Appendix D

ESTIMATED SAVINGS FROM CLIMATE CHANGE PROGRAMME as at May 2004

NB: Revised estimates of the Climate Change Programme measures have been included in the updated energy and emissions projections and further details can be found in Appendix E.

SECTION 1 - SUMMARY OF CARBON SAVINGS

1.1 The Climate Change Programme measures detailed at Table D1 below are broadly allowed for in our projection of emissions in 2010. For the first 2 measures shown – the Climate Change Levy and the Renewables Obligation – the measure is directly modelled (in the first case by inclusion within the UEP model run of the tax rates; in the second case by imposing the achievement of 10% renewables generation by 2010). In the other cases, carbon savings estimated outside the model have been imposed on model outputs.

1.2 In some cases, current estimates of carbon savings are below the estimate that was made for the measure in the November 2000 Climate Change Programme[1]. The derivation of latest estimates is explained further at Section 2 below.

Table D1: Climate Change Programme measures incorporated within projections for 2010

SECTOR (1)	**CARBON SAVING MEASURE**	**Current estimated saving in 2010 in UEP**
		MtC
Business	Climate Change Levy, including exemption for CHP and renewables	Incorporated in model
Business	Renewable Obligation to 10%	Incorporated in model
Business	Climate Change Agreements (CCAs)	2.4
Business	Existing CCAs extra (2)	0.9
Business (3)	New CCAs	0.5
Business	Carbon Trust	0.5
Business	UK ETS	0.5
Business	Building Regulations (England & Wales only) 2002	0.4
Business (3)	Building Regulations (England &	0.2

[1] Climate Change: The UK Programme, DETR, November 2000

SECTOR (1)	**CARBON SAVING MEASURE**	**Current estimated saving in 2010 in UEP**
	Wales only) 2005	
TOTAL BUSINESS SECTOR		**5.4+**
Transport	Transport Voluntary Agreement. Backed up by changes to company car taxation and vehicle excise duty	2.6
Transport	10 Year Plan	1.1
Transport	Sustainable distribution in Scotland & Wales	0.1
Transport	Fuel Duty Escalator to 1999	Incorporated in model
TOTAL TRANSPORT SECTOR		**3.8+**
Domestic	EEC1 (2002-5)	0.4
Domestic (3)	EEC2a (2005-8) and 2b (2008-11)	1.4
Domestic	Building Regulations (England & Wales only) 2002	1.0
Domestic (3)	Building Regulations (England & Wales only) 2005	0.8
Domestic	Community Energy 1 (2002-5)	0.1
Domestic (3)	New HEES/Warm Front	0.3
Domestic (3)	Other: Decent Homes, Boiler and Appliance standards	0.1
TOTAL DOMESTIC SECTOR (4)		**4.0**
Afforestation	Afforestation	0.7
Public Sector	New central Government, schools and NHS targets	0.5
Scottish Executive	Building Regulations, new central estate target, and NHSiS target	0.1
TOTAL OTHER		**1.3**
TOTAL ALL SECTORS		**14.5 (53 $MtCO_2$)**

Notes to Table D1:

(1) Estimated savings have been attributed to the main sector to which they apply.

(2) *This estimate has been based on the over-achievement of CCA sectors in relation to previous targets. New targets will be the subject of further discussion with sectors, which will then be incorporated in final installation level allocations.*

(3) *These measures are not directly incorporated within UEP, but the carbon savings attached to these measures are allowed for in our view of overall UK CO2 emissions in 2010. For the sectors covered by the EUETS the impact of these measures should be minimal in the period 2005-07. Further work to clarify this point will be carried out prior to the making of final allocations.*

(4) *Total may not appear to add up because of rounding.*

1.3 Since publication of the Climate Change Programme in November 2000, consideration of requirements for further measures has continued. Much of this consideration has related to energy efficiency requirements and has been brought together in the Energy Efficiency Implementation Plan published in April 2004. There are therefore a number of measures which the Government expects to progress, but which require funding or are not fully developed to the extent that they can be directly included within UEP. These measures are summarised in Table D2 below.

