

CEN/CLC BT JWG “Energy management”

Final report

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Summary – Background, result and proposal

The CEN/CENELEC BT/JWG "Energy management" was designed to initiate a European collective view of the general strategy for improvement of energy efficiency standardisation and to set an agreement between all CEN/CENELEC members on the objectives to achieve.

The working group acts as an advisory group to CEN and CENELEC BTs on all political and strategic matters related to standardisation in the field of energy efficiency.

The main result of the work is an overview of priorities in standardisation for the coming years in the field of energy management.

Three priorities have been defined as follows :

Level A – for immediate action;

Level B - that need further investigation or research before standardisation could be done;

Level C - that need to be discussed in the context of a strategic and holistic view, i.e. policy questions.

Concerning the future work, the CEN/CENELEC WG participants share the opinion that the concept of energy efficiency would require new ways of working and networks between TC, SC and WG in CEN and CENELEC to cope with relevant perspectives, approaches and issues. However, for efficiency purposes, the future work for immediate action (level A) should be allocated to the relevant existing CEN or CENELEC structure if any.

The group has included some representative of 15 countries (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom) but only 8 countries were represented during the last meeting. Furthermore, there are only three countries (France, Italy and Sweden) which have taken an active roll as project leaders for a given priority.

The members of the joint working group represent a network of expert and organisation willing to be a driving force In Europe regarding the standardisation in the field on the energy management.

Based on these results, the WG recommends to CEN and CENELEC Technical Boards to organise the programming of the future work and to take the necessary measures to establish standards or alternative deliverables (TS, TR, ...) for proposals for immediate action (level A) that are mentioned in table 1 below either by extending the work of the existing CEN/CENELEC bodies (TC, SC, WG, ...) or by establishing a dedicated body (a new CEN or CENELEC body as appropriate). For that purpose, CEN and CENELEC BTs should ask the identified structure/bodies to consider whether they would agree to develop the proposed deliverable and report back to BTs. For all the topics with no identified body, CEN and CENELEC BTs should invite the BT members to submit an application for each proposed new work to CEN and CENELEC central secretariat bearing in mind that some members have already submitted an application to the CEN/CLC BT JWG Energy management secretariat mentioned in table 1.

The WG recommends also to maintain and enlarge the network of partners created during this work in a flexible way, in particular for initiating further investigation and for evaluating whether further standardisation work should be needed for items identified as level B or C and for maintaining the exchange of information, experience and prospecting especially on the initiatives in course in the different countries or at European level.

The WG has finalised its work and the WG recommends to CEN and CENELEC Technical Boards to disband the group.

The table 1 below gives an overview of the proposals for future work where the standardisation on the subject could begin without further delay (level A) in an already existing body (CEN or CENELEC TC, SC, WG, ...) or in a structure to be set up. Subjects needing further investigation or research before standardisation be initiated or subjects needing to be discussed in the context of a strategic and holistic view are summarised in [annex VII](#).

Table 1 - Proposals for immediate action (level A)

Priority n°2	Harmonisation of Declaration environmental impact of energy use in building area
Proposal	Make an in-depth study of the state of the art. There are today several methodologies and databases, project results covering different parts of the building area and the normal energy carriers as district heating, electricity, oil, gas etc.
Stakeholder	Socio-economic actors in construction sector (designers, architects, ...°°) Research institutes, Universities, Industries, national Agencies and National Standardisation Organisations
Deliverable	Standard
Relevant body	CEN BTWG 174 "Integrated Environmental performance of Building" with regard of the mandate M340 on environmental performance of buildings
Priority n°4	Air conditioning especially in commercial buildings with the health aspect
Proposal	Gather the existing data from the different TCs whose working fields are related to this topic and the best practices especially for installation and maintenance
Stakeholder	Air-conditioner professional unions, manufacturers, users, installers
Deliverable	Standard
Relevant body	CEN/TC 113 "Heat-pumps and air-conditioners"
Priority n°5	Benchmarking in industry
Proposal	Establish a standardised method of benchmarking energy use and green house gas emissions in order to increase energy efficiency and reduce climate change
Stakeholder	Industry
Deliverable	Guideline (other deliverable than standard)
Relevant body	No structure identified, Proposal : new body to be set up
Priority 6	Goods transportation on road and intermodal modes
Proposal	Take the opportunity to emphasise CEN and CENELEC as an actor to co-ordinate standardisation for the four transport fields
Proposal	We recommend CEN and CENELEC BT to initiate a co-operation with organisations responsible for railway standardisation.
Proposal	Co-ordinate proposals from CENCLC BT/WG EM with the conclusion of the CEN/CENELEC/ETSI Conference "Transport - Getting there with European Standards - The benefits of standardisation for a single market in transport " 2004 to continue future work within the transport field
Proposal	Eco Driving Programs with Training and Fuel Consumption Monitoring/Reporting

Stakeholder	The road haulage industry, buyers of transport services, national road admin/agencies, truck and private car manufacturers, drivers licensing/training actors, fuel distributors/producers
Deliverable	Guideline (other deliverable than standard)
Relevant body	CEN/TC 320 "Transport - Logistics and services"
Proposal	Energy Saving and CO ₂ Reduction Programs for Transports by Truck
Stakeholder	Governments, agencies and public opinion, Buyers of transport services, the road haulage industry, truck manufacturers, fuel producers/distributors, national agencies within the transport
Deliverable	Standard
Relevant body	CEN/TC 320 "Transport - Logistics and services"
Proposal	Transport Logistics Programs (CAD)
Stakeholder	Transport services buyers, road haulage industry and other transporters, consultancy firms and CAD Program designers/producers
Deliverable	Standard
Relevant body	No structure identified, Proposal : new body to be set up within ETSI
Proposal	Systems for goods tracking
Stakeholder	Transport services buyers, insurers, road haulage industry and other transporters, manufacturers of tracking equipment would support a standard on goods tracking.
Deliverable	Standard
Relevant body	No structure identified. Need cooperation between the different transport modes
Proposal	Mobility Management Model
Stakeholder	Stakeholders within the transport sector, municipality planning, transport services buyers, public in general, manufacturers and designers of transport systems, vehicles, government agencies,
Deliverable	Guideline (other deliverable than standard)
Relevant body	No structure identified, Proposal : new body to be set up
Priority 8	Alternative fuels
Proposal	Integrated Set of Energy Efficiency and Environmental Parameters for Fuels
Stakeholder	Parameters on fuels for vehicles: Governments, agencies, consumers of fuels including the road haulage industry, car manufacturers, manufacturers of the equipment to be used in connection with the alternative fuels, fuel producers/distributors, universities. Stationary installations: manufacturers and owners of power/heat plants and their organizations.
Deliverable	Standard
Relevant body	No structure identified, Proposal : new body to be set up
Proposal	Testing, sampling and calculation methods for alternative fuels

