



**Caledonian  
Environment  
Centre**

## **Waste Data Tool for Local Authority Internal Waste Data Capture**



**SUSTAINABLE SOLUTIONS**

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# Waste Data Tool for Local Authority Internal Waste Data Capture

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Remade Scotland was the first UK market development programme for recycled materials. The programme has evolved to provide specific Scottish market intelligence, technical research and recycling performance support to Scottish Local authorities and the Scottish Government. The Scottish Government contracts with the Caledonian Environment Centre (part of Glasgow Caledonian University) for the delivery of the programme.

The Caledonian Environment Centre is part of the School of the Built and Natural Environment, Glasgow Caledonian University and is supporting environmental research and policy development in Scotland.

Glasgow Caledonian University is a registered Scottish charity, number SC02147



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## 1. Introduction

In 2005 Local authorities were funded to conduct internal waste audits and produce Waste Prevention Action Plans (WPAPs) funded through the Strategic Waste Fund. In 2008/09 support for local authorities on internal waste management was incorporated within the Remade programme. A survey of all local authorities in Scotland was conducted to assess how the WPAPs had been taken forward by Local authorities.

Many authorities stated in the survey that they do not know how much waste is generated internally or that is recycled beyond the data collected by the original waste audits. The recycling collections generally sit within the wider waste services provided for the area by the Council and as such the material collected is not quantified separately.

Following this survey, and a dissemination event with Local authorities, a report was produced including recommendations for future support that could be provided by Remade Scotland. The updated Remade Work Programme for 2009/10 outlines what support will be provided including working with authorities on internal waste data.

Authorities recognize the need for consistent data collection, analysis and recording. This is essential for planning, monitoring and benchmarking. Accurate data will allow Councils to target resources by identifying poor performers, largest waste producers, and potential costs savings.

In relation to this the Remade Work Programme for 2009/10 proposed a scoping study working closely with at least two Councils to develop a methodology for internal waste data capture.

This report presents the specification for a Waste Data Tool developed to enable internal waste data capture. Section 3 outlines the actions that would need to be taken to implement the tool successfully within a Local Authority. The tool will not stand alone without appropriate support within each Council. Section 4 sets out overlap that has been identified between the work on the Waste Data Tool and wider work on environmental reporting for the public sector within Scottish Government.



## 2. Waste Data Tool

A uniform method of calculating Local Authority internal waste would improve data availability and accuracy and support benchmarking between and within councils.

Several Local authorities have indicated that they would value a tool that would enable them to more closely monitor internal waste production. Many authorities are implementing systems in relation to environmental monitoring, particularly in relation to energy use. However, as yet no system has been identified that is being used by local authorities to monitor internal waste production.

An outline specification for an online Waste Data Tool which will enable internal waste data capture within Scottish Local authorities to cover all services and premise types has been developed and is presented in Appendix 1.

East Renfrewshire and Aberdeenshire councils have worked with Remade in the development of this specification. Remade have also liaised with Envirowise and outputs from their Local Authority waste audits were used in the tool development.

The tool, if implemented, has the potential to enable improved management of existing information but also identify where data gaps exist and resources need to be focused.

## 3. Implementation of Waste Data Tool in Local authorities

In implementing a tool for waste monitoring other support work should be undertaken in parallel by Local authorities and support agencies. Remade's understanding of the support required is set out in the following sections. These have been developed following discussions with various local authorities and with reference to the Waste Action Plan, produced for Health Facilities Scotland, which supports the implementation of the eMART tool.

### 3.1. Waste Management Policy

Local authorities should ensure there is an authority wide waste management policy or similar (e.g. environmental management policy).

This should clearly set out:

- Authority expectations in relation to sustainable procurement, waste minimisation, re-use and recycling.
- The benefits of sustainable waste management.
- The benefits of monitoring and benchmarking.
- Workplace specific procedures for all wastes produced including data reporting.

### 3.2. Responsibilities

A nominated officer within each Local Authority must have responsibility for waste data. This will involve:

- Clearly identifying appropriate 'Users' of the tool and clearly communicating their role. A 'User' may have responsibility for more than one premise.
- Circulating procedures for submitting data using the tool. Ideally these procedures will be produced at a Scottish level to prevent duplication of effort.
- Ensuring all premises submit data.
- Verification of the data submitted.
- Organising education and training to support 'Users' of the tool.
- Reporting on the data gathered.

The officer may only have waste management responsibilities or may have a wider environmental management role within the authority.

### 3.3. Testing procedure

A programme for trialling the tool will need to be developed including identification of the sample of premises that should be included and any necessary training.

