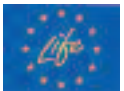


# CARRA

## Carbon Assessment and Reduction in Regeneration Areas



### Best practice manual



LIFE 02 ENV/UK/000147



ISLINGTON

## Carbon Assessment and Reduction in Regeneration Areas

- CARRA's aims were to develop a carbon budget to quantify carbon dioxide (CO<sub>2</sub>) emissions in an urban regeneration area of London, and
- test whether this, together with local action projects, would lead to more awareness and involvement in carbon reduction lifestyles and strategies.

CARRA ran from November 2002 to December 2004.

### **CARRA Rationale**

The need to translate national targets for emissions reductions into local action requires the development of strategies that are appropriate to all communities, including those in regeneration areas.

CARRA sought to find ways of improving people's understanding of the connection between their energy use and climate change. CARRA explored methods of raising awareness of climate change within communities and engaging them in action projects which linked their energy use to both climate change and regeneration objectives – demonstrating that the three policy objectives could work in harmony.

## Climate change impacts in London:



- flooding
- 150km<sup>2</sup> of London below sea-level
- 75,000 homes at risk from storm surge
- extreme summer temperatures
- insufficient water to meet demand

Source: London's Warming: GLA/ LCCP, 2002

## Policy Context

The EU Sixth Action Programme, 2001-2010 states: *“the consensus is that climate change is happening and that human activity is causing the increases in concentrations of greenhouse gases that are the cause of the problem.”*

EU Member States are developing and implementing CO<sub>2</sub> reduction strategies in order to meet emission reduction targets. The Sixth Action Environmental Programme identifies climate change as one of four key priorities. It also identifies other environmental themes and approaches, which CARRA has sought to address:

- the integration of environmental concerns into all relevant policy areas e.g. regeneration and urban sustainability;
- ensuring better and more accessible information on the environment for citizens; and,
- working with businesses and consumers to identify solutions.

The UK's climate change strategy (Climate Change: The UK Programme, DETR, 2000) sets out the government's strategic approach to tackling climate change. Specifically it states that, *“a strong and effective partnership between the public and private sectors, working closely with local communities, is critical if we are to respond to this challenge”*. CARRA was designed as a local response to this.

## The EC1 New Deal Regeneration Area



CARRA was undertaken in an urban regeneration area in inner-London. Eighty per cent of EU citizens now live in urban centres (Consensus Declaration: European Cities & Towns Towards Sustainability, European Sustainable Towns and Cities Campaign). Many urban centres include areas of social exclusion, therefore the development of climate change responses should address the relevant issues for these areas.

## Map 1: Islington and London Boroughs



## Map 2 – EC1 New Deal Regeneration Area



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The EC1 New Deal is part of the government's national New Deal for Communities programme which funds projects in areas identified as socially excluded e.g. higher levels of unemployment and poverty and lower educational attainment and literacy levels.

## The Carbon Budget

CARRA's carbon budget consisted of:

1. an initial baseline of quantified CO<sub>2</sub> emissions for the project area (2002).
2. implementation of 5 CARRA action projects to reduce emissions

3. an updated baseline - including the results of the action projects (2004).

CARRA set an emissions reduction target of 2% to be achieved by the end of the project.

## 1) The Initial Baseline

The budget baseline was developed using energy data, from which CO<sub>2</sub> emissions were extrapolated. Due to the lack of an existing formal method of estimating a baseline, a methodology had to be devised.

### Methodology

The project area was divided into the following sectors: domestic, commercial, education, street lighting and transport. Where primary data on energy consumption was unavailable, emissions were estimated using a combination of computer software (DMRB, MapInfo, NHER Auto Evaluator), SAP ratings and national building energy benchmarks which give annual energy usage per m<sup>2</sup> of floor area.

Production of the CO<sub>2</sub> baseline involved a steep learning curve. Initial difficulties in constructing it were:

- lack of primary data and inability to secure data e.g. from utility companies
- securing data at the same spatial scale as the project area
- the need to use different methods to calculate emissions for different sectors.



