

# **A CARBON LED APPROACH TO ASSESSING THE IMPACT OF A RESIDENTIAL DEVELOPMENT**

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## **Introduction**

Recently WSP was involved in the development of a carbon neutral site in the Middle East, where the main constraint on transport trips to, from and within the development was the carbon emissions these trips produced. This led to us developing a carbon calculator specifically for this project that took account of many modes of travel including walking, cycling, bus, private cars, Light Rapid Transport and Personal Rapid Transport.

As the project was nearing completion, we took time to reflect on the implications that the carbon calculator tool that had been developed could have on other developments within the same geographic area, i.e. those that were within the “near carbon zero” development area. It was during this process that the team considered other possibilities for this tool, including work within Scotland.

It is acknowledged that there has already been a significant amount of work undertaken in this field of developing carbon calculators and emissions. However, we believe this tool provides a pragmatic approach to assessing the carbon implications of major new developments in a clear and consistent way.

Transport Assessments (TA) should allow the transport implications (including carbon emissions) of proposed major developments to be properly considered and, where appropriate, will help identify suitable measures to achieve a more sustainable and environmentally sound outcome (Scottish Executive, 2005a). Clearly a tool that calculates the carbon emissions from a proposed development will have a role to play in assessing a development’s environmental impact and could also assess the impact of any mitigating measures that may be developed.

There has recently been a significant shift in national policy with a far greater emphasis being placed on carbon emissions from transport and more importantly the introduction of steps to control these emissions. This is being reinforced through emerging Scottish Government legislation on the statutory duty for sustainable development and climate change.

The forecast potential economic impacts of global warming (or not tackling the issue effectively, Stern Review) will undoubtedly mean that carbon emissions and their control will play a more significant role in almost all walks of life. This will be particularly evident in situations where the government can have a direct influence (such as through the planning process).

There is no serious scientific doubt regarding the existence or seriousness of human induced climate change. An overwhelming body of evidence demonstrates that our climate is being rapidly changed by an increase in greenhouse gases resulting from the actions of humans. If left unchecked, greenhouse gas emission levels are expected to reach double that of pre-industrial levels between 2030 and 2060 leading to a rise in temperatures of between 2 and 5 degrees centigrade (HM Treasury, 2006).

The Stern Review (HM Treasury, 2006) estimated that the economic consequences of unabated climate change over the long run could cost between 5 and 20% of global GDP – described as the equivalent of the combined effect of the Great Depression and the two world wars of the twentieth century (HM Treasury, 2006).

Transport globally accounts for 14% of all greenhouse gas emissions. In the UK, it accounts for a higher share of national emissions and has grown in recent years to become the largest 'end user' creator of emissions. Transport is expected to deliver the second largest share of emissions reduction in the Climate Change Programme (CCP) by 2020, with Energy Supply delivering the largest potential for emissions reduction.

A series of reports, (the Commission for Integrated Transport, 2007; Bannister & Hickam 2006; Fergusson, Kroger & Skinner, 2003; Sustainable Development Commission, 2005) all came to the same conclusion that a cut in transport emissions can be achieved through a mixture of technological and behavioural change (changes to Vehicle Excise Duty, biofuels, adjusting speed limits, road pricing and acceleration of smarter choices). The reports concluded that:

*The major contribution of technological innovation was not likely to occur until after 2020;*

*Travel behaviour change was seen as having a significant effect in the short term;*

*Without behavioural change, a 60% reduction in emissions was not possible.*

Overall CO<sub>2</sub> emissions in the UK have reduced since the beginning of the 1980's. Emissions in the industry sector are decreasing and residential emissions have been largely constant. However the road transport sector has been increasing significantly. Overall road transport contributes around 38 million tonnes of carbon equivalent annually, a doubling since 1970. The Transport Sector currently contributes around one quarter of all UK carbon emissions and this proportion is set to rise in the coming years.

Passenger car CO<sub>2</sub> emissions have doubled from 12 million tonnes of carbon equivalent in 1970 (cars currently make up 13% of the UK total carbon emissions hence the quantity of emissions from this mode is of particular significance). There has been little change in bus emissions over this time at 5 million tonnes of carbon equivalent.