With reference to the premise types listed in Section 2.1 those producing the largest amounts of waste should be targeted in the first instance. Remade found schools, community culture and leisure and offices (60%, 13%, and 11% of waste arisings respectively) are the largest waste producers<sup>1</sup>.

### 3.4. Education and training:

Appropriate education and training needs to be provided to ensure that staff given responsibility as 'Users' have the support required to ensure the tool is used correctly. Policies and procedures for using the tool should be put in place including details of how 'Users' should report mistakes and suggest changes to default information if necessary.

Induction procedures should incorporate sustainable waste management and council policy including duties in relation to Duty of Care and record keeping. Refresher training should be provided as necessary; this material could be made available as e-learning.

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<sup>1</sup> Remade (2008). Strategic Overview of the Waste Prevention Planning Project within Scottish Local authorities.

An additional benefit from the introduction of the tool is that it should result in greater awareness of the requirement for record keeping and ensure that invoices are checked against WTNs to ensure they are correct.

### 3.5. Reporting

Local authorities should use the tool to communicate to all staff performance levels. In particular performance between similar premises and services should be reported. This should be carried out at least on an annual basis. Comparison across authorities would enable benchmarking.

## 4. Overlap with other Scottish Government Plans

eMART is an environmental management tool that was developed by HFS to assist in environmental reporting across NHSS. The tool covers energy, water, wastewater and waste and also has the ability to calculate the associated carbon footprint. eMART has much of the functionality required for Waste Data Tool as outlined in Appendix 2.

A meeting was held with Judith Young<sup>2</sup> and Larry DeStefano on the 14<sup>th</sup> of September to discuss eMART. eMART is being piloted in six public sector organisations including Fife Council, the Scottish Parliament and the Botanic Gardens. The pilot is investigating the potential to use eMART as a consistent tool for environmental reporting across the public sector. The pilot is due to be completed in February 2010. The project is being led by John Dunlop at Health Facilities Scotland who has responsibility for eMART within Health Facilities Scotland.

The Waste Data Tool specification has been submitted to Judith Young. It is hoped that as the eMART tool goes forward that the specification is being considered. Remade proposed that Judith consider, in discussion with the waste team, if there is value in Remade becoming involved in the working group for the eMART pilot. No response has been received to this proposal.

A follow up meeting was held with John Dunlop on the 14<sup>th</sup> of October. This confirmed that eMART will have much of the functionality proposed in the Waste Data Tool specification. However, organisations are able to report a top level waste production figure rather than requiring a breakdown on a premise by premise basis. This limits the potential usefulness of the eMART tool in relation to benchmarking within the council and identifying low performing premises.

On the 9<sup>th</sup> November the Waste Data Tool was discussed with Martin MacDonald at the Quarter 3 Remade progress meeting. Remade require guidance on the extent to which the Waste Data Tool should remain within the waste minimisation element of the Remade programme given the work being taken forward by the Greener Division

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<sup>2</sup> At the time Judith was Team Leader, Leading by Example, Greener Scotland Division. It is understood that there has been some reorganisation within this Division since the time of the meeting.

in the Scottish Government. It was agreed at this meeting that Remade would submit a summary report outlining work to date to the Waste Team.

## 5. Conclusion

Local Authority waste officers have identified a need for improved systems to monitor waste arisings from their own premises. Remade have developed a specification for a Waste Data Tool that could assist in monitoring waste production from Local Authority premises.

For the Waste Data Tool to be successfully implemented within local authorities it will need to be enforced and supported by policy. In addition, local authorities will need to dedicate staff resource for someone to have responsibility for looking after the waste data as well as testing, education and training and reporting.

Resources have not been allocated in the Remade programme to develop and pilot the Waste Data Tool. However, Remade has investigated the most appropriate way for the Waste Data Tool to be taken forward. The Waste Data Tool must be supported across the Scottish Government to facilitate sign up by Local authorities and ensure a consistent approach.

At the present time work is ongoing to develop the Scottish Government approach in relation to public sector environmental reporting. Remade have submitted the draft Waste Data Tool specification to those in the Scottish Government with responsibilities in this area.

This report is being submitted to the Waste Team in Scottish Government in order to report on work to date and obtain guidance on the extent to which the Waste Data Tool should remain within the waste minimisation element of the Remade programme. No further work will take place on the Waste Data Tool unless directed by the Waste Team.

## Appendix 1 Waste Data Tool Specification

Figure 1 presents a proposed overview of how the Waste Data Tool could operate.

