



# CORPORATE RESPONSIBILITY REPORT 2016

## INDICATORS DOCUMENT

### *Making more from waste*

The data in Shanks annual CR Report and our more-in-depth CR the FULL DATA document comes from a wide variety of sources. It is critical this data is as consistent and accurate as practical. This indicators document is aimed at two audiences: **1. Internal stakeholders:** such as the Shanks employees who collect our CR data to ensure this is collected in a consistent manner. **2. External stake-holders,** such as readers of our CR Report documents to allow them access to how we calculate CR data and on what basis.





## 1. Index and general reporting guidelines

The tables below in section 2 show the CR performance indicators used in Shanks Group CR Report documents. These are listed by type (environment, employee wellbeing, wider community etc). Each indicator is listed by what it is, the units the indicator is reported in and comments. In addition, the method of calculation for the indicator, where appropriate. For many indicators the method of calculation is obvious, while for others more explanation is provided. However, in general: see right for overall reporting guidelines applied

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### 1. General reporting guidelines and boundaries

- ✓ In general Shanks annual CR reports state performance on a financial year basis. For example, 1<sup>st</sup> April 2015 to 31<sup>st</sup> March 2016. However, where data is collected on a calendar year (January – December) for regulatory purposes (for example where an environmental regulator requires an annual report), or for other reporting cycle and similar reasons such data is acceptable and is used to avoid duplication of effort
- ✓ Shanks CR reports cover all of its operating divisions across the Group and all countries of operation and all sites/operations of the Group. Report boundaries are not constrained by company structure or geography
- ✓ However, reports do not include the activities of sub-contractors or suppliers. As a waste management company Shanks upstream supply chain consists largely of the wastes its sites receive (see Shanks CR Policy, supply chain section)
- ✓ Reporting of joint ventures is on a case-by-case basis. Where Shanks has < 50% share in a company, data is not generally included. Where share is 50% or more reporting is generally by level of share. For example for the UK Joint Venture site at Cumbernauld, environmental data is reported as a proportion representing the shareholding of Shanks (50%) to reflect the financial reporting arrangements. But, H&S and H.R. parameters are reported as 100% for contractual reasons. Specific arrangements for specific joint ventures are decided on at Shanks Group CR Committee
- ✓ Where an operation was only operational (or owned by Shanks in the case of acquisitions) for part of the year, data is only be reported for that portion of the year Shanks operated/owned the site
- ✓ Conversion factors for calculating carbon dioxide emissions are detailed in appendix 1. Please note that Shanks sets itself 5-year key CR objectives, one of which is the amount of carbon avoidance our activities produce. To allow valid comparisons from year-to-year during these 5-year objectives cycles we retain the same carbon factors. At the end of each cycle we revise the factors to update them

## 2. Table of indicators with definitions



### 2a. Environment – climate change emissions

#### 1. Process based emissions (emissions from waste management processes)

<b>Landfill gas emissions</b>	<b>CO<sub>2</sub> equivalent tonnes</b>	<ul style="list-style-type: none"> <li>✓ Emissions are CO<sub>2</sub> emitted from the combustion of collected landfill gas in a flare or power engines and landfill gas (CO<sub>2</sub> and CH<sub>4</sub>) emitted from passive venting of collected gas or emitted from the surface of the landfill</li> <li>✓ If a methodology for calculating the emissions for a landfill site already exists - a method agreed for regulatory reporting, this is used. Otherwise, GasSim (model used in UK for regulatory reporting) is used</li> <li>✓ Emissions reported include operational landfill sites and closed landfills where Shanks still actively manages gas</li> </ul>
<b>Green waste composting emissions</b>	<b>CO<sub>2</sub> equivalent tonnes</b>	<ul style="list-style-type: none"> <li>✓ Tonnes green waste composted x conversion factor = CO<sub>2</sub> equivalent (see appendix 1 for conversion factors)</li> <li>✓ Note – green waste composting only – other composting calculated as for MBT, AD etc below</li> </ul>
<b>Other process emissions, such as MBT, AD etc</b>	<b>CO<sub>2</sub> equivalent tonnes</b>	<ul style="list-style-type: none"> <li>✓ Such processes will include MBT, mixed waste composting, anaerobic digestion etc. Technology specific calculations are used. These are peer reviewed by Shanks Group CR Committee</li> </ul>

#### 2. Transport based emissions

<b>Fuel use – Shanks waste collection and transport vehicles</b>	<b>CO<sub>2</sub> equivalent tonnes</b>	<ul style="list-style-type: none"> <li>✓ Includes all waste and recyclable materials collection, transfer, etc, transport movements by road by Shanks vehicles. Does not include third party transport (only emissions from Shanks vehicles are included)</li> <li>✓ Includes any diesel, petrol, LPG, biodiesel, etc. used (see appendix 1 for conversion factors)</li> <li>✓ Litres fuel consumed x relevant conversion factor = CO<sub>2</sub> equivalent (see appendix 1 for conversion factors)</li> <li>✓ Vehicles operated for business purposes but which do not carry waste (such as cars and light vans) are not included in this indicator (see below for this category)</li> </ul>
<b>Fuel use – business travel</b>	<b>CO<sub>2</sub> equivalent tonnes</b>	<ul style="list-style-type: none"> <li>✓ Based on distance travelled and average fuel consumption</li> </ul>

