



D 3.1 Guidelines for public procurement of designers and planners that are capable to handle sustainable summer comfort solutions through an “Integrated Energy Design Process”

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1 Sustainable summer comfort

Sustainable summer comfort can be defined as achieving good summer comfort conditions with no or limited use of conventional energy (fossil and nuclear) and through the use of environmentally non-harmful materials.

It can be achieved if the following ten steps are considered when planning, constructing and operating a building:

1. Define the thermal comfort objectives explicitly, using the Adaptive Comfort model where possible
2. Intervene on the site layout and features of the surroundings of the building which can affect summer comfort
3. Control and reduce heat gains at the external surface of the building envelope
4. Control and modulate heat transfer through the building envelope
5. Reduce internal gains
6. Allow for local and individual adaptation
7. Use passive means to remove energy from the building
8. Use active solar assisted cooling plants
9. If still necessary to reach the stated comfort objectives, use high efficiency conventional active cooling plants
10. Train building managers and occupants on how to use, monitor performances and adequately operate and maintain the building.

2 Integrated Planning – An effective strategy to meet energy efficiency requirements in buildings

During the life cycle of a building different costs arise:

Costs for

- planning
- construction
- operation (energy, water, cleaning, etc.)
- maintenance
- renovation
- demolition
- disposal

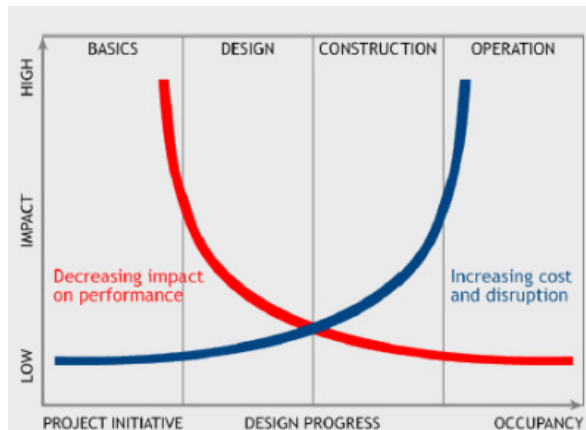
Quality criteria like indoor air quality, comfort in summer and winter, noise protection, ecological quality of construction material are not directly cost effective but can appear as a depreciation or can even cause additional costs. Moreover, flexibility, atmosphere and the appearance play an important role in regard to the value of a building.

Besides these requirements energy political advancements and legislative conditions (Energy Performance of Buildings Directive, “EPBD”¹), which assign a low energy demand of a building, necessitate new strategies of planning. The traditional way of planning, where the architect designs the building, and afterwards building service engineers equip the building with technology separately – irrespectively to the needs of users - hits the wall as can not meet these requirements. Therefore comprehensive, integrated planning is necessary.

Right from the beginning, the different trades (architecture, building physics, heating, ventilation, climate and electronic technologies, lighting design, etc.) and primarily the users have to be involved in the planning process. Only in this manner apparently discontinuous goals can be pulled together, synergy effects can be used and reciprocal obstruction of the different systems can be avoided.

Is the whole life cycle of a building considered, the running of a building causes more costs than construction and refurbishments. By applying integrated planning the investment costs can be up to 5 % higher but the annual running costs can be reduced by 40 – 70 %. These resulting low running costs will have a major impact on the buying decision of potential buyers in the future.

¹ The Directive 2002/91/EC of the European Parliament and Council on energy efficiency of buildings (“Energy Performance of Buildings Directive”, EPBD)



Changes/adjustments in early planning phases can be carried out cheaply and effectively. The later changes on the building are made, the more effort is necessary and the costs for these changes rise considerably.

Figure 1: Adjustment costs

If summer comfort is to be ensured by as low running costs as possible, passive design measures have to be undertaken, which can only be integrated, if they are considered from the beginning of the planning phase. For example:

- Orientation of the building
- Situation of rooms
- Storage mass etc.
- Glazing ration
- Shading system
- Lighting system
- Natural ventilation
- Use of solar assisted cooling plants

All these issues have to be considered from the beginning on, otherwise they are not realisable or implementing them at a later stage is too expensive.

During the planning phase regular and intensive communication between the different trades is the most important instrument to overcome the barrier of different profession languages and to find the optimal solutions under consideration of basic conditions and targets. Together in a team the building owner, users, architect, building service engineers, building physics engineers, light managers, energy/facility manager etc. have to define goals, towards which the engineers then align their activities. Regular project meetings have to take place, where the developed options and solutions are pre-

sented and discussed and further procedures and goals until the next meeting are defined.

The result of this intense planning are buildings which attract by their architectural design, offer excellent indoor air quality for its users and only have low running costs at the same time. To realise this, participating experts have to have special qualities.

- Open other ways of planning than usual ways
- Open for new, innovative, challenging solutions
- Social skills/good at communication
- Good at management
- Special interest in energy efficiency
- Expert in his field
- Widespread knowledge/effects on energy of different solutions regarding energy demand, comfort level, investment costs
- User requirements in the centre of interest
- Experience

This guideline supports public agencies to find these high qualified designers and planners to ensure an integration of sustainable summer comfort solutions through an integrated energy design process.

