated by DMU?
 2. What data was included by DMU in the figures for 1990, 2000 and 2006?
 3. How does this data compare to the NI185 methodology, which began in 2009?
 4. Using the data that exists, is there any visible trend for the last 19 years?
 5. When did LCC start collecting data that is both reliable and auditable?
 6. What are the options for the path forward?

4.4 How was the 1990 baseline calculated by DMU?

DMU were commissioned in the mid-1990's to calculate a 1990 baseline for the city and the city council. The emissions for the city were calculated using the DREAM model and for the Council figures were taken from survey and audit data.

- 4.5 Data for electricity, gas, oil, coal and were taken from Leicester City Council's 1989-1990 Energy Audit and figures for transport were estimated from a survey done in 1998/1999.

- 4.6 The accuracy of the data collection for the 1989-1999 Energy Audit has been brought into question. Given that the Council did not have comprehensive metering systems across it's buildings for this time it is unlikely to be as accurate as the data we collect today and so may not be comparable.

4.7 What data was included by DMU in the figures for 1990, 2000 and 2006?

DMU also collected data for subsequent years. However, for the 1999 estimate no water data was available and for 2006 figures from a survey carried out in 2000 were used. In addition for 1999 and 2006 employee commute was added in even though it was not included in the original baseline.

The figures sited by DMU for 1990, 2000 and 2006 also discounted any kWh bought from a green electricity tariff. NI185 insists that green electricity be counted in the same way as brown electricity.

4.8 How does the earlier data compare to the NI185, which began in 2009?

In 2009 was the first reporting year for National Indicator 185 (Council Carbon Emissions). The data collection process included all electricity and gas, fleet and grey fleet transport, outsourced services and schools. It was the first time all of this data had been collated together.

- 4.9 Table One shows the data included in each of the figures calculated by DMU and by NI185.

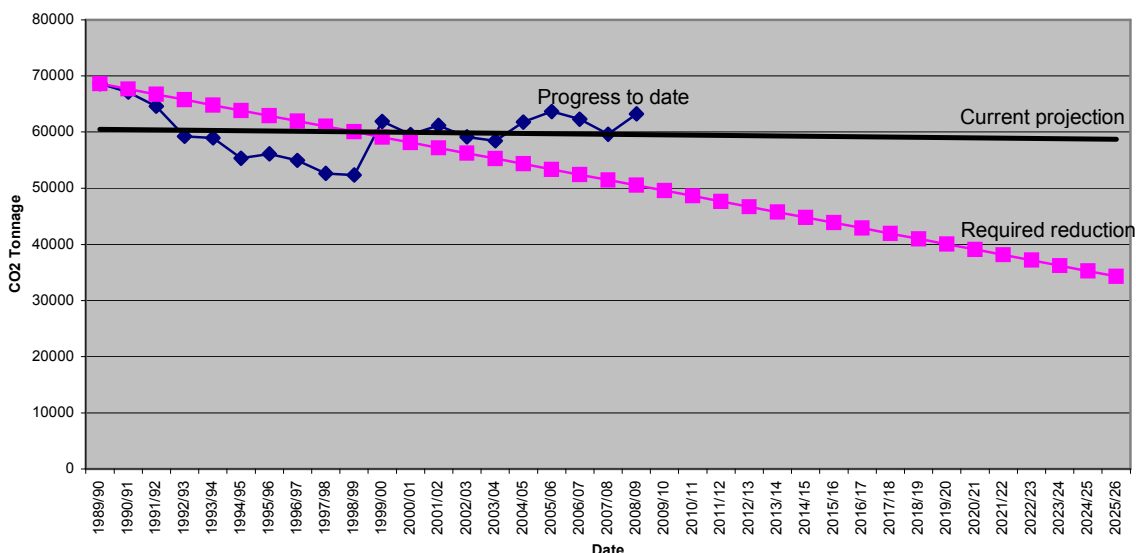
- 4.10 From the table the only fully comparable data for all years would be streetlighting, buildings and fleet. However, given that the data in the 1980-1989 Energy Audit has been called into question it may not be feasible to use data pre-2000.

