Real Estate Management

integral and sustainable

Katja Schmidt and René Leeuw
Austrian Energy Agency / Rijksgebouwendienst

(next page)
Concept of Energy Performance labelling in the Netherlands

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Energy Performance labelling in Germany

Energy efficiency is becoming a very hot topic of political and social importance, in Europe and throughout the world. Of the different sectors where energy savings might be realized, the European Directive on energy performance of buildings (EPBD) and the European Parliament action plan for energy end-use efficiency and energy services (EE-ESD) have identified the building sector as having top priority. This means not only extra work and costs for Corporate Real Estate Management (CREM) organisations, but also many opportunities. When Energy Performance is integrally weighted and embedded together with other aspects in CREM organisations, it will entail not only financial, but also technical and organisational profit for the users and the proprietors of buildings. A subsidy is assigned totalling approximately €1.4 million to the Rijksgebouwendienst, Builddesk, Austrian Energy Agency Energie Bewusst Karnten, and Centre Scientifique et Technique du Bâtiment to develop this idea within the project termed EPI – CREM: Energy Performance Integration in Corporate Public Real Estate Management.

Project idea

The vision of the EPI-CREM project is the improvement of Energy Efficiency (EE) and the Rational Use of Energy (RUE) across public building stocks within the EU Member States, thus contributing to better standards of work processes and to global environmental benefits. It renders the Energy Performance theme integrally to the overall Corporate Real Estate Management process. Building related energy is rarely integrated within management of public non-residential stock, but due to the obligations set by the EPBD and EE-ESD Directives, public organisations within the Member States have now a quantum leap ahead of them.

Objectives

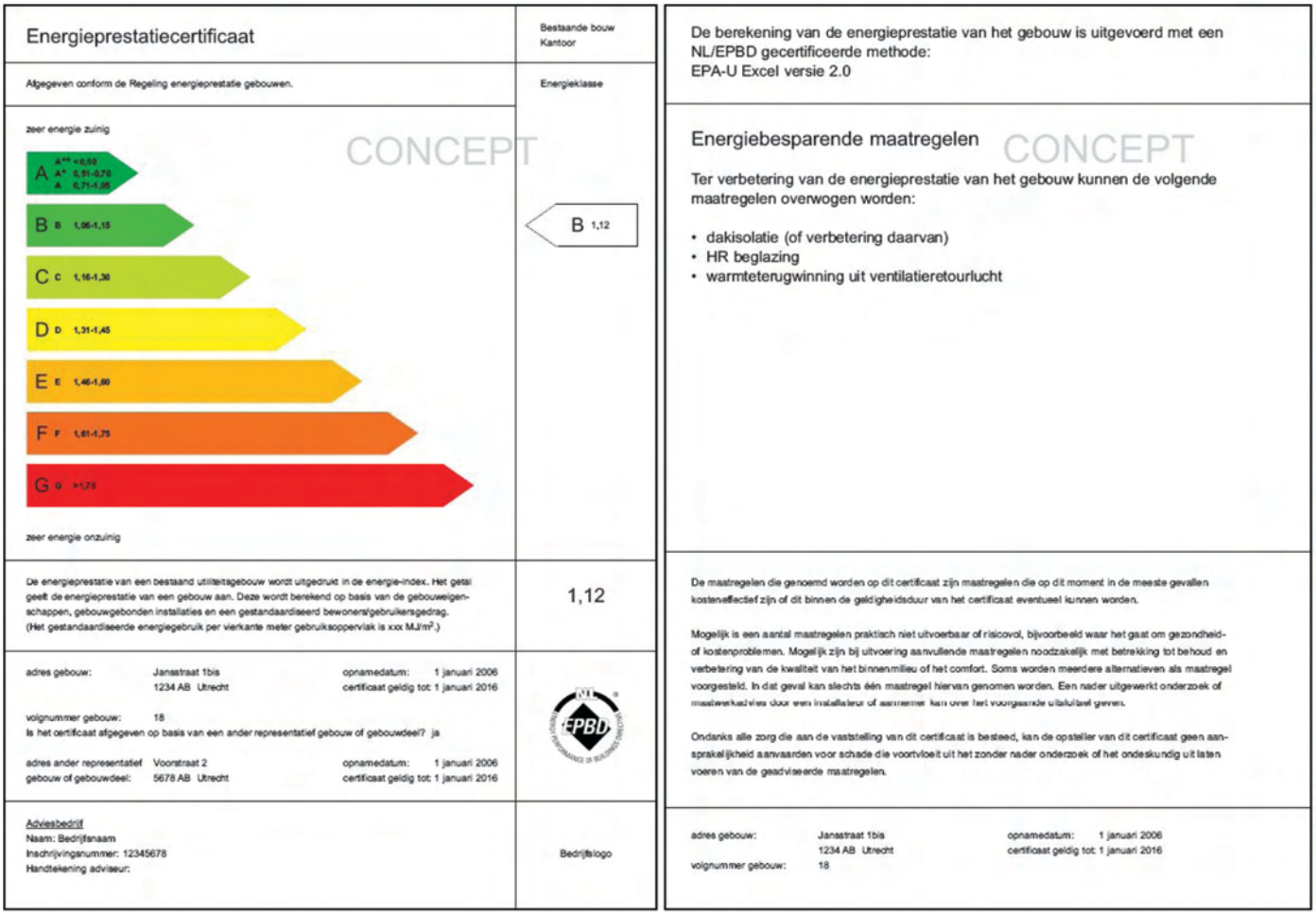
The expected outcomes are:
- A concise overview of current public property management processes, highlighting institutional barriers to sustainable energy saving strategies;
- EPI-CREM embedding Approach; manual with practical advice on how to embed EE and RUE issues into public property management processes;
- EPI-CREM Toolkit; with data-collection protocol; risk analysis model, supporting software with manual.

