Summary of Resource Planning Tool Report

BRE have carried out a DEFRA-funded project 'Understanding and Predicting Construction Waste' which aimed to set minimum reporting requirements for construction waste and to produce benchmarks for a set of performance indicators. The benchmarks produced have been incorporated into a new resource planning spreadsheet which allows users to predict waste arisings at a national, regional, county or local level. This has been funded from the Construction Resource and Waste Platform Programme managed by BRE and AEAT, and funded by Defra.

Benchmarks

Companies were asked to supply site waste data to BREs SMARTWaste Benchmarking website(http://www.smartwaste.co.uk/wastebenchmarking).The waste data collected included type and amount of waste produced, percentage segregated, cost and floor area of project and type of project. More details on the data collected is available on the Benchmarking website.

Data entered via the benchmarking website and data from BRE's SMARTStart system was analysed to produce a range of benchmarks. Before inclusion in the data analysis, data for all completed projects was subjected to a number of logical tests and then sorted into new build construction projects, refurbishment projects and demolition projects. At present there is still a limited number of refurbishment and demolition projects so benchmarks produced here are based on new build construction projects and the following assumptions have been made:

- no demolition waste is included
- no excavation waste is included
- no groundworks waste is included.

The following volume benchmarks were produced for new build construction projects:

- m^3 waste per $100m^2$ floor area by project types.
- m^3 waste per £100K by project type
- m^3 waste per $100m^2$ and m^3 waste per £100K by waste products by project type.

Tonnage benchmarks have been calculated from these figures by applying density factors (derived from the Environment Agency review of Construction and Demolition waste arisings) to the volume benchmarks. Benchmarks have also been calculated for standard, good and best practice for residential projects and for all other project types.

The data is still being collected through the benchmarking website and via BRE's new Site Waste Management Plan tool, SMARTWaste Plan which is also free to use. The benchmarks will be updated every two months which will help to refine, and add confidence to, the benchmark data produced.

Resource planning tool

The tool is an excel spreadsheet which is simple to use. Users need to enter details of planned new build construction projects or construction output and waste arisings are estimated by weight (tonnes) or volume (m^3). In addition, detailed waste arisings by waste type can be calculated for planned residential new build construction at a county or local level.

National level

The resource planning spreadsheet has been used at a national level to estimate waste arisings from new build construction output using information from the Construction Statistics Annual[1]. Applying the benchmarks for residential development to the total 2006 housing output and benchmarks for all other project types to output for all other new work gives an estimate of annual waste arisings for standard, good and best practice as shown in Table 1 below. These estimates have been calculated assuming everyone is at the same level, i.e. waste arisings for standard practice assume that all construction output is carried out using standard practice. In reality, there will be a large variation between companies.

	Tonnes waste arising for Great Britain		
	Standard	**Good**	**Best**
Residential new work output	2,922,778	2,025,232	1,357,826
Other new work output	5,062,634	3,236,766	2,448,323
All new work output	7,985,412	5,261,998	3,806,149

Table 1: Predicted annual waste arisings from new work construction output in Great Britain

Therefore, the resource planning spreadsheet can be used at a National level to:

- Help with forecasting and planning for sustainable waste management policy at a construction sector level
- Help to prioritise actions and policies related to construction waste management
- Help evaluate the performance of policies such as the Site Waste Management Plan Regulations
- Model possible future scenarios and capacities required for recovery of construction waste.

Regional level

Waste arisings at a regional level can be modelled in the same way as at a national level using data from the Construction Statistics Annual about construction output. For example the waste arisings from residential new build construction output and other new build construction output has been estimated for the East of England region as shown in Table 2 below.

	Tonnes waste arising for East of England		
	Standard	**Good**	**Best**
Residential new work	277,749	192,456	129,033
Other new work	446,642	285,558	215,999
All new work	724,391	478,014	345,032

Table 2: Predicted annual waste arisings for East of England from new construction output

[1] Construction Statistics Annual, August 2007, BERR

County/district level

The resource planning spreadsheet can be used at a county/district level in a number of ways. It can be used in the same way as at a national and regional level if information is available about construction output. Results for Hertfordshire are shown in Table 3 below.