Stakeholder	Certification bodies, car manufacturers, fuel producers/distributors, producers of electricity and heat, manufacturers of equipment for producing, distribution and storing alternative fuels.
Deliverable	Standard
Relevant body	To check CEN/TC 19 "Transportation fuels", CEN/TC 343 "Solid recovered fuels" and CEN/TC 335 "Solid biofuels"
Priority 10	Green certificates
Proposal	Create an EU standard for definition, obligations, and methodologies for issuing, auditing, monitoring, trading, banking, administration, redemption and consumption of certificates in order to make them tradable between different countries.
Stakeholder	Producers/distributors of RES technologies and fuels, Manufacturers of power plants which can be converted to use RES fuels, the electricity companies and other owners of power plants using RES including their organisations such as EURELECTRIC, EUROHEAT & POWER and COGEN EUROPE, Organisations for producers of other fuels than RES, such as natural gas (EUROGAS, MARCOGAZ), coal and oil, existing power exchanges such as Nord Pool ,governments and environmental organisations (including the national regulators)
Deliverable	Standard
Relevant body	No structure identified, Proposal : new body to be set up.
Priority 15	Energy efficiency and saving calculation
Proposal	Need for common methods of calculation of energy consumption, energy efficiencies, and energy savings, for a common measurement and verification protocol, and methodology for energy use indicators These needs refers to two different fields: a. - Standards on specific technologies or "systems" (rather than "products") to be developed by the relevant committees; b. - General Standard or Guidelines giving the general rules for calculation and measurements. Further investigation is needed to clarify the title, scope and possible content of the general Standards and / or Guidelines, and to define the specific "system" Standards needed, with the needed priority.
Stakeholder	Governments, agencies, energy users, energy services providers, ESCOs, utilities and energy distributors and sellers required to reach energy consumption reduction targets, certification bodies, energy using products manufacturers and energy systems providers.
Deliverable	a. Specific Standards for each technology b. General Standard or Guidelines for calculation and measurement. Excellent indications and examples are given by the: - "International Performance Measurement and Verification Protocol - IPMVP" (see www.impvp.org), and - ASHRAE Guidelines 14 - 2002 - "Measurement of Energy and Demand Savings".

Relevant body	<p>a. The relevant committees for each technology</p> <p>b. No structure existing; a new one should be established.</p> <p>Already one applicant. Italy is ready to organise and coordinate the needed structure</p>
Priority 16	Energy Service Companies (ESCO) definition: requirements and qualification procedure
Proposal	Establish a standard defining role, characteristics and requirements of the Energy Service Companies
Stakeholder	companies who already provide, or plan to provide, various kind of energy services, including equipment installers and facility management companies, energy service companies customers, energy users, energy distributors and selling companies, the qualified energy experts, the National and Local Energy Agencies and accreditations and certification organizations.
Deliverable	Standard
Relevant body	No structure identified, Proposal : new body to be set up, the one taking care of priority 16, 17 and 19. Already one applicant. Italy is ready to organise and coordinate the needed structure.
Priority 17	Energy managers and experts: roles, professional requirements and qualification procedure
Proposal	Define the possible roles, characteristics, and the minimum professional requirements of the Energy Management Expert.
Stakeholder	Engineers and technical professionals interested in getting a specific recognised qualification to offer their services, sole trader (consultant, advisor, auditor, verifier) or employed by private or public bodies, stakeholders interested in using the specific competencies of the Energy Management Experts either as an employee or external consultant.
Deliverable	Standard
Relevant body	No structure identified, Proposal : new body to be set up, the one taking care of priority 16, 17 and 19. Already one applicant. Italy is ready to organise and coordinate the needed structure.
Priority 19	Energy management system
Proposal	Define a European Standard on “Energy Management System” similar to the Danish, Swedish and Irish Standards, or Guidelines to establish such system in a company or organization, either by itself, or integrated in other management systems like Quality or Environment.
Stakeholder	The interested parties are: Governments and energy agencies, energy service companies, energy using products manufactures and installers, energy distributors and sellers, accreditation and certification organizations.
Deliverable	Guideline (other deliverable than standard) or standard
Relevant body	No structure identified, Proposal : new body to be set up, the one taking care of priority 16, 17 and 19. Already one applicant. Italy is ready to organise and coordinate the needed structure.

Foreword

The CEN/CLC BT JWG Energy management was set up in the beginning of 2002 to initiate a European collective view of the general strategy for improvement of energy efficiency standardisation and to set an agreement between all CEN/CENELEC members on the objectives to achieve. The working group members (see the composition of the group given in [annex I](#)) finalised the work within three years and produced the present final report to the attention of the CEN and CENELEC Technical Boards.

This document synthesises the result of the work which can be summed up by an overview of priorities in standardisation for the coming years in the field of energy management.

According to the terms of reference of the group (given in [annex II](#)), one of the main tasks of the group is to identify new standardisation fields of activity, corresponding to market needs and regulation needs; this means identification of trends and opportunities, state-of-the-art of existing standards and supply of tools to seek out the needs that have not yet been covered by normative documents. For that purpose, the working group members focus on a list of priorities for which project leaders were appointed (see [annex IV](#)). Another task of the group was to delineating a European standardisation strategy for improvement of energy efficiency. The WG decided that this could be reached by the method of work described above.

After the remind of the European context, the objectives of the work and the methodology adopted to reach the objectives, the report gives the result of the work and the recommendations to CEN and CENELEC Technical Boards.

For more detail of the work, we invite the reader to refer to the document produced by the working group (see list given in [annex III](#)).

At the time of the publication of this report, there are a number of European energy policies in preparation phases and number of CEN and CENELEC structure in charge of items link to energy efficiency. The CEN/CLC BT JWG Energy management identified a number of CEN/CLC/ETSI existing structure relevant on a given priority (see [annex V](#)).

The detail of the proposals by priority is given in [annex VI](#) and [annex VII](#)

A – for immediate action;

B - that need further investigation or research before standardisation could be done;

C - that need to be discussed in the context of a strategic and holistic view, i.e. policy questions.

Introduction

Energy is essential for a daily life and the topic of energy concerns all people in the Union. While it may appear that Europe has been benefiting from a relative abundance of energy since the 1986 rebound from the oil crisis, the future might be less reassuring. Energy consumption is rising by 1 % to 2 % a year. If no action is taken in the next 20 to 30 years, the environmental impact of energy will be untenable and the energy supply import dependency of Europe will rise to a level of 70% on average, going up to 90 % in the case of oil products.¹.

In the coming years, the Union will face a new context with deep evolutions and many challenges:

- KYOTO commitments on green house effect reduction,
- Security of supply for European Union and all Member States,
- In-depth structural changes of the energy sector : opening of the electricity and gas market, increasing role of the renewable energy sources.

All these challenges are widely linked to energy management and, more particularly, the improvement of energy efficiency. Greater energy efficiency will have a positive impact on supply as the overall efficiency is only 25 % (a unit which is not consumed is equal to saving four in fact)¹.