### Key Requirements

#### *Coverage*

- All council premises and services.
- Re-use, recycling and residual waste.
- Regular scheduled services.
- Special uplift.
- Highways and landscape waste – this waste isn't related to a specific premise. Therefore, tool will require flexibility to input data at a service level as well as premise level.

#### *Internet interface*

- Access via the internet.
- Access password protected.

#### *Multiple users*

- 'Administrator' with access to all records.
- 'User' able to enter data for allocated premises only.
- 'Users' may have different levels of access e.g. may be responsible for entering data only on recycling.

#### *Data entry*

- No constraint on when data can be entered i.e. should be possible to input data weekly, monthly, quarterly, yearly.
- Ability for administrator to set minimum frequency of data entry by 'User'.
- Ability to add and distinguish between different data sets for the same premise e.g. data from detailed waste audits.

#### *Email alerts*

- Email alerts to 'Users' if data not submitted.
- Email alerts to remind 'Users' to keep Waste Transfer Notes'.
- Alternatively, it could also be useful for 'Users' to see messages when they log onto the system.

#### *Premise information*

- Ability for 'Administrator' to add descriptive fields in relation to each premise e.g. accessibility - some premises cannot be accessed by recycling vehicles.

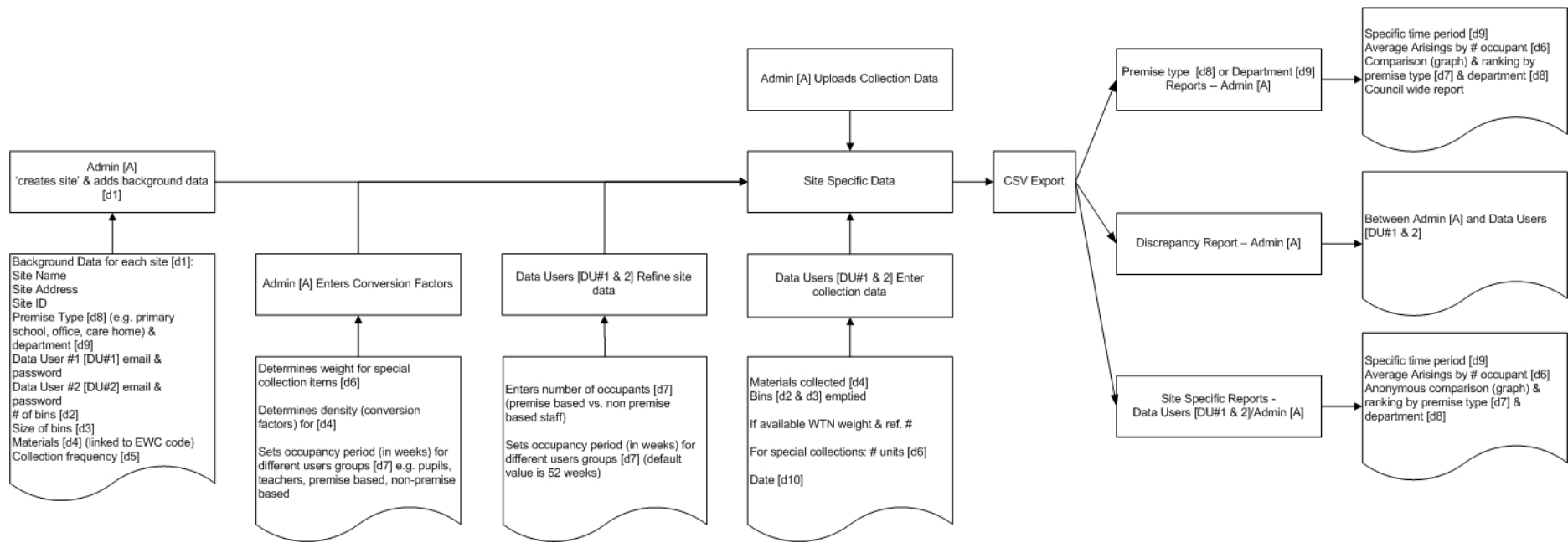


Figure 1 Waste Data Tool Overview

### *Data storage*

Secure storage of all data on server.

### *Verification and validation*

The tool should incorporate various ways in which the data can be verified and validated.

- All data entered and submitted by 'Users' validated by the administrator.
- Incorporate automatic limits in data fields.
- Basic descriptive statistics e.g. distribution based on standard deviation/normal distribution around a mean, upper and lower quartiles – highlight unusual data (outliers).
- Discrepancy reports to cross check when premise data submitted from more than one source e.g. Users vs. Administrator.

### *Units*

- Common unit of measurement of waste by mass i.e. 'tonnes'.
- 'Users' will have ability to add data on number of units and/or volume of waste. Tool will convert this data into a tonnage.