The European directive on the energy performance of buildings

The EU-Directive 2002/91/EC of the European Parliament and Council on EPBD was adopted on 16th December 2002 and enforced from 4th January 2003 onwards. It is considered a very important legislative component of the energy efficiency activities of the European Union, designed to meet the goals of the Kyoto Agreement. The Directive is first and foremost a measure that concerns a very large number of actors on all levels. It has different effects on and different rationales for designers, housing associations, architects, providers of building appliances, installation companies, building experts, owners, tenants, and essentially all energy consumers in the European Union.

Implementation and Articles

Since January 2006, the member states of the European Union have been obliged to adapt their national legislation to the requirements of the 2002/91/EG. The directive contains the following points:
- The general framework of a method for calculating the integrated energy performance of buildings;
- Application of minimum requirements for the energy performance of new buildings;
- Application of minimum requirements for the energy performance of existing large buildings undergoing radical renovation;
- An energy performance certificate for buildings, the validity of which shall not exceed 10 years;
- Buildings with a total useful floor area of over 1000 m² occupied by public authorities, are required to place the certificate in a place visible to the public;
- The regular inspection of boilers fired with non-renewable liquid or solid fuel of an effective rated output of 20 kW to 100 kW, and an inspection of the



Energieprestatiecertificaat

Bestaande bouw
Kantoor

Afgegeven conform de Regeling energieprestatie gebouwen.

Energieklasse

zeer energie zuinig

CONCEPT

A A** <0,50 A* 0,51-0,70 A 0,71-1,05

B B 1,06-1,15

C C 1,16-1,30

D D 1,31-1,45

E E 1,46-1,60

F F 1,61-1,75

G G >1,75

zeer energie onzuinig

B 1,12

De energieprestatie van een bestaand utiliteitsgebouw wordt uitgedrukt in de energie-index. Het getal geeft de energieprestatie van een gebouw aan. Deze wordt berekend op basis van de gebouweigenschappen, gebouwgebonden installaties en een gestandaardiseerd bewoners/gebruikersgedrag. (Het gestandaardiseerde energiegebruik per vierkante meter gebruiksoppervlak is xxx MJ/m².)

1,12

adres gebouw: Jansstraat 1bis, 1234 AB Utrecht
opnamedatum: 1 januari 2006
certificaat geldig tot: 1 januari 2016

volgnummer gebouw: 18
Is het certificaat afgegeven op basis van een ander representatief gebouw of gebouwdeel? ja

adres ander representatief gebouw of gebouwdeel: Voorstraat 2, 5678 AB Utrecht
opnamedatum: 1 januari 2006
certificaat geldig tot: 1 januari 2016

Adviesbedrijf
Naam: Bedrijfsnaam
Inschrijvingsnummer: 12345678
Handtekening adviseur:

Bedrijfslogo

De berekening van de energieprestatie van het gebouw is uitgevoerd met een NL/EPBD gecertificeerde methode:
EPA-U Excel versie 2.0

Energiebesparende maatregelen

CONCEPT

Ter verbetering van de energieprestatie van het gebouw kunnen de volgende maatregelen overwogen worden:

- dakisolatie (of verbetering daarvan)
- HR beglazing
- warmteterugwinning uit ventilatieretourlucht

De maatregelen die genoemd worden op dit certificaat zijn maatregelen die op dit moment in de meeste gevallen kostenneffectief zijn of dit binnen de geldigheidsduur van het certificaat eventueel kunnen worden.