Managing energy consumption is then essential for sustainable energy development in Europe. Improvement of energy efficiency is decisive for our long-term supply capacity, strategic freedom, European economic independence. It is also crucial for preserving environment since saved energy emits no local pollutant or green house gases.

Energy efficiency means reducing energy consumption without reducing the use of energy-consuming plant and equipment. The aim is to make better use of energy. Energy efficiency means promoting behaviour, working methods and manufacturing techniques

¹ "Green paper" on energy, please see http://europa.eu.int/comm/energy_transport/en/lpi_lv_en1.html

which are less energy-intensive. The economic potential of improving energy efficiency is still estimated at 18 % of current energy consumption ¹.

The consumers have an important role in the improvement of energy efficiency by using energy efficient technologies. The efficiency products available, however, can really contribute to energy saving. As an example, the labelling of the energy efficiency of refrigerators or boilers gives very good results. However, implementing energy performance management in equipment and products must be carried out within the broader context of their aptitude for the function and the respect of the other essential requirements (user safety, etc). These performances must be taken into account at marketing phase as well as during their maintenance through time. It is important to point out that features are not only related to the products but also to good practices, services and management systems. An integrated approach aimed at the overall optimization of installations and systems, associated with appropriate and co-ordinated actions on individual appliances and other components, should be addressed.

A number of either National or European energy policies are going on to face these stakes or are in preparation phases. The Union needs tools to achieve energy management, energy efficiency and CO₂ emission reductions, and to launch efficient energy policies. Many tools which can be combined are available to support actions : regulation, voluntary agreement, labelling and standardisation. Nevertheless, standardisation based on consensus has the necessary convenience to contribute to the implementation of these tools. To sum up, standardisation is a central instrument to achieve energy management.

1 – Context and objectives

The European Commission adopted an action plan on improving energy efficiency in April 2000. The action plan is a follow-up to the Commission communication adopted in April 1998 on the rational use of energy and the Council resolution on energy efficiency. It constitutes a framework for Community activities in this area and applies until 2010².

Industry can still play a part. The major energy consumers have made remarkable progress. They are now reaching high levels of efficiency. However, there is still some room for improvement. Cogeneration of Heat and Power CHP has a double role in contributing to energy efficiency and reducing environmental impact. The Commission proposed a directive that was approved 2004 to promote cogeneration of heat and power. New cogeneration plants have to save at least 10% of the fuel otherwise used for separate production of heat and electricity in order to be considered as high efficiency CHP plants³.

In the pulp and paper industry measures for improvement in energy efficiency have been taken since many years back. The consumption of oil has been reduced to a fifth of the consumption in the 70ies while the production of pulp and paper has been doubled. Oil has partly been replaced by biofuels but the specific consumption of energy is also lowered considerably.

Buildings represent approximately 40% of energy consumption and the potential energy saving is more than 20%. The action plan proposes amending one of the key directives in this area, i.e. Directive 93/76/EEC on the energy certification of buildings, which seeks to limit carbon-dioxide emissions and includes insulation measures and heating requirements. In May 2001, the Commission therefore made a proposal for a directive on the energy performance of buildings : the Directive on the energy performance of buildings (2002/91/EC) in force since January 2003 builds on those measures with the aim to provide for an ambitious step-ahead to increase the energy performance of public, commercial and private buildings in all Member States. The Directives on boilers (92/42/EEC) and on construction products (89/106/EEC) also figure among the main actions in the sector and,

² for more information, a summary of the measures proposed by the action plan and, where appropriate, an update of certain measures taken since its adoption is available under the [European commission web site](#)).

³ Promotion of combined heat and power, please see <http://europa.eu.int/comm/energy/library/chpmemodirectiveen.pdf>

in September 2000, a Directive on energy efficiency for lighting (Directive 2000/55/EC) was adopted. The dissemination of good practices, the extension of labelling and the training and qualification of fitters are also planned. Moreover, among the many initiatives in this sector, the EU also finances a "Green Light Programme" concerning lighting in commercial buildings.

The **transport** sector is a priority area for energy efficiency as it is responsible for over 30% of final energy consumption. The measures are mostly of a non-technological nature and include promoting the establishment of new infrastructures and, consequently, intermodality.

Production, conversion, distribution : The European Union is capable of generating 600 GWe of electricity. Between now and 2020 we will have to produce practically as much again to meet consumption requirements and to replace half of the present power stations which will reach the end of their lives. There are calls for oil and coal to reduce their role. Natural gas is going to predominate in new capacities. The nuclear sector will probably not expand. The contribution from renewables will depend on the political will to promote them and make them economically attractive. The liberalisation of the electricity and gas markets will certainly improve the efficiency of the system ¹.

The Commission has also presented two EU "horizontal" initiatives designed to improve efficiency, i.e. initiatives which affect several or all of the sectors concerned.

Eco-design requirements for Energy using Products

It is generally acknowledged that the production, distribution, use and end of life management of energy-using products ("EuP") is associated with a considerable number of important impacts on the environment such as climate change linked to energy consumption, consumption of other materials and natural resources such as water, waste generation and release of hazardous substances to the environment.

It is estimated that over 80% of all product-related environmental impacts are determined during the product design phase. Integrating environmental considerations as early as possible into the product development process is therefore the most effective way of introducing changes and improvements to products. It is expected that with the wide dissemination and considerable environmental impacts of energy-using products, growing

public awareness of environmental issues will result in the environmental aspects and performance of such products being increasingly targeted.

Energy end-use efficiency and energy services

Saving every year 1% more of the energy previously used in each Member State through increased energy efficiency will lead to around 6 % annual energy savings in the year 2012. This is the ambitious goal that the Commission has proposed with its new Directive to boost energy efficiency in the Union and promote the market for energy services such as lighting, heating, hot water, ventilation, etc. The proposal sets a framework with common definitions, tools, methodology targets and obligations, both for the public and for the private sectors⁴.

In this context, the CEN/CLC BT JWG Energy management was set up to act as an advisory group to CEN and CENELEC BTs on all political and strategic matters related to standardisation in the field of energy efficiency.

One of the main tasks of the group is to identify new standardisation fields of activity, corresponding to market needs and regulation needs; this means identification of trends and opportunities, modernisation of existing standards and supply of tools to seek out the needs that have not yet been covered by normative documents.

2 – Adopted methodology to reach objectives

Large consultation to collect the existing and the needs

Since the first meeting of CEN/CLC BT/JWG on Energy management held on March 28; 2002 in Brussels, the group met on September 20, 2002, in Sophia Antipolis (France) and on February 5, 2003, in Brussels. These two meetings were necessary to organise the collecting of the existing data and the needs in order to establish a common and shared evaluation of the state of the art and of the definition of needs in the field of energy management standardisation.

