



Sustainable Management and Construction



Why should local governments take action?

Construction and maintenance of buildings and facilities result in a wide range of environmental impacts. In addition construction standards across Europe vary greatly, partly because of different local climates. For example, the construction, operation and demolition of built facilities accounts for approximately 40% of all energy end use. The potential for reducing greenhouse gas emissions in existing and new buildings is greater than that of any other sector. Thus, reducing the overall environmental impact of this activity requires action on a broad front.

Consideration should be given to the following core principles during building and maintenance and when buildings are used:

- Aiming for efficient construction;
- Re-using existing built assets;
- Minimising energy use;
- Designing buildings to minimise waste;
- Avoiding air, water and ground pollution;
- Preserving and enhancing biodiversity;
- Conserving water resources;
- Respecting people and their local environment.

Buildings have an important environmental impact throughout their lifetime. This factsheet concentrates on new build, refurbishment and the construction process. More information on the environmental performance of buildings is available in the building performance factsheet.

This factsheet is divided into 2 steps; the first step includes the design phase and the contracting of the building works. The second step considers the construction phase including the impacts of demolition.

How to take action?

Step 1: Main principles for sustainable construction

The primary environmental focus of new build and refurbishment should be on the performance and not in the initial cost of new build. It is important to take into account the running and maintenance costs and the overall environmental impact of the building. Local and regional governments can have a regulatory role for example by setting energy performance standards for new buildings. They can also promote the use of renewable energy sources, cost-effective sustainable building measures; or even require the use of renewable energy in refurbishment.

When local governments are refurbishing their buildings or deciding to construct new ones, this work is usually tendered out. Whilst many public sector organisations have in-house design resources, it is not uncommon to procure both design and build. The right design skills can reduce the environmental impacts substantially. It is therefore particularly

important to award the contract to a design team, which has the proper sustainable design credentials.

In the design phase, proposals for significant building development should include a statement showing how sustainability principles will be met in terms of demolition, construction and long-term management¹. The same sustainability principles should be used to assess development proposals.

When defining the requirements for the contract the local government may ask for specific materials and environmental production methods. The local government can title the contract for example 'Energy-Efficient Building', which shows already that the environmental performance of the service will be important.

There are a range of standards available throughout Europe for sustainable construction such as the Minergie and BREEAM standard. The following list includes some measures that are important while designing a new building or refurbishing an existing one.

Environmental performance of new build and renovation

- Develop local standards for operation, construction and refurbishment and get them approved by the council (energy efficiency, use of renewable energy sources, water saving etc.)
- Maximise water conservation technologies and techniques like water metering, zero/low-flush toilets, automatic taps, rainwater harvesting, reuse of grey-water, black-water treatment to permit on-site re-use
- Apply sustainable urban drainage (SUDS) techniques to make surface run-off patterns more natural and sustainable
- Re-use existing buildings wherever possible, provided they can meet, or can be refurbished to meet, high energy conservation, materials, water and biodiversity standards

Energy efficiency of new build and renovation

- Promote the energy performance of new developments by using low-energy standards in new buildings e.g. passive house concept
- In particular pay attention to thermal performance (insulation, windows, frames etc.)
- Promote the energy performance of new developments among citizens
 - i. Define an information package of cost-effective sustainable building measures and include them in the planning and permit documents
 - ii. Encourage and require when possible the use of energy performance criteria when municipally owned land is sold

Renewable energy in new development and renovation

- Consider including, or retrofitting, renewables for new building contracts, e.g. technology based on wind, solar photovoltaic and biomass
- Incorporate renewable energy projects as part of a strategic asset maintenance/replacement programme
- Encourage the use of renewable energy among the citizens
 - i. Make permission procedures for using renewables easier
 - ii. Remove cultural barriers towards using renewable energy sources by providing training as part of professional development
 - iii. Provide dedicated financial resources (e.g. Kirklees Council Renewable Energy Fund) for renewable energy projects
(<http://www.kirklees.gov.uk/community/environment/renewable/renewable-projects.shtm>)