1.4 The carbon savings attached to these measures are uncertain. Overall they could provide up to around 0.7MtC further savings in 2010.

Table D2: Climate Change Programme measures not incorporated within UEP

SECTOR	CARBON SAVING MEASURE	Potential saving in 2010	Status
		MtC	
Business	Carbon Trust extra	0.5	Dependent on agreed funding
TOTAL BUSINESS SECTOR		**0.5**	
Domestic	Community Energy extended	0.1	Dependent on agreed funding
Domestic	Additional Warm Front	0.1	Dependent on agreed funding

Domestic	Other Extra: Decent Homes, Boiler and Appliance Standards	0.1	Dependent on agreed funding
TOTAL DOMESTIC SECTOR (1)		**0.2**	
TOTAL ALL SECTORS		**0.7 (2.7MtCO$_2$)**	

Notes to Table D2:

(1) Totals may not appear to add up because of rounding

SECTION 2 - DERIVATION OF CARBON SAVINGS

BUSINESS

Climate change levy agreements (CCAs) with energy intensive sectors- 3.8MtC

Derivation of figure

2.1 Negotiations with energy intensive industries have resulted in those industries signing up to challenging targets to improve energy efficiency and reduce carbon dioxide emissions over the next decade. In return, these industries will be eligible for a reduced rate of Climate Change Levy.

2.2 The original negotiations were based around estimates of "all cost effective" energy efficiency investment, which had been developed by FES for the DETR. For the sectors involved, FES estimated that "all cost effective" investment should result in carbon savings of around 4 MtC in 2010. When practical considerations such as constraints on management time and limited capital availability were factored into the negotiations, the original savings were expected to be about 2.5 MtC. The latest modelling by DTI indicates that the original agreements would deliver 2.4MtC. However, at the first 2-yearly “milestone” in 2003, most sectors exceeded their interim targets by a sufficiently generous margin that Defra is now negotiating revised targets with industry for 2010, to take effect from 2006. Defra expects additional savings of up to 0.9MtC by 2010.

2.3 Eligibility was originally defined using the scope of the Pollution Prevention and Control (PPC) Regulations, but in Budget 2004 the Chancellor announced new eligibility criteria for the Climate Change Agreements, to be introduced once EU state aid approval is obtained. Businesses currently eligible for CCAs will remain eligible but, in addition, we intend to extend CCAs to businesses in sectors that pass an energy intensity threshold, and can in some cases demonstrate the existence of international competition

issues. Consultations with potential new entrants to the CCAs are currently underway covering a number of processes which could generate savings of up to 0.5 MtC by 2010.

Sources of further information:

Further information on Climate Change Agreements can be found on http://www.defra.gov.uk/environment/ccl/analyses.htm.

In particular, details of the analysis behind the sectoral targets is contained in the report "Climate Change Agreements – Sectoral Energy Efficiency Targets" at www.defra.gov.uk/environment/ccl/pdf/etsu-analysis.pdf

Energy efficiency measures under the climate change levy package - 1.0MtC

Derivation of figure

2.4 The original carbon saving was derived from the effects of two separate measures: a system of 100 per cent enhanced capital allowances (ECAs) for energy saving investments; and a £50m energy efficiency fund aimed at stimulating carbon savings in the business and public sectors. Since then, the Carbon Trust (CT) has come into being and developed several programmes targeted at these sectors, as well as managing and updating the list of measures eligible for ECAs. The Carbon Trust, through Action Energy, provides direct advice to industrial companies on how to reduce emissions cost-effectively through carbon management, site visits, design advice, events, information and case studies.

2.5 Following a detailed assessment of the savings arising so far from Action Energy, the Carbon Trust has estimated mean annual savings by 2010 of around 1MtC, although with some uncertainty because of (as yet unknown) possible overlaps with savings from companies under CCAs. Other CT programmes, including loans for small businesses, its Innovation Programme, and the administration of the ECAs, could raise this figure substantially. However, for the moment, Defra has taken a very conservative approach and assumed a net total saving of only 1MtC from all CT activity - 0.5MtC of which is firm and included in Table D1 and 0.5MtC of which is dependent on additional resources, but could rise when more detailed monitoring and evaluation becomes available (as Defra has requested).

