SKANSKA

4 R Guide

Reduce
Reuse
Recycle
Recover

A part of Skanska's Green Initiative

4 R Guide

Skanska's Environmental Policy include a long term objective on Zero Waste Generation. This can be achieved by reducing upfront demand, reusing materials wherever possible and recycling (or down-cycling). Where these options are not practical, other environmentally sound treatment of waste should be used; eg energy recovery or best practice disposal treatment.

Skanska has developed one Green Strategic Indicator (GSI) related to resource efficiency. It was approved by the Senior Executive Team to drive forward the 2015 ambition to be the leading Green project developer and contractor.

To ensure that waste measurement is clear and comparable; requires reduction targets and measures of construction waste going to landfill for materials brought onto site and demolition waste going to landfill.

Extract from five year strategy

Materials – GSI #6 Be more resource efficient

Targets for waste from materials brought onto site:

<10% of waste at projects going to landfill by end 2011
< 8% of waste at end 2012
< 6% of waste at end of 2013
< 4% of waste at end of 2014
< 2% of waste at end of 2015

Demolition waste

The % target shall be decided at Business Unit level on a case by case basis.

In both cases hazardous materials shall be included in the data and uncontaminated soil shall be excluded from the data.

Skanska encourages waste handling according to this 4 R Guide; even with projects where the company can't directly control the amount of waste being generated; eg demolition projects

Definition of 4 Rs

(from a best to worst option view)

Reduce
- Prevent waste in the first place; by eliminating waste at source through better planning and design

Reuse
- Increase creativity on site – Reuse materials waste whenever possible; this is both cost-effective and reduces waste to landfill
- Secondary material use – Down-cycle if it cannot be reused

Recycle
- Ensure a good separation of waste into "one-material fractions" that can be more easily recycled
- Enable segregation of at least 6 fractions: Wood, Concrete, Gypsum/Plasterboard, Metal, Plastic -soft and hard, Paper/Cardboard

Recover
- Energy Recovery can be an alternative, if recycling is not available

Landfill
- Waste sent to be disposed at landfills without any 4 R activities taking place

Reward waste avoidance at project level

Encourage the use of waste with a recycled content

Make the cost of waste – recycling, recovery and disposal to landfill – visible in project accounts; and consolidate at BU level

Effective use of materials provides huge potential for savings; not only for the environment but also economically

Waste is everyone's responsibility! Designers, procurement managers, engineers, foremen; …everyone

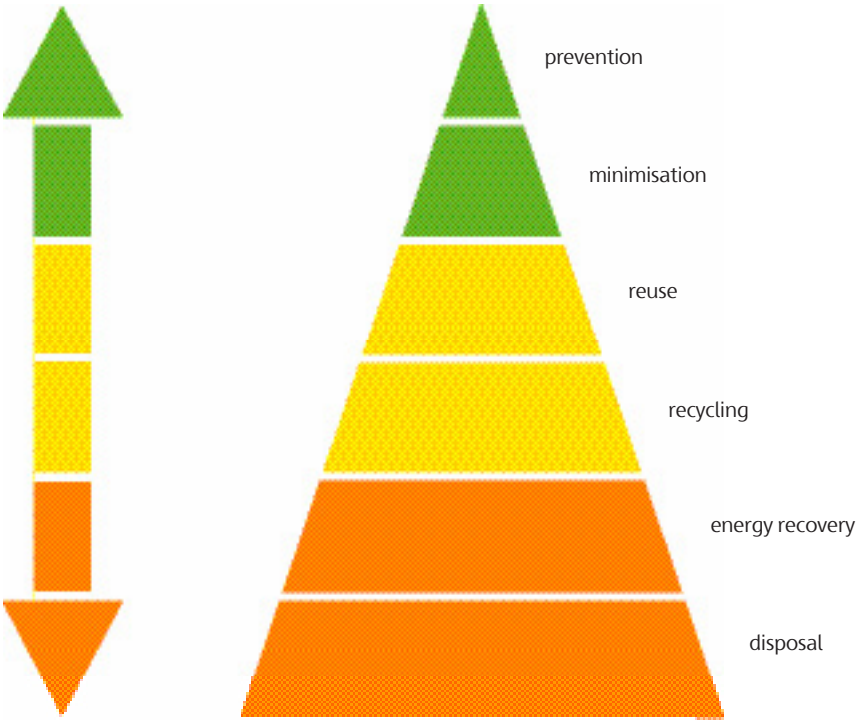
Steps to success

Planning is the key to success;

