

# Recommended criteria for planning and project management of construction

## 1. Product group

Planning and project management services

### 1.1. Limitation

Our recommendation on the use of environmental criteria for construction and property administration is based on the contracts covered by regulations on public procurement.

The Regulations on public procurement (FOA) do not apply to contracts concerning the purchase or leasing of land, existing buildings or other real estate, or concerning rights to such property. The basis for this exception is that the procurement will generally depend on geographical location and will therefore not concern cross-border trade. According to the wording of this regulation, the only exception is the leasing of existing buildings. Contracts established for buildings which are to be erected at a later date or which are currently being erected will therefore as a general rule not be exempt from the regulations on public procurement. FAD has stated in its guidelines on public procurement that they cannot see any clear justification for the cut-off point as regards when the regulations will apply; cf. FOA Section 1 – 3, second paragraph, letter b. Practice from the European Court of Justice does not provide any guidance either, so the problem must therefore be considered unresolved<sup>1</sup>.

Chapters 1-3 are the identically worded sets of criteria for the execution phase – building construction.

## 2. Environmental impact - facts

The environmental impact associated with construction occurs in all phases of a building's lifecycle. The construction sector is often referred to as "the 40% sector", as it accounts for approximately 40% of society's resource and energy consumption.

Energy consumption in construction is approximately 82 TWh in a normal year (approx. 38% of the country's energy consumption) – comprising 47 TWh for residential buildings (57%) and 35 TWh for commercial buildings (43%). Electricity accounts for the overwhelming majority of energy consumption. New construction is using ever more energy per m<sup>2</sup>. This can be attributed to the fact that the spatial efficiency of buildings has increased, but another probable reason is more technical installations and equipment. Today, approximately 20% of the energy consumption in Norwegian buildings goes towards climate control, whilst lighting accounts for approximately 15%.

One study<sup>2</sup> shows that in 2004 the building sector was responsible for the emission of 7.2 million tonnes of CO<sub>2</sub> equivalents; approximately 13.5% of the country's total emissions. Production of building materials accounted for approximately half of this, whilst operation of buildings is the next biggest contributor.

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<sup>1</sup> Veileder til reglene om offentlige anskaffelser, Part 2.2.2 pg. 19

<sup>2</sup> Source: *Byggsektorens klimagassutslipp. Notat for Byggemiljø*, prepared by KanEnergi 2006, ver. April 2007

According to the report, electricity, which is extensively used for heating, does not contribute to CO<sub>2</sub> emissions.

The building sector uses many materials – often in large volumes – in its production. Many of these materials contain substances that could constitute health, environmental or fire/explosion hazards. Products for building and facilities account for 19% of all declarable products<sup>3</sup> in Norway. Many chemicals used in the building industry are also included on the official priority list of substances to be phased out or eliminated wherever possible. Hazardous substances can cause health-related (indoor-climate related) problems in the operational phase through degassing, especially from surfaces. Such substances may also present problems in the demolition phase (disposal phase), as debris containing such substances over the course of the building's lifetime can be classified as hazardous waste with associated requirements concerning handling (such as products containing brominated flame-retardants).

The building materials industry is increasingly international in scope, and more and more of the materials used in Norwegian buildings are imported. There is also a trend towards an increase in the use of industrially produced elements and modules. All these factors are resulting in increased transport, but industrial production will often result in reduced waste production (less cutting, active use of recycling schemes) whilst damage from moisture is reduced at the same time. Moisture and water damage account for approximately 70% of all building damage. Building faults cost an estimated NOK 12-15 billion annually<sup>4</sup>.

The building industry generates approximately 1.24 million tonnes of building waste a year<sup>5</sup> a year, which requires management. The total amount of waste in Norway in 2005 was 9.5 million tonnes. Hazardous waste, which must be handled in an environmentally responsible and health-conscious manner, is reported to amount to approximately 7,200 tonnes, whilst electronic and electrical waste (EE waste) is reported to total approximately 3,300 tonnes.

