Site Waste Management, Monitoring & Measurement

Mervyn Jones, WRAP
Katherine Adams, BRE

WRAP exists to:

- Create stable and efficient markets for recycled materials and products, and…
- Remove barriers to waste minimisation, re-use and recycling

WRAP's approach:

- To accelerate the transition of construction waste to a useful, recycled material through:
  - Waste minimisation and management
  - Reprocessing CD&E wastes
  - Procurement of recycled content

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We are:

"A world leading centre of expertise for construction and fire, providing research, consultancy and information services to customers worldwide."

- Owned by a charity, BRE Trust
- Offices in UK: Garston (Watford), Scotland, Highlands, and Wales
- 220 research staff
- 650 employees

- Centre for Resource Efficiency specialises in C&D waste management including tools such as SMARTWaste

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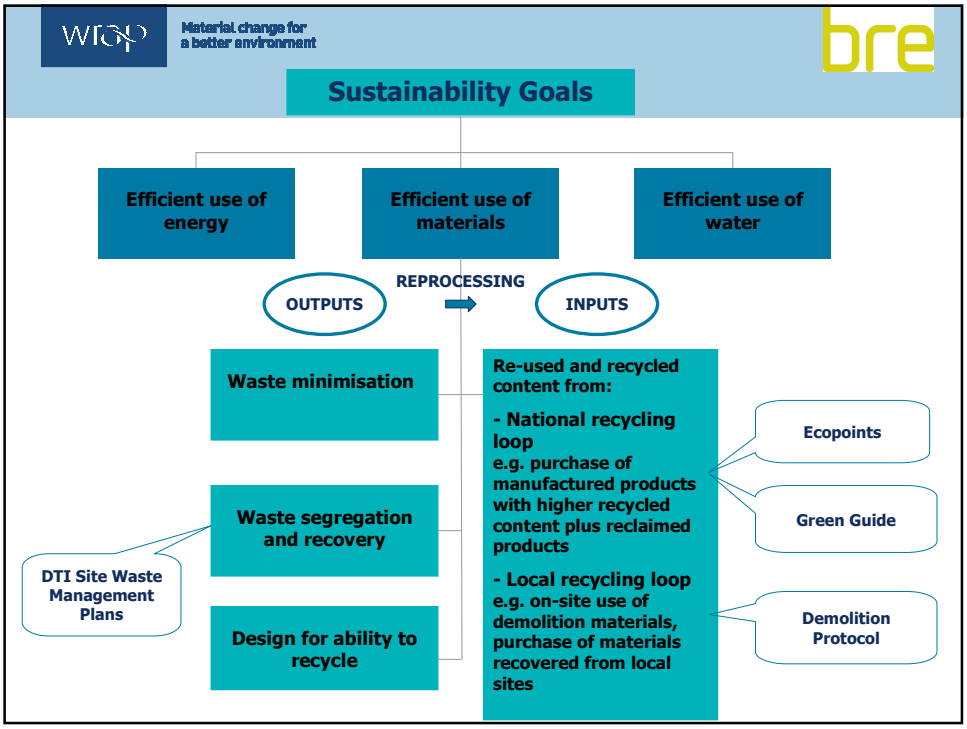

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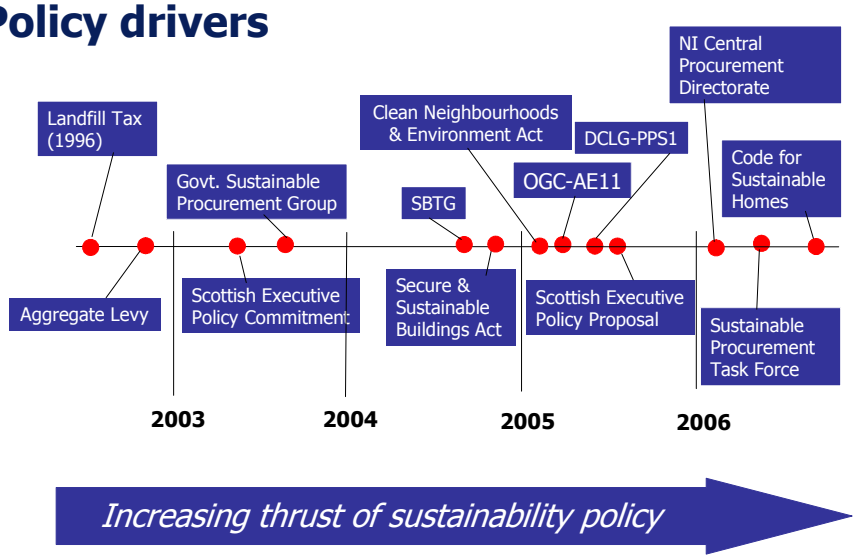
Policy drivers



Increasing thrust of sustainability policy

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Why are SWMPs Important?