Baseline results (2002) showed that the amount of CO<sub>2</sub> emitted from the project area was 112,356 tonnes.

## 2) CARRA Action Projects




The action projects aimed to:

- raise awareness of climate change
- engage different sectors of the community in action to address climate change
- show how it links to energy use and regeneration themes at the micro level
- reduce levels of CO<sub>2</sub> emissions.

**The five action projects were:**

- Energy Ambassadors
- Schools' Energy Action Project
- SMEs' Green Initiative
- The Safe and Sustainable Schools Travel Action Project
- Roscoe Street Towers Project

**The Action Projects in Detail**

 **Energy Ambassadors (EAs)** – aimed to train a number of EAs in the provision of energy efficiency advice, so that they could then raise awareness of energy efficiency with residents in their neighbourhood.

Having recruited 5 EAs, via methods such as distribution of flyers and posters, and via community meetings, the training needs of each EA were assessed. In line with a community




development approach, it was important to match training packages to the needs of each participant. All 5 EAs attended the 'Introduction to Energy Course' run in partnership with North West London Energy Efficiency Advice Centre (NWLEEC). This enabled them to assist clients in completing Home Energy Check forms (part of local authorities' implementation of the Home Energy Conservation Act 1995) and to provide general advice on energy efficiency grants.

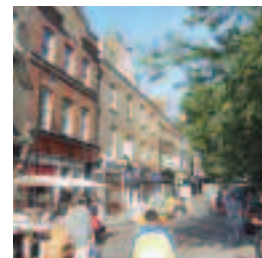
Two EAs attended the more advanced National Energy Association's 'Energy Awareness Course' and received the City and Guilds qualification.

Overall, the EAs:

- completed 514 Home Energy Check forms
- distributed 546 energy saving light bulbs to residents on low incomes
- undertook follow up visits to residents to discuss their Home Energy reports, which set out energy efficiency measures to save energy and money on fuel bills
- liaised with NWLEEC over implementation of energy efficiency measures, such as grant assistance and referrals to registered installers.

 **Schools' Energy Action Project (SEAP)** – aimed to educate school children about local energy issues and climate change. The project consisted of 2 components:

- Educational – what is the link between energy use and climate change?

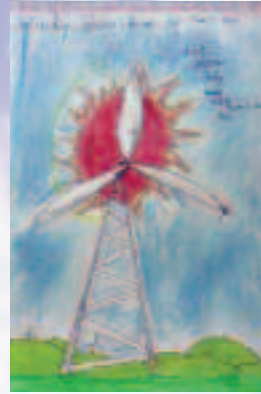


- Practical - audit of school energy use and identification of ways of reducing it.

Four primary schools were engaged in SEAP. It was important to ensure that SEAP linked to elements of the national curriculum to ensure their participation.

#### **SEAP's educational components were:**

- climate change lessons – explaining the basis of climate change and how it relates to pupils via use of electricity and fossil fuels
- energy diary – this was produced by CARRA as a monitoring tool for school children to see how they could save energy at home, and how they could incorporate energy saving into their daily routine over a weekly period
- school trips – to Didcot coal-fired power station to learn about electricity production and to Sutton Courtenay Environmental Education Centre in Oxfordshire where children learnt about low-energy eco-building
- 'Destination Earth' play – the Quantum Theatre for Science performed an environmental education play to SEAP schools
- arts competition – an arts competition with a climate change and energy-saving theme.
- energy day celebration – as part of London Sustainability Week, CARRA organised a celebration at Moorfields school to showcase the artwork from the competition.



#### **SEAP's practical components were:**

- SEAP schools received energy audits of their buildings.
- audits looked at the feasibility of installing energy efficiency measures and renewable technology in the schools.

#### **SMEs' Green Initiative:**

- Energy efficiency information was promoted to all SMEs (small and medium enterprises) in the project area.
- 10 SMEs were engaged, mostly via face-face approaches.
- each SME received an energy audit showing how they could save energy.
- follow-up work was undertaken to discuss reports with clients and to signpost them to sources of information about capital allowances for energy efficiency appliances and best-practice programmes such as Action Energy and Envirowise.