Mogelijk is een aantal maatregelen praktisch niet uitvoerbaar of risicovol, bijvoorbeeld waar het gaat om gezondheid- of kostenproblemen. Mogelijk zijn bij uitvoering aanvullende maatregelen noodzakelijk met betrekking tot behoud en verbetering van de kwaliteit van het binnenmilieu of het comfort. Soms worden meerdere alternatieven als maatregel voorgesteld. In dat geval kan slechts één maatregel hiervan genomen worden. Een nader uitgewerkt onderzoek of maatwerkadvies door een installateur of aannemer kan over het voorgestelde uitsluitsel geven.

Ondanks alle zorg die aan de vaststelling van dit certificaat is besteed, kan de opsteller van dit certificaat geen aansprakelijkheid aanvaarden voor schade die voortvloeit uit het zonder nader onderzoek of het ondeskundig uit laten voeren van de geadviseerde maatregelen.

adres gebouw: Jansstraat 1bis, 1234 AB Utrecht
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volgnummer gebouw: 18

entire heating installation for boilers of an effective rated output of more than 20 kW that are older than 15 years;

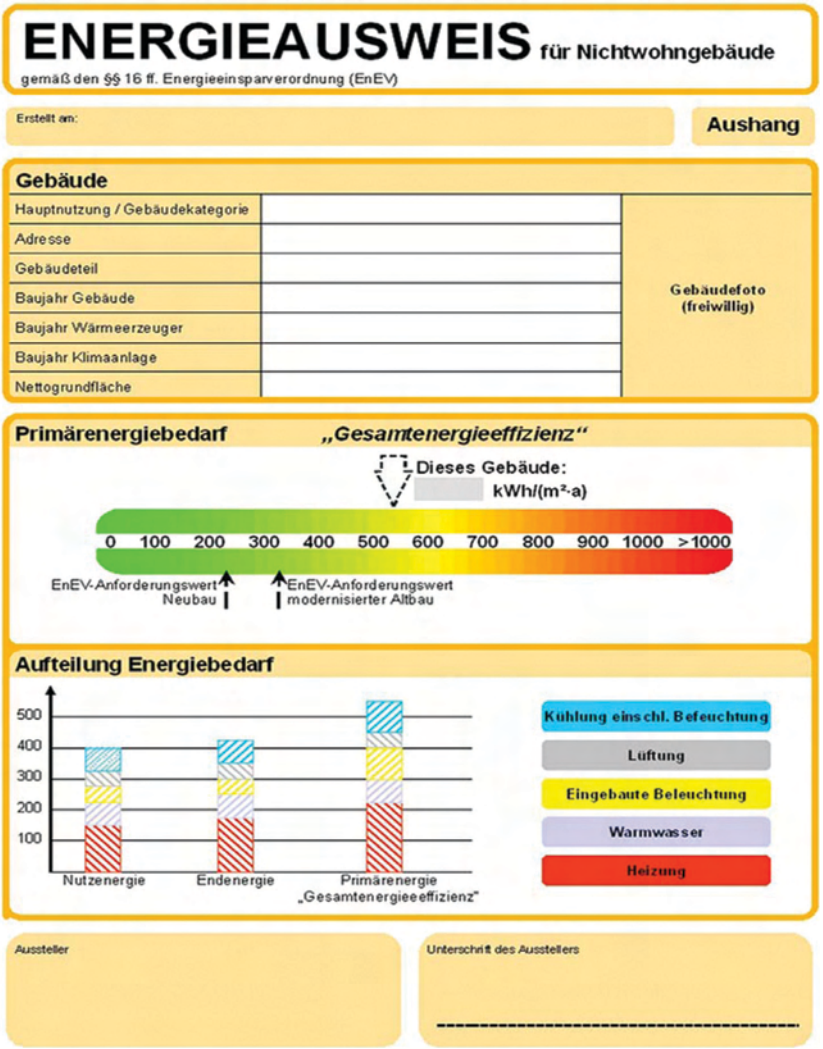
- The inspection of air-conditioning systems of an effective rated output of more than 12 kW.