⁴ Proposal for a Directive on the promotion of End-use efficiency and Energy Services (in legislative process), COM (2003) 739 final of 10.12.2003

The WG members agreed that this was a necessary first step to identify the needs and to collect the existing or the documentation under way. For that purpose, a large consultation was performed regarding the situation at national level in order to collect the existing standard and regulation and the needs for the energy management in general and for the following specific sectors :

- Energy efficiency in building;
- Energy efficiency in industrial activities;
- Energy efficiency in transports and logistics;
- Energy production, conversion and distribution

This consultation allows CEN/CENELEC members to express their views on the current national situation and on the foreseeable impact of the European standardisation. national situation and on the foreseeable impact of the European standardisation. It was also important to reach the target of the group regarding a standardisation strategy to CEN and CENELEC BTs.

Focus on a list of major priorities

When the group met on January 22, 2004, each WG member when presenting their national report, emphasized their major priorities and it was agreed to focus on these priorities (see the list given in annex IV and annex VII) . Following this meeting, project leaders were appointed on priorities. These project leaders were asked to compile the data transmitted in the national reports and to look further into the subject in order to produce a short report.

During this meeting, the WG members agreed that it would be suitable to appoint contact persons from each country for each priority, so that each project leader could use it in his work.

The meeting of the group held on May 26, 2004 was mainly devoted to the presentation of the draft reports by the project leaders and to the discussion which followed each presentation.

For each subject, the existing relevant standardisation structure/body was identified if any (see annex V). The WG members agree that the advice or inputs of the existing TC, SC or

WG would give added values to the work, even if the countries that participate today to our work made the link at national level. CMC and CLC CS organized the consultation of the chairman/secretaries of TC/SC/WG/TF of CEN and CLC to invite them to send advice and comments on a given priority. The comments received have been taken into account when producing this final report.

The latest meeting held on December 1, 2004 was mainly devoted to the discussion on the final proposals and the recommendation to CEN and CENELEC Technical Boards for the future action.

The will of the joint partners to be a driving force in Europe

A continuous effort was made to enlarge the participation to the work. The group includes today some representative of 15 countries (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom) but only 8 countries were represented during the last meeting. Furthermore, there are only three countries (France, Italy and Sweden) which have taken an active roll as project leaders for a given priority.

It shall also be noted that some mirror committees to the European group were set up in different countries (France, Sweden, Italy, United Kingdom ...) and that it was suggested to WG members, to appoint contact persons from each country for each priority.

Thus, the members of the joint working group represent a network of expert and organisation willing to be a driving force In Europe regarding the standardisation in the field on the energy management.

The present final report was presented to the European Commission, strengthening the relation with the European Commission being one of the objectives of the work.

Concerning the future work, the participants share the opinion that the concept of energy efficiency would require new ways of working and networks between TC, SC and WG in CEN and CENELEC to cope with relevant perspectives, approaches and issues. However, for efficiency purpose, the future work for immediate action (level A) should be allocated to the relevant existing CEN or CENELEC structure if any.

3 – Results of the work and recommendations to CEN and CENELEC Technical Boards

The main result of the work is the identified priorities in standardisation for the coming years in the field of energy management and the collection of the state of the art for participating countries and on a European level. The priorities are listed in annex IV.

For each priority, a report was produced that covers the following aspects:

- Description of the subject
- Regulatory situation (Available legislation or under preparation at EU level and key aspects from national level)
- Actors (industrial sectors, European associations, ...)
- Identified standardisation work relevant to the subject : standardisation structure/body and purpose of standardisation
- Overall benefits / Impact on energy management
- Proposals for future work
- Level of priority
 - A – for immediate action;
 - B - that need further investigation or research before standardisation could be done;
 - C - that need to be discussed in the context of a strategic and holistic view, i.e. policy questions.

The complete reports for each priority are given in annex VI. A summary of all proposals are given in annex VII.

Based on these results, the WG recommends to CEN and CENELEC Technical Boards to organise the programming of the future work and to take the necessary measures to establish standards or alternative deliverables (TS, TR, ...) for proposals for immediate action (level A) either by extending the work of the existing CEN/CENELEC bodies (TC, SC, WG, ...) or by establishing a dedicated body (a new CEN or CENELEC body as appropriate). For that purpose, CEN and CENELEC BTs should ask the identified structure/bodies to consider whether they would agree to develop the proposed deliverable and report back to BTs. For all the topics with no identified body, CEN and CENELEC BTs

should invite the BT members to submit an application for each proposed new work to CEN and CENELEC central secretariat bearing in mind that some members have already submitted an application to the CEN/CLC BT JWG Energy management secretariat mentioned in table 1.

The WG recommends also to maintain and enlarge the network of partners created during this work in a flexible way, in particular for initiating further investigation and for evaluating whether further standardisation work should be needed for items identified as level B or C and for maintaining the exchange of information, experience and prospecting especially on the initiatives in course in the different countries or at European level.

The WG has finalised its work and the WG recommends to CEN and CENELEC Technical Boards to disband the group.

ANNEXES

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Deliverables

ANNEX I – Composition of the group

P *	I *	Name	Country	Organisation - email
P		Jean-Louis PLAZY	Chairman	ADEME email : jean-louis.plazy@ademe.fr
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P		Robert ANGIOLETTI	France	ADEME email : robert.angioletti@ademe.fr
	I	Alain ANGLADE	France	ADEME email : alain.anglade@ademe.fr
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*

P – Expert having taken part to the debates

I – Expert having received the whole documentation

ANNEX II – Terms of reference

1. Scope

In CEN/CENELEC, BT/JWG "Energy management" is designed to initiate a European collective view of the general strategy for improvement of energy efficiency standardisation and to set an agreement between all CEN/CENELEC members on the objectives to achieve.

Note 1 In principle, the scope is very large and covers production, conversion, distribution and consumption of energy.

Note 2 The field of activities comprises products, systems and services.

2. Objectives and partnership of the CEN/CENELEC BTJWG “Energy management”

Back ground

We are facing a new context with deep evolutions and many challenges:

- KYOTO commitments on green house effect reduction,
- Security of supply for European Union and all Member States,
- Market liberalisation which will create a European energy market in-depth modification.

All these challenges are widely linked to energy management and, more particularly, the improvement of energy efficiency.

Managing energy consumption is therefore essential for sustainable energy development in Europe and is decisive for:

- long term supply capacity,
- strategic freedom,
- European economic independence,
- preserving the environment: saving energy which no longer emits local pollutant or green house gases.

Number of either National or European energy policies are going on to face them or are in preparation phases.

But we need tools to achieve energy management, energy efficiency and CO₂ emission reductions, and to launch efficient energy policies.

Standardisation is a central instrument to achieve energy management.

Objectives and partnership of the CEN/CENELEC BTJWG “Energy management”

BT/JWG "Energy management" acts as an advisory group to CEN/CENELEC BT on all political and strategic matters related to standardisation in the field of energy efficiency.