### *Reports*

Compare performance

- Ability to interrogate system and run reports.
- Reports to include:
  - Waste per employee/pupil etc
  - Waste by premise
- Import and export of data as MS Excel or csv files.
- 'Users should only be able to run reports and download data on their own allocated premises and associated premise types.

### *Carbon*

- The tool should calculate the waste carbon footprint.

## **Development Issues**

### *Waste volume to weight conversion factors*

Most data available will be in the form of volume rather than weight.

A standard set of conversion factors should be included to convert from volume to mass. It is important to adopt a single set of conversion factors across all authorities to enable benchmarking across local authorities.

Conversion factors are an issue with many different conversion factors being available. This is illustrated by the data in **Appendix 2** and the following quote from WRAPs 2008 report on waste in schools:

*“A second report (Eunomia Research & Consulting et al., 2007) criticised the conversion factors that had been used in the Waste Watch report (40kg/m<sup>3</sup>) and cited what they considered to be a more appropriate conversion factor (230kg/m<sup>3</sup>) based on their own research, which would give rise to an estimated 126kg of waste per student per annum. The Environment Agency has in the past used a factor of 139kg/m<sup>3</sup> for mixed commercial waste and 174kg/m<sup>3</sup> for mixed household waste. Without additional research, it is not clear which of these very different factors is more appropriate for use by those planning collection services for schools. Due to the inevitable inaccuracies of estimating an appropriate conversion to translate volumes to weight, WRAP commissioned research based on actual measurements of the weight of waste collected from schools, the results of which are presented in this report.”<sup>3</sup>*

It is proposed that in consultation with SEPA the following conversion factors are used by default:

- SEPA Density conversion factors
- Furniture Reuse Network average weights list 2009<sup>4</sup>

However, it may be valuable to have the flexibility within the tool for ‘Administrators’ to tailor the conversion factors to reflect actual arisings in each council.

### *Waste Data*

The data entered into the tool will be dependent on what is available at different premises. Sources of data:

- Waste Transfer Notes.
- Invoices.
- Trade waste records.

In the future it may be possible to automatically upload data if records are provided electronically. This functionality is being investigated by HFS for eMART.

This would cut down the amount of time required by ‘Users’ for data entry. ‘Users’ would simply have to verify that the uploaded information matched premise records.

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<sup>3</sup> The Nature and Scale of Waste Produced by Schools in England.  
[http://www.ukyouthparliament.org.uk/recycling/pdf/Nature\\_and\\_Scale\\_of\\_Waste\\_produced\\_by\\_schools.pdf](http://www.ukyouthparliament.org.uk/recycling/pdf/Nature_and_Scale_of_Waste_produced_by_schools.pdf)

<sup>4</sup> <http://www.frn.org.uk/pdfs/FRN%202009%20Final%20average%20weights%20list.pdf>

## Database Fields

### *Premise fields*

The following fields in the database will be completed at an Administrator level and it should not be possible for 'Users' to change this information:

- Premise name.
- Premise ID (premises may already have been allocated a reference number from Local Authority Carbon Management (LACM) work).
- Premise address.
- Premise type.
- Services located on site (may be more than one).
- Service restrictions e.g. accessibility.
- Floorspace (if available from LACM work).

In addition, the 'User' should be able to complete and/or amend the following fields.

- Number of occupants (by employee and other users e.g. pupils).
- Site occupancy period (user) (default 52 wks).

### *Premise type*

Premise lists created for carbon reporting have been reviewed from three local authorities. Key premise types and other premise types are set out in Table 2 below.

**Table 2 Local Authority Premise Types**

Key premises	Other
<ul style="list-style-type: none"> <li>• Care centre</li> <li>• Cemetery</li> <li>• Community centre</li> <li>• Day centre</li> <li>• Fire station</li> <li>• Hall</li> <li>• Leisure centre</li> <li>• Library</li> <li>• Office</li> <li>• Roads depot</li> <li>• School – primary</li> <li>• School – secondary</li> <li>• Sports centre</li> <li>• Swimming pool</li> <li>• Town hall</li> </ul>	<ul style="list-style-type: none"> <li>• Allotment</li> <li>• Art Centre</li> <li>• Bandstand</li> <li>• Boathouse</li> <li>• Café</li> <li>• Car park</li> <li>• Caravan Park</li> <li>• Children’s home</li> <li>• Clock tower</li> <li>• Depot</li> <li>• Harbour</li> <li>• Housing</li> <li>• Industrial unit</li> <li>• Lodge</li> <li>• Marina</li> <li>• Mausoleum</li> <li>• Museum</li> <li>• Park</li> <li>• Pavilion</li> <li>• Police station</li> <li>• Public toilets</li> <li>• Radio hill station</li> <li>• Refuse depot</li> <li>• Residential</li> <li>• Shop</li> <li>• Store</li> <li>• Theatre</li> <li>• Village hall</li> <li>• War memorial</li> <li>• Workshops</li> </ul>

