GREEN BUILD QUESTIONNAIRE

Questionnaire about sustainability measures for new or existing buildings and urban development areas.

Guidelines for the use of the questionnaire

The „Green Build" questionnaire is based on the Danish developed Green Build Tool, which works as an „energy and environmental point system". It has for example been used in the EU „Energie" supported project, „Green Solar Regions", where it was used in connection to a new urban development project with individual houses and apartment blocks for around 800 inhabitants in the municipality of Glostrup in Denmark. Here it is also being used for new building and retrofit projects in the municipalities of Roskilde and Copenhagen.

The Green Build tool has been developed by Peder Vejsig Pedersen from Cenergia in cooperation with architect Klaus Boyer Rasmussen from SolarVent. An interactive version of the Green Build questionnaire exists in the website www.greenglobal21.com (www.plinio.dk/green), which is operated by SolarVent.

In Glostrup the Green Build questionnaire was used by the municipality which asked interested builders to fill in the questionnaire when they were bidding for land. The aim was to identify a way to monitor energy efficient and sustainable building measures and to initiate a work that utimately could lead to a standard evaluation method in new and retrofit building projects.

The Green Build questionnaire is part of the so-called Green Build tool, which shall make it possible for European municipalities to assess and compare their individual environmental performance. It is here possible to work with the questionnaire concerning sustainable building measures in general. It can also be used by municipal authorities and builders who want to document sustainability in their own building and planning projects.

The answering of the questionnaire is divided into two phases. One phase for what is the intention to do, and another phase is telling what is the aim to do, just before the building project starts, when the final economy is known.

Phase 1 is thus what the building owner intends to do with his building from the beginning.

Phase 2 is about what the builder intents to do just before the building project starts, when the economy is know. Can e.g. be delivered to the municipality in connection to the application for a building permit.

When energy and environmental points are attached to the questionnaire, then the achieved number of energy and environmental "points" in 6-7 different areas can be used to identity a rating between A and M which can be compared to aimed at local standards. To motivate sustainability measures and improved financing based on achieved point levels can be an efficient promotion tool.

The questionnaire is filled in by ticking off the questions which [are intended] / [will be fulfilled]. For example regarding energy savings. If the energy consumption is below for example 32 kWh/m^2 all 3 lines should be ticked off as shown below:

☑ Energy consumption for heating is below 46 kWh/m^2
☑ Energy consumption for heating is below 40 kWh/m^2
☑ Energy consumption for heating is below 35 kWh/m^2

In other words: The fully filled in questionnaire will be a picture showing the degree of agreement between the original intentions and real facts in the project that will be realised.

Green Build questionnaire, including suggestion for "energy and environmental points" [ ]

A) Water, rainwater and sewage

	PHASE1	**PHASE 2**
1. Water saving toilets with differentiated flush is installed (3/6 litre) [1]	☐	☐
2. Rain water collection for garden irrigation is installed [1]	☐	☐
3. Water saving taps are installed: Toilet-sink max. 6 l/min., kitchen-sink max. 12 l/min. and shower max. 12 l/min [1]	☐	☐
4. A main water metering device is installed at each main plot of land (for use in main green accounting) [1]	☐	☐
5. Measures that minimise amount of rain water collected by the sewage system are carried out (permeable pavements, rain water ponds etc.) [1]	☐	☐
6. Rain water collection for use in washing machines is installed [2]	☐	☐
7. Rain water collection for use in toilet flushing is installed [3]	☐	☐
8. Washing- and dishwashing machines with minimised water consumption are installed [1]	☐	☐
9. Thermostat-mixing tabs of a type which can be serviced without the installation is opened is installed [1]	☐	☐
10. "Grey" wastewater is utilised [1)] [4]	☐	☐
11. Individual water meters installed [1]	☐	☐

Building owner's suggestions for other measures within " Water, rainwater and sewage": _____