This Group aims primarily at:

- delineating a European standardisation strategy for improvement of energy efficiency to be approved by BT,
- strengthening the relation with the European Commission;
- allowing CEN/CENELEC members to express their views on the current national situation and on the foreseeable impact of the European standardisation;
- identifying new standardisation fields of activity, corresponding to market needs and regulation needs; this means identification of trends and opportunities, updating of existing standards and supply of tools to seek out the needs that have not yet been covered by normative documents;
- consider international programme on this field and actions undertaken under the fifth RTD Framework Programme and other multi-year research-related programmes (SAVE, ALTENER, etc.);
- proposing CEN/CENELEC BTs possible means for complementing the standard corpus.

CEN/CLC Group will pay attention not to duplicate work already carried out in other structures. It would not replace any existing CEN/CENELEC TCs and other bodies but would express the will of the joint partners to be a driving force in Europe, to provide elements of clarification to the national and European commitments and to act as a key player in the standardisation world.

Even if improvement of energy efficiency has an important role for the preservation of the environment, since the energy saved does not give off any local contaminants, or any greenhouse effect gases, the proposed approach has its own justifications which support the current initiatives concerning the environment, in particular those under the responsibility of the Environmental Help Desk (EHD) or of the Strategic Advisory Board on the Environment (SABE), CENELEC BT WG 85-3 and other relevant groups in CEN and CENELEC. The group should work closely with CEN Sector Fora and other relevant group in CEN and CENELEC. The participation of ETSI is also recommended.

ANNEX III – Main documents circulated to the working group members

N°	Title	Source	Date	Action
CEN/CLC BT WG EM079	Feed back on Report from CEN/CENELEC BT/WG "Energy Management" by CEN Committees	CEM Management Center (CMC)	2005-01-04	D
CEN/CLC BT WG EM078	Minutes of the sixth meeting of the CEN/CLC BT/JWG on Energy management (December 1, 2004, Paris)	Secretariat	2005-01-10	R
CEN/CLC BT WG EM067	Draft agenda for the sixth meeting - Paris - 1 December 2004	Secretariat	2004-11-12	R
CEN/CLC BT WG EM066	Consultation of the chairman/secretaries of TC/SC/WG/TF of CEN and CLC - TG/SC/WG/TF invited to give advice and comments on a given priority before the 12th November 2004	CMC and CLC CS	2004-10-14	C
CEN/CLC BT WG EM065	Report to CEN and CENELEC BT following the fifth meeting of the CEN/CLC BT/JWG on Energy management - Revised version	Secretariat	2004-10-14	I
CEN/CLC BT WG EM064	Priorities - List of the priorities, project leaders for each priority and reference of the report	Secretariat	2004-07-01	C
CEN/CLC BT WG EM063	Mandate M/341 - Mandate to CEN/CENELEC/ETSI for Programming of Standardisation work in the field of Eco-design of Energy using Products (EuP)	CEN BT	2004-07-01	I
CEN/CLC BT WG EM056	Minutes of the fifth meeting of the CEN/CLC BT/JWG on Energy management (May 26, 2004, Paris)	Secretariat	2004-07-01	R
CEN/CLC BT WG EM055	Mandate M/341 - Mandate to CEN/CENELEC/ETSI for programming of standardisation work in the field of Eco-design of Energy using Products (EuP)	CEN and CENELEC BT	2004-05-25	D
CEN/CLC BT WG EM054	Resolution BT C21/2004 on mandate M/343 - Energy performance of buildings	CEN BT	2004-05-25	D
CEN/CLC BT WG EM049	Priorities	Secretariat	2004-05-18	I
CEN/CLC BT WG EM039	A review of global capacity estimates for the geological storage of carbone dioxide	Mr Inge Pierre	2004-05-03	I
CEN/CLC BT WG EM038	The European renewable Electricity certificate trading project	Mr Inge Pierre - Project leader	2004-05-03	I
CEN/CLC BT WG EM037	Market Mechanisms for Supporting Renewable Energies : Tradable RES Certificates	Mr Inge Pierre - Project leader	2004-05-03	I
CEN/CLC BT WG EM034	Action plan for the survey of priority list for Production, distribution and conversion of Energy	Mr Inge Pierre - Project leader	2004-05-03	R
CEN/CLC BT WG EM033	Draft agenda of the meeting - Paris – 26 May 2004	Secretariat	2004-04-30	R

CEN/CLC BT WG EM032	Mandate M/341 - Mandate to CEN/CENELEC/ETSI for programming of standardisation work in the field of Eco-design of Energy using Products (EuP)	CEN/CENELEC	2004-03-11	R
CEN/CLC BT WG EM031	Summary note	Secretariat	2004-03-11	R
CEN/CLC BT WG EM030	Appointment of project leaders on each priority	Secretariat	2004-03-10	C
CEN/CLC BT WG EM029	Market Development of Alternative Fuels - Report 2003 of the Alternative fuels contact Group	Working Group of the European Commission	2004-02-05	I
CEN/CLC BT WG EM028	Business plan of CEN/BT/WG 149 Liquid and gaseous alternative fuels (Document N3Rev2)	CEN/BT/WG 149	2004-02-05	I
CEN/CLC BT WG EM027	"The transport Business - What can standardisation contribute ?" Circular n° 16/03 of NORM APME	NORMAPME	2004-02-05	I
CEN/CLC BT WG EM026	Proposal for a directive of the European parliament and of the council on energy end-use efficiency and energy services	European Commission	2004-01-23	I
CEN/CLC BT WG EM025	Proposal for a mandate for Eco-design requirements of energy-using products	European Commission	2004-01-23	I
CEN/CLC BT WG EM024	Proposal for a mandate for energy performance of buildings	European Commission	2004-01-23	I
CEN/CLC BT WG EM023	Minutes of the fourth meeting of the CEN/CLC BT/JWG on Energy management (January 22, 2004, Brussels)	Secretariat	2004-01-23	R
CEN/CLC BT WG EM022	French comments on Swedish proposal	French delegation	2004-01-19	D
CEN/CLC BT WG EM021	German comments on Swedish proposal	Germany	2004-01-13	D
CEN/CLC BT WG EM020	Proposal for Sweden	Sweden	2003-12-23	D
CEN/CLC BT WG EM019	The situation at the European level	Secretariat	2003-12-22	D
CEN/CLC BT WG EM018	Draft agenda of the next meeting - Brussels - 22 January 2004	Secretariat	2004-01-19	R
CEN/CLC BT WG EM017	Report to CEN and CENELEC BT of the third meeting of the CEN/CLC BT/JWG on Energy management	Secretariat	2003-02-26	I
CEN/CLC BT WG EM016	Minutes of the third meeting of the CEN/CLC BT/JWG on Energy management (February 5, 2003, Brussels)	Secretariat	2003-03-13	R
CEN/CLC BT WG EM015	Contributions received from CEN/CLC members following the second meeting	Secretariat	2003-01-01	D
CEN/CLC BT WG EM014	Draft agenda for the third meeting	Secretariat	2003-01-01	R
CEN/CLC BT WG EM013	Terms of reference	Secretariat	2002-10-03	I
CEN/CLC BT WG EM012	Minutes of the second meeting of the CEN/CLC BT/JWG on Energy management (September 20, 2002, Brussels)	Secrétariat	2002-10-03	R