#### 3. Energy use based emissions

<b>Electricity used at sites and in offices</b>	<b>CO<sub>2</sub> equivalent tonnes</b>	<ul style="list-style-type: none"> <li>✓ All electricity used at sites and in offices included. Includes electric motors etc used in recycling and other operations, electric heating, general electricity usage etc</li> <li>✓ Electricity consumed (kWh) x relevant conversion factor = CO<sub>2</sub> equivalent (see appendix 1 for factors)</li> <li>✓ Electricity generated from renewable sources on- site and used on site (other than parasitic usage) is excluded</li> <li>✓ Imported electricity from renewable sources reported separately so that a different conversion factors can be used</li> </ul>
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<b>Gas used at sites and in offices</b>	<b>CO<sub>2</sub> equivalent tonnes</b>	<ul style="list-style-type: none"> <li>✓ Gas consumed (kWh) x conversion factor = CO<sub>2</sub> equivalent (see appendix 1 for conversion factors)</li> <li>✓ Emissions from gas consumption are reported separately from electricity consumption</li> </ul>
<b>Fuel used on sites and in offices</b>	<b>CO<sub>2</sub> equivalent tonnes</b>	<ul style="list-style-type: none"> <li>✓ Includes fuel used in heavy mobile and static plant, oil heating etc</li> <li>✓ Litres of fuel consumed x relevant conversion factor = CO<sub>2</sub> equivalent (see appendix 1 for conversion factors)</li> </ul>

#### 4. Gross total emissions from significant sources

<b>Gross total of all above emissions</b>	<b>CO<sub>2</sub> equivalent tonnes</b>	<ul style="list-style-type: none"> <li>✓ Total of 1 (process emissions), 2 (transport emissions) and 3 (energy use emissions) to give Shanks total significant carbon emissions expressed as CO<sub>2</sub> equivalent tonnes (in outline, scope 1 and 2 emissions)</li> </ul>
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The above represents Shanks emissions. Below are avoidance indicators: That is Shanks activities, such as recycling and recovery and production of various 'fuels' have a carbon benefit in that they avoid carbon emissions compared with the fuel or material they are displacing. For example, metals separated for recycling and passed to a processor emit less CO<sub>2</sub> than producing the same metal from raw ores. Likewise waste derived fuels may displace fossil fuels such as coal in a cement kiln so reducing CO<sub>2</sub> equivalent tonnes emissions. Shanks does not use a simple add and subtract calculation – rather emissions and avoidance are stated and the reader can make their own conclusions

### 2b. Environment – climate change 'avoidance'

#### 5. AD and other 'gas-use' based renewable energy 'avoidance' to above carbon data

<b>Landfill gas power generation</b>	<b>CO<sub>2</sub> equivalent tonnes</b>	<ul style="list-style-type: none"> <li>✓ Comparison used is CO<sub>2</sub> emissions avoided from average grid electricity generation</li> <li>✓ Electricity generated (kWh) x relevant conversion factor = CO<sub>2</sub> equivalent (see appendix 1 for conversion factors)</li> <li>✓ Electricity generated and used elsewhere on site and electricity generated and sold to grid reported separately</li> </ul>
<b>Anaerobic digestion power generation</b>	<b>CO<sub>2</sub> equivalent tonnes</b>	<ul style="list-style-type: none"> <li>✓ Comparison used is CO<sub>2</sub> emissions avoided from average grid electricity generation</li> <li>✓ Electricity generated (kWh) x relevant conversion factor = CO<sub>2</sub> equivalent (see appendix 1 for conversion factors)</li> <li>✓ Electricity generated and used elsewhere on site and electricity generated and sold to grid reported separately</li> </ul>

#### 6. Waste derived fuels based renewable energy 'avoidance' to above carbon data

<b>Waste derived fuels produced and sold</b>	<b>CO<sub>2</sub> equivalent tonnes</b>	<ul style="list-style-type: none"> <li>✓ Includes all waste derived fuels: Icopower pellets, woodchips for biomass, SRF from MBT, etc</li> <li>✓ Only materials going to production and recovery processes are included. Non-recovery incineration not included</li> <li>✓ Emissions avoided based on calorific value of fuel and what it replaces (see appendix 1 for conversion factors)</li> </ul>
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#### 7. Recycling based potential 'avoidance' to the above carbon data

<b>Amount of various waste types recycled</b>	<b>CO<sub>2</sub> equivalent tonnes</b>	<ul style="list-style-type: none"> <li>✓ Each waste type recycled to be reported separately</li> <li>✓ Tonnes waste recycled x relevant conversion factor for each waste type (see appendix 1 for conversion factors)</li> </ul>
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The above sections (1 – 7) represent Shanks carbon 'footprint'

#### 8. GHG emissions and avoidance intensity ratios

<b>Total GHG emissions from 4a above</b>	<b>CO<sub>2</sub> equivalent tonnes / revenue</b>	<ul style="list-style-type: none"> <li>✓ Total emissions from above / £ turn-over = emissions intensity ratio</li> </ul>
<b>Total GHG avoidance from 4b above</b>	<b>CO<sub>2</sub> equivalent tonnes / revenue</b>	<ul style="list-style-type: none"> <li>✓ Total avoidance from above / £ turn-over = avoidance intensity ratio</li> </ul>

## 2c. Environment – other indicators

### 9. Water consumption

<b>Water use – tap / potable</b>	<b>Cubic metres</b>	✓ Tap/potable water: water delivered to Shanks sites by the municipal water supply
<b>Water use – surface water</b>	<b>Cubic metres</b>	✓ Water extracted from inland waters, transitional waters and coastal waters like rivers, lakes, canals etc
<b>Water use – groundwater</b>	<b>Cubic metres</b>	✓ Water extracted from below ground in the saturation zone and in direct contact with the ground or subsoil
<b>Water use – rain water</b>	<b>Cubic metres</b>	✓ Water used from the collection of rain water which is accumulated and stored for use (such as from roofs)
<b>Water use – grey water</b>	<b>Cubic metres</b>	✓ All water used which is wastewater treated to be used again as process water