The base level of greenhouse gas is set at 1990 levels (being 280 parts per million CO<sub>2</sub>). The UK government has set out a target of at least a 26 to 32% reduction in greenhouse gas emissions by 2020 from 1990 levels and an 80% reduction by 2050 (recently announced revision of the previous 60% target – accepting advice provided by the Commission for Integrated Transport [2007]).

The current draft Climate Change Bill (Scottish Government, 2008) will enshrine these targets in law. The draft Bill:

*Makes targets legally binding;  
Introduces a system of ‘carbon budgeting’; and*

*Allows the purchase of emission reductions from overseas to count towards the UK’s targets; and*

*Creates a new independent body to advise on the setting of carbon budgets and to report on progress (the Committee on Climate Change).*

*Emissions Targets- Proposal to set mandatory targets on vehicle manufacturers to reduce tailpipe CO<sub>2</sub> emissions. Target of 130g CO<sub>2</sub>/km to be delivered by 2012.*

*Fuel efficiency labels- deliver information to car buyers on how they can save money and help the environment*

*Biofuels - 5% of all UK fuel sold on UK forecourts to come from a renewable source by 2010.*

*Transport and carbon emissions trading - possible inclusion of surface transport into the EU Emissions Trading Scheme or as a UK self-standing measure.*

*Rail – targets to be set for reducing CO<sub>2</sub> emissions per passenger-kilometre and per tonne-kilometre by increasing rail capacity (so that it can accommodate the demand and growth forecast as people and firms factor carbon-costs into their travel and transport decisions).*

*Travel Plans – the government has put in place a substantial programme to promote change of travel behaviour using a range of measures called ‘Smarter Choices’. These include workplace, school and personalised travel planning, travel awareness campaigns and marketing.*

The target to reduce Scotland’s emissions by at least 80% by 2050 from the 1990 baseline set in the Kyoto Protocol, which the Scottish Government committed to in June 2007, is one of the most ambitious in the world. It will form the keystone of the Bill.

The Scottish Government is clear that emissions reductions should be achieved in the most cost effective way possible in support of its commitment to increasing sustainable economic growth in Scotland.

The Stern review of the economics of climate change (HM Treasury, 2006) reported that if the world does nothing to mitigate climate change, the impacts could cost the world the equivalent of 5 - 20% of global GDP each year.

The Committee on Climate Change (2008), in its interim advice to the UK Government, advised that the 2050 emissions reduction target for the UK Climate Change Bill should be increased from 60% to 80%, and that it should be extended to cover all greenhouse gases. This expert, independent Committee advises that this is challenging but achievable with the right policies and could cost between 1-2% of UK GDP in 2050.

Scottish Ministers agree that strong action is needed to avoid dangerous climate change. They therefore commit Scotland to playing its part in addressing the global challenge presented by climate change and to Scotland leading the way by bringing forward a Scottish Climate Change Bill with a target to reduce emissions of the basket of six greenhouse gases by at least 80% by 2050.

Taking all this background work, targets and pressure placed on governments to reduce carbon emissions, how can we achieve this through practical and realistically viable measures? We believe that sustainable living begins with the planning process and that by targeting new developments, and ensuring their transport-related carbon emissions are the lowest they can be, it will provide a significant step towards achieving the targets imposed by Kyoto and Stern.

### **A global problem tackled at a local level**

There is no denying that climate change (or “global warming” in old speak) is truly a global problem, however one single global remedy is unachievable. The solution has to be the sum of a host of small measures ranging from work practices to development layouts and power generation. Independent tasks working towards the greater goal. A global problem tackled at a local level.

Part of this change could be alteration to the planning process. Alteration that ensures carbon emissions can be controlled for all new major developments within the country. Alterations that ensure Scotland can realistically attempt to achieve its carbon reduction targets set for them.

This, we believe, can be done in four stages within the planning process, which has already supported sustainable transport objectives through policy such as *SPP17: Planning for Transport* (Scottish Executive 2005b). These stages are:

*Site selection stage;*