CEN/CLC BT WG EM011	Draft agenda for the second meeting	Secretariat	2002-07-31	R
CEN/CLC BT WG EM010	Contribution of the CEN/CENELEC members	Secretariat	2002-07-31	I
CEN/CLC BT WG EM009	Report to CEN and CENELEC BT of the first meeting of the CEN/CLC BT/JWG on Energy management	Secretariat	2002-07-17	I
CEN/CLC BT WG EM008	Contribution form for CEN and CENELEC members	Secretariat	2002-06-03	I
CEN/CLC BT WG EM007	Minutes of the first meeting of the CEN/CLC BT/JWG on Energy management (March 28, 2002, Brussels)	Secretariat	2002-05-07	R
CEN/CLC BT WG EM001	Draft agenda for the first meeting	Secretariat	2002-03-01	R

* A = Action; C = Comments; V = Vote; I = Information; R = Meeting; D = Debate.

ANNEX IV – List of the priorities and the project leaders

<p>Priority 1 Tools for energy performance in building Prof. Livio De Santoli</p>
<p>Priority 2 Harmonisation of Declaration environmental impact of energy use in building area Valery Laurent</p>
<p>Priority 3 Allocation of energy use. Merged with priority 6 and 21</p>
<p>Priority 4 Air conditioning especially in commercial buildings with the health aspect Robert Angioletti</p>
<p>Priority 5 Benchmarking in industry</p>
<p>Priority 6 Goods transportation on road and intermodal modes Goran Rosenberg</p>
<p>Priority 7 Transport : control of emission. Merged with priority 6.</p>
<p>Priority 8 Alternative fuels Inge PIERRE</p>
<p>Priority 9 Standardisation of energy system for tomorrow Inge PIERRE</p>
<p>Priority 10 Green certificates Inge PIERRE</p>
<p>Priority 11 CO2 capture and storage Inge PIERRE</p>
<p>Priority 12 Quality assurance for system. Merged with priority 19.</p>
<p>Priority 13 Harmonisation of standards taking into account new European Members States in use in building industries and production area. Merged with priority 1.</p>
<p>Priority 14 CO2 emissions trading directive, measurement of energy use, end-use product Mario de Renzio</p>
<p>Priority 15 Energy efficiency and saving calculation Mario de Renzio</p>
<p>Priority 16 Energy Service Companies (ESCO) definition: requirements and qualification procedure Mario de Renzio</p>
<p>Priority 17 Energy managers and experts: roles, professional requirements and qualification procedure Mario de Renzio</p>
<p>Priority 18 Eco-design requirements for energy using products Nouredine Hakimi - CMC</p>

Priority 19 Energy management system Mario de Renzio
Priority 20 White certificates Mario de Renzio
Priority 21 Communication on Energy load and tariff management Rosario Cortina

ANNEX V – Relevant structure existing in CEN/CLC/ETSI on a given priority

Priority	Relevant structure existing in CEN/CLC/ETSI
1. Tools for energy performance in building Project leader : Prof. Livio De Santoli – Italy Email : livio.desantoli@uniroma1.it Liaison with EPBD project group : Bruno ZIEGLER – France Email : bruno.ziegler@edf.fr	CEN/TC 89, 'Thermal performance of buildings and building components' CEN/TC 156, 'Ventilation for buildings' CEN/TC 169, 'Light and lighting' CEN/TC 228, 'Heating systems in buildings' CEN/TC 247, 'Controls for mechanical building services'; CEN BT WG 173 EPBD project group
2. Harmonisation of Declaration environmental impact of energy use in building area Project leader : Valery Laurent – France Email : valery.laurent@afnor.fr	CEN BTWG 174 "Integrated Environmental performance of Building" CEN BT WG 173 EPBD project group and CEN/TCs systems (TC 89, TC 228, TC 247, TC 169, TC 156) CEN/CSNPE ISO/TC 59/SC17 and ISO/TC 207
4. Air conditioning especially in commercial buildings with the health aspect Project leader : Robert Angioletti – France Email : robert.angioletti@ademe.fr <i>Share the coordination with</i> Prof. Livio De Santoli - Italy Email : livio.desantoli@uniroma1.it	CLC/TC 61 : Household and similar electrical appliances ISO/TC 86 : Cooling and Air-conditioning CEN/TC 89 : Thermal performance of buildings and buildings components, specially WG 6 CEN/TC 113 : Heat-pumps and air-conditioners CEN/TC 156 : Ventilation for buildings (specially WG 7 ?) CEN/TC 182 : Refrigerating systems, safety and environmental requirements CEN/TC 195 : Air filter for air cleanness CEN/TC 299 : Gas-fired sorption appliances and domestic gas-fired washing and drying appliances.
6. Goods transportation on road and intermodal modes Project leader : Goran ROSENBERG - Sweden Email : goran.rosenberg@akeri.se	CEN/TC 320 "Transport - Logistics and services" ISO/TC 22 "Road vehicles"
8. Alternative fuels Project leader : Inge PIERRE - Sweden Email : inge.pierre@svenskenergi.se	CEN/BT WG 149

<p>9. Standardisation of energy system for tomorrow Project leader : Inge PIERRE - Sweden Email : inge.pierre@svenskenergi.se</p>	<p>CLC/TC 8X "Systems aspects for electrical energy supply" CEN/TC 312 "Thermal solar systems and components" CLC/TC 82 "Solar photovoltaic energy systems" CLC/TC 88 "Wind turbines" Fuel cell technologies, CLC/SR 105, Combined Heat and Power (CHP) - CEN/CENELEC Workshop on 'Manual for Calculating Combined Heat and Power (CHP) CLC/TC 2 Rotating machinery, CLC/TC 20 Electric Cables</p>
<p>10. Green certificates Project leader : Inge PIERRE - Sweden Email : inge.pierre@svenskenergi.se</p>	
<p>11. CO₂ capture and storage Project leader : Inge PIERRE – Sweden Email : inge.pierre@svenskenergi.se</p>	<p>CEN/TC 234 "Gas supply" for EN 1918-1 for storage of gas</p>
<p>14. CO₂ emissions trading directive, measurement of energy use, end-use product Project leader : Mario de Renzio - Italy Email: derenzio.firemi@iol.it</p>	<p>ISO/TC 207/WG 5 "Climate change"</p>
<p>15. Energy efficiency and saving calculation Project leader : Mario de Renzio - Italy Email: derenzio.firemi@iol.it</p>	
<p>16. Energy Service Companies (ESCO) definition: requirements and qualification procedure Project leader : Mario de Renzio - Italy Email: derenzio.firemi@iol.it</p>	
<p>17. Energy managers and experts: roles, professional requirements and qualification procedure Project leader : Mario de Renzio - Italy Email: derenzio.firemi@iol.it <i>Share the coordination with: Robert Angioletti – France email : robert.angioletti@ademe.fr</i></p>	
<p>18. Eco-design requirements for energy using products Project leader : Nouredine HAKIMI - CMC Email: : nouredine.hakimi@cenorm.be</p>	
<p>19. Energy management systems Project leader : Mario de Renzio - Italy Email: derenzio.firemi@iol.it</p>	