Energy performance certification must include reference values such as current legal standards and benchmarks, in order to make it possible for customers to compare and assess the energy performance of a building.

The energy performance certificate has to be shown when buildings are constructed, sold or rented out. The certificate has to be made available for the owner or by the owner to the prospective buyer or tenant.

The European action plan for energy end-use efficiency and energy services

The EU-Directive 2006/32/EC of the European Parliament and Council on EE-ESD were adopted on 5th April 2006. The purpose of this Directive is a more economic and efficient use of energy. EU-Member States must adopt and achieve an indicative target for saving energy of 9% by 2015. One or more independent public sector authorities or agencies must ensure the overall monitoring of the process for achieving these targets. The Member States must also ensure that the public sector adopts measures to improve energy efficiency, inform both the public and businesses of the measures adopted and promote the exchange of good practice. More economic and efficient energy-use should be achieved by:



ENERGIEAUSWEIS für Nichtwohngebäude
gemäß den §§ 16 ff. Energieeinsparverordnung (EnEV)

Erstellt am:

Aushang

Gebäude

Hauptnutzung / Gebäudekategorie		Gebäudefoto (freiwillig)
Adresse		
Gebäudeteil		
Baujahr Gebäude		
Baujahr Wärmeerzeuger		
Baujahr Klimaanlage		
Nettogrundfläche		

Primärenergiebedarf „Gesamtenergieeffizienz"

Dieses Gebäude: kWh/(m²·a)

0 100 200 300 400 500 600 700 800 900 1000 >1000

EnEV-Anforderungswert Neubau

EnEV-Anforderungswert modernisierter Altbau

Aufteilung Energiebedarf

500 400 300 200 100

Nutzenergie Endenergie Primärenergie „Gesamtenergieeffizienz"