3 How to find a good planner/designer

To find the most suitable planner, you can start a tender. As the public procurement law is an important European issue, besides national standards, EU-public procurement laws play an important role: RL 2004/17/EG, RL 2004/18/EG as well as appellate directives 89/665/EWG and 92/13/EWG

The following has to be followed:

“The award of contracts concluded in the Member States on behalf of the State, regional or local authorities and other bodies governed by public law entities, is subject to the respect of the principles of the Treaty and in particular to the principle of freedom of movement of goods, the principle of freedom of establishment and the principle of freedom to provide services and to the principles deriving there from, such as the principle of equal treatment, the principle of non-discrimination, the principle of mutual recognition, the principle of proportionality and the principle of transparency. However, for public contracts above a certain value, it is advisable to draw up provisions of Community coordination of national procedures for the award of such contracts which are based on these principles so as to ensure the effects of them and to guarantee the opening-up of public procurement to competition. These coordinating provisions should therefore be interpreted in accordance with both the aforementioned rules and principles and other rules of the Treaty.”²

Furthermore the jurisdiction of the European Court of Justice about questions about procurement laws plays an important role.

3.1 The tender

The tender should include a description of the planned building and clear expectations for the bidders. Functional tenders merely involve stating the function to be carried out. The potential contractors provide their expertise by develop measures that will help meet the objectives. If the general framework given by the client is inaccurate and vague, errors and misunderstandings are likely to occur.

In the specification-based tender the customer presents an accurate and detailed list of the services to be undertaken. Offers can thus be compared more easily and effectively but it bars the contractor from the creativity in finding better solutions. For this reason, both the framework and the contractor's freedom to implement new ideas need to be well-balanced.

² DIRECTIVE 2004/18/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 31 March 2004 on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts

The checklist shows key issues of a good bid. By checking these issues you will find out who could be capable to handle the planning process. It is wise to invite the (e.g. 3) most attractive bidders for a separate interview to get to know them better and to find out more about their real qualities. The second checklist helps to analyse the interview and to find out who fits best to the project.

3.2 Checklist for the bid

1. Is a first meeting offered?
2. Time estimated for a survey of the site?
3. Is a time plan developed?
regular meetings included?
4. Is it planned to include more professions in the meetings?
e.g. architects, daylight planners, heating engineer, energy consultants, experts for building ecology and building physics, experts for ventilation systems, experts for structural engineering, etc.
5. Is the time plan realistic?
enough time for phases estimated, no critical progression
6. Is it recommended to integrate other professions or does he want to do all of his own?
One person can't be a specialist for all fields. If it is recommended to integrate other professions it shows that the bidder is likely to cooperate to get a good result.
7. Is there evidence of his Know-How?
e.g. certificates
8. Are references mentioned?
9. Are the references similar to your planned building?
10. Is there information about reference cases?
11. Are contact persons for reference cases mentioned?
12. Is a BlowerDoor test planned?
As BlowerDoor test is a differential pressure method to measure the tightness of a building
13. Is a Thermography measurement planned?
Procedure to check the thermal weakness of a building
14. Are companies considered which are close to the planned building?
in order to minimise transport ways and to optimise availability
15. Is it mentioned to use regionally available resources?
To keep transportation ways as low as possible

16. Does it seem that ecology is an important issue for the bidder?
17. Are there simulations recommended?
With different programmes you can simulate the behaviour of a building and analyse therewith advantages and disadvantages of different solutions.
18. Do you have the impression that he is interested in innovative strategies and technologies?
(e.g. passive cooling technologies, innovative façade concepts, etc)
19. Do you have the impression that he is interested in renewable energy?
(solar energy, heat pump, wood pellets, etc.)
20. Does he refuse air conditioning systems?
21. Is it avoided to write: You should, ... - does he give away responsibility to the owner?
22. Do I have enough influence capability?
23. Did the bidder include site management?
The orientation, shading objects like other buildings, trees or mountains have a big influence on the energy need of a building. Architecture and implemented technologies can vary significantly.
24. Did he offer an aftercare?
If the bidder offered an aftercare he will likely build a good building because he doesn't have much work and risks afterwards.
25. Did he offer warranty?
26. Did he include time for discussing or informing about different financing strategies?
e.g. alternative strategies like Contracting
27. Did he inform you about energy management?
To keep the running costs of a building as low as possible it is important to watch the energy consumptions to analyse them and to react.
28. Does he consider training for users?
Users of a building have a big influence on the buildings energy performance. They have to be informed accurately about the building, the technology and how to operate it.

If most of the questions are answered with "Yes", the bidder seems have know-how in and integrated energy design. Invite the three "best" ones for an interview.

Prepare some questions to know more about the bidder:

Let him tell something about his references.

With which trades have you foreseen cooperation? ...

3.3 Checklist for the first meeting

1. Did the bidder take enough time to inform you and to answer your questions?
2. Does he inform you about risks (time adjustments, emerging costs, useful insurances, etc.)
3. Does he know about new technologies?
4. Does he have standards in his mind?
5. Is he able to roughly estimate costs?
6. Does he know enough about grants?
7. Does he take the use of the building into consideration?
8. Is he interested in energy targets?
9. Does he have own recommendations? (changes to the site, changes to existing plans, further ideas etc.)
10. How much value does he lie on the orientation, window sizes, shading?
11. Do you have the impression that he is willing to work together with other professions?

What can you do more?

Inform yourself about the mentioned reference cases. Talk to building owners and the building users.

For checking the results an energy consultant can support you.

Inform yourself about the company philosophy and eventually about the philosophy and references of recommended professions.

For more information about building an energy efficient building the guide "Introduction to Integrated Energy Design". It contains basic information about Integrated Energy Design as well as rules of thumb of building an energy efficient building.