B) Indoor air climate

	PHASE 1	PHASE 2
1. Air tightness of the building is measured to be less than 0.1 per hour [2]	☐	☐
2. Noise from installations is kept below 25 dB. [3]	☐	☐
3. Daylight optimisation [3)] is performed and documented [2]	☐	☐
4. Passive solar energy design is applied. How the problems with overheating are coped with so the indoor temperature is not exceeding 26°C. Is documented [2]	☐	☐
5. In-door materials with in-door climate certification is applied, if such is available for the material type in question [1]	☐	☐
6. There is a minimum air exchange rate of 30 m^3/h per person. The mechanical air exchange rate is at least 0.4/h and it is possible to have 0.6/h extra air exchange rate by manual opening of windows [2]	☐	☐
7. Balanced ventilation, exhaust and inlet air [2]	☐	☐
8. Moisture controlled ventilation [1]	☐	☐
9. Individually controlled ventilation [1]	☐	☐

Building owner's suggestions for other measures within " Indoor air climate":
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C) Materials and constructions

	PHASE 1	PHASE 2
1. Water installations without PVC is applied [1]	☐	☐
2. Cable work and related installations are without PVC [1]	☐	☐
3. Only building components totally free of PVC are applied [1]	☐	☐
4. Pressure-creosoted wood or similar is not applied [5)] [1]	☐	☐
5. Materials with environmental certification are applied (please specify) [1]	☐	☐
6. Foam materials using CFC and HCFC is totally avoided [1]	☐	☐
7. Gravel replacement in the form of crushes concrete is applied [1]	☐	☐
8. As flooring materials are only applied wood, natural stone or ceramic tiles [1]	☐	☐

9. Insulation materials of recycled organic origin is applied (for example flax and paper granules) [1]	☐	☐
10. Surfaces are treated with materials that are indoor-climate certified [1]	☐	☐
11. Low "not renewable" energy consumption materials, 200 MJ/m² or less [3]	☐	☐
12. Use of bricks in interior walls [2]	☐	☐
13. Use of polyolefin floors [2]	☐	☐
14. Natural materials in walls [1]	☐	☐
15. Natural materials in flooring [1]	☐	☐
16. Natural materials in roofs [1]	☐	☐
17. Natural materials in ceilings [1]	☐	☐
18. Recycled materials in insulation [1]	☐	☐
19. Recycled bricks are used [1]	☐	☐
20. Recycled tiles are used [1]	☐	☐
21. Special care so constructions are protected against the local weather conditions, e.g. using extended eaves [2]	☐	☐
22. Use of flat roofs are avoided in rainy climates [2]	☐	☐
23. Documented lifetime optimised facades [2]	☐	☐
24. Documented lifetime optimised roofs [2]	☐	☐
25. Documented use of glass and windows to obtain a maximum utilisation of daylight [1]	☐	☐
26. Documented use of glass and windows so overheating in the summer is avoided (less than 26°C in a Danish climate) [1]	☐	☐
27. Documented use of glass and windows in a way so the yearly heat loss including solar gain is less than for the insulated walls [1]	☐	☐
28. Use of built-in solar shading design [1]	☐	☐
29. The building is designed to utilise natural and cross ventilation in the summer [1]	☐	☐
30. The building is made with a documented level of thermal mass as basis of storage of solar gains [1]	☐	☐
31. A building design is used which avoids the need for air condition/cooling systems [2]	☐	☐
32. Areas with a high amount of "free heat" gains is designed for natural or hybrid ventilation [2]	☐	☐
33. A detailed calculation programme is used as basis of achieving an optimised building design with respect to heat and cooling demand and comfortable temperatures [2]	☐	☐

Building owner's suggestion to other measures within "Materials and constructions"

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D) Waste

	PHASE 1	PHASE 2
1. Space for composting container is included in the garden plot [1]	☐	☐
2. Appropriate containers for fractionated waste disposal is built in both in kitchen and in the out door disposal place [1]	☐	☐
3. Green accounting is applied on the household waste [1]	☐	☐
4. The waste from the construction phase is sorted in as many fractions as the municipality can find an outlet for [1]	☐	☐
5. At each main plot of land space is reserved for "waste-islands" where the waste can be disposed off in fractions as paper, cardboard, metal, electronic waste etc [1]	☐	☐
6. Life cycle assessment of materials [1]	☐	☐
7. Documentation and maintenance guide concerning materials [2]	☐	☐

