



Innovative concepts and Energy Performance Regulations

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1. Introduction

An increased number of countries and regions in Europe is implementing so-called Energy Performance Regulations (EPR). It is expected that more countries will follow this tendency. The envisaged new European Directive on Energy Efficiency (ref. 1) will, if adopted, surely enhance this development since it will make the application of an EPR mandatory for new buildings and for major renovations.

If one is obliged to make an assessment of buildings in terms of energy performance, it is clear that one should be able to assess all kinds of building designs and of technologies. However, the present regulations clearly not cover all possible technologies.

2. SAVE ENPER and the issue of innovation

Within the SAVE ENPER project, the 2nd task is entitled '*Approaches for dealing with innovative concepts in Energy Performance Regulations*'.

The context for this task is described as :

“Although the wide-scale application of the existing technologies can already result in major improvements in the energy efficiency of buildings, it is clear that new concepts and technologies allow further improvements and/or constitute more cost-effective ways for achieving the same improvement. An EP regulation must not be a barrier for such innovative concepts. For practical reasons, it is not possible that the standard procedure includes all such new concepts. Therefore, alternative methods for assessing these concepts and technologies must exist. At present, there is a lack of information about the procedures applied or under development in the various member states.”

The objectives of this task are :

“The objective of this task is to obtain a good overview of the approaches applied or under development in the different member states.

Attention will be given to the following aspects:

- *Philosophy with respect to the scientific method(s) used for assessing new concepts;*
- *Approaches used for defining the boundary conditions for such performance assessment;*
- *Formal (administrative) framework for assessing such innovative concepts: at local level, at national level, etc.”*

The envisaged tasks are described as :

- *“Workshop in combination with the 2nd project meeting during which various issues are presented and discussed*
- *Preparation of a first concept document about the treatment of innovative concepts in EP procedures*
- *Development of a strategy for collecting and analysing the various procedures in a structural way*
- *Collecting relevant information according to the agreed procedures*
- *Synthesis of the information*
- *Recommendations for a model code”*

It is clear that the available resources within the SAVE ENPER-TEBUC project are insufficient for solving all these problems. However, it is the intention to at least identify the critical issues and to come with recommendations for actions which can allow a structural solution.

3. Challenges in relation to handling of innovation

As discussed in ref. 2, an EP approach that really achieves environmental and societal quality: requires that a whole range of challenges have to be dealt with (figure 1):

