POSITION PAPER

on the

Recasting of the Directive 2002/91/EC of 16 December 2002 on the Energy Performance of Buildings

The CONCERTO initiative focuses on the integration of the energy efficiency (EE) improvement techniques and the use of renewable energy sources (RES) towards sustainable communities supported by energy management strategies. Since the launch of the initiative in 2005, 45 participating communities are developing and demonstrating concrete strategies for a variety of measures which include the refurbishment of existing buildings, the construction of highly efficient eco-buildings, energy systems using renewable energy sources and polygeneration to supply whole districts with energy from renewable energy sources. Today about 5 million European's live in CONCERTO communities and before 2010 approximately 300.000 people will be living and working in CONCERTO demonstration buildings or indirectly benefit from the CONCERTO measures. The contribution of all CONCERTO communities in terms of reduction of CO_2 emissions is comparable to a 35.000 inhabitants town being totally CO2 neutral. But much more than a quantifiable amount of avoided CO_2 emissions, the CONCERTO communities innovate in creating and implementing new mechanisms for the development of sustainable communities, and therefore the impact of CONCERTO is expected to be much higher in future. For this reason the CONCERTO communities would like to present a collective position paper on recasting the Directive 2002/91/EC based on their own concrete field experiences.

The CONCERTO Communities appreciate the activities of the European Commission, of the European Parliament and of the Council to promote the improvement of the Energy Performance of Buildings Directive (EPBD) within the European Community.

Main conclusions and recommendations from the CONCERTO communities:

The definition of the word "inspection" in article 8 and 9 should be clarified in order to have a common understanding of what an inspection procedure consists in. The regular inspection of boilers and/or air-conditioning systems should be kept and include ventilation systems although if they are not considered as air-conditioning systems. The results from the inspection should be documented in an inspection report.

The lowering of the 1000 m² total useful floor area threshold for existing buildings that undergo major renovation should be accompanied by new systematic technical, legal and financial supporting mechanisms defined at national level. In the same way, the 1000 m² total useful floor area threshold for the requirements on 'alternative systems' should be eliminated.

The energy performance certificate should include both energy needs and final energy use figures (as defined in EN15603), as well as the corresponding primary energy use and CO_2 emissions ratings. For existing buildings, the actual energy consumption of the building in the past years should be clearly reported, in order to include the energy use of all electrical appliances and sensitise the user to his own influence: CONCERTO projects have demonstrated the benefit and the functioning of user feedback systems. The energy performance of the single components like heat pumps, ventilation or domestic hot water preparation systems should be also reported in the certificate.

The quality of the inspections and the energy performance certificates can only be insured if a certified professional category legally recognized for certification is defined at national level. Member states should also be obliged to create national databases to ensure the storage of historical data and allow for statistical analyses. Member states should also set up a legal framework to oblige a third party, like notaries, to authorize a transaction only when a certificate is made available.

Considering the public sector, every public building should act as front runner in energy performance aspects and have the energy performance certificate including the actual energy performance figures placed in a prominent place clearly visible to the public.

Introduction

The 2002 EPBD deals specifically with improving the energy efficiency of new and existing residential and non-residential buildings. The deadline for transposing this directive was 4 January 2006. However, various Member States have requested - and been granted - an extension, while others are subject to infringement procedures by the Commission for failed or incorrect transposition. Nevertheless, all the Member States should have established criteria for energy certification by the end of 2007.

The Presidency Conclusions of the Brussels European Council (8/9 March 2007) stress *"the need to increase energy efficiency in the EU so as to achieve the objective of saving 20% of the EU's energy consumption compared to projections for 2020 […]"* and identify *"energy-efficient and energy-saving behaviour of energy consumers, energy technology and innovations and the energy savings from buildings"* as priority areas.

Energy efficiency of buildings is an issue which falls within the scope of the Community initiatives on climate change (commitments under the Kyoto Protocol) and security of supply, particularly in the context of the green papers on security of energy supply and energy efficiency.

The CONCERTO Communities do support the Commission initiative for the recasting of the Directive with the revision of some articles and the addition of new ones. Energy consumption in buildings-related services accounts for around 40%[1] of the EU's energy consumption. CONCERTO Communities believe that initiatives in this sector can bring huge savings, consequently helping to achieve goals related to climate change and the Kyoto protocol The CONCERTO communities are convinced that there is a great potential in the building sector for saving energy, particularly from heating, air conditioning and lighting as well as through insulation techniques both in building design and use.

Preliminary findings show that before 2010 the first 26 communities alone are expected to achieve an estimated reduction in CO2 emissions of approximately 210.000 t_{CO2}/yr when the installed technologies are compared to reference technologies[2]. The next 19 communities are expected to save approximately 110.000 t_{CO2}/yr when following the same assumptions. Detailed analysis which will include the monitoring results after completion of the projects is currently being carried on and will be published in future.