Building owner's suggestion to other measures within "Waste"

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E) Energy

	PHASE 1	PHASE 2
1. The building project is being coupled to the local district heating [1]	☐	☐
2. User controlled mechanical ventilation with heat recovery of outlet air is installed. The thermal efficiency rate must be at least 80% and the electrothermal ratio [9] must be at least 1:8. Power consumption max. 40 W and noise level from the installation must be below 25 dB [5]	☐	☐
3. Individual consumption displays are installed [2]	☐	☐
4. The number of hot water taps are limited and are placed centrally with short and small diameter tubing [2]	☐	☐
5. Main meters are placed at the entrance of each main plot of land, so losses from the distribution system can be monitored [1]	☐	☐
6. It is documented to the municipality that the heating system in the house ensures maximum cooling of district heated water and with the lowest	☐	☐

possible return temperature [1]		
7. Energy consumption for heating below [6] 46 kWh/m² is documented [2]	☐	☐
8. Energy consumption for heating below [6] 40 kWh/m² is documented [2]	☐	☐
9. Energy consumption for heating below [6] 35 kWh/m² is documented [2]	☐	☐
10. Energy consumption for heating below [6] 30 kWh/m² is documented [2]	☐	☐
11. Energy consumption for heating below [6] 25 kWh/m² is documented [2]	☐	☐
12. If a domestic hot-water tank is installed, this should be of the standardised type prepared for solar collectors [1]	☐	☐
13. A solar collector for domestic hot water is installed. Sized for 100% coverage in the summer period [3]	☐	☐
14. The housing design is performed in a way that maximises the contribution of passive solar energy without reducing the comfort in periods with high solar exposure [1]	☐	☐
15. Use solar walls as an alternative to conventional façade solutions – for example for preheating of ventilation air [1]	☐	☐
16. Integrated solar protection is installed where passive solar energy is utilised [1]	☐	☐
17. Both hot- and cold water taps are installed at washing- an dishwashing machines [1]	☐	☐
18. All white goods must be certified as "low-energy" types[7] A. (As white household electrical appliances goods is understood freezers, refrigerators, kitchen range, washing- and dishwashing machines and tumbler drier [2]	☐	☐
19. Low-energy basic lighting is installed. Supplied with user-activated specific lighting [1]	☐	☐
20. Electricity savings amounting to 10% lower than normal is planned [8] (Documented) [2]	☐	☐
21. Electricity savings amounting to 20% lower than normal is planned [8] (Documented) [2]	☐	☐
22. A local, covered clothes drying ground is established [2]	☐	☐
23. Tumbler driers are not installed [1]	☐	☐
24. Tumbler driers of the condensing type is installed [1]	☐	☐
25. Only low-energy bulbs are applied [1]	☐	☐
26. Solar cells as power supply for circulation pump in the solar heating system is installed [2]	☐	☐

27. Solar cells as power supply for the ventilation fans are installed [2]	☐	☐
28. Grid-connected solar cells are installed [3]	☐	☐
29. Movement-activated lighting is installed [1]	☐	☐
30. Low energy lighting is installed in all common areas [1]	☐	☐
31. Common covered drying grounds are established at the different block of flats [2]	☐	☐
32. A common laundry is established [1]	☐	☐
33. Low temperature floor heating [1]	☐	☐
34. Energy management system survey [2]	☐	☐
35. Energy optimised windows, U-value of total window below 1.2 W/m²°C [3]	☐	☐
36. Use of condensing boilers [2]	☐	☐
37. Biomass based district heating [2]	☐	☐
38. Heat pumps with COP over 3.0 [2]	☐	☐
39. Local CHP plant [2]	☐	☐
40. Primary energy use which is not coming from renewable energy is less than 120 kWh/m², year [3]	☐	☐
41. Deviation of the longest building facade from south is less than 45° [2]	☐	☐
42. As a mean solar energy irradiation to buildings should not be reduced by more than 20% because of shadows, orientation and topography [2]	☐	☐
43. The relation between building surface A and volume V should be A/V < 0.65 m [2]	☐	☐

Building owner's suggestion to other measures within "Energy"

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F) Building and urban development area. Methods for sustainable development and sustainable urban management