Sources of further information:

The latest figures from the Carbon Trust can be found in their Annual Review 2002-03 on www.thecarbontrust.co.uk

Voluntary reduction targets through first stage of an emissions trading scheme - 0.5 MtC (CO_2 reductions only)

Derivation of figure

2.6 The UK Emissions Trading Scheme is a voluntary scheme with 31 participants from a wide range of private and public sector organisations. The Scheme began in 2002.

2.7 The Climate Change Programme envisaged emissions trading would deliver CO_2 emissions reductions of 2 MtC (equivalent to 7.3 $MtCO_2$) by 2010. The Direct Participant element of the UK Emissions Trading Scheme which is included in the with CCP projections, is expected to lead to CO_2 reductions of about 1.8 $MtCO_2$ or 0.5 MtC (together with non-CO_2 savings of roughly 2.2 $MtCO_2e$).

Sources of further information:

- Further details on the UK Emissions Trading Scheme can be obtained at http://www.defra.gov.uk/environment/climatechange/trading/uk/index.htm.

Upgrading of building regulations (England and Wales only), 2002 & 2005 - 0.6MtC

Derivation of figure

2.8 Minimum standards for both new build and buildings undergoing major refurbishment, applying to insulation of the fabric and the efficiency of heating, lighting and air-conditioning equipment, were raised in 2002. Detailed assessments of the consequential carbon savings were made by BRE for ODPM, and indicated savings by 2010 of some 0.42MtC/y. These assessments take account of the improvements against the previous standards for each of the items, and of the expected market activity. However, non-compliance reduces this figure. A further tightening of these standards is planned for the end of 2005, discussions are currently underway with the building industry and other interested parties and formal consultation is expected to take place early in 2005. Detailed figures are not yet available but similar rates of improvement would be expected to produce further savings by 2010 of around 0.2MtC. The total effect of both revisions should be savings of at least 0.6MtC. The revised Regulations will also enable the Energy Performance of Buildings Directive to be implemented, with the possibility of some additional savings. However, no figure has been put on these.

Sources of further information:

See references under the Domestic section

TRANSPORT

Voluntary agreements on CO_2 from cars and impact of changes to company car taxation and vehicle excise duty – 2.6MtC

Derivation of figure

2.9 The figure of 2.6MtC represents the estimated carbon savings in 2010 from the voluntary agreements with car manufacturers, the reforms to company car tax and to vehicle excise duty. The figure has been produced by the DTI consistent with current Department for Transport assumptions on expected improvements in new car fuel efficiency in the UK.

Sources of further information:

For further details of the Voluntary Agreements, please see:
http://www.acea.be/ACEA/20040317PublicationEmissions.pdf

10 Year Plan for Transport – 1.1 MtC

Derivation of figure

2.10 This figure (using the low end of the 1.1 to 1.4MtC range estimated) was produced using the Department for Transport's National Transport Model (NTM). It is the difference between a baseline forecast and a forecast that takes into account the impact of the Plan on traffic, congestion and public transport use. The main policies behind the savings are assumed improvements in the efficiency of HGVs and 'soft policies' such as travel awareness. It comprises a 1.4 to 1.7 MtC saving in road traffic emissions, partially offset by a 0.4 MtC increase in rail emissions. The carbon savings estimated are additional to those estimated for the voluntary agreements on CO_2 from cars.