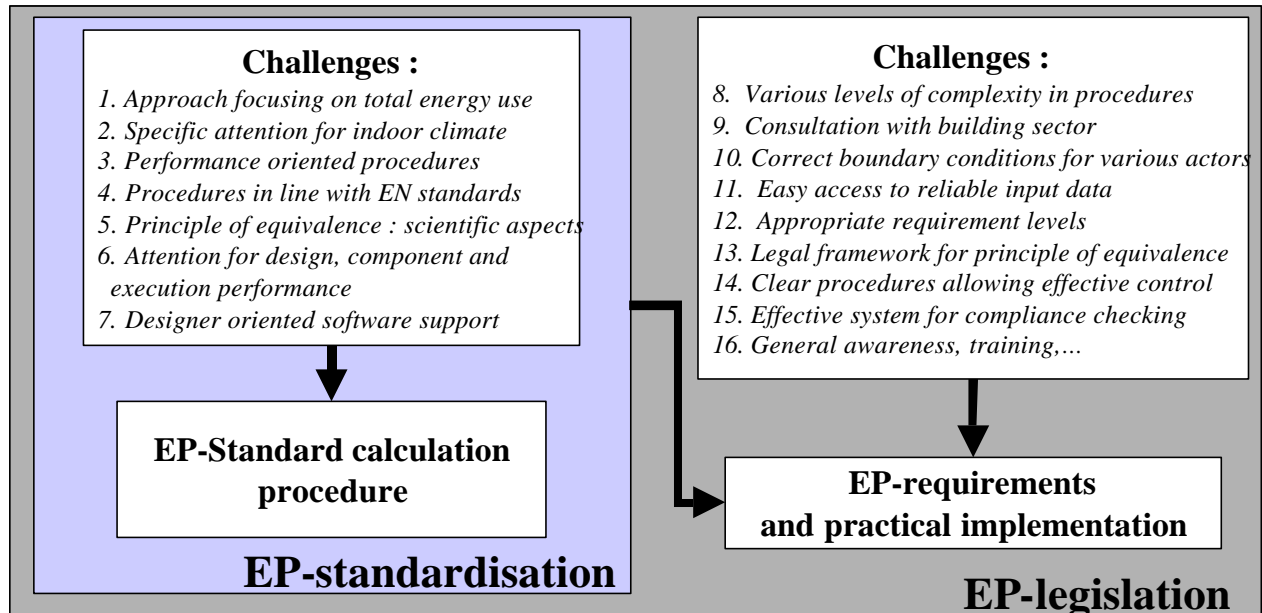


figure 1: Challenges for an EP approach and interaction between EP standardisation and legislation

As is shown in the figure, 2 of these challenges clearly deal with the issue of innovation :

5. *Open platform for innovation: coherent scientific philosophy with respect to the principle of equivalence*

It is crucial that the whole EP philosophy takes from the beginning the principle of equivalence into consideration. It means in practice that one should have a correct philosophy for allowing in a later phase a correct assessment of the principle of equivalence.

13. *Legal framework for the application of the principle of equivalence*

Given the importance of the principle of equivalence as a measure for correctly assessing innovative approaches, a legal framework for proof of compliance is needed. The authors believe that it is not realistic to expect from a communal civil servant to correctly assess such approaches and, therefore, an assessment procedure at a higher level is required.

It is important to stress that these 2 challenges are of a completely different character :

- (1) The first one is mainly a scientific-technical issue : the availability of an assessment method which allows to correctly compare various innovative systems whereby it is crucial that there is a consistent treatment of various technologies. This may seem evident but we believe it is not so simple.
- (2) The second one is mainly an administrative issue : there should be clear procedures for formally assessing (and approving) studies made in relation to the principle of equivalence.

4. Innovation and the Construction Product Directive

In principle, the Construction Product Directive (CPD) (ref. 3) aims to create an open platform for performance assessment of building products whereby mainly CEN (European Standardisation Organisation) and EOTA (European Organisation for Technical Approval) are the organisations in charge of the development of practical assessment procedures.

It is the target to have a single (European) assessment method for the various performances. This target will probably be reached during the coming years for most of the common building materials and systems.

However, this is not yet the case for systems with time variable properties. Examples are :

- Demand controlled ventilation systems;
- Presence and daylight controlled lighting systems;
- Active facades;
- Switchable glazing systems;
- ...

For most of these technologies, there are 2 different kinds of performance assessment :

1. To identify the performances for a given operation mode
What is the U-value, the g-value, of an active and ventilated façade for a given air flow rate and a given solar protection?
2. To identify the performances on a yearly basis as is required in the framework of an energy performance regulation
What are the energetic performances of this active and ventilated façade on a yearly basis (including winter and summer situation)?

We have the impression that one is at present not capable to give clear and unique answers on these questions. Therefore, there probably is a clear mission for CEN and/or EOTA.

5. Innovation and the industry

The EPR approaches in the different member states and the envisaged directive on energy efficiency become more and more driving factors for industry in relation to product development. One of the key questions for industry is: *how can we improve and optimise our products with respect to the performance assessment made in EPR approaches?*

In order to allow such approach, it is crucial that there is transparency in relation to the assessment methodology. Our impression as well as the reaction from several major manufacturers who are active throughout Europe is that this transparency is lacking for the majority of the innovative systems.

As such, the EPR approaches, which in principle should be strong stimuli for product innovation, may become a barrier for innovation. This of course cannot be the objective.

6. Conclusions

1. A whole range of innovative systems are at present not covered by the so-called EPR procedures and/or not treated in a uniform way throughout the European members states.
2. This lack of appropriate procedures seems to be a major barrier for product and system innovation by industry.
3. It is crucial to achieve transparent assessment procedures.

7. References

1. Commission of the European Communities , Proposal for a Directive of the European Parliament and of the Council on the Energy Performance of buildings (presented by the Commission);; Brussels, 11.5.2001; COM(2001) 226 final; 2001/0098 (COD)
2. Wouters, P., Porrez J., Van Orshoven D., Vandaele L., European collaboration on energy performance regulations : why and why now?, BBRI, 2nd ENPER workshop, Paris, 12 November 2001
3. CEC, COUNCIL DIRECTIVE of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products (89/106/EEC), European Commission, Brussels, 1989