	PHASE 1	**PHASE 2**
1. A "Use & Maintenance" manual is delivered and/or planned for each housing unit. This describes all the types of building materials and technical devices with information about maintenance and relevant supplier information, etc. [2]	☐	☐
2. The Building owner/contractor can document an environmental management system (not necessarily certified), which ensures a minimal environmental impact in the construction phase [2]	☐	☐

3. Green accounting is performed for each building (monitoring of water-, heat- and power consumption) [2]	☐	☐
4. Use of technical installations are done according to the manual mentioned under item 1 [1]	☐	☐
5. The building is optimised according to a total economic lifecycle costs assessment (assessment of investments where operation and maintenance costs are taken into consideration). Can e.g. be done by help of the "Optibuild" tool which can be downloaded from www.ecobuilding.dk [2]	☐	☐
6. The design is planned for an easy access to technical installations [1]	☐	☐
7. The building project is placed in the existing terrain [1]	☐	☐
8. Existing vegetation is saved and protected in the construction phase [1]	☐	☐
9. Unheated additions are connected to the main building (porch, garage etc.) [1]	☐	☐
10. Extra protection of façades is instituted by means of extended eaves (minimum 700 mm) [1]	☐	☐
11. All fittings in piping systems are easily accessible (non-destructive inspection) [1]	☐	☐
12. Only few modifications are needed to change the housing unit for disabled/older people [1]	☐	☐
13. Differentiated protection of wood is performed (functional wood-protection), dependent of how it is exposed to the weather [1]	☐	☐
14. Joining methods and construction principles are chosen so reconstruction/additions/reuse will be less problematic [1]	☐	☐
15. Green accounting is performed at each main plot of land (monitoring of water-, heat- and power consumption) [2]	☐	☐
16. Technical installations in house blocks are placed in a noise core [10] [1]	☐	☐
17. A green common area is included in each main plot of land [1]	☐	☐
18. A "nature playing ground" is included in each main plot of land [1]	☐	☐
19. Energy efficiency of realised building project will be assessed by comparing a monitored energy signature, e.g. by help of an energy management system, with a reference energy signature calculated prior to the realisation phase [2]	☐	☐
20. A quality and performance verification process is started already in connection to the design work. Here performance demands and performance	☐	☐

indicators are identified [2]

21. A quality assurance procedure is performed both in connection to design and realisation by help of "specialist" companies (check of design and tender material, inspection procedures and performance tests as part of the building process) [3] ☐ ☐
22. Check of cold bridges, airtightness, ventilation design, solar energy systems, heating systems, electrical appliances, water systems and waste handling systems as part of performance check procedure [4] ☐ ☐
23. Optimisation and documentation of energy use, heat and cooling demand (yearly and daily) temperatures and daylighting, by help of a detailed calculation programme like "Rensim" [3] ☐ ☐

Building owner's suggestion to other measures within " Urban development area and sustainable urban management"

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Appendix

1) Grey waste water is defined as water from sink and shower.
2) Air tightness is performed after the finishing of the building.
3) Daylight optimisation according to DS 700
4) Intensified noise regulations according to NR-curves (Noise Rating Curves)

5) **If** pressure impregnated wood is applied it must be NTR-marked or impregnated with compounds approved by the Danish Environmental Agency.
6) Energy consumption amounting to e.g. 46 kWh/m^2 means that the consumption must be maximum 46 kWh pr. m^2 floor area per year .
7) On the Danish "Electricity Saving Fund's" website www.elsparefonden.dk there is information about energy marking of household appliances and price reduction terms for larger scale purchases.

8) It must be documented that electricity savings higher than the normal (4 kwh/m^2) is obtained for the building.

9) The electrothermal ratio for heat recovery systems is the ratio between the electricity consumption and the savings in heat consumption (documented)
10) Noise core is defined as a shaft, which ensures that noise from technical installations is not exceeding the values given in the Danish building regulations.

The statements about water savings originate from the recommendations from ”Københavns Vand” (Copenhagen Water), a publication called ”Miljøorienteret byfornyelse og nybyggeri”, the municipality of Copenhagen, 1999.