Sources of further information:

- The government's first report on progress towards delivery of the Government's 10 Year Plan for Transport – *Delivering Better Transport: Progress Report* - appears on the DfT website at:

http://www.dft.gov.uk/stellent/groups/dft_about/documents/page/dft_about_023008.hcsp

- Further details on the modelling and forecasts can be found on the DfT website at:

http://www.dft.gov.uk/stellent/groups/dft_transstrat/documents/page/dft_transstrat_024013-09.hcsp#P189_33140

DOMESTIC

Energy Efficiency Commitment - 1.8MtC

Derivation of figure

2.11 The Energy Efficiency Commitment (EEC), together with the Building Regulations, is the principal policy mechanism driving increases in the efficiency of existing homes[2]. Under EEC, electricity and gas suppliers are required to achieve targets for installing energy efficiency measures in the household sector. These targets do not prescribe how suppliers should attain these improvements, and they can fulfil their obligations by carrying out any combination of approved measures including installing insulation or supplying low-energy light bulbs, high efficiency appliances or boilers. The only constraint on the suppliers' activity is that they must achieve at least half of their energy savings in households on income-related benefits and tax credits. Costs fall on the suppliers and are expected to be passed on (at least partly) to their customers: given the competitive nature of the market, this provides a strong incentive on the suppliers to minimise costs.

2.12 The current EEC (2002-5) is expected to achieve carbon savings in the region of 0.4 MtC by 2010, relative to the Climate Change Programme baseline. In order to achieve the significantly increased activity required by EEC after 2005, we recognise the need for business confidence in the long-term demand for the key measures delivered by EEC, to allow appropriate investment by manufacturers and others. We therefore intend to extend EEC for six years, to March 2011, at a level roughly double that of the present EEC. This will enable both suppliers and industry to benefit from opportunities for long-term contractual arrangements and encourage new business opportunities. The periods 2005-08 and 2008-11 will be separately targeted. A firm target for the first three-year period, will be set later this year following public consultation. The target for the second period, 2008-11, will be set in 2007, taking account of the need for continued cost effectiveness in relation to other carbon abatement options and the value for money for consumers.

2.13 Over 2005-8, we expect EEC to deliver carbon savings of around 0.7 MtC a year. The assumptions underlying this are of costs of around £8.50 per fuel per customer per year, assuming suppliers pass on the full costs. Like the current EEC, this is expected to be highly cost-effective. For the moment, we have assumed similar savings for the period 2008-11.

[2] The Energy Efficiency Commitment applies in England, Scotland and Wales.

2.14 Carbon savings have been calculated for individual measures (e.g. Cavity Wall Insulation, Condensing Boilers, Compact Fluorescent Lamps) then summed. For each measure, these depend on:

- The "total improvement" per household, (i.e. the energy savings assuming no comfort taking by occupants) (data provided by BRE - see 'Sources of further information');

- The "slippage" to comfort or rebound - which varies: (1) between disadvantaged households (i.e. on income or health related benefits) and others; (2) between measures (most for fabric insulation, less for condensing boilers and heating controls and none for electrical appliances such as fridges or washing machines); (3) over time, since as incomes rise householders can afford to use as much fuel as they need and therefore have less need to take part of any improvement in energy efficiency as comfort.; and

- The number of additional installations beyond Business as Usual - this is always difficult to gauge but increasing experience from the current phase of EEC, and from the predecessor EESOPs (Energy Efficiency Standards of Performance) schemes provides a useful guide. Particularly for cavity wall insulation, constraints on the rate of expansion of current markets are built in.

2.15 All of these considerations are pulled together in a set of tables which define an “Illustrative Mix” of measures, showing numbers of installations in different tenure and income groups, with the corresponding costs, energy and carbon savings.

Sources of further information:

The EEC (2002-5) Consultation Document can be found at www.defra.gov.uk/environment/energy/eec/index.htm

The EEC (2005-8) Consultation Document will be on the Defra website from late May 2004.

The detailed analysis is contained in the BRE report for Global Atmosphere division of Defra - Carbon emission reductions from energy efficiency improvements to the UK housing stock. L D Shorrock, J Henderson, J I Utley and G A Walters. BRE Report BR435. Dec 2001.

A technical overview paper, at http://www.defra.gov.uk/environment/energy/review/pdf/tech-overview.pdf, summarises the general analysis.

