

David Miliband
'Every industry should be an environmental one'

Councils struggle
The fight for resources in the battle against climate change

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Driving the message home

The general public is taking a long time to wake up to the reality of climate change, but a new piece of software could help to speed up the process, as **Dr Rajat Gupta** explains

In the UK, energy consumption from households is responsible for almost 27% of the nation's carbon dioxide (CO₂) emissions, a fact often forgotten in the media furore surrounding emissions from vehicles and aviation. It has, however, been acknowledged by the Department for Communities and Local Government, which has said that within ten years all new developments should be carbon-neutral, and that local authorities should make significant moves to improve their energy efficiency.

Achieving this is surprisingly simple. Making housing more energy-efficient is easy compared with other emission-reducing measures and can be achieved to varying degrees in both old and new homes. Where we are struggling, though, is in making people aware of the problem.

This is where the DECoRuM model we developed at Oxford Brookes can help. It is a system of carbon-emissions mapping that brings the problem down to street level, mapping the country house-by-house.

It works through a unique GIS-based interface that estimates current energy-related CO₂ emissions from existing UK dwellings, and aggregates them to street, neighbourhood and city levels. This enables DECoRuM to evaluate the potential and financial costs for domestic CO₂ emission reductions by implementing a range of best-practice energy-efficiency measures and renewable energy systems.



Homeowners can compare their emissions with their neighbours'

Where this offers an obvious advantage is that homeowners can use the system to see how their particular dwelling compares with the efficiency of their neighbours. This is not merely a case of keeping up with the Joneses, but of seeing how energy efficient a home could realistically be. A large Victorian house will never be as energy efficient as the latest eco-dwelling. The visual representation of each home, colour-coded against its neighbours, makes the system more accessible to the public, negating the need to wade through complicated figures and statistics.

Once above the level of the individual homeowner, the model provides local authorities and cities with the ability to create credible emission reduction plans. The model develops housing stock energy databases containing a unique record for every dwelling in the stock, with details of its energy rating.

The variable scale of the model gives local authorities the ability to identify, and thus tackle, pollution hot spots.

Individual CO₂ reduction measures can then be deployed and the outcome shown to determine the most cost-effective package for emission reductions. This can then help planners to develop and review their energy-efficiency strategy and set achievable targets for improvement.

The effectiveness of the DECoRuM can be seen in the results of the trial we ran in Oxford. What became clear is that the majority of the public was unaware of the energy efficiency of their homes, what they could do to improve matters and, crucially, the various grants available.

As climate change becomes increasingly worrisome, we must accept our responsibility in CO₂ emissions

By highlighting the efficiency of individual dwellings in a simple manner, and providing supplementary advice, the project achieved some impressive results.

The modelling results showed that CO₂ reductions in excess of 60% were possible from the case study dwellings at a cost of between £6 per tonne of CO₂ - £77 per tonne of CO₂ emissions saved. This cost depended upon the package of measures used, and the scenario of capital costs (low or high) employed.

Unlike traditional carbon calculators, the model offers the opportunity to highlight not only individual problems, but problem areas.

It is not designed to name and shame homeowners but offer them and planners a clear picture of the issue and a strong indication of the amount of energy, and money that can be saved.

As the issue of climate change becomes increasingly worrisome, we all must accept our responsibility in the emission of CO₂. DECoRuM puts energy efficiency on the map, giving individuals no excuse to plead ignorance.

Yet, unlike other measures, reducing household carbon emissions, it requires little sacrifice in our standard of living, and leads to a reduction in our cost of living. **EB**



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