Tropical forests are especially important for the planet's biological diversity and climate. A high proportion of these forest resources is used in a non-sustainable manner. There are currently no international or national certification schemes that can give adequate certainty that imported wood products have been lawfully and sustainably sourced.<sup>6</sup>

### 3. Proposed procurement process

Project management and construction of a building is a long-term and complicated process involving many suppliers. Aspects of the procurement take place early on in the process, long before everything that has to be procured is clarified in detail. Such procurements also involve sectors where there is generally a low level of competence regarding the environment.

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<sup>3</sup> Product register: Product figures. Report 2000 – 2005.

<sup>4</sup> See Byggekostnadsprogrammet.

<sup>5</sup> Statistics Norway: *Avfallsregnskap for Norge*, <http://www.ssb.no/emner/01/05/40/avfregno/>

<sup>6</sup> See Regjeringens handlingsplan for 2007 -2010 om miljø- og samfunnsansvar i offentlige anskaffelser. Wood from tropical timber sources may not be used either in the building itself or in materials used during the construction period. Tropical timber refers to wood originating from the region between the tropics (23°N and 23°S), as well as all of Myanmar (Burma). It is currently not possible for a producer to evaluate in practice whether tropical timber originates from sustainable tropical timber sources with reliable certification; see also Regulation No. 895 of 4 July 2003 on special measures with respect to Burma (Myanmar), as subsequently amended.

The construction, operation and maintenance of public buildings requires substantial financial resources, and there is usually a requirement for investments in environmental measures to be measurable in the form of good administrative economy. Evaluation of the building's lifecycle costs (LCC) will be an essential (ref. Section 6 of the LOA) tool for establishing the costs of different options considered over the entire lifetime of the building. This will often produce results that demonstrate that environmental investments are worthwhile. Where environmental considerations, quality and economy in construction go hand-in-hand, it often proves that environmental considerations contribute to better quality and economy in construction.

The following are aspects that should be taken into consideration in order to ensure a good procurement process:

### **Political anchoring**

In order to fulfil the role of owner and provide the necessary guidelines, there should be a politically anchored resolution (municipal and county councils) or a central management resolution (government or publicly owned enterprise) on environmentally friendly construction, refurbishment and operation of the building. The decision-makers should provide guidelines where it is clear and evident that there should be environmental requirements concerning the construction and operation of the building.

### **Assessing needs – involving users**

At an early stage in the process, there should be an evaluation from an environmental and economic perspective as to how the spatial requirements can best be covered:

- What are the actual spatial requirements today and in the foreseeable future?
- What needs does the user have for the building in terms of future flexibility in building construction and technical installations?
- Is it possible to meet this need through means other than extensive refurbishment or new-build?
- Will it be possible to achieve an appropriate building change without total refurbishment?

A good needs assessment can be an effective way to avoid unnecessary construction or refurbishment, and thereby also unnecessary materials and resource usage.

User involvement will also be important in the process of determining the actual need. Experience shows that users who have taken the time to define their needs and views will have a greater understanding of the solutions that are eventually chosen. Here, it may also be desirable to review work processes and operations that will be carried out in the building.

It is important that users also have a certain minimum level of competence in understanding the building process and its opportunities and limitations. Those involved must have a knowledge and understanding of the environmental objectives in the project and be involved in their development wherever possible.

### **Good planning – setting environmental objectives early in the process**

The construction and management of a building are, as previously mentioned, complex processes involving numerous actors with different roles. In order to achieve the best possible results in environmental terms, it is important to incorporate environmental conditions in all processes. The best results will be achieved at optimal cost by formulating concrete and measurable environmental objectives that are accounted for from

the very beginning. Good planning in advance will also result in significant advantages concerning the subsequent maintenance and operation of the building.

The environmental objectives established for a given project will vary depending on scope, local circumstances, etc., but should be linked to the most important and relevant environmental conditions in the project.

A start-up meeting with the parties involved, during which the project's environmental objectives are clarified, will usually produce positive results.