### 10. Bio-diversity and spills

<b>Land owned/leased in, or next to, protected and areas of high biodiversity</b>	<b>1. Number sites</b>	✓ Any land owned, managed, leased etc by Shanks which falls under legal definitions relating to environmental protection, special bio-diversity value etc – note, only areas which are specifically identified by legal requirements
	<b>2. Description</b>	✓ And, the same as above, but for land next to Shanks sites (directly next to rather than simply being near to)
<b>Total number of significant spills</b>	<b>1. Number spills</b> <b>2. Descriptions</b>	✓ Number of spills which were reportable to environmental regulators under site environmental permits. Small scale spills which were not reportable (that is spills which fell below site permit reporting requirements) are not included

### 11. Waste and resources

<b>Electricity used at sites and in offices</b>	<b>Kilowatt hours</b>	✓ As for section 3 above energy use based emissions, but expressed as raw consumption data in kilowatt hours
<b>Gas used at sites and in offices</b>	<b>Kilowatt hours</b>	✓ As for section 3 above energy use based emissions, but expressed as raw consumption data in kilowatt hours
<b>Fuel used on sites and in offices</b>	<b>Litres</b>	✓ As for section 3 above energy use based emissions, but expressed as raw consumption data in litres used
<b>Fuel use – Shanks waste transport vehicles</b>	<b>Litres</b>	✓ As for section 2 above transport use based emissions, but expressed as raw consumption data in litres used
<b>Total waste handled at Shanks sites</b>	<b>Tonnes</b>	✓ Total waste handled by Shanks sites whether collected by Shanks or third parties, but not wastes collected/transported by Shanks to third party sites
		✓ For Shanks the waste handled is equivalent to raw materials used for many other companies (such as production companies). Other materials used, other than wastes, are a minor proportion of Shanks materials usage
<b>Amount waste recycled and recovered at Shanks sites</b>	<b>Tonnes</b>	✓ All materials separated for recycling/re-use/recovery (e.g. paper, plastics, metal, green waste, aggregates, soil, etc). Reported from all types of facilities undertaking recycling/recovery activities
	<b>Tonnes</b>	✓ For recycling plants only those materials that are to be re-used/sent to re-processors included (i.e. not the total received at a recycling facility only that portion which is recycled)
	<b>Tonnes</b>	✓ For recovery operations (such as MBT, AD etc) only that material re-used/sent to a secondary use are included (i.e. not the total received at a recovery facility only that portion which is recovered)



<b>Proportion of waste recycled/recovered</b>	<b>Percentage of total waste handled</b>	✓ Percentage of wastes received at Shanks sites (all types of site) which are recycled or recovered. See below calculation and notes
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### Calculation of % of waste recycling/recovered by Shanks (for reference)

$\frac{\text{Total waste accepted at Shanks sites (collected by Shanks or third parties) – waste sent to landfill or incineration disposal}}{\text{Total waste handled (that is accepted at) at Shanks sites (tonnes) whether collected by Shanks or by third parties}} \times 100$	= % waste recycled and recovered
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Note - for wastes accepted at Shanks landfill sites the % recycled or recovered is zero

<b>Types of waste accepted by Shanks</b>	<b>Tonnes (for each of the types of waste)</b>	Tonnes of waste accepted at sites (not transported) split into Shanks standard waste categories as required by Shanks QlikView reporting (see appendix 2 for categories). <b>Note</b> – where it is not possible to match categories 100% wastes are allocated to the nearest category. <b>Note</b> – <b>ONLY</b> the 'Top Hierarchy' categories as shown in appendix 2 are used
<b>Disposal method for waste not recycled or recovered</b>	<b>Type of disposal</b>	Tonnes of waste sent from Shanks sites (not simply transported) split into: Landfill and incineration



## 2d. Management systems and compliance

### 12. Management systems

<b>Number operations certified to recognised management systems</b>	<b>Number of operating centres</b>	✓ Report number of operating centres certified to ISO14001, EMAS, ISO9001, OHSAS18001, VCA, etc. Specify number of sites certified to each standard separately
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### 13. Compliance

<b>Number environmental convictions and fines</b>	<b>Number convictions/fines</b>	✓ Convictions (cases where the company goes to court) and significant administrative fines (such as those that can be received in Belgium and the Netherlands) reported
<b>Details of environmental convictions and fines</b>	<b>Penalty in £/Euros</b>	✓ Reported date of offence or date of prosecution/fine, company concerned, nature of offence and amount of fine
<b>Number of safety convictions and fines</b>	<b>Number convictions/fines</b>	✓ Convictions (cases where the company goes to court) and significant administrative fines (such as those that can be received in Belgium and the Netherlands) to be reported

<b>Details of safety convictions and fines</b>	<b>Penalty in £/Euros</b>	✓ Reported date of offence or date of prosecution/fine, company concerned, nature of offence and amount of fine
<b>Other convictions and fines</b>	<b>Number convictions/fines</b>	✓ Legal actions for anti-competitive behaviour, anti-trust and monopoly practices
<b>Details of other convictions and fines</b>	<b>Penalty in £/Euros</b>	✓ Reported date of offence or date of prosecution/fine, company concerned, nature of offence and amount of fine
<b>% businesses analysed for bribery/corruption risk</b>	<b>% of operations</b>	✓ % of operations which have undergone risk assessment for bribery and other similar risks to identify higher-risk areas