<p>20. White certificates Project leader : Mario de Renzio - Italy Email: derenzio.firemi@iol.it <i>Share the coordination with Robert Angioletti – France Email : robert.angioletti@ademe.fr</i></p>	
<p>21. Communication on Electrical load and tariff management Project leader : Rosario Cortina – Italy Email: corina@ceiuni.it <i>Share the coordination with Didier George – France email : dq@ute.asso.fr</i></p>	<p>CLC/TC 8X CLC/TC 205 CLC/TC 13 and CLC/TC 57 TC 59X</p>

ANNEX VI – Reports for the priorities

Tools for energy performance in building (Priority n°1)

Proposals for future work:

Promotion of the CEN standards at the ISO level

To finish the work with the present work items of CEN Mandate 343. To carry on with the expected future need for further development of these standards/work items. To initiate standards covering more heat and cool generation utilities, covering more/future system levels than are identified today.

Level of priority:

Level A. Most of the proposals are already engaged within CEN BTWG 173

Description of the subject:

One important function of a building is to provide a comfortable and healthy environment for its occupants, the attainment of which generally requires the use of energy for heating and/or cooling and for ventilation, domestic hot water, and lighting. The use of energy for these purposes exploits natural energy resources in competition with other energy needs and also causes environmental impact. Attention is also paid to the generation of CO₂ by the use of this energy. Directive 2002/91/EC on the energy performance of buildings (EPBD) requires several different measures and tools to achieve the prudent and rational use of energy resources and to reduce the environmental impact of the energy use for buildings.

These objectives are to be achieved by increasing energy efficiency and the enhanced use of renewable energies in both new and existing buildings. One tool for this will be the application by Member States of minimum requirements on the energy performance of new buildings and for large existing buildings that are subject to major renovation (Articles 4, 5 and 6). Other tools will be energy certification of buildings (Article 7) and inspection of boilers and air-conditioning systems (Articles 8 and 9). A basic requirement for the measures in Articles 4, 5 and 6 is the existence of a general framework for a methodology for calculation of the integrated energy performance of buildings, as set out in Article 3 and in the Annex to the Directive. Access to such a calculation methodology in the form of European standards will make it possible to harmonize the various measures for improving the energy efficiency in buildings between the Member States. It will increase the accessibility, transparency and objectivity of the energy performance assessment in the Member States, as mentioned in article (10) of EPBD. The use of European standards for calculating energy performance, as well as for energy performance certification and the inspection of boilers and air-conditioning systems will also reduce costs compared to developing separate standards at national level. The standards should be flexible enough to allow for necessary national and regional differentiation.

Beginning 2003 the European Commission decided to support Directive 2002/91/EC Energy performance of buildings with an appropriate mandate and a set of related standards.

End 2004, about 30 standards ready to be sent for public CEN enquiry in accordance with Mandate M/343.

Regulatory situation (Available legislation or under preparation at EU level and key aspects from national level)

Directive 2002/91/EC on the energy performance of buildings (EPBD)

Actors (industrial sectors, European associations, ...)

Research Institutes, Universities, Energy Agencies or equivalent., Industries

Identified standardisation work relevant to the subject : standardisation structure and purpose of standardisation

CEN/TC 89, "Thermal performance of buildings and building components"

CEN/TC 156, 'Ventilation for buildings'

CEN/TC 169, 'Light and lighting'

CEN/TC 228, 'Heating systems in buildings'

CEN/TC 247, Building Automation, Control and building Management;

CEN BTWG 173 EPBD project group

ISO TC 205, 'Building environment design'

ISO TC 163, 'Thermal performance and energy use in the built environment'

Overall benefits / Impact on energy management:

Prepares standardised tools to address common background for implementing and carry through of the energy performance of Building directive in different member states and for building owners, facility managers, consultants, inspection companies, governments and agencies.

Gives information on energy consumption of buildings to customers

Major benefits attended for retrofitting in buildings

Harmonisation of declaration environmental impact of energy use in building area (Priority n°2)

Proposals for future work:

This priority needs to be further investigated.

Make an in-depth study of the state of the art. There are today several methodologies and databases, project results covering different parts of the building area and the normal energy carriers as district heating, electricity, oil, gas etc.

Level of priority:

Level A: CEN BTWG 174 to prepare a business plan with regard of mandate M340 on environmental performance of buildings

Description of the subject:

The environmental impact of energy use in building is being dealt with, on the technical side, within several CEN/TCs (e.g. TC 89, TC 228). The environmental impact is normally described in terms of CO₂ equivalents.

In ISO work about "sustainability in building", the following parameters/indicators are considered when making an assessment (at design, construction or refurbishment stage) :

- Primary energy use (kWh or MJ) and its reduction, mainly when non renewable
- Global warming and climate change potential

The management of the use of energy in buildings is also considered in several documents (ISO CD 21931, Work programme "EPD mandate" DG Enterprise, French standard NF P01-020-1, etc.) when talking about the general methodology to assess the environmental performance of buildings.

When making a decision related to the energy system or energy use of buildings, implies a need for a methodology/standard for declaration of the environmental impact. At different levels, either design or use of a building, the impact should be assessed and published to the decision making stakeholder. The Energy Performance of Building Directive and the suggested draft standards (WI 2/at the time being) implies work with primary energy factors to describe the environmental impact. At the same time there is no standardised way to calculate the impact. Also the indoor environmental issues should be taken into account, as was initiated by the 6FP research project *Intelligently designed buildings – Ideeb* (DG Tren). There are also a need for standardised methods to calculate the input values from of electrical power mixes, I e the European mix.

Available legislation or under preparation at EU level and key aspects from national level :

It seems there are no specific regulations existing in the different countries directly related to the environmental impact of energy use in buildings. At European level, the Directive 2002/91/CE brings the first regulatory framework and the DG environment strategy for an urban environment will probably deal with some energy related aspects (CO₂ emissions level, etc.). Directive 2002/91/EC on the energy performance of buildings is focusing on the environmental impact of the building sector by making the energy use transparent.

Mandate has been sent to CEN to prepare standards about information and declaration of environmental performance of buildings.

However it seems the International policy for CO₂ emission permits exchanges does not cover, for now, the building area.

Actors (industrial sectors, European associations, ...)