Communities innovations and research programmes play a decisive role in shaping the energy efficiency of buildings, as regards the technological goal of developing “zero energy” intelligent buildings, or even “positive energy” buildings which produce more energy than they consume, using the most common alternative forms of energy such as solar, wind and geothermal energy.

Through the implementation of energy efficiency measures, the CONCERTO communities taken altogether are expected to nearly cover their energy needs by locally installed RES systems. This balance varies from one community to the other: the share of RES in energy use is expected to be higher in communities with large scale RES systems.

The 45 communities[3] took the opportunity by responding the public consultation on recasting of the Energy Performance of Buildings Directive (2002/91/EC) launched by the European Commission. The CONCERTO Communities’ answers have been summarized as below.

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[1] 32% in transport, 28% in industry - Source: European Commission, DG TREN.

[2] For the purpose of this preliminary analysis, no life-cycle analysis has been carried out. The reduction of CO2 emissions is therefore based on the yearly amount of electricity and heating energy displaced by the implementation of the CONCERTO demonstration activities (both RES and energy efficiency). For the biogas projects in Amsterdam and Måbjerg, the calculation is based on the total amount of natural gas replaced through the installation of the new biogas plants. For gas and electricity, the CO2 production factors are taken from the European norm EN15603 (informative Annex E): Electricity mix UCPTE 617 kgCO2/MWh, Gas 277 kgCO2/MWh, Efficiency of gas boilers 90%, Seasonal performance factor of cooling units 3.

[3] Act2 (Hannover, Nantes), Class 1 (Stenloese), CONCERTO AL Piano (Alessandria), cRRescendo (Ajaccio, Almere, Milton Keynes, Viladecans), ECO-City (Helsingborg, Helsingor, Trondhelm, Tudela), ECOSTILLER (Amsterdam, London, Mabjerg), energy in minds! (Falkenberg, Neckarsulm, Weiz Gleisdorf, Zlin), Green Solar Cities (Valby, Salzburg), HOLISTIC (Dundalk, Modling, Neuchatel), POLYCITY (Cerdanyola del Vallès, Ostfildern, Torino), REMINING-LOWEX (Heerlen, Zagorje), RENAISSANCE (Lyon, Zaragoza), SEMS (Wellerbach, Tulin, Redange, Slubice), SERVE (Serve Region), sesac (Delft, Grenoble, Vaxjo), SORCER (Hillerod, Apeldoorn), STACCATO (Amsterdam, Budapest, Sofia), TetraEner (Geneva).

1. Which of the definition(s) or requirement(s) of the existing Directive should be clarified or implified?

The CONCERTO Communities suggest that the definition of the word "*inspection*" in article 8 and 9 should be clarified in order to have a common understanding of what an inspection procedure consists in. It is suggested to develop a specific CEN standard which should be made publically available BEFORE the publication of the directive.

In the existing article 2 the use of the phrasing "*energy performance of a building"* includes various energy consumptions such as heating, hot water heating, cooling, ventilation and lighting. Some of these are thermal and some electrical energy. The energy performance should be specified for each of these energy uses to avoid excessive consumption in one area.

2.1 Do you propose that the 1000 m² total useful floor area threshold for existing buildings that undergo major renovation be changed or eliminated?

The CONCERTO Communities suggest that the threshold be lowered to a floor area in the range of 50 to 500 m^2. Although there is no concrete finding in their experience which could justify the impact of this measure, the elimination or the lowering[1] of the 1000 m² total useful floor area threshold for existing buildings that undergo major renovation should be done only if systematic technical, legal and financial supporting measures are set up at national level.

Large scale comprehensive renovation programmes can be realised only under the following conditions:

- any policy packages should include a good set of organisational support measures for energy refurbishment of buildings (audit, communication, helpdesk and training);
- financing integrated concepts for specific target groups (including banks, public institutions, insurances) are absolutely necessary. The refurbishment programmes could inspire from the newest developments in social protection systems;
- easy realisable and cost effective renovation concepts are needed;
- marketable solutions are needed (products should be available and construction companies should be specialised in the renovation of such buildings and include all measures as a package in their portfolio: thermal insulation / replacement of windows / ventilation system / replacement of heating system).

<u>Lessons learnt</u>

According to the experience of the CONCERTO German communities, single or multi-family houses have enormous energy saving potentials. The same applies also to medium size flats or commercial buildings. The expected benefit in both environmental and socio-economical aspects are huge: by including private houses, CO_2 emissions will be reduced, higher housing quality will be achieved and the building value will be increased. Therefore a higher regional added value, as an economic benefit especially for private householder, may engage local handcraft.

2.2 Do you propose that the 1000 m² total useful floor area threshold for the requirements on 'alternative systems' and/or on the display of the energy performance certificate be changed or eliminated?