## 2e. Employee well-being and business ethics

### 14. Employee workplace injuries

<b>Total employee lost-time injuries</b>	<b>Number total lost time injuries</b>	✓ Total number of lost time injuries (> 1 days absence from work)
<b>Total employee lost-time injury rate</b>	<b>Rate per 100,000 employees</b>	✓ Total number of lost time injuries (> 1 days absence from work) / number of employees x 100,000
<b>Employee &gt;3 day reportable injuries</b>	<b>Number &gt;3 day injuries</b>	✓ Number of >3 day employee injuries
<b>Employee &gt;3 day injury rate</b>	<b>Rate per 100,000 employees</b>	✓ Number of >3 day employee injuries / number of employees x 100,000 (standard rate)
<b>Lost time accident (LTA) frequency rate</b>	<b>Rate per 100,000 days worked</b>	✓ Number of lost time injuries / number of days worked x 100,000
<b>Incident severity rate</b>	<b>Average days lost as result of LTAs</b>	✓ Number of days lost as result of workplace accidents / number of lost time accidents

### 15. Absence through illness and injury

<b>Total employee absenteeism from work</b>	<b>% of available days</b>	✓ Number of days lost because of illness and injury / total number of available work days x 100
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<b>Work related absenteeism from work</b>	<b>% of available days</b>	✓ Number of days lost as the result of workplace injury or illness (such as the above lost time injuries) / total number of available work days x 100
<b>Non-work related absenteeism from work</b>	<b>% of available days</b>	✓ Number of days lost as the result of non-work related injury or illness (such as sports injuries, flu and other non-work related conditions) / total number available work days x 100
<b>Short-term absence</b>	<b>% of available days</b>	✓ As above – short-term defined as <8 days absence
<b>Average duration of employee absence</b>	<b>Days</b>	✓ Total number of days lost because of illness and injury / number of employees who were ill or injured
<b>Average frequency of absence</b>	<b>Number of absence periods</b>	✓ Total number of absence periods of whatever length / total number of employees
<b>Employees with more than 2 absence periods</b>	<b>% of workforce</b>	✓ Number of employees who had more than 2 absence periods / total number of employees x 100
<b>Employees with zero absence days</b>	<b>% of workforce</b>	✓ Number of employees which zero absence periods / total number of employees x 100

#### 16. Staffing, employee retention, training and discrimination

<b>Total number permanent employees</b>	<b>Number employees</b>	✓ Total number of all employees, but not including non-permanent/temporary workers (see definition below and appendix 4). Reported as annual average
<b>Number of operational employees</b>	<b>Number employees</b>	✓ Number of operational ('blue-collar') employees, such as operators, lorry drivers, mobile plant drivers etc. Reported as annual average
<b>Number of admin, support etc employees</b>	<b>Number employees</b>	✓ Number of non-operational ('white collar') employees, such as managers, support staff, administration staff etc. Reported as annual average
<b>Total number male permanent employees</b>	<b>Number employees</b>	✓ Number of male employees (all types) ✓ Reported as year-end figure for reporting rules reasons
<b>Total number female permanent employees</b>	<b>Number employees</b>	✓ Number of female employees (all types) ✓ Reported as year-end figure for reporting rules reasons
<b>Number male directors</b>	<b>Number</b>	✓ Number male directors (as listed via Company House etc) ✓ Reported as year-end figure for reporting rules reasons
<b>Number female directors</b>	<b>Number</b>	✓ Number of female directors (as listed via Company House etc) ✓ Reported as year-end figure for reporting rules reasons
<b>Number male senior managers</b>	<b>Number</b>	✓ Number male senior managers – senior managers being divisional directors and regional etc managers ✓ Reported as year-end figure for reporting rules reasons
<b>Number female senior managers</b>	<b>Number</b>	✓ Number female senior managers – senior managers being divisional directors and regional etc managers ✓ Reported as year-end figure for reporting rules reasons
<b>Number male operational employees</b>	<b>Number employees</b>	✓ Number male operational employees (blue collar employees) ✓ Reported as year-end figure for reporting rules reasons



<b>Number female operational employees</b>	<b>Number employees</b>	<ul style="list-style-type: none"> <li>✓ Number female operational employees (blue collar employees)</li> <li>✓ Reported as year-end figure for reporting rules reasons</li> </ul>
<b>Age profile</b>	<b>Number by age groups</b>	<ul style="list-style-type: none"> <li>✓ Number of permanent employees split into age categories: &lt;25 years old, 25 to 34 years old, 35 to 44 years old, 45 to 54 years old, 55 to 59 years old, &gt;60 years. Reported as annual average % for each age group</li> </ul>
<b>Number full-time permanent employees</b>	<b>Number employees</b>	<ul style="list-style-type: none"> <li>✓ Number of full time permanent employees (all types)</li> <li>✓ Report as annual average</li> </ul>
<b>Number part-time permanent employees</b>	<b>Number employees</b>	<ul style="list-style-type: none"> <li>✓ Number of part-time permanent employees (all types)</li> <li>✓ Report as annual average</li> </ul>
<b>Permanent employee turn-over</b>	<b>% replacement over year</b>	<ul style="list-style-type: none"> <li>✓ Number of employees replaced during the year / total average number of employees x 100</li> </ul>
<b>Average number of years' service</b>	<b>Years</b>	<ul style="list-style-type: none"> <li>✓ Average number of years served with Shanks for current employees. Total number of years worked for Shanks by all current employees / total number of current employees</li> </ul>
<b>Number external non-permanent workers employed</b>	<b>Number external non-permanent workers</b>	<ul style="list-style-type: none"> <li>✓ Number of non-permanent workers employed expressed as a FTE (full time equivalent). That is: Total number days worked by non-permanent workers in year / average number of days worked by a full time permanent employee = FTE figure (see appendix 4)</li> </ul>
<b>Number of cases of discrimination</b>	<b>1. Number 2. Description</b>	<ul style="list-style-type: none"> <li>✓ Number of confirmed cases of discrimination (gender, race, religious, sexual orientation, disability, age etc)</li> <li>✓ Brief description of incident and the action taken</li> </ul>
<b>Employees covered by joint safety consultation</b>	<b>% of total employees covered</b>	<ul style="list-style-type: none"> <li>✓ Number of employees covered by formal joint management / worker health and safety committees expressed as a % of the total workforce</li> </ul>