Kühlung einschl. Befeuchtung
Lüftung
Eingebaute Beleuchtung
Warmwasser
Heizung

Aussteller

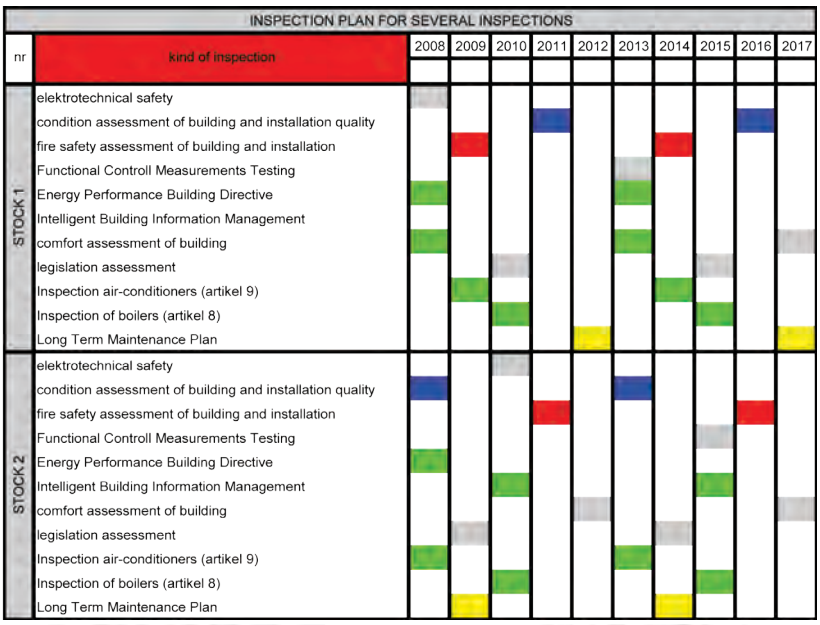
Unterschrift des Ausstellers

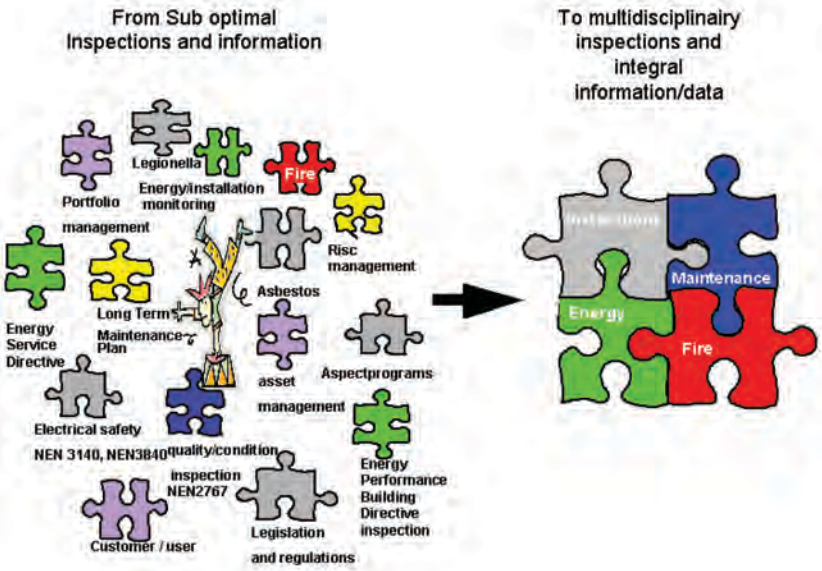
- Establishing indicated targets, incentives and the institutional, financial and legal framework needed to eliminate the market barriers and shortcomings which prevent efficient end use of energy;
- Creating the conditions for the development and promotion of the market for energy services and for the delivery of energy-saving programs and other measures aimed at improving end-use energy efficiency;

Challenges for (public) CREM – organisations (EPI-CREM Project)

CREM organisations, including public organisations, work sub-optimally in Europe at present. Inspections and the technical information they yield are not integrally carried out and integrated into maintenance exploration or investment plans. So an overall integral approach and a connection between integral inspections, technical information, SHEEQ aspects considerations (technical, facility, financial, asset) and decision making is not made, but is necessary. Building related energy measures are rarely integrated within the management of public non-residential stock. Through the obligations now entailed by the EPBD and EE-ESD, public organisations can take a quantum leap in optimizing technical processes related to a sustainable management process. Modules that have been so far regarded individually can be usefully connected taking their economic, ecologic and social aspects into consideration. If CREM organisations are able to do so, a lot of immediate processes will develop into interesting and profitable combinations for operating procedures.

CREM functions have to deal with inspections, inspection information and data that are sub optimal.





Impact of implementing EPBD in national legislation

The implementation of the EPBD has not only technical impact, it has organisational, financial and social impact in particular. Tenants will have questions about declaring the energy performance certification and labelling, linked to the EU-Directive. Furthermore, they desire to be informed about the relevance of the energy labels and the possibilities for reducing energy consumption to increase the energy efficiency of their building. The strong relationship between the political and social role of CREM organisations and public CREM organisations turns energy performances into a logical component of portfolio, asset, facility and property & maintenance policies. As a consequence, energy consumption and energy efficiency demand to be embedded at all levels of management, policy and daily ongoing concerns according to modern standards of responsibility. To embed energy, energy performance and also the other aspects (SHEEQ: Safety Health Environment Energy Quality) into CREM organisations, these organisations must adopt a positive policy on:

- Integrated Design (structure of customer, process and organisation);
- Risk management FMECA (structure of technical, financial and organisational information and decisions)
- Connection of operational, tactical and strategic information (structure of various inspections for different aspects and element levels);
- Consideration and decision making processes.

How are CREM organisations, including public ones structured?

Public real estate management is organised differently from country to country and also between organisations. The main functions, however, in real estate management processes are defined in the same way; these functions could be presented differently but the content of each function does not differ from one country to another. According to Pity van der Schaaf, the definition of public real estate management is the management of a government's real estate portfolio by aligning the portfolio and services to:

- The needs of the users;
- The financial policy set by treasury;
- The political goals that government wants to achieve.

Public real estate management is closely related to corporate real estate management (CREM), in theory;

public real estate management incorporates the same disciplines as CREM: general management, asset management, facility mana-gement and cost control. Unfortunately, the theories, opinions and experiences described in corporate real estate literature are not always applicable to a public setting for the following main reasons:

Business	Government
Leaders are driven by the profit motive	Leaders are driven by the desire to get re-elected
Money from customers	Money from tax-payers
Competition	Monopolies

- Influence of political steering and governance within public organisations;
- The number of external stakeholders is important in public organisations, so the boundaries of the playing field within which the real estate manager has to operate become unclear and more difficult to handle than in the private sector.