Table One

| | | | DMU | | | NI185 |
|--|----|--------------------------------------|---|---|---|---|
| | | | 1990 | 1999 | 2006 | 2009 |
| Electricity, Gas, Coal, Burning Oil | 1 | Street Lighting | 1999 data used 16,232,558 (kWh) | 16,232,558 (kWh) | Green energy supply 20,014,057 (kWh) | 19,129,526 (kWh) |
| | 2 | Council (Including District Heating) | E: 19,547,911 (kWh) NG: 80,752,090 (kWh) BO: 6,489,207 (kWh) C: 51,465,965 (kWh) | E: 14,707,004 (kWh) NG: 130,645,107 (kWh) BO: 801,122 (kWh) Green: 2,710,890 (kWh) | E: 23,628,301 (kWh) NG: 153,560,787 (kWh) BO: 2,000,000 (kWh) Green: 6,797,900 (kWh) | E: 37,145,855 (kWh) G: 153,183,966 (kWh) |
| | 3 | Schools | No data | No data | No data | E: 20,283,911 G: 58,247,034 BO: 1,339,187 |
| | 4 | Outsourced | No data | No data | No data | E: 6,496,141 G: 2,910,371 |
| Transport energy | 5 | Council (Fleet) | 1999 data used P: 138,000 litres D: 2,162,000 litres | P: 138,000 litres D: 2,162,000 litres | P: 52,218 litres D: 4,489,277 litres BD: 78,383 litres | P: 40,325 litres D: 1,682,839 litres |
| | 6 | Schools | No data | No data | No data | P: 1070 CO2 tonnage D: 4,763 CO2 tonnage |
| | 7 | Outsourced | No data | No data | No data | P: 61 CO2 tonnage D: 2,210 CO2 tonnage |
| | 8 | Grey fleet | No data | No data | No data | 821 CO2 tonnage |
| | 9 | Commute | No data | P: 2,717,165 litres D: 711,756 litres | Previous data used P: 2,717,165 litres D: 711,756 litres | No data |
| Water | 10 | n/a | 97 tonne CO2 | No data | No data | No data |
| Carbon tonnage DMU estimation | | | 74,000 ¹ | | 54,000 ¹ | |
| Actual Figure Based on audit data and DEFRA GHG conversion factors | | Includes sources 1, 2 and 5 | Actual figure = 68,626 | | Actual figure = 63,656 | Actual figure = 67,625 |

- 4.11 **Using the data available, is there any visible trend for the last 19 years?**
 Despite the discrepancies in data collection the data collected from the energy audits between 1990 and 2009 still gives a useful interpretation of trend over the last 19 years.
- 4.12 The graph below shows carbon emissions for Leicester City Council from 1990 to present, the path needed to hit the current target and the current trend.

LCC Carbon Emissions and Progress Towards Existing 2025 Target



- 4.13 The graph demonstrates that although good progress was made up to 1999 it appears that this work was largely reversed between 1999 and 2009. Actual figures show a very small actual decrease from the 1990 baseline (table below). This reversal can be attributed to continued increasing service delivery. Without the projects implemented (examples detailed below) we would have undoubtedly seen a significant increase.

| | |
|---------------|--------------|
| 1990 baseline | 68626 tonnes |
| 2009 levels | 67625 tonnes |

It is important to recognise that Leicester City Council has carried out a significant amount of work to cut the energy consumption (and so carbon emissions) of the Council's operations. The individual projects are too numerous to mention here however a few of the key actions that have been completed include:

- Installation of intelligent metering into over 300 Council buildings
- Installation of a number of renewable energy projects to Council buildings. Examples include photovoltaic arrays at Leicester Leys Leisure Centre and Mayflower Schools and a wind turbine at Eyres Monsell School.
- Lighting efficiency schemes have been completed in many of the administrative buildings cutting electricity consumption.
- A vast amount of work to increase the efficiency of our buildings through boiler replacements and insulation.
- Conversion of energy production to such as low carbon fuels. This includes increasing use of gas in place of electricity and powering boilers on biofuels. For example, the boiler at St Andrews runs on waste vegetable oil.