## 2f. Wider community

### 17. Neighbourliness

<b>Number of environmental complaints received</b>	<b>Number complaints received</b>	<ul style="list-style-type: none"> <li>✓ Number of complaints received from any third party relating to an environmental issue (can be reported direct or via a regulator). Includes substantiated and unsubstantiated complaints</li> <li>✓ If a site has received a particularly high number of complaints comments are given in footnotes</li> </ul>
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<b>Average number of complaints per site</b>	<b>Number per operating centre</b>	✓ Total number of complaints / number of operating centres
<b>Details of complaints made by type</b>	<b>Number of various types of complaints</b>	✓ Split into the following categories: Odour, litter, vermin (flies, birds, rats etc), traffic (mud on the road, numbers of lorries etc), noise, dust and others

### 2g. Shanks key facts and figures (collected for Group financial report and other documents)

<b>Number of permanent employees</b>	<b>Number employees</b>	✓ As already reported as above under 15
<b>Number active operating centres</b>	<b>Number operating centres</b>	✓ Not including offices, small civic amenity and similar sites, and other non-operational sites such as closed sites
<b>Number recycling or recovery centres</b>	<b>Number operating centres with recycling/recovery</b>	✓ All operating centres with recycling and/or recovery operations on them
<b>Number operational landfill sites</b>	<b>Number sites</b>	✓ Number of operational landfill sites – not including closed landfill sites
<b>Number waste collection and transport lorries</b>	<b>Number vehicles</b>	✓ Number of waste collection commercial vehicles (not including light vans etc)
<b>Amount waste recycled or recovered</b>	<b>Tonnes</b>	✓ Already reported as above under 9 – total amount of waste recycled or recovered at Shanks sites expressed as tonnes
<b>Overall recycling and recovery rate</b>	<b>% of above</b>	✓ As calculated already under section 9 above
<b>Renewable energy generated by Shanks</b>	<b>Megawatt hours</b>	✓ For example electricity generated by landfill gas power stations, AD power generation etc

Note much of the above data is already included as above. The key facts and figures data section is simply to show the extent of the Group and to give an indication of the size of its activities. Where data is already included above this is noted next to the indicator. This key facts and figures data is also used in the Group annual financial report.

## Appendix 1. Carbon conversion factors

### Carbon factors

These factors are used to convert energy use, recycle material production etc to carbon equivalents. Factors vary from country to country for a variety of reasons. For example, the UK has a greater reliance on fossil fuels than the Netherlands and therefore will have a different conversion factor to express electricity used as a carbon equivalent

### Carbon factors for emissions and avoidance

Source of emission or avoidance	Unit of measurement	Conversion factor to convert to tonnes of carbon dioxide equivalents			
		NL	BE	UK	CA
<b>1. Emissions</b>					
<b>Transport based emissions</b>					
Diesel for road transport	litres	0.0032	0.0026694	0.0025839	-
Petrol	litres	0.0028	0.0023307 <sup>8</sup>	0.0021944	-
LPG	litres	0.0019	0.0014968 <sup>8</sup>	0.00150938	-
Bio-ethanol	litres	0.00124	-	-	-
Biodiesel	litres	0.003154	Factor depends on specific fuel		
Business travel	Km	Various	0.000250416	-	-
<b>Energy use emissions</b>					
Electricity	kWh	0.000526	0.00026738	0.00049636	0.0003234
Electricity - solar	kWh	0	-	-	-
Electricity - self-generated	kWh	-	-	0.0004585	-
Gas	see individual column	0,001884 (Nm3)	0.00018396 (kWh)	0.00018407 (kWh)	-
Diesel used on sites	litres	0.003154	0.00266948	0.0025839	0.0031351
Other fuels	Factors for other fuels, including alternative fuels, available – ask your CR contact				
<b>2. Avoidance</b>					
<b>Waste derived fuels produced and sold</b>					
Icopower pellets	tonnes	0.713	-	-	-
Woodchips/Wood for biomass incineration	tonnes	0.747	1,088917 <sup>12</sup>	-	-
Wood dust for biomass incineration	tonnes	0.643	1,795025 <sup>12</sup>	-	-

## Carbon factors

### Continued...

We first set ourselves quantified key CR objectives in 2010. These original objectives ran over a five-year cycle, and ended in 2015. One of these five-year 2010-2015 objectives was to improve the level of carbon avoidance our activities produce. We achieved this objective. In 2015 we set ourselves a new and wider range of CR objectives, again over a five-year period running to 2020. These new objective also include a carbon avoidance target.