Upgrading of building regulations (England and Wales only), 2002&2005 – 1.75MtC

Derivation of figure

2.16 There are two components to this figure: (a) raised standards for new buildings and (b) new minimum standards for replacement boilers and windows in existing buildings.

2.17 Raised New Build Standards: For the 2002 revision, the National Home Energy Rating (NHER) Evaluator v3.4 domestic energy model was used to assess the impact of the proposed amendments in a number of key dwelling types. The national figure was calculated on the basis of the proportion of these dwelling types built in 1997 and 1998 (data obtained from National Home Building Council (NHBC) quarterly statistics bulletin) and the average annual rate of construction of new dwellings in England & Wales from 1989 to 1998 (data obtained from government Housing & Construction Statistics). Annual savings of 0.25MtC/y by 2010 were estimated. There is inevitably some uncertainty, including the degree of non-compliance and whether this changes over time. In the White Paper, we committed to work with Local Authorities to see whether and how enforcement of the Building Regulations can be cost-effectively improved to achieve better correlation between design and as built performance.

2.18 The NHER Evaluator model is produced by National Energy Services Ltd. and uses an annual calculation method to produce a robust estimate of a dwelling's energy use and potential energy savings, given relevant information about the dwelling characteristics and the behaviour of the occupants. As its basis the model uses BREDEM-12 (see reference below). The NHER Evaluator model also produces an output which conforms to the Standard Assessment Procedure (SAP) for energy rating schemes for dwellings in the UK (see reference below).

2.19 The government plans to upgrade the standards again later in 2005 and will be consulting formally early in 2005. Precise details are not yet available but a similar rate of improvement to the previous one will give further savings of around 0.1MtC/y by 2010. So the total from raising new build standards is around 0.35MtC/y.

2.20 Minimum standards for boilers and windows: These were introduced for the first time in 2002, and boiler savings dominate the impact. From June 2002, replacement gas boilers must be rated at least D on the SEDBUK scale (minimum efficiency 78%), except for back boilers, because of unusually high cost, and in very small dwellings (floor area less than 50m2). Previously, the average efficiency of new boilers was in the low 70s (%). Some 1.4M gas boilers are replaced each year, and the carbon saving by 2010 was estimated to be around 0.6MtC/y.

2.21 From the same date, all replacement windows were required to be good quality double-glazed, with a maximum U-value of 2.0 W/m^2/K.[3] Savings were calculated from the expected number of window replacements over the period to 2010 and the typical savings per window using the average U value for previous replacements, and the average heat loss per house. The overall savings were around 0.1MtC/y.

2.22 The government plans to raise the minimum boiler standard for most applications to a B from April 2005 and will be consulting in summer 2004. Given the annual number of replacements, it is straightforward to calculate the maximum carbon savings resulting from all replacements being at the lowest part of the B range, i.e. 86% efficient, rather than the bottom of the D range at 78%. There are several uncertainties: the number of exemptions to the new standards; possible "comfort-taking" by households afterwards, i.e. taking part of the improvement as comfort rather than reduction in consumption; non compliance with the regulations; possible substitution of repair for immediate replacement by householders; lifetimes of current boilers, which affects the annual number of replacements (which have been rising recently). An overall figure of 0.7MtC lies in the middle of the range. No savings are assumed for tighter window standards at present.

2.23 The total savings from minimum boiler and window standards over both revisions is 1.4MtC.

2.24 The grand total from building regulations in the household sector is 1.75MtC/y; 0.95MtC in 2002 and 0.8MtC in 2005.

Scottish Building Regulations

2.25 The Building Standards system in Scotland is undergoing a review at present. The primary legislation is in place and its scope now includes furthering the achievement of sustainable development. This review will also assist with the implementation of the EU Energy Performance of Buildings Directive. Once secondary legislation is in place, the new system will allow expeditious updating of energy efficiency measures for buildings. The new system will become operational in 2005. The current Technical Standards introduced in March 2002 require some of the most demanding levels of thermal insulation for building fabric in the UK and these will be maintained (by a level transposition) with the introduction of the new system. At the first amendment of the new system the energy requirements will be reviewed and changes will be broadly in line with any improvements/revisions effected in England and Wales. No savings have been included at this stage. The 0.06 MtC projected savings from the 2002 changes to the Scottish building regulations have been incorporated in Table D1, under the Sector entitled 'Scottish Executive'.