- which materials to order and in what quantities
- on time delivery
- planning for proper storage; to avoid damage of materials before use

Prepare local "Project Waste Management Plans", identifying the local home market recommendations.

most favoured option



least favoured option

How to treat waste

Examples of different types of waste and how it can best be treated at end of life, using the 4 R Best Practice

Construction Waste

	Examples of Waste	4 R Best Practice
Construction Waste (including Sub Contractor waste)	Concrete Plasterboard/Gypsum Paper Metal	Reuse Recycle Recycle Recycle
Office Waste	Paper Cardboard Plastic (hard/soft) Toners	Recycle Recycle Recycle or Recover Recycle
Waste from Manufacturing plants	Asphalt Concrete	Reuse Reuse or Recycle

Demolition Waste

	Examples of Waste	4 R Best Practice
Demolition waste	Concrete Steel Cabling Glass Timber Other materials	Reuse Recycle Recycle or Recover Recycle Reuse or Recycle Reuse or Recycle
Soil (not included in target)	Unpolluted soil Polluted soil Excavated material	Reuse Hazardous Waste/Special treatment Reuse

Definition of Metrics

Metric	Guidance
Weight in Kg/Tonnes	For applicable fractions. KPI preferably measured in tonnes for comparison
Volume	For applicable fractions in: m^3, cubic yards, skips, containers, dumpsters

4 R – Glossary

A brief definition of words relating to 4 R: looking from both an external and internal point of view.

A	
Aggregated masses	Stone/crushed rock, gravel and sand = ballast
B	
Ballast	Gravel and sand
BAT	Best Available Technique
Bio-degradable waste	Waste that is capable of being broken down by living organisms, principally bacteria and fungi
By-products	1. Something produced in the making of something else 2. A secondary result; a side effect
C	
Combustion	The controlled burning of municipal solid waste. Energy recovery could be performed in technically advanced combustion chambers.
Composting	Method to decompose organic material by bacteria under controlled conditions. Makes a nutrient-rich natural fertilizer for use in gardening or farming
Construction waste	Waste that arises from the construction of new buildings/structures
Container	Containers are designed for receiving, transporting, and dumping waste materials
Contamination	A clean waste fraction that has been polluted by an unwanted substance e.g. Asbestos
D	
Demolition waste	Waste that arises during demolition work on old buildings/structures
Depletion of finite resources	Non-renewable resources i.e. oil, gas, minerals
Disposal	Waste sent to final treatment without being segregated for recycling or recovery
Down-cycle	Using "waste materials" for an alternative use i.e. blast furnace slag in asphalt or concrete or as aggregate in e.g. roads
Dumpster	A trademark used for containers designed for receiving, transporting, and dumping waste materials

E

Earthworks	Excavated materials used for landscaping or noise bunds
Emissions	Commonly refers to flue or exhaust gas resulting from combustion.
Environmentally sound	Best treatment available of materials/waste with the least risk of harm to humans, animals or environment
Equipment	Generic term for: yellow equipment i.e. road transporters, lifts and also machines or electrical equipment
Excavated	Materials that have been dug up during preparation of a construction site

F

Fly tipped materials	Product waste that isplaced in the environment either intentionally or by mistake
Fraction	A waste can be sorted into a fraction; thereby keeping wastes of the same type together. This is required to enable efficient recycling.