The CONCERTO Communities recommend:

- to eliminate the 1.000 m² total useful area threshold for requirements on 'alternative systems' from the directive. In this way private households and smaller public buildings will be aware of taking into account alternative systems before construction starts. The expected benefits will be the same as stated

in question 2.1. The construction permit should be released only if a certain share of renewable energy is guaranteed.

- the energy performance certificate should be exposed on every public buildings (not only in buildings with 1.000 m2 total useful area) in order to show all visitors the energy performance of the building. In such a way more people will be informed on environmental benefit of 'alternative systems' and energy performance arising costumer acceptance;
- the limit for the assessment of the feasibility of alternative systems should also be reduced or eliminated.

Lessons learnt

The CONCERTO Communities recognize that the EPBD should go further in the direction of minimum compulsory requirements as some European countries and regions already have similar strategies (as a condition for obtaining public financial support).
The Irish Government for instance has introduced a minimum share of renewable energy requirements for residential buildings from the 1st July 2008[4].

2.3 Do you propose that the thresholds on the rated output of boilers and/or air-conditioning systems subject to regular inspections be changed or eliminated?

The CONCERTO Communities strongly recommend to keep the regular inspections of boilers and/or air-conditioning systems because only through periodic inspections technical problems can be successfully removed, thus guaranteeing a high energy performance and rising the economical life-time of the installations. Regular inspections should be performed depending on the energy source used in boilers and the age of air-conditioning system. Beyond this, CONCERTO Communities believe that advising only is not sufficient: the results from the inspection should be documented in an inspection report delivered to the user.

Lessons learnt

CONCERTO Communities experienced that technical failure, when not early identified and dangerous gases escape, can cause environmental pollution and endanger health.

3.1 Which new/changed requirement(s) or content concerning the energy performance certificate do you consider to have a high impact on realizing energy savings in the building sector?

The CONCERTO Communities recommend that:

- the energy performance certificate should include both energy needs and final energy use figures (as defined in EN15603), as well as the corresponding primary energy use and CO_2 emissions ratings;
- for existing buildings, the actual energy consumption[5] of the building in the past years should be clearly reported on the energy performance certificate in order to include the energy use of all electrical appliances and sensitise the user to his own influence: CONCERTO projects have demonstrated the benefit and the functioning of user feedback systems. The energy consumption of electrical appliances should be included in the energy performance certificate since the energy consumption of all electrical devices in the residential sector has been increasing a lot[6]. The influence of the energy consumption of electrical devices on the actual energy performance of residential buildings will therefore be crucial in future.

[4] CONCERTO SERVE's project observation (Ireland)

[5] The idea of including actual energy consumption data is in line with the Energy Service Directive which specifies that "end user must be informed about own consumption"

[6] In Europe, new multimedia equipment, such as personal computers, printers, scanners, modems and mobile phone chargers plugged in continuously account for 20% of household energy consumption. (Antonello Pezzini Member of the EESC – Exploratory opinion on "Energy efficiency of buildings, the contribution of end users")

- the energy performance of the single components like heat pumps[7], ventilation or domestic hot water preparation systems should be also reported in the certificate;

Lessons learnt

In Ireland the certificate relates to final energy use but also displays the carbon emissions per m². This gives the opportunity to put more emphasis on the CO_2 emissions. The reference value used for calculation as well as the definitions of the units used should be specified on the certificates.
According to the CONCERTO Swiss Communities the construction period of the building and technical installations should be indicated in the energy performance certificate.

3.2 Which new/changed requirement(s) concerning the inspection of boilers do you consider to have a high impact on realising energy savings in the buildings sector?

The CONCERTO Communities suggest that:

- the inspection of boilers should be extended to boilers under 20 kW, follow a clearly defined inspection procedure and be realised by a certified energy consultant or chimney sweeper;
- a more powerful instrument (financial or fiscal) with a higher impact on realizing energy savings in the building sector should be set up[8].

Lessons learnt

In the Netherlands, a performance certificate has been compulsory as from 01.01.2008, whenever a dwelling is constructed, sold or rented out. Research shows that, in reality, a certificate has so far been available in no more than 15% of all housing sales in the country[9]. Currently, no consequences exist for sellers who fail to comply with the requirement of making available a certificate. Positive incentives or penalties are absent. Hence, the potential of the requirement concerning the energy performance certificate is insufficiently grasped. This flaw could be repaired by explicitly stating that the 'ensure' in article 7.1 requires legislation that guarantees that the certificate is available in all relevant transactions. Member States could, for instance, require that a third party (such as the notary) authorizes a transaction only when a certificate is made available.

3.3 Which new/changed requirement(s) concerning the inspection of air-conditioning systems do you consider to have a high impact on realizing energy savings in the buildings sector?

