

UK
TRADE &
INVESTMENT



Energy Efficiency

Construction projects present a huge potential for increasing energy efficiency

- Environmental Life Cycle Analysis
- Green Procurement
- Construction Waste Management
- Benchmarking



What is Life Cycle Analysis

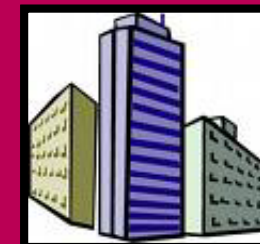


A tool to determine sustainability of a building or element

- Help clients make investment decisions
- Optimise energy efficiency
- Cost options for the entire commercial life of the building
- Defining minimum 'in use' performance levels
- Optimises construction solutions

Summary of the areas covered

- Planning and Design
- Design and Construction
- Buildings in use
- Green Procurement



Planning and Design

Integrated Project team

- Client, Architect, Consultants , Contractors



Enable specialists to contribute

- Manufacturers, Suppliers, Designers
- Opportunities to optimise operational efficiency
- Output based design brief – explicit reference to value

Building users

Planning and Design

Information

A transparent measuring system



Product Environmental Profiles

- Manufacturers demonstrate energy performance
- Clients, Architects, Designers can identify the best products for the sustainability brief
- Products can be compared for energy consumption
- Raise awareness of lifecycle issues

Planning and Design

Product Environmental Profiles

- BRE Foundation, London
- BREEAM
- Green Guide to Sustainable Materials
- Manufacture - virgin/recycle inputs, energy use impact
- Use in building - building life, maintenance, replacement
- Demolition - recycling, reuse, demolition



Planning and Design



Life cycle analysis is also about value for money

- Lowest price tendered is rarely value for money
- Relationship between long term costs and benefit achieved by client represents value for money
- Meeting the needs of end users with high quality projects at lower life costs
- Time and effort at the design stage will save significant amounts of money, energy and waste downstream.

Design and Construction

Management



Considerate constructors

- construction site management that is environmentally and socially considerate

Construction site impacts

- environmentally sound in terms of resource use, energy consumption and pollution

Design and Construction

Materials

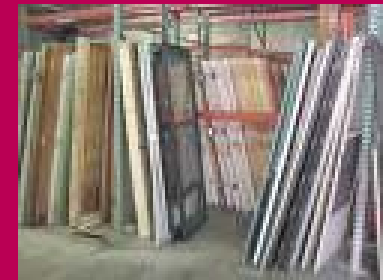


Specification

- materials with low environmental impact over whole life cycle

Responsible sourcing of materials

- for key building elements



Design and Construction

Waste



Construction site waste management

- promote resource and energy efficiency through the effective and appropriate management of construction site waste.



Recycled aggregates

- use of recycled and secondary aggregates in construction, reducing the demand for energy intensive virgin material.



Design and Construction



Health and Wellbeing

- Thermal comfort - the use of design tools to ensure correct comfort levels and reduce unnecessary heating and cooling.

Management

- Building services commissioning - ensure optimum performance under actual occupancy conditions



Materials

- Design for robustness - reduce the need for replacement
- Insulation - good thermal properties



Buildings in use

Energy



Design to minimise emissions from operational energy consumption

Sub-metering of substantial energy uses and tenanted areas
– to allow monitoring of in use energy consumption

External lighting

– encourage the specification of energy-efficient light fittings

Low or zero carbon technologies

– to reduce energy consumption and carbon emissions

– local energy generation from renewable sources to supply a significant proportion of the energy demand.

Green Procurement



Procurement / purchasing of goods, materials and services

- a major challenge for organisations.
- energy efficient and environmentally sound sources
- opportunity to boost the country's competitiveness.
- stimulate the market for green and energy efficient technologies, products and services.



Construction Waste Management

Simple observation of any construction site reveals the huge amount of waste.



Can this be eliminated?

Energy efficiency in the construction process in reducing, reusing, and recycling of waste materials.



Construction Waste Management

The first rule to observe in waste management



Reduce the amount of material initially - then, think about recycle, re-use

Careful choice of materials and methods of construction during the design phase.