[3] 2.2 W/m^2/K for glazing in metal frames.

Sources of further information:

- BREDEM-12 Model Description. B R Anderson, P F Chapman, N G Cutland, C M Dickson and L D Shorrock. Building Research Establishment Report. BR 315. 1996.

- The Government's Standard Assessment Procedure for Energy Rating of Dwellings. 1998 edition. BRECSU, BRE. 1998.

Details of the analysis are given at
www.odpm.gov.uk/stellent/groups/odpm_buildreg/documents/page/odpm_breg_600316.hcsp

Community Energy programme - 0.16MtC

Derivation of figure

2.26 Community Energy is a UK-wide programme part-funded by the Government to encourage and enable the installation, extension or refurbishment of community heating schemes which are mainly based on CHP. Savings are estimated from (1) a leverage factor for external funding, which gives the total budget available; (2) typical installation costs per kW of installed CHP capacity, which, with (1), gives the capacity likely to be installed; and (3) agreed rules of thumb, based on detailed analysis of a range of CHP schemes, relating carbon savings to capacity. The current programme is now expected to deliver some 0.07MtC pa over a 5-year period. Defra is hoping to continue the programme at this reduced annual level up to 2010, with additional savings of a similar order, subject to additional resources becoming available.

Sources of further information:

More details of the Community Energy programme are given at
www.defra.gov.uk/environment/energy/communen.htm

Fuel Poverty Programmes - 0.35MtC

Derivation of figure

2.27 The principal policy directed specifically at fuel poverty is the Warm Front grant scheme in England and its equivalents in the Devolved Administrations. The schemes install a range of heating and insulation measures, helping to take households out of fuel poverty and to improve the energy efficiency of their homes. Where houses are poorly heated before assistance is given, much of the efficiency improvement tends to be taken in terms of improved comfort, rather than reduced energy use. The number of

households in fuel poverty is reasonably well known from the English House Condition Survey and the corresponding DA ones, as are the required numbers of central heating systems, cavity and loft insulation installations etc. Carbon savings are calculated in similar fashion to those for EEC, but with much higher “comfort factors”, ranging from 75% to 100% (i.e. little or no energy saving, but potentially still carbon savings e.g. due to fuel switching, and certainly financial savings). The programmes cannot achieve 100% accurate targeting of fuel poor households, but those other low income households which benefit from Warm Front do contribute higher carbon savings since they are assumed to have rather lower comfort factors, around 45% (as in EEC). A Fuel Poverty Implementation Plan, setting out detailed plans for meeting our fuel poverty targets for England, will be published later this year.

2.28 The Decent Homes standard is designed to ensure that social landlords tackle the worst housing conditions across a range of criteria. By ensuring that homes are warm, dry and have reasonably modern facilities, the delivery of the decent homes target will help to make homes more energy efficient, as well as contributing to other cross-Government commitments to reduce health inequalities and tackle fuel poverty. The target is to ensure all social homes are decent by 2010. There is also a decent homes target for the private sector. Savings are calculated in the same way as for Warm Front, although allowance must be made for overlaps with EEC.

2.29 Over the decade to 2010, we estimate that all the fuel poverty programmes could save 0.3 – 0.4MtC per annum by 2010. A small fraction of this is dependent on additional resources.

Sources of further information:

BREDEM-12 Model Description. B R Anderson, P F Chapman, N G Cutland, C M Dickson and L D Shorrock. Building Research Establishment Report. BR 315. 1996.

The Government's Standard Assessment Procedure for Energy Rating of Dwellings. - see http://projects.bre.co.uk/sap2001/

The Physically-based Model BREHOMES and its Use in Deriving Scenarios for the Energy Use and Carbon Dioxide Emissions of the UK Housing Stock. L D Shorrock and J E Dunster. Energy Policy. Vol 25, No. 12. 1997.