Four main functions in CREM

The field of Real Estate Management processes is subdivided into four specialized management fields on three organisational levels, known as:

- Portfolio Management (strategic level);
- Asset Management (tactical level);
- Facility Management (tactical level);
- Property & Maintenance Management (operational level).

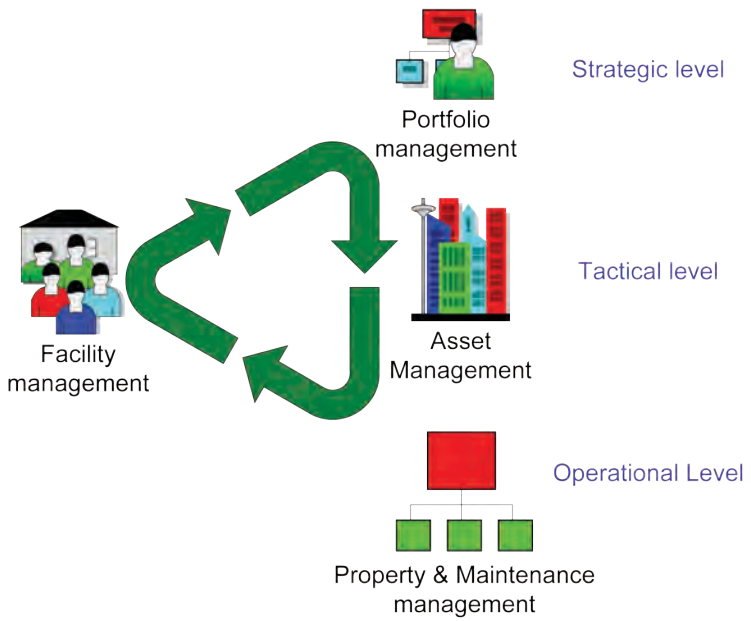
These management fields and organisational levels are related to each other, as shown in figure on top.

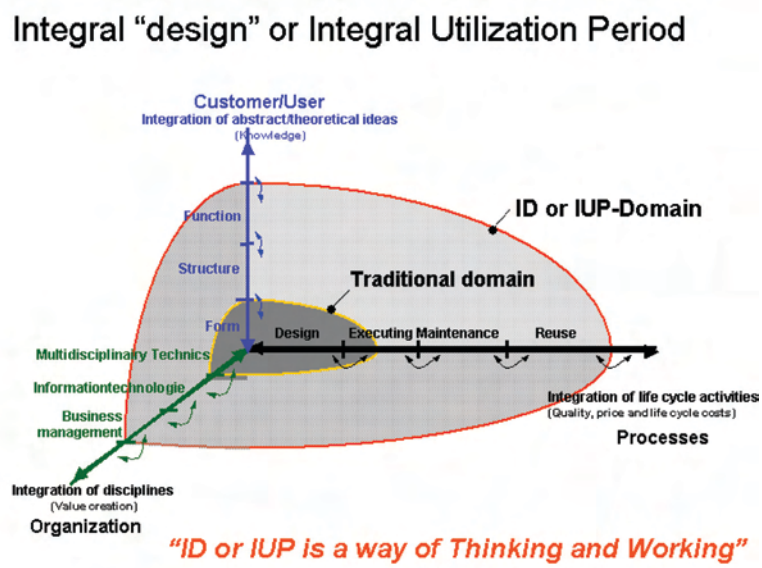
Information about the SHEEQ aspects, and the financial and planning aspect, goes around within the process. Policy goes top down within the process. Due to every specific function on every level, a strategy must be made to integrally embed the energy aspect.

Integrated "Design" or Integral Utilization period

One issue for embedding energy efficiency for public real estate, is to improve the way for taking it into account through CREM by implementing energy efficiency, quality and communication measures and data into the integral 'design'. This will greatly affect awareness of energy use in buildings, and is intended to lead to substantial increases in investments in energy efficiency measures within these buildings.

Learn how to think and work outside of the traditional CREM boxes. The principals of integrated 'Design' can therefore be used. In the 'Traditional domain' a form is described, hopefully a 'Team' of experts of various disciplines will work together to make a design. When a building is constructed and completed, it is usually not clear who is responsible for SHEEQ, maintenance, sustainability etc. Even worse, after a while we have





to conclude that we do not know whether what has been designed and constructed is what was desired and requested. And what is also very important, the cost for its life cycle and dismantling are not known.