4.14 How far back does LCC have reliable data?

After consultation with the Energy Team and the Fleet Manager fully reliable data on all of the areas required can be obtained from 2005 onwards.

4.15 What are the options for the path forward?

4.15.1 Option One: Recalculate 1990 baseline using paper data

| Pros | Cons |
|---|--|
| Would allow all work to date to be taken into consideration | Historical data has dubious reliability |
| | Grey fleet data would have to be researched |
| | Although audit data is available original data collection is not – not auditable now |

4.15.2 Option Two: Set a new baseline from highest levels since 2000 for which we have good data in the system

| Pros | Cons |
|---|---|
| Data is reliable and auditable | Work pre-new date will not be able taken into consideration |
| Setting a start date a few years ago will allow us to plot a trend line on work to date | Target line in steeper than original |
| High impact projects of the last few years will be taken into consideration | Grey fleet data would have to be researched |

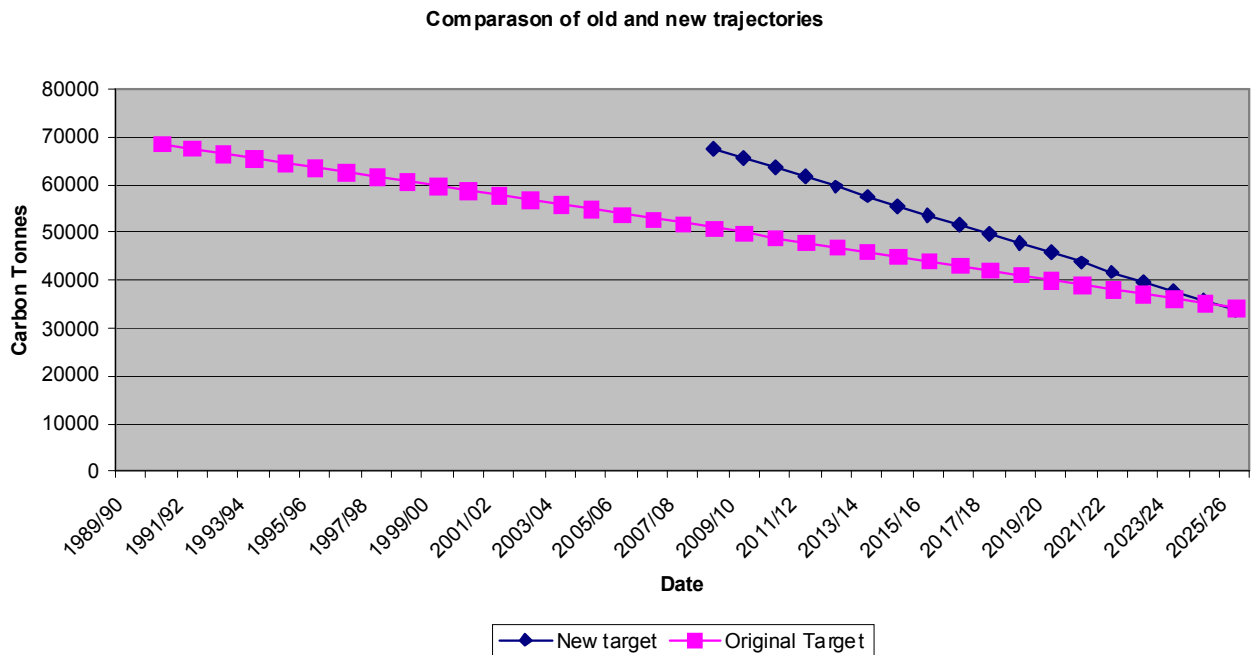
4.15.3 **Option Three:** Start a new baseline from 2009 given little actual progress had been made

| Pros | Cons |
|--|--|
| Data is reliable and auditable | No work pre 2009 will be taken into consideration |
| Fully comparable with NI185 | Target line will be much steeper than the original |
| Using only one number will greatly simplify interpretation | We would not be able to see a trend still will be uncertain of how we are doing. |
| Increased scope allows for a better representation of true emissions | |

4.15.4 The way forward

It is clear that Option Three has the most positive points attached to it.

The graph below show the comparison between the old target and the proposed new target in terms of the trajectory required.