Many carbon calculations are based on 'factors'. For example, amount of electricity consumed x a factor = amount of carbon emitted. These factors are taken from various sources, such as Government agencies, and are periodically revised by their producers as knowledge increases or external conditions change. To allow comparison between years we did not revise the carbon factors used to arrive at our carbon emissions and avoidance over the five-year period 2010-2015 – any revision during the five-year cycle would have resulted in false year-on-year comparisons. When we set our new objectives in 2015 we took the opportunity to revise the factors we use and bring them up-to-date. As a result some of our longer-term carbon data may not be comparable. The factors in this document are revised 2015 onwards factors

SRF from MBT used in cement kilns	tonnes	-	1,532932 <sup>12</sup>	1.01426	-	
Non dangerous sludge used in cement kilns	tonnes	-	0,469843 <sup>12</sup>	-	-	
Dangerous sludge used in cement kilns	tonnes	-	0,363036 <sup>12</sup>	-	-	
Non dangerous impregnated sawdust	tonnes	-	1,237843 <sup>12</sup>	-	-	
Dangerous impregnated sawdust	tonnes	-	1,203849 <sup>12</sup>	-	-	
<b>Materials separated for re-use/recycling</b>						
Aggregates (replacing sand)	tonnes	0.0023	0.0001 <sup>9</sup>	0.0001 <sup>9</sup>	-	
Aggregates (replacing gravel/rock)	tonnes	0.0049				
Silt/soil	tonnes		0.0001 <sup>9</sup>	0.0001 <sup>9</sup>	-	
Sieving Sand	tonnes	0.0031				
Asphalt	tonnes	0.019				
Gypsum	tonnes	0.108				
Metals (ferrous)	tonnes	1.736	1.487 <sup>10</sup>	1.487 <sup>10</sup>	-	
Metals (non-ferrous)	tonnes	4.530	12.7 <sup>9</sup>	12.7 <sup>9</sup>	-	
Aluminium	tonnes	6.953				
Copper	tonnes	2.107				
Wood	tonnes		0.0479 <sup>9</sup>	0.0479 <sup>9</sup>	-	
Woodchips (to chipboard industry)	tonnes	0.202	-	-	-	
Rock wool	tonnes	0.093				
Plastics	tonnes	1.207 <sup>5</sup>	1.55 <sup>11</sup>	1.55 <sup>11</sup>	-	
Plastics (foils)	tonnes	1.472				
Glass <sup>6</sup>	tonnes	0.210	0.253 <sup>10</sup>	0.253 <sup>10</sup>	-	
Glass (flat)	tonnes	0.126				
Paper/cardboard	tonnes	0.817	0.45 <sup>9</sup>	0.45 <sup>9</sup>	-	
Textiles	tonnes	3.432	1.34 <sup>9</sup>	1.34 <sup>9</sup>	-	
Compost (from green waste)	tonnes		0.0039 <sup>9</sup>	0.0039 <sup>9</sup>	-	

## Carbon factors

### Continued...

Compost for agriculture	tonnes	0.171	-	-	-
Compost for potting soil	tonnes	1.207	-	-	-
Compost for other usage	tonnes	0.800	-	-	-
Digestate	tonnes		0.0635 <sup>5</sup>	-	-

#### Sources of carbon conversion factors

Handbook CO2 performance Ladder 2.0 (version 23rd of June 2011) SKAO

Energy from grid in the State of Ontario Canada, calculated according to Handbook CO2 performance Ladder 2.0 (version 23rd of June 2011) SKAO

2015-2016 CRC energy efficiency scheme order: table of conversion factors (Version 5: Published 24th June 2015)

DCF Carbon Factors 7 4 2016 11540

Carbon Balances and Energy Impacts of the Management of UK Wastes, ERM December 2006

Waste management options and climate change, AEA Technology for DG Environment 2001

CO2 impacts of transporting the UK's recovered paper and plastic bottles to China, WRAP August 2008

Factors of the DEFRA/DECC's 2009 and Bilan Carbone de L'ADEME, 2011

Waste recycled conversion factors have been chosen from a number of sources as best available. However, treat with care; what is included and excluded should be considered (eg, a factor for emissions avoided by paper recycling may take into account emissions associated with sorting but already accounted for this in site energy usage). Full life cycle assessment (LCA) figures will not correlate directly with operational emissions data as LCA approach not taken

## Appendix 2. Shanks common waste categories

### Shanks common waste categories

We use common waste categories across our operations. Data on these categories is collected via a system called QlikView. This operates on two levels: A top hierarchy consisting of high-level descriptions and a lower hierarchy with more detail descriptions. Data in Shanks CR Report and CR FULL DATA document follow these categories

#### Waste categories

Top hierarchy description	Lower hierarchy description	Comment
PAPER BASED	PAPER	Usually waste outputs rather than inputs
	NEWS & PAMS	
	MIXED PAPER	
	HIGH GRADE PAPER	
	CARDBOARD	
METALS	FERROUS	Usually waste outputs rather than inputs
	NON FERROUS	
RUBBLE	RUBBLE	Usually waste inputs
	GRANULATE	
PLASTICS	PLASTICS	Usually waste outputs rather than inputs
RUBBER	RUBBER	
GLASS & CERAMICS	GLASS & CERAMICS	Usually waste outputs rather than inputs
OTHER RECYCLATES	MIXED RECYCLATES	Usually waste outputs rather than inputs
	OTHER RECYCLATES	
COMPOST	COMPOST	Usually waste outputs rather than inputs
BIOMASS	BIOMASS	Usually waste outputs rather than inputs
WOOD	WOOD CHIPS	May be inputs or outputs
	WOOD TRADING	
	WOOD TREE BARK	
	TIMBER	
GREEN WASTE	GREEN WASTE	Usually waste inputs
	AGRICULTURAL WASTE	
	GARDEN WASTE	
	GREEN WASTE OTHER	
ROCKWOOL	ROCKWOOL	May be inputs or outputs