### **Delineating responsibility and qualifications**

It must be clearly stated who is responsible for ensuring that environmental requirements are established, and who is responsible for ensuring that the goals are followed up and achieved during the various phases of the building process.

It would be an advantage if the entire project management group were engaged at the same time, and as early as possible in the project. This lays the groundwork for close interdisciplinary cooperation concerning environmental issues from the very beginning.

## **4. Recommended requirements and criteria**

The criteria for building and property management use a system that is slightly different from those used in other sets of criteria. This must be seen in the context of the construction industry's special position and contractual circumstances. There are many more contractual requirements for the sets of criteria for building and property management than for the other sets of criteria, whilst at the same time the qualification requirements and technical specifications are correspondingly reduced in scope.

### **Subdivision of criteria according to building life phase**

The planning and building process can be divided into many phases and many different contract forms are utilised. We have chosen to formulate four sets of criteria that will collectively cover the entire lifecycle of the building.

For building and property management, we differentiate between:

- Planning and project management, including planning in connection with rebuilding/refurbishment.
- Construction and rebuilding/refurbishment of buildings.
- Building maintenance.
- Management and operation - service agreements.

It is a prerequisite for the use of 1) and 2) that the project is covered by the requirements of the Norwegian Planning and Building Act (PBA) concerning applications for planning permission. These criteria will also be used on large-scale rebuilds and refurbishments that require such approval. Small-scale projects and rebuilds not requiring such approval are defined here as building maintenance.

The initiation phase, in which the very first thoughts and ideas for a new building take shape, is not included here. Services will also be procured for this phase in respect of individual buildings.

### **General preconditions**

The following are established as general preconditions for the project:

- There should be a minimum of one, but preferably more, testable environmental goals<sup>7</sup> for the project.
- Calculations of the lifecycle costs (LCC) must be carried out for different options for the building and technical installations.

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<sup>7</sup> For example, requirements for waste reduction in the building process or material selection.

- It is an obvious precondition for the delegation of all tasks that the supplier is familiar with and follows all relevant laws and regulations<sup>8</sup>. The proposed criteria described below are requirements that extend further than the minimum regulatory requirements.

It is recommended that documentation that is obtained should wherever possible be supplied in accordance with Norsk Standard NS 3450 "Project documents for buildings and facilities. Editing and content of documentation for competitive tendering" (4th edition January 2006).

#### **4.1. Purpose of the contract**

The planning and project management phase refers to all parts of planning after the first initiation phase (during which ambitions, etc. are clarified) – from the outline project and concept phase through the entire feasibility project period and design planning, which provides competitive tendering documentation for the selection of contractors to deliver the project. The phase continues through the completion of the competitive tendering process to select the contractor to carry out the project. (In some cases, most of the project management is carried out in parallel with the execution.)

Environmental requirements and criteria that are established should be included in the documentation for competitive tendering for public procurement. This will serve as part of the documentation for competitive tendering together with other requirements and criteria.

The fundamental principle of proportionality presented in Section 3-1, fifth paragraph of the Regulations on public procurement (FOA) means that the environmental requirements and criteria that are established must be in relation to the contract that is being established. According to the fundamental principles, the requirements must be relevant for the actual contract and the documentation requirements established should also be in relation to the contract.

This means that some of the environmental requirements and criteria proposed must be adapted to the actual procurement. This also means that documentation requirements and scope must be adapted to the size and type of contract. Some contracts can be complex even if the contract value is not large. This means that there must be a concrete evaluation as to whether or not the proposed requirements and criteria are appropriate for the planned procurement.