To achieve this target we need to reduce our carbon emissions by 3.1% per year (1,988 tonnes per year)

4.16 It is worth noting that there are some commitments that Leicester City Council has made that will still run on a 1990 baseline (for example Covenant of Mayors).

4.17 The scope of the new baseline

Currently in the EMAS there are a number of objectives that are involved with this issue.

Objective No. 1.1 Reduce the Council's carbon dioxide emissions

Objective No. 12.1 Reduce the Council's total energy consumption

Objective No. 12.3 Reduce schools total energy consumption

4.18 Schools

Schools have not been included in any of the calculations above simply due to the fact that 2009 was the first year that the Council has collected full information on schools energy usage.

4.19 It is appropriate that schools exist as a separate target as they are responsible for such a high level of energy usage and carbon emissions (see exact figures below)

4.20 The current target is to reduce schools energy use by an average of 1.43% per annum between 2008/9 and 2025/6.

4.21 In the 2008/9 schools energy usage was 78,440 mWh creating just over 22,000 tonnes of carbon dioxide emissions.

4.22 The current target adds up to only a cut of 22.88% by 2025. It is unlikely that schools have already achieved a 27% reduction, which is what would be required to have a 50% reduction on a 1990 baseline.

4.23 Also, We are unable to quantify what the success has been in schools from 1990 to present day however, a number of projects have been implemented over the past few years (since 2006) through the EMAS schools programme. The new Sustainable Schools for the Future programme should provide high level savings in the future.

4.24 Therefore it would be reasonable to set a tougher target for schools that is more inline with other existing targets. A new target worded as below is suggested:

4.25 Reduce schools total energy consumption by 50% by 2025/26 based on a 2008/9 baseline.

4.26 Social Housing

Leicester City Council is directly responsible for the maintenance and upkeep of 22,371 homes. This number of houses will lead to a significant level of carbon emissions. Even though the Council is responsible for the maintenance it is the individual owner that sets heating controls and electricity consumption, each to their individual requirements. It is therefore not appropriate to include these with the Council's own targets.

4.27 There is also an EMAS objective relating to city-wide CO2 consumption (Objective 12.1), which 22,000 homes would significantly contribute to and any activity to make these homes more efficient would be captured under this target. This will be reported on under National Indicator 186.

4.28 However, as the Council is directly responsible for the maintenance of these properties we should be demonstrating that we are doing all we can to make them energy efficient.

4.29 Under the Home Energy Conservation Act data is compiled each year of the energy efficiency measures implemented in each home and the related savings attributable to that measure. This data is collated by the Home Energy Team and is fully auditable. The savings levels are calculated using figures from the Energy Savings Trust.

4.30 The table below demonstrates progress since 2006:

| | 2004/5 | 2005/6 | 2006/7 | 2007/8 | 2008/9 |
|--|--------|--------|--------|--------|--------|
| Loft insulation | 104 | 127 | 81 | 114 | 328 |
| Cavity wall insulation | 230 | 237 | 22 | 1 | 49 |
| Draught proofing | 9 | 50 | 0 | 40 | 295 |
| Heating controls | 1,604 | 1,266 | 1,122 | 1,101 | 1,069 |
| Double glazing | 2,836 | 3,315 | 1,836 | 1,567 | 295 |
| Low energy lightbulbs (per bulb) | 2,442 | 2,934 | 1,867 | 3,058 | 3,960 |
| New conventional boiler | 1,477 | 0 | 0 | 0 | 0 |
| Condensing boiler (insulated dwelling) | 3 | 1,266 | 1,122 | 1,101 | 1,069 |
| Heat recovery fans | 672 | 1,262 | 1,400 | 884 | 0 |
| Electrical appliances | 0 | 0 | 0 | 0 | 211 |
| Radiator foil panels | 0 | 353 | 0 | 192 | 0 |
| Total Carbon Savings | 4,144 | 5,329 | 4,045 | 3,449 | 2,042 |

4.31 This data shows that a substantial amount of work has been done over the past few years and we should attempt to ensure this is maintained. However, it is important to recognise that a point will be reached where efforts will plateau (as there is only a certain number of measures you can implement in each home) when setting a target. For example the figures for number of cavity wall insulations and double-glazing installations have reduced steadily over the years. This is not due to reducing effort but due to lack of need, nearly all those requiring this action have been covered.