**Shanks common waste categories**  
Continued...

SOIL / SAND / SLUDGE	SOIL	May be inputs or outputs
	SAND	
SRF / RDF	SRF / RDF	Usually waste outputs
	SLUDGE	
C&D	C&D (construction and demolition)	Usually waste inputs
BULKY WASTE	ELECTRICAL	Usually waste inputs
	BULKY WASTE OTHER	
SPECIAL WASTE	SPECIAL WASTE Other	Usually waste inputs
	MEDICAL WASTE	
FOOD WASTE	FOOD WASTE	Usually waste inputs
COMMERCIAL WASTE	COMMERCIAL WASTE	Usually waste inputs
DOMESTIC WASTE	DOMESTIC WASTE	Usually waste inputs
LIQUID WASTE	LIQUID WASTE	Usually waste inputs
GENERAL WASTE	GENERAL WASTE	Only use if no other alternative
LANDFILL	LANDFILL	Do not use - waste output only
CONTAMINATED SOIL	SOIL	
	GRID	
	TAG	
	REUSE	
	SOIL OTHER	
PAINT	PAINT	Usually hazardous wastes
	SOLVENTS	
	PAINT OTHER	
	SCRAP / PALLETS	
CONTAMINATED WATER	EXTERNAL	
	SHIPCLEANING	
	SLUDGE	
	WASTE FUEL	
OTHER	OTHER	Only use if no other alternative

The above categories are those in QlikView. However, different Shanks countries of operation use different sections of the above as they are relevant to their operations. As such not all reporting will cover all of the above categories.

## Appendix 3. Audiences and stakeholder engagement and materiality

### Audiences for Shanks CR Reports

Many groups of our stakeholders may be interested in Shanks CR Report. However, from work conducted by Shanks Group CR Committee, we consider the main stakeholder groups the report is aimed at to be

Our CR reporting complies with Global Reporting Initiative (GRI) guidelines. Part of this is assessing our stakeholder materiality. We have a responsibility to ensure our CR reporting is relevant to stakeholders, from local communities to employees, customers and shareholders.

Presented right is our stakeholder materiality matrix. The stakeholder issues identified in red are those which are of highest concern and are where we have set ourselves key CR objectives (see objectives section of our CR Report).

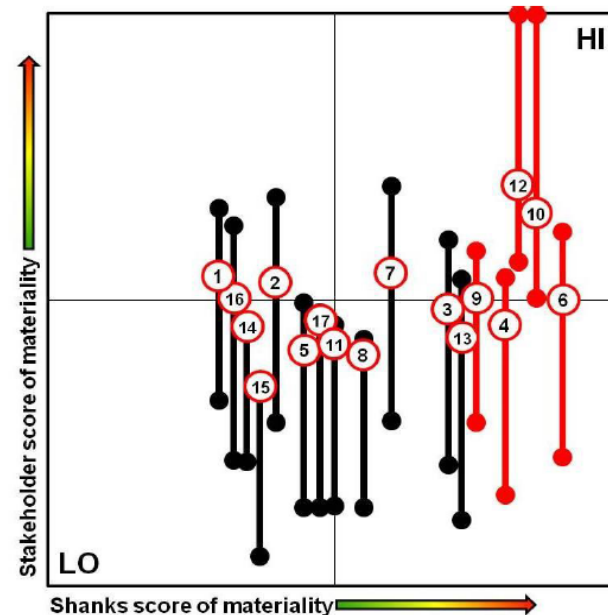
### Main stakeholder audience groups

Employees, Shanks Board and shareholders and other financial stakeholders, contractors and suppliers/off-takers of wastes and existing and potential customers and clients, regulators and non-governmental organisations, communities and businesses near to Shanks sites and operations and educational establishments, internal and external auditors, researchers, ratings agencies and corporate responsibility organisations, politicians and civil servants (national and local)

### Stakeholder materiality matrix

#### Key

1. Overseas human rights – complicity in poor human rights. Low risk for Shanks but important for stakeholders such as ethical ratings bodies
2. Overseas human rights - due diligence of business partner activities. Low risk, but important for some external stakeholders
3. Employee working conditions – important issue for Shanks, less important for some external stakeholders
4. Employee relations and communication – important issue for Shanks, less important for many external stakeholders
5. Employee civil rights – lower risk because of areas of operation
6. Employee and others Health and safety – key issue for Shanks but less so for external many stakeholders with low safety focus
7. Fraud and bribery governance – not a very high risk for Shanks, but important internally and externally
8. Financial governance - not a very high risk for Shanks, but important internally and externally
9. Sustainability and carbon issues – key issue, but Shanks strategy is aligned with external stakeholders
10. Environmental regulation compliance and potential pollution incidents – key issue for Shanks and external stakeholders
11. Community education and culture – medium issue as Shanks strategy aligned with societal requirements
12. Community nuisance and potential health effects on third parties from our activities – key issue for Shanks and selected external stakeholders – permit and reputational risk
13. Service maintenance/continuity – importance depends on external stakeholder group – high for some clients
14. Product liability – not a high risk for Shanks, although may become more important over time
15. Data protection – not a high risk for Shanks
16. Fair practices - anti-corruption - not a high risk for Shanks
17. Fair practices - fair competition - not a high risk for Shanks



Positions of circles indicate level of importance of issue for stakeholders (vertical axis) compared with Shanks' view of their importance (horizontal axis) Numbers in circles correspond to issues noted to the left. Vertical black lines show range of stakeholder materiality scores – some stakeholders will value an issue very differently to others Red indicates stakeholder key CR objectives area

## Appendix 4. Definition of non-permanent workers

### Non-permanent workers

Employment law varies across the countries Shanks operates in. One area where a degree of confusion has arisen is what is a non-permanent worker. This appendix gives guidance.