ANNEX III

“Green Build” questionnaire concerning environmental initiatives in retrofit and urban renewal projects.

Guidelines for the use of the questionnaire.

The questionnaire can be used for assessment of the environmental conditions and urban environmental initiatives in connections to retrofit and urban renewal.

The answering of the questionnaire is divided up according to the urban renewal 20 point programme and should be answered in two phases showing what the intention is and what actually has been done.

Phase 1 - the building owner intentions before the retrofit urban renewal
Phase 2 - what is actually accomplished.

The questionnaire is filled in by ticking off all the questions. E.g. regarding energy savings on heating. If the dwelling has a energy consumption of 32 kWh/m² all 5 lines should be ticked off.

√ Energy consumption is below 80 kWh/m²
√ Energy consumption is below 70 kWh/m²
√ Energy consumption is below 60 kWh/m²
√ Energy consumption is below 50 kWh/m²
√ Energy consumption is below 40 kWh/m²

“Green Build” questionnaire

		Phase 1	Comments	Phase 2	Comments
1.1	**Building constructions generally**				
1.1.1.	**Roof and roof constructions**				
1.	In connection with change of the roof a decision will be taken on the possibilities for a possible mounting of sun cells or photovoltaic (PV) modules as well as solar thermal collectors. In any case preparations are made for a possible later mounting of PV modules or solar thermal collectors, including				

	labelling / piping to inverters or storage tanks in loft room or cellar [1]				
2.	Extra insulation of attic is carried out from a total economic optimisation and with check systems concerning cold bridges [1]				
1.1.2	**Facade and facade construction**				
1.	In connection with renovation of the facades it is checked whether it will be practical to place the PV modules on the facade. In any case preparations are made for a possible later mounting of PV modules including labelling to cellar [1]				
2.	An improved insulation of facades are carried out from a total economic optimisation and with a check system for cold bridges [1]				
		Phase 1	Comments	Phase 2	Comments
1.1.3	**Windows and entrance doors**				
1	Daylight optimisation in connection with choice of windows [1]				
2.	The dwelling is optimises regarding utilisation of passive solar heat, with an account of how possible overheating problems, if any, have been solved [2]				
3.	When changing windows. Energy optimised windows are				

	installed [2]				
4.	U-value for window including frame / window sill below 1,2 W/m²°C, check system for cold bridges [2]				
5.	Windows are optimised regarding inflow of light and / or sunshading, documented [1]				
6.	During renovation of windows existing windows are kept, but based on an energy economic optimisation e.g. by using removable airtight windows [2]				
		Phase 1	Comments	Phase 2	Comments
1.1.4	**Foundation and cellar construction**				
1.	Improved insulation of cellar and ceiling, check system for cold bridges [1]				
1.1.5	**Materials in general**				
1.	Only building components and installations totally free of PVC are applied [2]				
2.	Pressure-creosote wood is not applied [1]				
3.	Where possible only materials with environmental certification are applied (documented) [2]				
4.	Foam materials using CFC and HCFC are totally avoided [1]				
5.	Gravel replacement in form of crushed concrete is applied [1]				

		Phase 1	Comments	Phase 2	Comments
6.	Alternative insulation using "green" materials or materials of recycled organic origin (e.g. flax and paper granulate [1]				
7.	Materials which require depositing are avoided[1]				
8.	Mainly use of materials which are: 1 : recyclable 2 : renewable 3 : "green" materials (documented) [1]				
9.	Documentation (e.g. BEAT-calculation) of low "not renewable" energy consumption for materials, divided up in : Over 3000 MJ/m² Over 2000 MJ/m² Under 2000 MJ/m² [1]				
10	Use of indoor materials with documented indoor climate quality (Danish Indoor climate certificate) if such materials are in existence within the range of the required type of material [1]				
11.	Differentiated protection of woodwork through choice of wood, design and construction including surface treatment depending on weather influence [1]				
12.	Documented lifetime optimised facade solutions are used as regards energy consumption, materials, level of maintenance or similar [2]				
13.	Documented lifetime				