Significantly reduce the quantity of waste produced on site.
Reduce energy wasted in manufacturing surplus materials

Summary of the areas covered

- Procedures
- Construction waste groups
- Site Waste Management Plans
- Do's and don'ts
- Benchmarking



Procedures



Target benchmarking for resource efficiency

- m³ of waste per 100m² of building floor area.
- commitments for minimising hazardous and non-hazardous waste.
- monitoring, measuring and reporting site waste.

Procedures



Target benchmarking for resource efficiency

- sorting, re-using, re-cycling into defined groups on site.
- nominating a responsible person.
- audits pre-demolition/refurbishment to maximise the recovery of material.



Construction waste groups

Bricks, Concrete, Architectural features, Tiles and Ceramics

Insulation, Packaging, Plastics, Floor coverings

Timber

Electric and electronic equipment

Canteen and office

Oils, Asphalt and tar

Metals, Gypsum, Furniture

Liquids

Soils

Inert

Hazardous

Mixed/other



Site Waste Management Plan (SWMP)

Conception and design

- Client should be responsible for its preparation
- Designer can write on behalf of the Client



Site design and tendering

- Design out waste through construction method and materials
- Written into the terms of the contract to ensure understanding and accountability



Site Waste Management Plan (SWMP)

Construction phase

- Principal Contractor implements and updates
- Living document describing the current state of progress against waste management forecasts in the plan
- Update the plan as waste is disposed of reused or recycled



Site Waste Management Plan(SWMP)

Preparing the plan

- forecast how much of each waste type
- decide how it will be managed



Managing the waste

- consider onsite re-use and recycling
- consider offsite re-use and recycling
- sent for another form of recovery
- sent to landfill
- otherwise disposed of





Site Waste Management Plan(SWMP)

Post completion

- completed SWMP is compared to SWMP at design/pre-construction stage.
- identify where forecasts were exceeded or missed
- lessons learned
- estimate the level of cost and energy savings achieved



Site Waste Management Plan (SWMP)

The important thing to remember is

- The more we practice this the more affordable it becomes.
- The energy reductions increase, saving clients and developers money
- People understand and promote it.



Do's and Don'ts



Do

- incorporate the requirements of the SWMP into site inductions
- employ staff and companies that sign up to the SWMP
- take waste seriously
- identify the true cost of waste, environmental and monetary
- identify the real value of energy and resource efficiency

Do's and Don'ts



Do

- think about how you can better contribute to waste minimisation and management on site.
- educate yourself and staff about how to reduce waste and increase profit through resource efficiency.
- Work with others who recognise the business benefits and financial rewards of SWMP.

Do's and Don'ts

Don't

- allow waste to be removed by unlicensed carriers.
- mix hazardous and non-hazardous wastes.
- leave materials exposed to weather or unprotected.
- over order materials you don't need
- employ staff or contractors who are not willing to adopt the requirements of the SWMP
- use service providers that are unwilling to discuss how they can add value to the SWMP



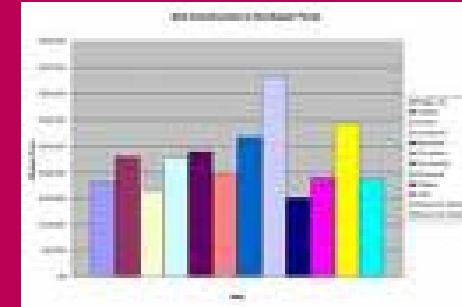
Benchmarking

Set SWMP targets

Compare against previous projects

Compare design stage SWMP and post construction SWMP

Benchmark with other organisations
– share best practice and innovation





Conclusion



Sustainability at its highest level constitutes a closed or 'cradle to cradle' cycle

Involves understanding the supply chain and lifecycle of sustainable materials and systems

One of the most effective method of being energy efficient is to minimise waste of materials and energy.

Consider the principles of the triple bottom line - Economic growth, Environmental performance, Social responsibility



Conclusion



The system you use must be the most appropriate to the needs and aspirations for energy efficiency and green buildings in Brazil.

The emphasis should be on utilising these principles where they are absent.

And develop them for energy efficiency, economic development and sustainable, green growth in Brazil.