#### Non-permanent workers

There are three main groups of people who perform tasks for Shanks:

1. **Permanent employees** – have a contract of employment direct with Shanks, and this contract is not for a fixed or limited time period
2. **Non-permanent workers** - variously these persons may be called temporary workers, agency workers, contract workers, accommodation workers, systematic workers, fixed term contract workers or other descriptions. These non-permanent workers may be split into two main categories:
  - ✓ **External non-permanent workers** – temporary, contract, accommodation, systematic etc workers typically employed via an external body such as an agency
  - ✓ **Fixed term contract non-permanent workers** – workers who have a contract with Shanks, but this contract is time limited. Typical examples may be workers contracted for a fixed time period to cover maternity leave, or on a fixed term time limited contract prior to potential permanent employment
3. **Other third parties** – such as contractors performing construction tasks, contract waste collections etc

The difference between permanent employees (1 above) and non-permanent workers (2 above) may be obvious, but the difference between non-permanent workers and other third parties (3 above) such as contractors may be less distinct. If a worker shows the most of the characteristics given in the first column of the table below then it is very likely that they are a non-permanent worker. However, if they show more of the characteristics given in the second column then it is likely they are a contractor or other similar third party and not a non-permanent worker.

Non-permanent worker	Contractor / other third party
Uses Shanks tools, equipment, plant, vehicles etc	Uses their own tools, equipment, plant etc
Works to Shanks procedures	Works to their own procedures approved by Shanks
Is paid by time period (day, hour etc)	Is paid by the job / task
Typically does tasks Shanks employees also do	Typically does tasks Shanks employees do not do

Shanks reporting of data, internally and externally and whether for human resources or CR reasons, will be to the above definitions: Permanent employees, external non-permanent workers, fixed term contract non-permanent workers.

## Appendix 5. Use of EPRTTR emissions data

### Significant emissions

We use a wide variety of technologies. These technologies use different processes and their potential significant environmental emissions are often very different: For example, methane emissions are significant for a landfill, but not for a recycling plant. As a result reporting in a meaningful way on potentially significant emissions is complex for us, and requires common indicators and a common set of parameters to report against.

All of our sites operate under environmental permits. With the exception of Shanks Canadian operations, these permits fall under common European (EU) law. Part of this regulation is that larger facilities are required to report on specified emissions using the European Pollution Release and Transfer (EPRTTR) protocols. This gives us a common set of emissions and measures of significance.

However, EPRTTR does not cover all of our operations, only larger facilities where the regulator deems there may be significant emissions. In practice this means that Shanks EPRTTR emissions reporting covers some 70% of the wastes our sites handle, leaving some 30% not covered. This does not mean we do not report emissions from our non-EPRTTR sites - we do but as part of our greenhouse gas/carbon reporting. The table right lists our operational types in broad categories, whether they are covered by EPRTTR, brief descriptions of potential significant emissions and where Shanks reports on these.

For example, a small or medium sized recycling plant will typically have two significant emissions: Indirect greenhouse gas (GHG) emissions associated with electricity used on site to power recycling equipment and direct GHG emissions from diesel use in heavy mobile plant. There will be other emissions, such as discharges to sewer from employee welfare facilities, but these are very unlikely to be significant

### Significant emission types by operation type

EPRTTR	Operation types	Description of potential significant emissions	Where reported
EPRTTR sites Some 70% waste handled	Landfills	Treated leachate to environment/sewer Methane to environment from landfill gas Direct CO2 and other GHG to environment from landfill gas Direct CO2 and other GHG to from green energy generation Direct CO2 and other GHG emissions from fuel use (mobile plant)	CO <sub>2</sub> and other GHG emissions included in Shanks carbon footprints. Other emissions in EPRT data as below
	Mechanical Biological treatment	Effluent discharge to environment/sewer Direct CO2 and other GHG to environment Indirect GHG emissions from power use (eg, electricity) Direct CO2 and other GHG emissions from fuel use (mobile plant)	
	Hazardous waste treatment	Effluent discharge to environment/sewer Direct CO2 and other GHG to environment Indirect GHG emissions from power use	
	Larger recycling plants	Indirect CO2 / other GHG emissions from power use (eg, electricity) Direct CO2 and other GHG emissions from fuel use (mobile plant)	
	Larger composting plants	Direct CO2 and other GHG to environment from compost process Indirect GHG emissions from power use (eg, electricity) Direct CO2 and other GHG emissions from fuel use (mobile plant)	
	Larger AD plants	Direct CO2 and other GHG to from green energy generation Indirect GHG emissions from power use (eg, electricity) Direct CO2 and other GHG emissions from fuel use (mobile plant)	
Non-EPRTTR sites Some 30% waste handled	Smaller recycling plants	Indirect CO2 and other GHG emissions from power use (eg, electricity) Direct CO2 and other GHG emissions from fuel use (mobile plant)	CO <sub>2</sub> and other GHG emissions included in Shanks carbon footprints
	Smaller recovery plants	Indirect CO2 and other GHG emissions from power use (eg, electricity) Direct CO2 and other GHG emissions from fuel use (mobile plant)	
	Smaller AD plants	Direct CO2 and other GHG to from green energy generation Indirect GHG emissions from power use (eg, electricity) Direct CO2 and other GHG emissions from fuel use (mobile plant)	
	Transfer stations	Direct CO2 and other GHG emissions from fuel use (mobile plant)	
	Amenity sites	Direct CO2 and other GHG emissions from fuel use (mobile plant)	
NA	Offices	Indirect CO2 and other GHG emissions from power use (eg, electricity)	CO <sub>2</sub> and other GHG emissions included in Shanks carbon footprints
	Vehicles sites	Direct CO2 and other GHG emissions from fuel use (road lorries)	