<sup>8</sup> Applicable rules include:

- Planning and Building Act (PBA); ACT 1985-06-14 No. 77: <http://www.lovdatab.no/all/hi-19850614-077.html>
- TEK – Regulations on requirements for construction and construction products (TEK); FOR 1997-01-22, most recently amended on 26 January 2007: <http://www.lovdatab.no/cgi-wift/ldles?doc=/sf/sf/sf-19970122-0033.html>
- Act on control of products and consumer services (Product Control Act); LOV-1976-06-11-79: [http://www.lovdatab.no/cgi-wift/wiftldles?doc=/usr/www/lovdatab/all/nl-19760611-079.html&emne=produktkontroll\\*&&](http://www.lovdatab.no/cgi-wift/wiftldles?doc=/usr/www/lovdatab/all/nl-19760611-079.html&emne=produktkontroll*&&) including substitution requirements
- Regulations on restrictions on the use of chemicals constituting a health and environmental hazard and other products (Product Regulations); FOR-2004-06-01-922: <http://www.lovdatab.no/cgi-wift/ldles?doc=/sf/sf/sf-20040601-0922.html>
- Regulations on recycling and handling of waste (Waste Regulations); FOR-2004-06-01-930: <http://www.lovdatab.no/cgi-wift/ldles?doc=/sf/sf/sf-20040601-0930.html>

## 4.2. Qualification requirements<sup>9 10</sup>

### 4.2.1. Requirements concerning environmental management systems<sup>11</sup>

The main contractor must document that an environmental management system has been established, which at least consists of routines that account for the following elements:

- System for the company's environmental goals and environmental policy.
- System demonstrating a competence strategy concerning the environment.
- Procedure for delivery of the service in an environmentally responsible manner.

**Documentation:** Statement of existing routines documenting that the requirement is met. A self-declaration can be provided that describes how these routines work and how they are implemented. If the routines are described in the company's quality or environmental management system in accordance with Miljøfyrtårn, ISO 14001, EMAS or an equivalent third party-verified system, it is sufficient to provide a valid certificate.

### 4.2.2. Environmental competence requirements<sup>12 13</sup>

Suppliers of key consulting services – architect (arch), consulting HVAC engineer (HVAC), consulting electrical engineer (CE) and consulting construction engineer (CE) - must document a knowledge and experience of the preparation and implementation of environmental goals, environmental programmes or equivalent, as well as design and project management that safeguards environmental conditions in the project management process.

Environmental conditions include:

- Spatially efficient solutions relating to gross/net factors (for architect).
- Material usage - substances that are hazardous to health and environment in materials (for all).
- Energy-efficient building design<sup>14</sup> (for architect).
- Energy-efficient technical solutions (for consulting HVAC engineer and consulting electrical engineer).
- Large-scale projects (> 500 m<sup>2</sup>): Use of energy-flexible heating systems (for all).

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<sup>9</sup> Qualification requirements are minimum requirements associated with the contractor's ability to deliver the procurement object in question. The purpose of establishing qualification requirements is partly to ensure that the contractor has the technical and organisational basis for completing the contract. The requirements that are established must be reasonable in relation to the procurement.

<sup>10</sup> It is important that the requirements that are established are not so stringent that they exclude too much of the market from the competition. For each project, it must therefore be evaluated what requirements may reasonably be established. The criteria should not be static, but continuously adapted to developments over time. Requirements that today might be so stringent that they restrict competition excessively may become common in the future.

<sup>11</sup> Requirements concerning environmental management systems must be seen in relation to the size of the project and this will in particular apply to central consulting firms in major projects, e.g. projects over 500 m<sup>2</sup>. An environmental management system helps create environmental awareness in the company, whilst at the same time establishing systems and routines for handling environmental issues. In smaller projects and with smaller consultants, it may be more appropriate to use environmental management systems as an award criterion. In large-scale projects, it may be reasonable to establish a requirement for all firms in the project management group to have an environmental management system. (The size of the project management group will depend on the size and complexity of the project).

<sup>12</sup> Requirements concerning environmental competence must be viewed in the context of the project's size – this requirement will be more prevalent in large projects than in small ones. For large projects, it may be pertinent to establish requirements for all consultant groups to possess such competence.

<sup>13</sup> For an individual project, the client may evaluate the scope of the documentation requirement – the number of years and number of relevant projects.

<sup>14</sup> Including the building's shape factor, technical solutions and glass facades – see [veileder for utforming av glassfasader](#).