Conserve and improve biodiversity

¹ Please note that for certain public projects it is necessary to carry out an Environmental Impact Assessment, which might have an influence on the contracts. Also the Directive on Energy performance of buildings will have an effect on the definitions when dealing with new buildings or renovation of large existing buildings. For more information visit http://ec.europa.eu/energy/demand/legislation/buildings_en.htm

- Ensure there is no (or minimal) net loss of open space as a result of the development or building works
- If some loss is unavoidable, encourage habitat improvement by providing at least an equivalent area and quality of accessible open space nearby to compensate the loss
- Secure a net increase in biodiversity on development sites for example by incorporating vegetation into buildings (green roofs, walls, balconies, terraces etc.)

A range of tools exist for selecting sustainable building materials and methods and some of the useful links are listed in the 'where' section of this factsheet. When selecting raw materials and products priority should be given to those ones that are:

- reused or recycled
- locally sourced
- renewable
- eco-labelled

Furthermore, hazardous and harmful substances such as products which contain fluorohydrocarbons (H-FKW), sulphur hexafluoride (SF6) and paints and varnishes with a high solvent content should be avoided.

Urban renewal plan "Quatre Cantons", Manresa, Spain

The plan of City Council aims at revitalising the Old City of Manresa by building a new residential area. The main objective is to combine social and environmental aspects in a harmonious way. The plan foresees for the new buildings to be designed in a way that guarantees efficient energy use, water conservation and effective waste management.

In terms of improving the energy efficiency, the following mechanisms have been planned:

- solar energy for production of hot water and heating
- centralised boiler
- ventilated roofing and heat bridges
- isolation and solar protection system.

From a water conservation point of view, the plan contains the following provisions:

- rainwater use for irrigation
- installation of water conservation mechanisms in all sanitary ware and drainage systems
- sinks and shower water reutilisation for cisterns.

In order to ensure effective waste management, the City Council has foreseen:

- buildings' collective and private spaces adaptation for waste separated storage
- buildings' design with construction criteria to facilitate the use of waste after dismantling.

More information is available on: <http://www.ajmanresa.cat/>

Step 2: Construction process

The construction process itself can create much noise and pollution and disturbance in the neighbourhood. Good performance is therefore essential and there are examples of schemes that try to control potential nuisance. For example UK Local Government Association has prepared instructions and checklists for site managers to help in monitoring the construction process (this is linked to the Considerate Construction Scheme <http://www.considerateconstructorscheme.org.uk/>). The main aspects include issues such as environment, cleanliness, safety, respecting neighbours etc. Although waste management is a major issue on building sites there are as yet no standards on this.

During the construction process the local governments should consider the following environmental aspects:

- Minimise, reuse and recycle all demolition waste on site
- Waste prevention and waste management
- An action plan for waste on site for example including an accessible waste reuse and recycling facilities (e.g. composting) in all developments
- Efficient procurement and material delivery on site (less material losses, lower waste volumes)
- Adequate storage of materials
- Legally compliant handling and disposal of waste

- Include facilities for recycling, separation of waste on site/off-site, as well as securing markets for recycled materials.

Where to find more information?

- Method for assessing environmental performance of new and existing buildings <http://www.breeam.org/>
- Cost effective measures for sustainable construction – guidance for planners and developers <http://www.sustainable-construction.org.uk/>
- Quality label for new and refurbished buildings <http://www.minergie.com/>
- Considerate Construction Scheme <http://www.considerateconstructorsscheme.org.uk/>.
- Considerate constructors guidance for local governments in UK <http://www.considerateconstructorsscheme.org.uk/downloads/050830-LAadvnote.pdf>
- Advice on building materials and components <http://www.greenspec.co.uk>
- Wood etc. products - Forest Stewardship Council <http://www.fscus.org/>