Integrated 'Design'or Utilization Period – within this domain, there are three domains known as:
- Customer/User: a customer has abstract and theoretical ideas which must be translated into the Organisation and the Processes, and executed;
- Organisation: the several organisations involved in realization have to work together (not only the architect with the customer and the building designer, but also with the financial manager, electronic, climate, transport designer and maintenance;
- Processes: integration of life cycle aspects.

The last aspect in this line is the first aspect we should become acquainted with. Function goes for structure and form. Reuse (sustainability) goes for maintenance, execution and design. Costs of several aspects during the Life Cycle go to information technology and multidisciplinary techniques.

(top)
Four main management fields in CREM

Integral 'Design' or integral utilization period is a way of thinking and working.

Integrated Inspections

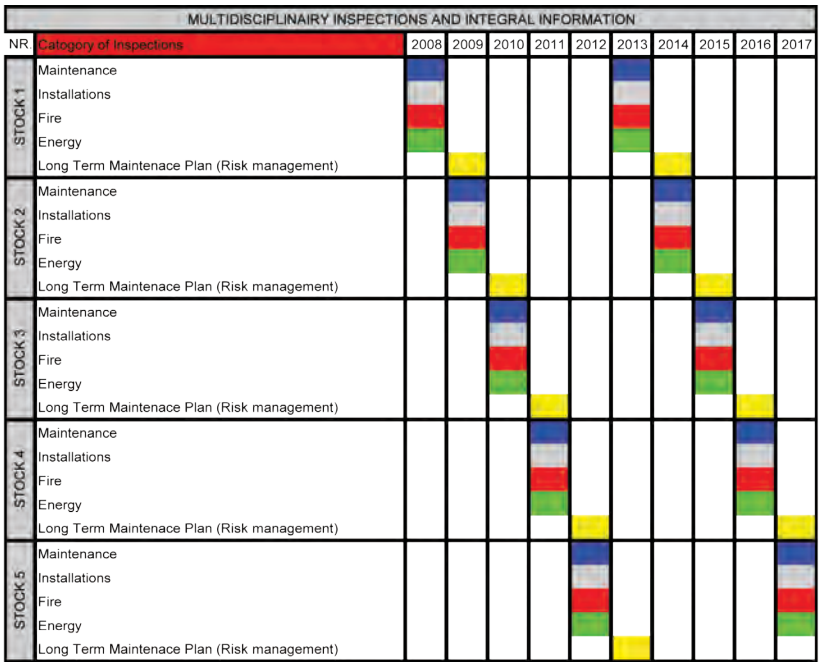
Connecting inspections to each other (Integral Inspections) due to interchangeable and comparable elements.

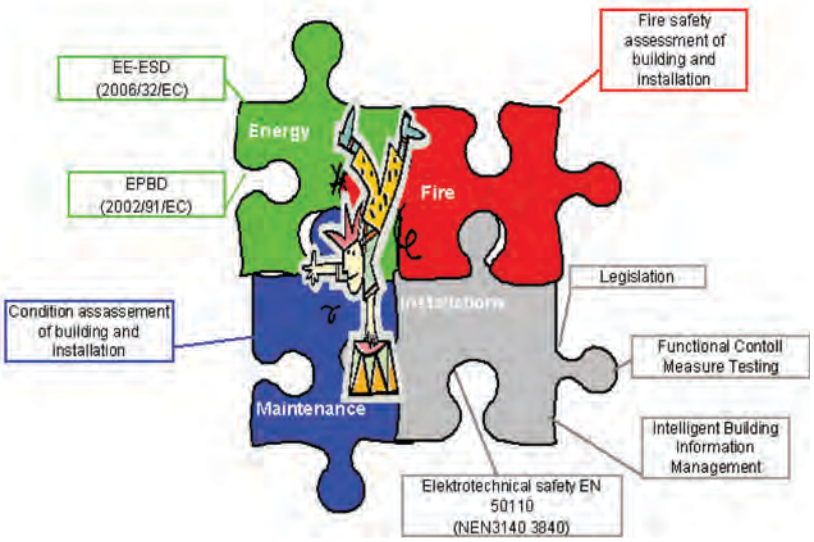
At the moment there is great diversity with regard to inspections in Europe. Please consider fire safety, maintenance, energy or installation inspections in this connection. The reasons for carrying out an inspection are equally very diverse indeed:

- Obtaining a picture of the maintenance condition, energy performance, fire safety, electrical safety, installation performance, comply with legislation etc. for the property with its systems;
- Alterations in rational production / use of buildings or systems;
- Changes in legislation and regulations;
- Changes in market/social demand;
- Media influences;
- Social responsibility;
- Image improvement, exemplary role;
- Energy / environmental economies.