- Large-scale projects (> 500 m<sup>2</sup>): Central operational control (OC) and automation of technical installations (for consulting HVAC engineer and consulting electrical engineer).
- The project's own specified environmental goals<sup>15</sup>: Establish requirements for competence/experience with these themes.

**Documentation:** <sup>16</sup>

Brief description (max. two pages) of a relevant project carried out over the last five years, with a statement of the project's name, scope (m<sup>2</sup> and cost), environmental goals and results, construction client and date of completion. Relevant tools and methods used should be reported along with follow-up of any environmental goals or environmental programmes used in the project.

### **4.3. Technical specifications**<sup>17</sup>

None. <sup>18</sup>

### **4.4 Award criteria** <sup>19</sup>

**Service quality:** It is the individuals tendered for the project that will be evaluated here, not the supplier. The supplier must state whether the proposed consultant (architects and/or technical consultants) can document experience in project management concerning sustainable building design with an emphasis on the following:

- Use of energy sources other than fossil fuels and energy carriers other than electricity.
- If relevant for the project, experience of safeguarding indigenous flora and fauna.
- If the project has recycling goals, experience of the use of recycled materials or of refurbishment projects involving the re-use of materials.
- If the project has waste goals, experience of establishing requirements for waste management during the building phase and construction solutions that produce the least possible waste during the building process.
- Choice of materials that have the least possible impact on environment or health.

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<sup>15</sup> Requirements for waste reduction in the building process or material selection, for example. If material requirements are established in the project's environmental goals, this must be reflected in the other requirements.

<sup>16</sup> The client must be aware that all those who can provide satisfactory documentation will participate further in the competition without being rejected. At the same time, tenderers who cannot provide such documentation must be rejected. It is therefore important that the qualification requirements are set out uniformly, so that no rejection becomes the subject of discussion.

<sup>17</sup> The client must describe for the market what is to be purchased. FOA Section 4-3 g 2) gives a definition of what is meant by technical specifications in building and installation contracts.

<sup>18</sup> Requirements are not addressed here; not relevant with respect to the environment.

<sup>19</sup> The award criteria must be associated with the contract object. The award criteria are the client's wishes, according to which the tenders will be ranked. The main criteria should be given a weighting as a %, so that the contractors can get an idea of what the client wants and thereby better meet these wishes. Each award criterion should be stated in concrete terms. Criteria associated with the environment will be one of several criteria. Other criteria will usually include price and quality. As a general rule, the client will also be relatively free to choose what award criteria are to be included and what weighting these criteria are to be given.

**Documentation:** Reference projects not more than five years old with a description of the consultants' roles in the projects and a statement of how the project pertains to the above criteria (max. two pages). Reference people for these projects should be noted.

## **4.5. Contractual requirements**<sup>20</sup>

### **4.5.1. Environmental requirements**

NS 8401/ 8402 dated..... shall apply as the general contract provisions, with the addition of what follows below.

The supplier's proposed consultants (architects and/or technical consultants) must have completed a training course in these areas (choose the relevant subject areas and specify a deadline for completion):

- Energy
- Material selection
- Spatial efficiency
- Chemicals presenting environmental or health hazards that may be used in construction
- Waste reduction in the building process

### **4.5.2. The supplier must fulfil these functional requirements:**

#### **Energy**

- The completed building must at least achieve energy class B<sup>21</sup> according to the requirements for energy-marking of the building.
- Plans should be made to avoid local cooling systems, with the exception of rooms with special cooling requirements, such as server/computer rooms.
- When in operation, the completed building must not rely on fossil fuels for direct heating purposes<sup>22 23</sup>. Requirements for the building's energy supply should be more stringent than the minimum regulatory requirements<sup>24</sup>.

#### **Material selection**

- Low-emission materials<sup>25</sup> should be used on interior exposed surfaces in heated areas (BRA).
- Design and construction solutions involving the use of substances that are hazardous to health or the environment mentioned on the official priority list<sup>26</sup> must be avoided where technically and economically possible.

#### **Clean Dry Building**

- Planning and project management should follow the Clean Dry Building concept<sup>27</sup>.