- Biggest consumer of material resources: 420 million tonnes/year
- Produces about 150 mta waste
- 10% wastage rates - unused building materials
- 26% of waste can be packaging
- Void space of 40% in skips
- C&D waste accounts for 16% of all national fly-tipping incidents
- £200 million on landfill tax

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True cost of Waste

8 cu yd skip

Skip hire	£85
Labour to fill skip	£163
Cost of materials put in skip	£1095
TOTAL TRUE COST	**£1343**

(Source: AMEC)

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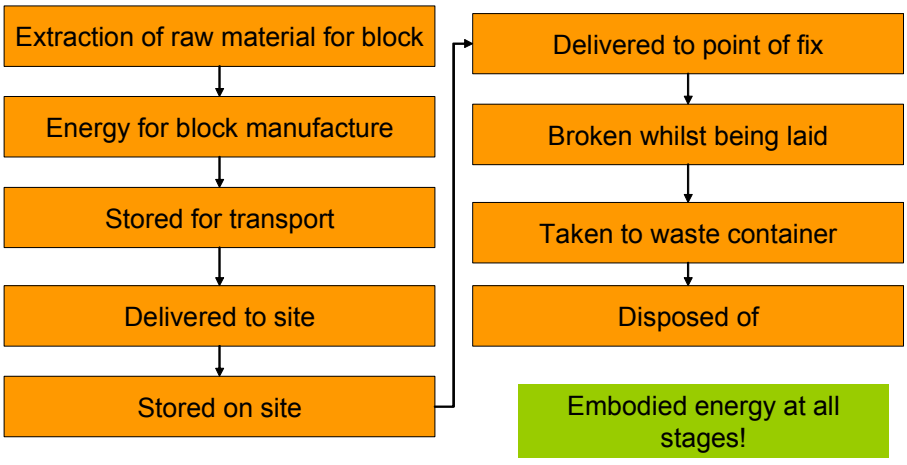
True cost of waste

Example – Concrete Block



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Why Site Waste Management Plans?

- DTI introduced SWMPs as a voluntary code of practice in 2004.
- Companies are already seeing significant savings from better waste management.
- Helps compliance with other legal requirements, e.g. duty of care.
- Can improve Safety & Health record
- Will help customers with CSR
- Mandatory from October 2007?

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The DTI Guide / Code of Practice

- Aimed principally at projects over £200,000
- Benefits not limited to larger companies
- Applicable to the whole range of projects:
  - buildings
  - infrastructure
  - new-build
  - refurbishment

What does the Code of Practice comprise?

- Guidance document
- Checklist - broken down into stages of a project
  - Policy
  - Procurement
  - Project planning
  - Site operations
  - Post-completion
- Site data form

What form should the SWMP take?

- Whatever form suits your organisation best!
- Simple and straightforward

Photo: Greenwich Millennium Village Phase 2a © NGS

Stages 1-3 of the SWMP:

- **Step 1 – Write the Plan**
- Step 2 – Identify the Wastes
- Step 3 – How will you deal with them?

Stages 1-3 of the SWMP:

- **Step 1 – Write the Plan**
  - **who is responsible?**
- Step 2 – Identify the Wastes
- Step 3 – How will you deal with them?

Stages 1-3 of the SWMP:

- Step 1 – Write the Plan
- **Step 2 – Identify the Wastes**
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Stages 1-3 of the SWMP:

- Step 1 – Write the Plan
- **Step 2 – Identify the Wastes**
  - **what types?**
  - **when will they occur?**
- Step 3 – How will you deal with them?

Stages 1-3 of the SWMP:

- Step 1 – Write the Plan
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Stages 1-3 of the SWMP:

- Step 1 – Write the Plan
- Step 2 – Identify the Wastes
- **Step 3 – How will you deal with them?**
  - **what are the on- off-site options for the waste?**

Stages 4-6 of the SWMP:

- **Step 4 – Duty of Care**
- Step 5 – Training
- Step 6 – Planning

Stages 4-6 of the SWMP:

- **Step 4 – Duty of Care**
  - **identify waste management sites and licensed carriers**
- Step 5 – Training
- Step 6 – Planning

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Stages 4-6 of the SWMP:

- Step 4 – Duty of Care
- **Step 5 – Training**
- Step 6 – Planning

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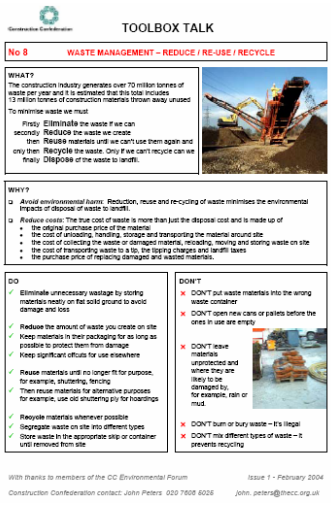
Stages 4-6 of the SWMP:

- Step 4 – Duty of Care
- **Step 5 – Training**
  - **what incentives and obligations are required?**
- Step 6 – Planning



TOOLBOX TALK

No 8 WASTE MANAGEMENT – REDUCE / RE-USE / RECYCLE

WHAT?