		Phase 1	Comments	Phase 2	Comments
	optimised roof solutions are used e.g. with reference to lifetime of tile roofs and underroofs [2]				
14.	Documented optimised use of glass and windows to obtain a maximum utilisation of daylight [1]				
15.	Documented optimised use of glass and windows so overheating in summer is avoided (less than 26°C) [1]				
16.	Description of environmental assessment in connection to choice of materials [1]				
17.	Choice of materials from an estimate of maximum lifetime and minimum operation and maintenance (life cycle optimisation) [2]				
18.	The building scheme is designed so as to use natural cross ventilation during summer [1]				
19.	A detailed calculation programme is used, e.g. BSIM, TRNSYS or Energy 10, as basis for achieving an optimised building design with respect to heating and cooling demands and comfortable temperatures [2]				
1.2	**Building constructions – indoor**				
1.2.1	Floor slab, ceiling and floor				
1.	As flooring materials are only applied wood, natural stone or ceramic				

tiles [1]

		Phase 1	Comments	Phase 2	Comments
1.3	**Building installations**				
1.3.1	Heating installations				
1.	The building project will be connected with the local district heating [2]				
2.	Use of condensing furnace [1]				
3.	Use of individual energy / supply meters [1]				
4.	Heating with low temperature operation 60/40°C [1]				
5.	Documented low distribution losses for heating (max. 15%) [1]				
6.	Optimised heating system as compared to saved level of power [1]				
7.	Individual consumption displays are installed [2]				
8.	Number of draw-off points are limited and the points are placed centrally with short pipes and a small diameter [2]				
9.	Main supply meter for heating will be installed, registering losses from the distribution grid [1]				

		Phase 1	Comments	Phase 2	Comments
10.	The municipality has received documentation to the effect that the heating system in the house ensures maximum cooling of district heated				

water and with the lowest possible return temperature [1]

11. Energy consumption for heating 2) is below 80 kWh/m² [1]

12. Energy consumption for heating 2) is below 70 kWh/m² [1]

13. Energy consumption for heating 2) is below 60 kWh/m² [2]

14. Energy consumption for heating 2) is below 50 kWh/m² [2]

15. Energy consumption for heating 2) is below 40 kWh/m² [2]

16. A solar collector for domestic hot water is installed. Sized for 100% coverage in the summer period [3]

17. The housing design is performed so as to maximise the contribution of passive solar energy [1]

18. Use of solar walls as an alternative to conventional facade solutions – e.g. for preheating of ventilation air [1]

19. Integrated outdoor solar protection is installed where passive solar energy is intended utilised [1]

20. Optimisation of total heat supply solution as regards reduction of distribution losses for heating as well as hot

		Phase 1	Comments	Phase 2	Comments
	water (documented) [1]				
21.	Use of monitoring equipment and energy characteristics for optimum heat consumption [2]				
22.	Demand controlled balanced mechanical ventilation with heat recovery is installed where the exhaust air is used for heating inlet air [2]				
23.	The heat recovery efficiency for ventilation with heat recovery ought to be min. 80% and the electro thermal condition min. 1:8 [2]				
24.	No use of electricity for heating purposes [1]				
25.	The average energy consumption for heating and hot water will be reduced with minimum 20% as compared to consumption before the urban renewal [2]				
1.3.2	**Water and plumbing**				
1.	Water saving toilets with differentiated flush are installed (3/6 litres) [1]				
2.	Rain water collection for garden irrigation is installed [1]				
3.	Water saving taps are installed. Wash basin max. 6 l/min. Kitchen sink max. 12 l/min. and shower max. 12 l/min. [1]				
4.	A main water metering device is installed in each block, for use in green accounting for all blocks				

[1]

		Phase 1	Comments	Phase 2	Comments
5.	Measures to minimise the amount of rain water collected by the sewage system are carried out (permeable pavements, rainwater ponds, fascines etc.) [1]				
6.	Rainwater collection for use in washing machines is installed [2]				
7.	Rainwater collection for use in toilet flushing is installed [3]				
8.	Washing- and dishwashing machines with minimised water consumption are installed [1]				
9.	Thermostat mixer tap for showers of a type which can be serviced without opening the installation [1]				
10.	"Grey"waste water is utilised 1) [4]				
11.	Use of water- and drainage installations without PVC [1]				
12.	Use of individual water meters, with consumption display, for hot and cold water [1]				
13.	Domestic cold water pipes are installed in order not to be warmed-up by the surroundings [1]				