The latest Domestic energy fact file: England, Scotland, Wales and Northern Ireland, J I Utley, L D Shorrock and J H F Bown, can be found at http://www.defra.gov.uk/environment/energy/research/domestic/index.htm

Other Savings - 0.15–0.25MtC

Derivation of figure

2.30 Further savings are expected from market transformation, probably stimulated by "support" policies such as minimum appliance standards, compulsory labelling, voluntary agreements with industry groups, and the various activities of the Energy Saving Trust and Carbon Trust, and by one or more of the programmes already described above, but not formally attributed to them. For example, the market for household appliances has transformed considerably in the past 2-3 years, with well over twice as many A-rated appliances sold as are credited to the current phase of EEC.

2.31 Another instance is expected to arise with condensing boilers once the new building regulations standards are in place in England and Wales. The savings we have attributed to the regulations per se are based on all condensing boilers installed reaching only the minimum efficiency prescribed (86%). EEC will stimulate the installation of higher efficiency boilers, up to 91-92%, and be attributed with the marginal savings. But the current market average efficiency for condensing boilers is close to 91%, since manufacturers are keen to achieve the top rating. When the regulations change, it is expected that the only way the large increase in demand can be met initially will be for most boilers just to qualify at 86%. But over time, increasing numbers are likely to become A rated, i.e. over 90% efficient. Those above 86% but not counted in EEC will provide additional carbon savings, which are accounted for here

2.32 Finally, there is inevitably some overlap amongst programmes, particularly between EEC and fuel poverty programmes. In estimating the overall savings, it has been very conservatively assumed that there is almost complete overlap between EEC and Decent Homes, whereas in practice, every effort will be made to maximise the synergy between the programmes and hence the total net savings.

2.33 Overall, there is quite a range of savings. Additional work, particularly by EST, funded by additional resources, is likely to consolidate these, and quite possibly towards the upper end of the range.

Sources of further information:

- To find out more about the Market Transformation Programme and the scenarios that it has produced, visit its web-site at: www.mtprog.com

AGRICULTURE, FORESTRY AND LAND USE CHANGE

Afforestation - 0.7MtC

Derivation of figure

2.34 The projected carbon saving for expansion in UK forest area between 1990 and 2010 was obtained using the dynamic model CFLOW that allows estimation of rates of uptake by carbon of trees at different stages of growth.

2.35 The model performs separate calculations for conifers and broadleaves, areas of which are assumed to expand at 57 kha and 130 kha per year respectively in line with recent planting rates. It allows for carbon storage in woody biomass, soils and litter. There are no associated timber products before 2010.

2.36 The figure has been revised from the 0.6MtC presented in the UK 3rd National Communication

Sources of further information:

- R Milne, T Brown, T Murray, 1998: The effect of geographical variation of planting rate on the uptake of carbon by new forests of Great Britain Forestry vol 71 pp 297-309

-R Dewar, M Cannell, 1992: Carbon sequestration in the trees, products and soils of forest plantations; an analysis using UK examples. Tree Physiology vol 11 pp 49 72

-R. Milne, R. Tomlinson, & T. D. Murray, 2003: Land Use Change and Forestry: The 2001 UK Greenhouse Gas Inventory and projections to 2020. http://www.edinburgh.ceh.ac.uk/ukcarbon/docs/DEFRA_Report_2003_Section02.pdf

PUBLIC SECTOR

Central and Local Government, Schools and NHS target - 0.5MtC

Derivation of figure

2.37 Overall savings estimates have been based on a similar share of the "All Cost-Effective" (ACE) potential to that in the business sector overall, i.e. just under 50%. In terms of how energy is used (e.g. primarily building services plus IT, a few large estates, large numbers of small users), the public sector is much more like the commercial sector than industry, so the share of ACE might be similarly rather lower than 50%. However, since the public sector is expected to set an example, it is likely that the outcome will be higher than for the commercial sector, but not as high as for heavy industry.

Sources of further information:

Not applicable.