#### **Safe and Sustainable Schools Travel Action Project**

Focusing on travel to and from school, the aim was to encourage modal shift amongst pupils from motor vehicle to cycling and walking. Three sub-projects (Young Voyager, Walk Safer/ Practical Pedestrian Training and Walk to School Week) were used to assist children from three schools to travel to school in a more sustainable way.



### Roscoe Street Towers (RST) Project

Working in partnership with the Peabody Trust the project involved refurbishment works to the RST, in tandem with energy awareness advice for residents.

- the project's key aim was to significantly improve the energy efficiency of the towers (constructed in 1957), and to increase the SAP ratings (and hence minimise CO<sub>2</sub> emissions) for the 104 flats.
- as an extension to the consultations the Peabody Trust normally undertook for such refurbishment projects, residents were engaged in the CO<sub>2</sub> budget concept. This was achieved via provision of energy efficiency advice and distribution of energy/climate change fridge magnets to residents. CARRA gauged the impact of the energy advice on residents' awareness and the improvement works on energy efficiency and climate change through sample interviews and monitoring energy bills.

### 3) The Baseline Review

Following the 5 action projects, results for the updated baseline 2004 were 110 095 tonnes of CO<sub>2</sub> per year. Most of the emissions were from the commercial sector, which is due to the large number of prestige offices with air conditioning units in the project area. Transport emissions were relatively low due to good public transport connections in the regeneration area and low car ownership.



The results for 2004 showed a reduction in emissions of 2.01% from 2002 levels, which met the CARRA target of 2% reduction.

The reduction in CO<sub>2</sub> emissions was attributed to various factors:

- actual reductions resulting from the action projects;
- general CARRA activities;
- traffic reduction due to the congestion charge (introduced in 2003), and
- potential reductions attributed to CARRA energy savings advice and energy audits.

A further reduction of 4.06% was predicted for 2005, based on potential savings from the Energy Ambassadors project (from Home Energy Check form recommendations to households) and the SMEs project (from the SME energy audit recommendations). The CARRA project has shown some real reductions in emissions. However, problems were found in estimating emissions from the advisory and educational aspects of the project as these are difficult to quantify.

Figure 1 - Proportion of CO<sub>2</sub> emissions from various sectors for 2004

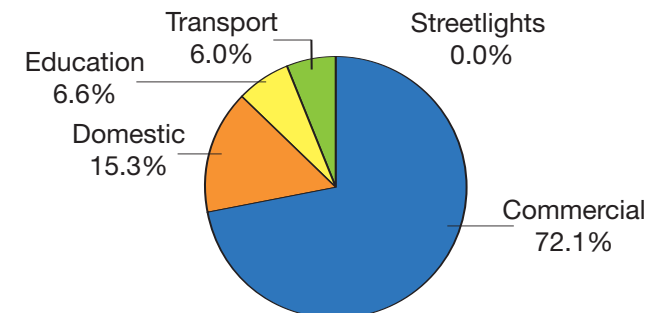
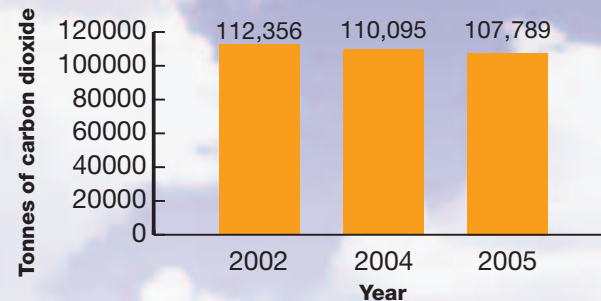


Figure 2 - Total estimated CO<sub>2</sub> emissions



### Action Projects Evaluation Matrix

The Action Projects Evaluation Matrix (APEM) was produced as a means of assessing the effectiveness of each action project against 5 criteria (based on policy objectives from the EU Sixth Action Programme and EU Focus on Green Jobs):

- actual reductions in CO<sub>2</sub> emissions
- effectiveness in involving people in action to reduce emissions.
- changes in awareness of CO<sub>2</sub> budgeting by project participants and those affected by its outcomes.
- cost effectiveness of the project in reducing emissions (Euro per tonne)
- potential for creating employment.