The construction industry generates over 70 million tonnes of waste per year and it is estimated that this total includes 13 million tonnes of construction materials thrown away unused

To minimise waste we must

Firstly, **Eliminate** the waste if we can
secondly **Reduce** the waste we create
then **Reuse** materials until we can't use them again and
only then **Recycle** the waste. Only if we can't recycle can we
finally **Dispose** of the waste to landfill.

WHY?

- *Avoid environmental harm:* Reduction, reuse and re-cycling of waste minimises the environmental impacts of disposal of waste to landfill.
- *Reduce costs:* The true cost of waste is more than just the disposal cost and is made up of
  - the original purchase price of the material
  - the cost of unloading, handling, storage and transporting the material around site
  - the cost of collecting the waste or damaged material, reloading, moving and storing waste on site
  - the cost of transporting waste to a tip, the tipping charges and landfill taxes
  - the purchase price of replacing damaged and wasted materials.

DO

- ✓ Eliminate unnecessary wastage by storing materials neatly on flat solid ground to avoid damage and loss
- ✓ Reduce the amount of waste you create on site
- ✓ Keep materials in their packaging for as long as possible to protect them from damage
- ✓ Keep significant offcuts for use elsewhere
- ✓ Reuse materials until no longer fit for purpose, for example, shuttering, fencing
- ✓ Then reuse materials for alternative purposes for example, use old shuttering ply for hoardings
- ✓ Recycle materials whenever possible
- ✓ Segregate waste on site into different types
- ✓ Store waste in the appropriate skip or container until removed from site

DON'T

- ✗ DON'T put waste materials into the wrong waste container
- ✗ DON'T open new cans or pallets before the ones in use are empty
- ✗ DON'T leave materials unprotected and where they are likely to be damaged by, for example, rain or mud.
- ✗ DON'T burn or bury waste – it's illegal
- ✗ DON'T mix different types of waste – it prevents recycling

With thanks to members of the CC Environmental Forum

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Stages 4-6 of the SWMP:

- Step 4 – Duty of Care
- Step 5 – Training
- **Step 6 – Planning**

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Stages 4-6 of the SWMP:

- Step 4 – Duty of Care
- Step 5 – Training
- **Step 6 – Planning**
  - **when should you plan and for what?**

Measurement: why is it important?

- ✓Know your process
- ✓Set targets
- ✓Improve performance
- ✓Design-out waste
- ✓Save disposal costs
- ✓Increase profit margins
- ✓Comply with environmental obligations
- ✓Use for environmental reporting and tenders

Stages 7-9 of the SWMP:

- **Step 7 – Measure waste quantities and types of waste**
- Step 8 – Monitor the implementation of the SWMP
- Step 9 – Review the SWMP at the end of the project and identify learning for next time.

Stages 7-9 of the SWMP:

- **Step 7 – Measure waste quantities and types of waste**
  - **what can we measure?**
  - **how can we use this information?**
  - **what targets/benchmarks can we set?**
- Step 8 – Monitor the implementation of the SWMP
- Step 9 – Review the SWMP at the end of the project and identify learning for next time.

EPIs and KPIs

EPI = $m^3/100m^2$ of floor area

KPI = m^3/£100,000 project value

Average EPIs (actual waste):

Median KPI (provided by Constructing Excellence) for 2005: 37

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Stages 7-9 of the SWMP:

- Step 7 – Measure waste quantities and types of waste
- **Step 8 – Monitor the implementation of the SWMP**
  - **what needs to be monitored?**
  - **how can we monitor?**
  - **how can we measure the effectiveness?**

- Step 9 – Review the SWMP at the end of the project and identify learning for next time.

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- **Step 9 – Review the SWMP at the end of the project and identify learning for next time.**
  - **what processes do we need for the review and how do we ensure transfer of good practice?**

10 point action plan

1. Assign responsibility
2. Agree procedures for implementation
3. Identify likely waste arisings, types and amounts
4. Plan for likely waste management on and off site
5. Communicate and ensure relevant training
6. Ensure waste is segregated where possible and handled effectively on-site
7. Monitor Duty of Care
8. Record and monitor waste generation and management
9. Regularly review
10. Carry out a post project review and transfer best practice

The DTI Checklist:

- Useful 'aide memoir' for developing and implementing a SWMP
- 'Questions to consider' based on project stages:
  - Policy
  - Procurement
  - Project Planning
  - Site Operations
- Provides clear audit trail and record for actions

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Sources of help:

WRAP: www.wrap.org.uk/construction

BRE SMARTWaste system and BREMAP: www.smartwaste.co.uk

Envirowise: www.envirowise.gov.uk

Constructing Excellence (DTI Voluntary Code): www.constructingexcellence.org.uk

Construction Resource efficiency (CoRE): www.smartwaste.co.uk/core.jsp

Environment Agency NetRegs: www.netregs.gov.uk

NISP: www.nisp.org.uk

Recycled Building Product Network: www.recycledbuildingproducts.co.uk

CIRIA - many publications: www.ciria.org.uk

Colour Coding Scheme - www.wasteawareconstruction.com/

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Materials Resource Efficiency in Construction

Any Questions?