G

Granulated	A material is crushed or grained into smaller parts. normally this is performed with minerals, stone and used asphalt (to reuse it)

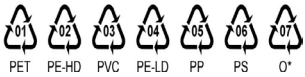
H

Hazardous waste	Waste that is dangerous to humans, animals and environment. Must always be treated in a well controlled manner using special treatment.
Heavy Metals	Heavy Metals refer to any metallic chemical element that has a relatively high density and is toxic or poisonous at low concentrations. Most commonly known are Mercury (Hg), Cadmium (Cd), Arsenic (Ar), Lead (Pb)

I

Incineration	Waste treatment technology used to burn waste at high temperature
Inorganic waste	Generally speaking, waste made up from mineral materials e.g. concrete
Intelligent Selection of Materials	Selecting commercially viable materials which are more benign to human health and environment than more hazardous materials

K	
KPI	Key Performance Indicator; with an either short or long term set targets
L	
Landfill	The disposal of solid waste at engineered facilities in a series of compacted layers on land and the frequent daily covering of the waste with soil. Fill areas are carefully prepared to prevent nuisances or public health hazards, and clay and/or synthetic liners are used to prevent releases to ground water.
Life-cycle analysis (LCA)	Looking at all stages of a product's development, from extraction of fuel for power to production, marketing, use, and disposal.
Life-cycle cost (LCC)	Looking at the cost of a product's development, from extraction of raw materials, to production, use and disposal.
M	
Manufacturing Plants	In Skanska this can be e.g. an Asphalt plant or a Pre-fabrication facility
Materials	Any material (fluid or solid) that is used in construction e.g. steel, iron, aluminium
O	
Optimal treatment option	Best treatment option of a waste fraction; using the least energy and resources
Organic waste	Generally speaking, waste made of biological materials i.e. wood, paper
P	
Packaging	This covers all packaging parts used to contain a product until final use. It can be paper, plastic, Styrofoam, metal etc
Paper, corrugated & plain	In the recycling business, it refers to products and materials, including newspapers, magazines, office papers, corrugated containers (wave shaped brown paper), bags and some paperboard packaging that can be recycled into new paper products.

Plastic marking European standard	
Plastic marking US standard	
Polluted soil	Soil that has been polluted and cannot be reused unless "cleaned".
Polluter Pays Principle	This principle relates to the Producer/Importer/Seller having to ensure the correct collection of waste at end-of-life. Normally this is performed by paying fees per material type and amount of product placed on the market (EU)
Pre-fabricated	Anything that has been produced for a certain purpose i.e. bathroom wall with all connections for water etc already placed in the wall. This method reduce the amount of waste because items are ready-made for use
Prevent	To stop or hinder something from happening i.e. to prevent production of waste from materials used (eg: a secondary beneficial use is one alternative).
R	
Raw material	Material that is used for the first time. Eg Aluminium
Ready-made	Something that is made for use instantly
Recover	e.g. Energy recovery refers to waste being converted into a usable form of energy e.g. heating of houses, usually via a combustion process.
Recycle	Minimizing waste generation by recovering and reprocessing usable products that might otherwise become waste (e.g. recycling of aluminum cans, paper, and bottles, etc.).
Recycled content	The portion of a product's or package's weight that is composed of materials that have been recovered from waste; this may include pre-consumer or post-consumer materials.
Reduce	Reduction at source, recycling, or composting to prevent or reduce waste generation
Resource efficient	Materials that are used in the most efficient way
Reuse	The use of a product more than once; either in the same form for the same purpose or for different purposes, such as reusing a soft-drink bottle when it is returned to the bottling company for refilling.

S

Secondary raw material	Materials that have been manufactured and used at least once and are to be used again either as original material or in combination with other materials
Segregate	To separate waste materials into single material fractions
Skip	An open container for transporting building materials or rubbish
Special waste	Items such as hazardous waste, chemicals, bulky wastes (refrigerators etc.) tires, and used oil.
Styrofoam	Expanded Polystyrene, plastic packaging used to protect fragile products eg PCs
Systems (in Skanska's Environment Strategy)	For example a "wet room system"

T

Toxins	A poisonous substance, especially a protein, that is produced by living cells or organisms

V/W

Virgin materials	Resources extracted from nature in their raw form, such as timber or metal ore. Also called Raw materials
Waste hierarchy	A way to classify waste management strategies according to their desirability, in order of importance from most favoured option to least favoured option. (See pyramid diagram).

"The 4 R Guide was last updated in April 2012"

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