The inspections of air-conditioning systems should be extended to installations under 12 kW (except mobile installations) including information on state-of-art of this technology and its energy performance. In addition CONCERTO Communities suggest foreseeing an inspection report standard for each type of system. Furthermore the inspections should be extended to mechanical ventilation systems, although if they are not used as air-conditioning systems. The actual energy performance of passive houses depends a lot on the quality and maintenance of mechanical ventilation systems.

3.4 What type of approach do you consider feasible and effective which could be laid down at EU level with regard to minimum energy performance requirements for buildings?

Regarding the minimum energy performance requirements for building refurbishment, the definition of minimal performance for single components is more practicable, standard parameters, such as "U value", should be set for all member States.

[7] In this context, the energy performance of single HVAC systems (heat pumps for instance) should be explicitly mentioned in the energy performance certificate of the building, in order to encourage the use of heat pumps with high Coefficient of Performance for instance.
[8] In the Netherlands, already many initiatives have been taken to overcome these barriers. When all barriers are addressed in an integral approach, still a rather limited share of the target group (approx. 1%) engages in renovation activities.
[9] source: Dutch Ministry of Housing, Spatial Planning and Environment

As climates vary in Europe maximum allowable levels of heating, cooling, ventilation and lighting energy levels should be defined for different building categories. This would assure a unified approach all over Europe.

Lessons learnt

In France[10], a study performed within the Renaissance project demonstrates that the most practicable way to ensure a high renovation rate of one-family houses towards high energy standards is to propose a "universal technical solution" which would be valid for the whole country. Households can not afford energy consultants to customize their renovation concepts but need "ready to use concepts" which can be applied at low cost but with high quality. The "universal technical solution" has to be defined in terms of performance of single components (U-values…) and not in terms of overall energy performance (this would require an energy performance calculation that construction companies would not be capable of). The "universal technical solution" can not be the optimal solution for each building as it can not be customised, but it would guarantee in average in the whole country a significant reduction of energy use in the residential sector.

3.5 Which other requirement(s) do you consider to need strengthening, and in which way?

The CONCERTO Communities recommend that the energy performance of the single components like heat pumps, ventilation or domestic hot water preparation systems should be reported in the energy performance certificate and considered in the definition of "energy performance" in the art. 4.

4.1 Do you consider the public sector should play a stronger role to act as a leading example for energy savings in buildings?

The CONCERTO Communities propose that:

- considering the public sector, every public building (not only in buildings with 1.000 m2 total useful area) should act as front runner in energy performance aspects and have the actual energy performance certificate including the actual energy consumption figures placed in a prominent place clearly visible to the public;
- all new public buildings should be required to exceed the national regulations by a particular percentage. All existing buildings should also show their strategy to reduce energy consumption and the realised savings should be reported on an annual basis.

5.1 Do you consider that climate adaptation should significantly influence the level of requirements laid down by buildings regulations?

Based on the experiences of the CONCERTO Communities, located in different European climate zones[11], each country should be responsible to optimize the implementation taking into account factors such as regional climate conditions, heated floor/wall, condensation risks, etc. This parameters should be considered while defining the requirements of the single components (see the "universal technical solution").

The CONCERTO Communities suggest that all new buildings should include in the advisory report a section showing that the building is appropriate for the site and can deal with any climate adaptation issue. To face the

[10] source: report „Renovation à basse consommation d'énergie des logements en France", O. Sidler, Renaissance & Sesac CONCERTO projects

[11] (Antonello Pezzini Member of the EESC – Exploratory opinion on "Energy efficiency of buildings, the contribution of end users"). In the main climate zones of northern and southern Europe, average consumption in the residential sector is equal to 4 343 kWh/year. This energy is used principally for heating, which consumes 21.3% of demand for electricity, despite being concentrated mainly in northern and central Europe. Next in line is the share of electric energy used by fridges and freezers (14.5%) and by lighting (10.8%). In southern Europe (Italy, Spain, Portugal, Slovenia, Malta, Greece, Cyprus, and the south of France), one of the main factors in increased electricity consumption is the rapid spread of low power consumption, low yield residential air conditioning units (< 12 kW output cooling power) and their widespread use in summertime.

increasing cooling energy demand, specific requirements should be set to avoid overheating (maximal glazed area, natural ventilation…). The energy performance requirements should be defined in a way that the buildings are suitable for extremely hot summer conditions.

5.2 Do you propose other aspects/ideas than the aforementioned to be included in the recasting of the Energy Performance of Buildings Directive?

The CONCERTO Communities suggest that:

- the EPBD should consider the evaluation of the energy embedded in the construction components. The results of this assessment should be reported in the energy performance certificate.
- a certified professional category legally recognized for certification should be defined in order to ensure a high quality of inspections and energy performance certificates.