		Phase 1	Comments	Phase 2	Comments
1.3.3	**Electric installations**				
1.	Use of electric installations without PVC				

[1]

2. Installation of individual consumption display for electricity consumption [1]

3 Hot- and cold water taps are installed in connection with washing- and dishwashing machines [1]

4. All white goods must be certified as "low energy" 7) type A or be prepared for that. (White household electrical appliance goods are freezers, refrigerators, stoves, washing machine, tumble dryers and dishwashing machines [2]

5. Low basic lighting is installed outdoor. Supplemented with user activated stronger specific lighting [1]

6. Electricity savings amounting to 10% compared with normal 8) is planned (documented) [2]

7. Electricity savings amounting to 20% compared with normal 8) is planned (documented) [2]

8. Tumbler dryers are not installed [1]

9. Tumbler dryers of the condensing type (if installed in cellar only after thorough evaluation) [1]

		Phase 1	Comments	Phase 2	Comments
10.	Use of low energy bulbs only [1]				
11.	Installation of solar cells as power supply for the circulation pump in the solar heating system [2]				
12.	Installation of solar cells as power supply for the ventilation fans [2]				
13.	Installation of grid connected solar cells [2]				
14.	Installation of movement activated lighting, where this comply with the demand pattern [1]				
15.	Installation of low energy lighting in all common areas indoor as well as outdoor [1]				
16.	Establishment of alternative space for clothes drying rack of the outdoor area of the single dwelling, or common outdoor drying spaces, or drying spaces in attics or in basements. In that case good natural ventilation is required[2]				
17.	Use of common laundry with low energy washing machines [1]				
18.	Power consumption for ventilation per dwelling below 40 W for installations with heat recovery and 25 W for installations with exhaust ventilation [2]				

		Phase 1	Comments	Phase 2	Comments
19.	Power consumption for ventilation with heat				

recovery below 0,2 W/m³/h (at 125 m³ it is equal to 25 W) [2]

20. Wiring prepared for connection of energy efficient fixtures and energy efficient light sources [1]

21. Within a possible gas net area the gas installations should be utilised if possible [1]

22. Entrance lighting is controlled from the dwelling [1]

23. If darkness is acceptable in periods lighting can be activated by user-activated detectors [1]

1.3.4 Indoor air climate and ventilation

1. Airtightness measurement 3) of the building in order to document a natural air change via constructions, below 0,1/h [2]

2. Noise from installations in living room is below 25 dB [2]

3. Easy access for check-up of installations [1]

4. Inspection possibilities available for all pipe joints [1]

5. Installation of user controlled balanced mechanical ventilation with heat recovery, on demand, where exhaust air is used for heating of inlet air [2]

		Phase 1	Comments	Phase 2	Comments
6.	Installations in a building of flats are placed in a 5) "core of noise" [1]				
7.	The mechanical air exchange rate is at least 0,4/h and minimum 30 m³/h per person [2]				
8.	Use of balanced ventilation, exhaust of used air and inlet of fresh air [2]				
9.	Use of humidity controlled ventilation [1]				
10.	Possibility of individually user controlled ventilation [1]				
1.3.5	**Waste**				
1.	Space for composting container is included in the garden plot [1]				
2.	Appropriate containers for fractionated waste disposal are built in kitchens and in the outdoor disposal places [1]				
3.	Green accounting is applied for the household waste [1]				
4.	The waste from the construction phase is sorted in as many fractions as the municipality can find an outlet for [1]				
5.	At each main plot of land space is reserved for "waste islands" where the waste can be disposed of in fractions like paper, cardboard, metal, electronic, waste				