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<sup>20</sup> The client should specify in the invitation to tender documentation what contract standards will be used. As a general rule, the client should use contract standards; cf. FOA Section 3-11 first paragraph. FOA Section 4-1c) presents a more detailed definition of building and facility contracts.

<sup>21</sup> The final regulations have not yet been established (April -08). It is expected that Energy class C will correspond to the official requirements (the level that fulfils the regulatory requirements). If determined otherwise, this level will be one class better than the regulatory requirements according to the impending energy marking scheme.

<sup>22</sup> For buildings which use electricity for heating purposes, it is recommended that electricity with a product declaration or RECS certificate (Renewable Energy Certificate System) which guarantees that the electricity is produced from renewable energy sources, be purchased.

<sup>23</sup> Installations based on fossil fuels to cover peak loads (e.g. a small percentage of annual energy requirements) are permissible.

<sup>24</sup> Technical Regulations for the Planning and Building Act (TEK) Section 8-22

<sup>25</sup> See Prosjekteringsanvisning fra Statsbygg (includes glue, flooring and trim). The Norwegian Defence Estates Agency's fgdokument for HMS also gives useful information on interior climate factors in section 2.3.

<sup>26</sup> Priority list: [http://www.miljostatus.no/templates/pagewide\\_2828.aspx](http://www.miljostatus.no/templates/pagewide_2828.aspx). Byggemiljø materialvurderingsliste, is also a useful tool for assessing materials.

### **4.5.3 These supplementary requirements may be included in the contract:**

#### **Energy**

- The building must be planned with technical installations for heating, lighting, ventilation, cooling and solar protection with time- and/or presence-based control for optimal energy efficiency.
- The building must be planned with a central control unit (master system) for monitoring and effective administration of technical installations.
- The requirement for dado height in offices, training rooms and overnight accommodation rooms is 70 cm.

#### **Material selection and hazardous substances**

- The building must be arranged for efficient cleaning<sup>28</sup> – e.g. with a low “ledge factor” and smooth surfaces. It is also important to be able to use a uniform cleaning method over the entire area – there should not be a mix of floor materials that require different methods.
- Known construction principles must be utilised. It must be documented and approved by the builder if pre-approved solutions are not used (e.g. [Byggforskserien](#)).
- Wood and wood-based products must be sourced from sustainable forestry and documented through a recognised certification schema<sup>29</sup>.
- Maintenance-friendly facades must be incorporated into the plan.
- The use of sealing compounds must be avoided where technically and economically possible.

#### **Waste**

- The building must be planned so that it is easy to demolish the building (or parts thereof) and sort the resulting building waste.
- If the project includes demolition, an environmental assessment must be performed concerning the possible presence of hazardous substances in the building, and a plan must be prepared for demolition that separates these occurrences out.

#### **Other**

- Criteria must be established for maximum values of outdoor dust and noise during the installation phase.

## **5. Background material**

Reference to background material and sources is included in footnotes throughout the entire document.

### **Background to the work**

In June 2007, the Norwegian Government launched an action plan for environmentally and socially aware procurement. State procurements in particular are being targeted and the environmental policy is designed to give state-owned bodies guidelines and assistance in the task of establishing sound environmental requirements. The action plan came into force on 1 January 2008 and places an emphasis on

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<sup>27</sup> Clean dry building, preventative health measures in buildings. CDB handbook from the Association of Consulting Engineers. 2<sup>nd</sup> edition, 2007.

<sup>28</sup> See also NBI advisory: Floorplan 379.243 “Arrangements for streamlined cleaning”

<sup>29</sup> Wood and wood-based products produced from lumber from FSC-certified, living forest-certified or PEFC-certified forestry

environmental requirements for project planning and the erection of buildings and property management. A set of recommended criteria must be prepared for the selected product/service areas. The task of preparing these criteria has been delegated to the Panel for environmentally aware procurement with GRIP as secretariat. For construction and property management, four sets of criteria will be developed as mentioned previously to cover project planning, construction, maintenance, operations and service agreements.