	Tonnes waste arising for Hertfordshire		
	Standard	**Good**	**Best**
Residential new work	68,885	47,731	32,002
Other new work	128,832	82,368	62,304
All new work	197,717	130,099	94,306

Table 3: Predicted annual waste arisings for Hertfordshire from new construction output

The tool can also be used at a county or local level to estimate detailed waste arisings from planned new build residential construction. This has been done for Hertfordshire on a county and district level using figures from the East of England Plan Panel Recommendations for housing development and using a figure of 88 m^2 as the floor area of a typical dwelling (based on information from the English House Condition Survey, 2006). These figures have been input into the resource planning spreadsheet to give estimates of waste arising by district and by waste product. The results for some of the key waste products are summarised in the chart below.

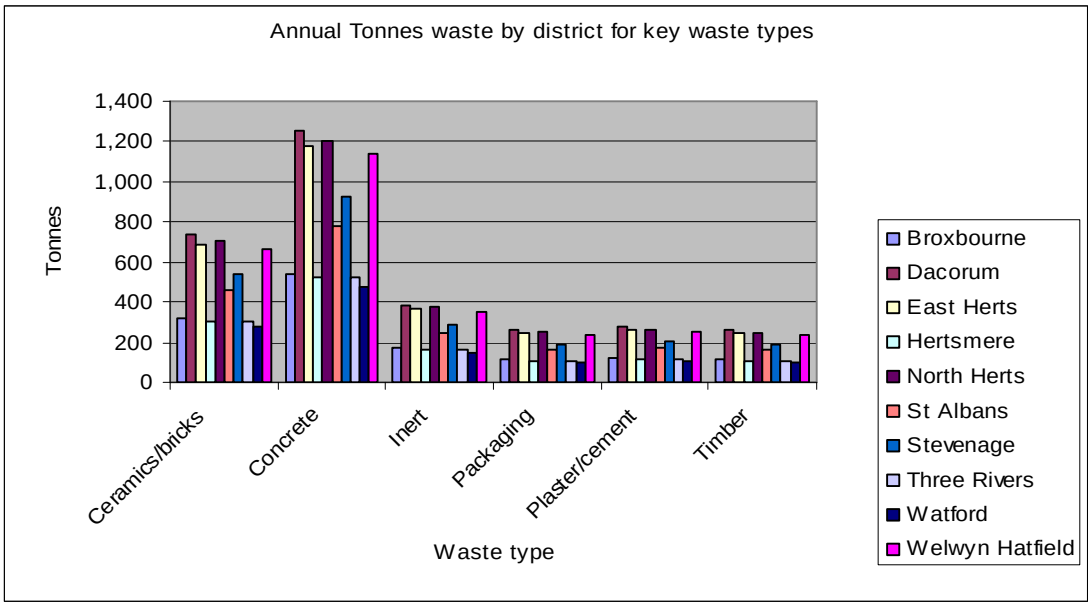

Figure 1: Predicted annual waste arisings from residential development for key waste products (by district)

Local level

Locally it is possible to predict waste arisings from specific developments based on the floor area of the development and the project type (e.g. residential, commercial retail etc.). For example, a development of 73 dwellings has been modelled and the floor area estimated using the figure of 88 m^2 for the average dwelling size. The estimated waste arisings by waste type have been calculated in volume and tonnes and are shown in Table 4.

	Predicted waste arisings	
Waste type	**m^3**	**Tonnes**
Canteen/office/ad-hoc	111.54	23.42
Ceramics/bricks	89.65	96.82
Concrete	130.36	165.55
Electrical equipment	6.34	1.71
Furniture	0.76	0.43
Hazardous	2.40	0.66
Inert	41.38	51.31
Insulation	61.39	15.35
Liquids and Oils	0.18	0.04
Metals	33.24	13.96
Packaging	163.88	34.41
Plaster/cement	110.58	36.49
Plastics	63.35	14.57
Timber	100.27	34.09
Grand Total	915.30	488.81

Table 4: Predicted waste arisings from construction of 73 residential units

This information can be used to assist with planning for waste management and can be used as part of Site Waste Management Plans. BREMAP can then be used to locate suitable waste management facilities near the development. In addition, the effect of setting waste reduction targets for specific projects can be modelled.