Results showed which projects were successful in delivering against some, or all, of the above objectives:

- the majority of action projects resulted in actual or potential CO<sub>2</sub> emission reductions.



- CARRA's aim of involving all sectors of the community via the action projects was met.
- residents showed little awareness of CO<sub>2</sub> budgeting before and after the project.
- results showed that the potential emission reductions could be achieved in the most cost-effective way for the SME sector.
- all action projects were able to demonstrate potential for employment.

### Monitoring

Monitoring of CARRA was undertaken by London Metropolitan University and sought to independently assess whether CARRA had achieved its aims. Overall, it found that:

- there was awareness of climate change, but its causes were less well understood.
- residents' motives for undertaking 'environmentally beneficial actions' were chiefly to save money and help the environment, rather than for environmental reasons alone.
- awareness of CO<sub>2</sub> budgeting was low to non-existent – however, residents understood concepts of 'energy-saving measures', 'saving the environment' and 'fuel poverty'.
- people were willing to change their behaviour in response to prices or other relevant information, despite not understanding the term 'CO<sub>2</sub> budget'.
- the report noted that after much effort CARRA succeeded in recruiting 4 schools to the SEAP project, 10 SMEs to the SMEs Green Initiative,





3 schools in the SSSTAP project, and 5 EAs in the Energy Ambassadors project. In the context of the regeneration area, this was seen as an achievement in itself.

- the most successful EA was already well known in the community and this familiarity helped him reach out and engage residents.
- teachers involved in SEAP indicated that its success was due to project design which adopted the following criteria: fit with the curriculum; activities offering experiential learning opportunities; favourable school environment e.g. head teacher championing environment; and favourable community and local authority environment.
- feedback showed that on learning of the project via CARRA dissemination, schools from outside the CARRA project area wanted to be involved.
- as a result of the RST energy-efficiency refurbishment works and awareness raising activities, residents said that their awareness of energy issues had increased.
- SME managers were the most aware of climate change.
- follow-up interviews were held with SME managers – many of them had implemented energy-efficiency recommendations from their audits.

## Conclusions

### Carbon Budget

- The CARRA team devised a methodology and produced a carbon budget for the EC1 area. However, problems were encountered with securing energy data due to data protection, and quantifying behavioural and educational responses. Hence, for CARRA this required some iterative re-shaping of the original baseline methodology and devising alternative methods of data collection. Measuring which educational aspects are more effective (e.g. turning off lights, using less water) could be estimated if the household/building energy usage is measured simultaneously with the advice given. This would require additional resources as well as the need to secure access to data.
- CARRA undertook a 'bottom-up' approach to identifying and collecting energy data. This was worthwhile in terms of raising awareness with community and business sectors as well as encouraging subsequent actions to address climate change. However, potential conflict arises between the benefits of a bottom-up approach and the potential requirement for more formal methods of quantifying emissions under national CO<sub>2</sub> management frameworks.

## Conclusions against the broader policy context

- CARRA was able to show how climate change issues could be practically linked, via energy use, to regeneration issues. This is important in the context of undertaking such projects in urban regeneration areas, where it is important to address all three pillars of sustainable development.
- The CARRA approach provides a policy link between EU objectives on employment, regeneration and the environment – i.e. it is about sustainable development rather than just the environment.
- London Metropolitan University's research finding that: 'it does not look as if major changes can be expected in response to appeals to the 'environmental citizen' in each of us', is crucial
- CARRA showed how people, schools and business could be engaged in climate change via the action projects.
- The APEM offers an evaluation tool to assist policy and programme makers regarding the nature of climate change project design.
- Results from the baseline review and APEM analysis tell us that the potential for cost-effective emissions reduction is greatest in the SME sector.
- The CARRA project achieved some real results and outcomes, which can be replicated elsewhere.

This manual is a substantially edited version of the full report on CARRA.

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