Consider, for example, health and safety legislation, the environmental management act or a NEN (Netherlands Standardization Institute) / DIN (German Standardization Institute), fire safety, personal safety etc, in this connection. The results of these inspections overlap each other or do not adequately supplement each other. Moreover, carrying them out separately leads to increases in costs and to great lack of clarity for the property and facility managers. The customers and users see and receive various companies, and attending to the companies conducting inspections on Real Estate owner instructions costs time. An integral-inspection can offer a solution for this. An integral-inspection gathers technical element information of a property and its installations on four aspects, namely; Maintenance, Installations, Fire safety and Energy (MIFE). All this technical information/ data must be comparable and interchangeable on the level of elements and supplemented by a risk analysis.

From sub optimal inspection information, costs and planning to spread integral Inspections and technical plans and costs





Consideration and decision making due to Risk management

Much as most people would like to live in an environment in which there is no possibility at all of death or injury, it is generally accepted that there is an element of risk in everything we do. In other words, absolute zero is unattainable, even though it is worthy target to strive to attain. This immediately leads us to ask what is attainable? To answer this question, we first need to consider the question of risk in more detail.

Risk assessment consists of three aspects:

- What could happen if the event under consideration did occur?;
- How likely is it that the event might occur at all?;
- Is this risk tolerable?

Risk analysis according to FMECA is designed for all possible failures influencing technical, organisational or financial aspects on the four main CREM functions.

For risk analysis in CREM organisations the following is needed:

- Technical inspection information (Integral Inspections)
- Element list of the inspected elements divided over the several aspects;
- Considerations of the four main functions in CREM (technical, facility, financial, stock, environmental, social, political etc);
- Classification of risk.

Addition of a risk analysis is useful if the building and/or installation has exceeded its technical life span (or has almost done so), but inspections show that the main elements are still in a condition tree. This is also advisable if large sections of the building and installations are older than fifteen years, in the case of supplementary client wishes and/or requirements for interior and user installations, and in the case of purchase or hiring of property older than ten years.

Example

A maintenance inspection conducted in 2001 revealed that the building management system ought to be

replaced in 2002. There were plans to replace the boiler in 2005 and the air conditioning in 2007. This is how replacement occurs at the moment, without taking into account the risk of breakdown if no replacement should occur. There is also no account taken of energy consumption and fire prevention and any other combination of systems, such as fire alarms and security systems, for example. Even worse, whether or not all this is necessary for the user/client and whether there is further Technical, Functional and Representative Requirements and desires are scarcely taken into account, if at all.

1. A maintenance inspection reveals that the 25-year-old central-heating boiler ought to be replaced. If the requirements a modern heater room must comply with are not taken into consideration here, this will have major financial consequences for planning and implementation. There will then be no financing left over for it. After all, a modern heater room should comply with many requirements mentioned in the building decree, bearing in mind fire prevention, constructions and energy performance for example.

2. The same 25-year-old boiler is replaced by a state-of-the-art HR boiler, because the Integral Replacement (IV) indicates this. In addition, the window frames and the glazing are replaced and the roof is insulated. All good but stand-alone measures, in order to economize on energy. It is, however, of vital importance that the distribution net be adapted to this new energy conserving boiler. Otherwise – in spite of the energy saving measures – an unnecessary amount of energy will be used, and complaints about temperature comfort may occur because the regulating technnology has not been adapted.

3. The same 25-year-old boiler is replaced. All kinds of duct grids in the heater room are replaced/extended. These ducts and grids go through the fire resistant construction. If no financing concerning fire prevention measures is included in the maintenance inspection, then the heater room will not pass the legal requirements for starting operation. (At present it often happens that the state of affairs as a whole does pass, but that it still does not comply with requirements on a number of points. With many possible risks to safety as a consequence.)<<

Both Authors are working on the EACI (www.IEEA.eu) subsidised Project EPI-CREM (www.epi-crem.org). The project will be carried out by The Netherlands (Rijksgebouwendienst and BuildDesk) Austria (Austrian Energy Agency and Energie Bewusst Kantern) and France (Centre Scientifique et Technique du Bâtiment) The project started in December 2007 and is to end two and a half years later.