*Service form fields*

Residual waste and segregated recycling:

- Type of container (drop down list to select) e.g. bin (including size in litres), box, bag.
  - It may be necessary/helpful to have visuals/photographs associated with container types to ensure the right container type selected.

- For all containers including those that are non-standard containers e.g. bag, box etc the size in litres should automatically be completed in form once container type selected.
- Material type (drop down list to select). This should be by European Waste Catalogue code. This code itself could be 'hidden' from the 'User' so only text description displayed in order to simplify. Additional information to ensure correct waste type selected could be made available to the 'User' via 'information' buttons.
- Number of containers collected.
- Collection frequency.
- Data source (drop down list to select) e.g. WTN, invoice.
- Reference in relation to data type e.g. WTN reference, invoice reference.

Bulky waste and special uplifts:

- Item description (drop down list to select)
  - May require two levels to ensure list is not overly long e.g. first level 'furniture' second level 'office desk'.
- Number of units collected.
- WTN reference.
- Invoice reference.

## Appendix 2 Waste Conversion Factors

	SEPA Density Conversion Factors <sup>5</sup>	Local Authority <sup>6</sup>	Landfill Tax Guidance - HMRC <sup>7</sup>	WRAP - The Nature and Scale of Waste Produced by Schools in England.
<b>Cubic metres to tonnes</b>				
<b>Paper</b>	0.2105 <sup>8</sup>	0.32		
<b>Cardboard</b>	0.2 <sup>9</sup>	0.20		
<b>Glass</b>	0.3332 <sup>10</sup>	0.40		
<b>Mixed Cans</b>	0.22 <sup>11</sup> - 0.23 <sup>12</sup>	0.16		
<b>Plastic</b>	0.14 <sup>13</sup> - 0.22 <sup>14</sup>	0.015		
<b>Meat</b>	0.2 <sup>15</sup>	0.09		
<b>Catering</b>	0.2 <sup>16</sup>	0.10		
<b>Lamps</b>	0.1886 <sup>17</sup>	0.20 <sup>18</sup>		
<b>Oil</b>	0.6109 <sup>19</sup>	0.25		
<b>General waste</b>	0.26 <sup>20</sup>	0.064	0.2 <sup>21</sup> -0.4 <sup>22</sup>	0.04-0.23 <sup>23</sup>

<sup>5</sup>[http://www.sepa.org.uk/waste/waste\\_data/commercial\\_\\_industrial\\_waste/business\\_waste\\_surveys.aspx](http://www.sepa.org.uk/waste/waste_data/commercial__industrial_waste/business_waste_surveys.aspx)

<sup>6</sup> Confidential Local Authority. Calculated based on surveys of actual arisings.

<sup>7</sup> <http://www.hmrc.gov.uk/manuals/lftmanual/Index.htm>

<sup>8</sup> 20 01 01 Paper and cardboard

<sup>9</sup> 15 01 01 Paper and cardboard packaging

<sup>10</sup> 15 01 07 glass packaging and 20 01 02 glass

<sup>11</sup> 15 01 04 metallic packaging

<sup>12</sup> 20 01 40 metals

<sup>13</sup> 20 01 39 plastics

<sup>14</sup> 15 01 02 plastic packaging

<sup>15</sup> 20 01 08 biodegradable kitchen and canteen waste

<sup>16</sup> 20 01 08 biodegradable kitchen and canteen waste

<sup>17</sup> 20 01 21 fluorescent tubes and other mercury-containing waste

<sup>18</sup> 65 lamps per tube/collection

<sup>19</sup> 20 02 25 edible oil and fat

<sup>20</sup> 20 03 01 mixed municipal waste

<sup>21</sup> Household waste – not compacted

<sup>22</sup> Household waste –compacted

<sup>23</sup> The Nature and Scale of Waste Produced by Schools in England.

[http://www.ukyouthparliament.org.uk/recycling/pdf/Nature\\_and\\_Scale\\_of\\_Waste\\_produced\\_by\\_schools.pdf](http://www.ukyouthparliament.org.uk/recycling/pdf/Nature_and_Scale_of_Waste_produced_by_schools.pdf)



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