		Phase 1	Comments	Phase 2	Comments
	etc. [1]				
6.	Life cycle assessment of building materials [1]				
2.	**Technical consultancy**				
1,	A "Use and Maintenance" manual is delivered and/or planned for each housing unit for the builder. This describes all the types of building materials and technical devices with information on maintenance, relevant supplier information and technical installations etc. [2]				
2.	A short account of the synthesis of architectural quality and environmental quality of the total project [1]				
3.	Preparation of an environmental account for each project [1]				
4.	Active working concerning the promotion of product development in the urban environmental area e.g. with "green foodstuffs" [1]				
5.	Demolition with recycling of materials and with a minimum of pollution [1]				
6.	Efficient shielding of worth preserving vegetation is established [1]				

		Phase 1	Comments	Phase 2	Comments
3.	**Building owner,**				

administration and outdoor areas

1. The building owner/contractor can document an environmental management system (not necessarily certified) which ensures a minimal environmental impact in the construction phase [2]

2. Documentation of waste processing solution in the construction phase [1]

3. Green accounting is applied for each dwelling (registration of water, heat and power consumption) [2]

4. Operation of installations according to maintenance manual [1]

5. The building is optimised on a total economic basis (estimation of investments as compared to operation and maintenance [2]

6. Using few modifications the dwelling can be altered to a senior / handicap dwelling [1]

7. Use of construction principles and choice of materials to facilitate retrofit and recycling of building materials [1]

		Phase 1	Comments	Phase 2	Comments
8.	A green common area is included in each main plot of land [1]				
9.	A "nature playing ground" is included in each main plot of land				

[1]

10. Realisation of a life cycle estimation of the total building, from e.g. the BEAT-calculation [2]

11. Realisation of environmental planning / designing e.g. based on BPS121 and/or ABC planner [2]

12. When possible existing vegetation is kept, and favourable conditions of growth for the plantation are secured. Plantation is chosen in order to secure experience of nature through flowering, the berry-season and leaf fall [1]

13. Green common areas are prepared with max consideration for environmental maintenance thus avoiding use of pesticides in installations and operation of these [2]

14. Building ground areas are minimised and finished with grubbing and milling [1]

15. Wetlands are sought to be established on common areas [1]

		Phase 1	Comments	Phase 2	Comments
16.	Plantation plans are devised to secure shelter, creation of space and use of facade plantation, e.g. espalier where extensive plantation is not possible [1]				

4.	**Financing**				
1.	If possible use of financing principles which further a sustainable development e.g. calculated points over a certain level can secure a more beneficial financing e.g. with low interest and a long term [4]				
1.1	**Structural engineering generally**				
1.1.1	Roof and roof construction				
1.1.2	Facade and facade construction				
1.1.3	Windows and entrance doors				
1.1.4	Foundation and cellar constructions				
1.1.5	Materials generally				
1.2	**Building constructions – internal**				
1.2.1	Floor slab, ceiling and floor constructions				
		Phase 1	Comments	Phase 2	Comments
1.3	**Building installations**				
1.3.1	Heat installations				
1.3.2	Water and plumbing				
1.3.3	Electric installations				
1.3.4	Indoor air climate and ventilation				
1.3.5	Waste				
2.	**Technical consultancy**	0		0	

3.	**Building owner, administration and outdoor areas**	0	0
4.	**Financing**	0	0
	Total		

Good	=	130 - 188 points
OK	=	53 – 129 points
Improvement advisable	=	0 - 52 points

Notes :

1. If pressure impregnated wood is applied it must be NTR-marked or impregnated with compounds approved by the Danish Environmental Agency

2. Energy consumption for heating e.g. 46 kWh/m², year means that max. 46 kWh per m² floor area per year is used for heating /tests for airtightness

3. Blowerdoor tests are performed after the finishing of the building to show airtightness of the dwelling

4. The electrothermal ratio for heat recovery is the ratio between the yearly electricity consumption for ventilation systems and the yearly savings in heat consumption (documented)

5. Noise core is defined as a shaft which ensures that noise from technical installations is not exceeding the values in dB given in the Danish building regulations.

The statements about water savings originate from the recommendations from "Københavns Vand" (Copenhagen Water)
a publication called "Miljøorienteret byfornyelse og nybyggeri", the municipality of Copenhagen, 1999.

Optimised heating system as compared to saved level of effect [1]

Individual consumption display for heat is installed [2]

The number of taps for hot water are limited and the taps are placed centrally with short pipes and a small diameter [1].