4.32 There are further restrictions on this target including resources within the council to pay for measures, capacity to fit the measures and availability of tenants. Therefore, if a target was to be set for this sector it should concentrate on key actions such as loft insulation. It should be based on the recognition that substantial work has been done so far and that this level of activity should be maintained as far as possible. The new targets suggested are:

1. Continue to increase loft insulation installation at a minimum of 300 homes per annum in the social housing sector.
2. Continue to install heating controls at a minimum rate of 1000 per annum in the social housing sector.

4.33 If these targets are hit they will give a continual saving of nearly 1,500 tonnes of carbon per annum.

4.4 Setting sub-targets

Currently the Council is struggling to set planned programmes that show we are able to achieve the 50% reduction required by 2025/26. This is often the issue with large long-term targets.

- 4.5 With reducing carbon emissions it is a recognised fact that low-hanging fruit gives large wins at the beginning of a programme with benefits diminishing over time as programmes become more difficult to identify.
- 4.6 Therefore to make this large 50% reduction more achievable and monitoring easier it should be broken down into easy-to-manage chunks.
- 4.7 If the new baseline is selected it is anticipated that it will show an approximate 10% reduction between 2006 and 2009. Leaving a 40% reduction to achieve over 16 years. This averages out at 2.5% reduction per year but as explained above the quick wins should give a large benefit.
- 4.8 The commissioning statement that has been compiled recently the Council has approximately 15,000 tonnes of CO2 reduction programmes planned over the next 3-5 years, which equals a 24% reduction.

25% reduction between 2009/10 and 2014/15 based on 2009 baseline (17,000 tonnes)
 15% reduction between 2014/15 and 2019/20 based on 2009 baseline (10,000 tonnes)
 10% reduction between 2019/20 and 2025/26 based on 2009 baseline (7,000 tonnes)

Totaled equals 50% reduction based on 2009 baseline (34,000 tonnes)

5. FINANCIAL, LEGAL AND OTHER IMPLICATIONS

5.1. Financial Implications

Changing the base line data from unverifiable 1990 data to verifiable 2008/09 data does not have any direct financial implications.

Martin Judson, Financial Services

5.2 Legal Implications

There are no direct legal implications of this report

Anthony Cross, Head of Environment & Advocacy Law

5.3 Climate Change and Carbon Implications

Better ability to achieve carbon reduction targets and meet the EMAS verifiers requests.

6. OTHER IMPLICATIONS

| OTHER IMPLICATIONS | YES/NO | Paragraph references within the report |
|-------------------------------|--------|--|
| Equal Opportunities | No | |
| Policy | No | |
| Sustainable and Environmental | Yes | All elements of the report |
| Crime and Disorder | No | |
| Human Rights Act | No | |
| Elderly/People on Low Income | No | |

7. RISK ASSESSMENT MATRIX

None.

8. BACKGROUND PAPERS – LOCAL GOVERNMENT ACT 1972

9. CONSULTATIONS

Nick Morris, Head of Energy Services, LCC
David Ison, Transport section, Group Manager, LCC
Patrick Flavin, Carbon Manager, Kirklees Council
Mike Richardson, Home Energy Manager, LCC
Pravin Patel, Strategy and Performance Officer, LCC
Dave Pate, Director of Housing, LCC

10. REPORT AUTHOR

Claire Pipe, Senior Environmental Consultant, X29 6776

11. REFERENCES

1. Report from De Montfort University to the Climate Change Committee, 15th May 2007, **Climate Change Calculations for the City of Leicester and Leicester City Council.**
2. Friends of the Earth, 2009, **Getting Serious About Climate Change: How Local Government Can Cut Carbon, Create Jobs and Save Cash.**

| | |
|--------------------------------------|---------------------|
| Key Decision | No |
| Reason | N/A |
| Appeared in Forward Plan | N/A |
| Executive or Council Decision | Executive (Cabinet) |