Research institutes, Universities, Industries, national Agencies and National Standardisation Organisations

Identified standardisation work relevant to the subject: standardisation structure and purpose of standardisation

CEN BTWG 174 as leader

Contribution from:

CEN Project Group EPBD (CEN BTWG 173) and CEN/TCs systems (TC 89, TC 228, TC 247, TC 169, TC 156)

CEN/CSNPE

ISO/TC 59/SC17 and ISO/TC 207

ISO/TC 205

ISO/TC 163

Air conditioning especially in commercial buildings with the health aspect (Priority n°4)

Proposals for further investigations :

The following actions or ideas could be considered for further investigations:

- To gather the existing data from the different TCs whose working fields are related to this topic.
 - About product certification:
 - To gather the existing elements from the European directives on energy efficiency labelling of air-conditioners and on the periodic technical visits.
 - About requirements on the building, the air-conditioning unit and its maintenance:
 - To discuss and validate if it is convenient to require mandatory conditions in commercial buildings for an air-conditioning systems to be installed. For instance: minimum level of insulation, presence of a sas with the outdoor, presence of solar protections, etc.
 - To discuss and validate if it is convenient to implement a standardised maximum temperature gap between indoor and outdoor for commercial buildings. Furthermore, the units could be controlled by a desired gap (with a maximum) and not by a desired temperature.
 - To verify that the maximum levels of pollutants, dust, particles, etc. imposed by the indoor air quality agencies are also relevant for air-conditioned area. Are there some worsening factors to consider in air-conditioned areas ?
 - To give some elements on the regulation systems and heat storage systems to encourage operators in reducing electrical consummation and/or power peaks.
 - About installation and maintenance:
 - To implement a minimum technical skill level for operators installing and/or controlling the air-conditioning system efficiency.
 - To implement a periodic technical visit of the air-conditioned commercial buildings (energy efficiency and health aspect should be checked) with the necessity to display the control certificate in the building for the public to be able to check.
 - To gather the best practices by craftsmen in order to promote quality of the installation and the maintenance.
 - About requirements for the end of life of the unit:
 - To install on the air-conditioners, a system (tank with a tap for instance) to confine the cooling fluids at the end of life for recycling.
 - To implement a system of "pay-in-advance" contract to be mandatory contracted directly at the air-conditioners purchaser, for the recycling of the cooling fluids at end of its life.

Level of priority :

The proposal is to consider this project as a **level A** one.

Description of the subject:

N.B.: a strategic group set up by AFNOR in 2003 on Energy also reported this subject. For information, an extract of the final report from this group is reported in annex 2.

In France, the very warm summer of 2003 and the subsequent very high increase of deaths by overheating (specially for the elderly) have highlighted a poor adaptation of the buildings to the problem of keeping an acceptable indoor temperature when the outdoor one is very high for a long period. The ultimate solution to increase the comfort in buildings, if all the other natural solutions are not

enough, can be to use air conditioning systems. In France, the market is already experiencing a high increase, especially for commercial buildings, where the comfort can be seen as strongly linked to the sales.

Nevertheless, air conditioning sets several environmental and health issues.

1) About the stakes in terms of energy consumption and greenhouse effect:

The systems used to increase the comfort in buildings are mainly electric powered. Their development could thus impact the electric grid. For instance, for the tertiary sector in France, an evaluation (based on CEREN data) of the energy consumption for year 2010, in the frame of a "business as usual" scenario, leads to a yearly energy consumption of 13 TWh. That is to say an increase of 30 % from 2002 to 2010 only for the tertiary sector.

Furthermore, the need for this electric power is concentrated at a period of the year when the electric production is less adapted to face a consumption peak (summer is traditionally the period of maintenance for generating plants, hot temperatures decrease the efficiency and the ampacity of generators and networks, etc).

Thus, an uncontrolled increase in air-conditioners could endanger the production and network capability of facing the demand (as experienced in summer 2003 in France) and the increase of the CO₂ emission linked to the energy consumption would feed the greenhouse effect (and thus lead to more demand of air-conditioning...) and be against the Kyoto protocol commitments. The problem is all the more highlighted when considering high-GWP cooling fluid losses in the atmosphere, that could further contribute to the global warming effect, feeding a dangerous cycle.

2) About the stakes in terms of health aspects :

Beyond energy efficiency, air conditioning can also be associated to the following topics in terms of health aspects :

- Temperature impact : The thermal shock that results in case of a too big gap (typically more than 7°C) between outdoor and indoor temperatures can generate some "mechanical" pains (vertebra, neck, etc) or respiratory ailments.
- Air humidity : The indoor atmosphere should be kept at a relative humidity between 30% and 60% to avoid problems of dehydration (specially for the elderly) and to permit sweating, very important for the body temperature control.
- Dust : The filters used in air conditioning units can accumulate dust and be responsible for rashes. They should be kept reasonably clean. Moreover, a check could be made on old units to look for "amianted" components.
- Noise : The acoustic level (both for indoor and outdoor) is to be limited to avoid noise induced stress and sleeping troubles.
- Sick building syndrome : This syndrome affects people working or living in air-conditioned buildings. Its causes are not well known and a serious study is needed. The consequences depend on the person, but are frequently related to difficulty of breathing, headache, etc.
- Allergy, infections : A few allergies or infective ailments are linked to the development of mildews or bacteria inside air conditioning systems. The most important one is legionella that can develop in cooling chimneys.

Knowing these different aspects, it appears that :

- the spreading of air-conditioning units should be limited for environmental reasons, when some satisfactory answers for indoor comfort can be found without the systematic use of air-conditioners.
- nevertheless, when air-conditioners are necessary, it is essential to give some tools to promote the development of energy efficient and safe units and also of their maintainability, considering their possible impact on health and environment.

Regulatory situation (Available legislation or under preparation at EU level and key aspects from national level) :

Regarding the efficiency of air-conditioning systems, a European directive (2002/31/CE dated 22 mars 2002) was issued to implement the marking of domestic air-conditioning systems with a refrigerating power of less than 12 kWf. The activation of this directive was postponed for a while due to difficulties to issue standard EN 14511-1. This standard is now available and the marking will be mandatory starting in January 2005.

For the maintainability of air-conditioners, the article 9 of the European directive on the Energy Efficiency of Buildings (2002/91/CE dated 16/12/2002) foresees the implementation of periodic technical inspections to verify the operating conditions of air-conditioners (> 12 kW) and also their conformity with the needs.

In France, regarding the alternative solutions to air-conditioning, the Thermal Regulation (RT 2000 & 2005 under preparation) gives some elements to limit the solar and internal thermal loads of the buildings in order to increase the comfort in summer. The RT 2005 is also going to implement a simple calculation method for the buildings engineers in order to allow them to dimension correctly the air-conditioning installations.

Actors (industrial sectors, European associations, ...) :

Several standardisation Technical Committees seem to have a work-in-progress related to the present subject:

– CLC/TC 61 : Household and similar electrical appliances

This TC works on household appliances including air-conditioners and heat pumps. It seems that it is more dedicated to security aspects (electric hazards) than to impacts on health.

– ISO/TC 86 : Cooling and Air-conditioning

This TC works on "short terms" security aspects (mechanical or electrical shocks). Apparently, "long term" health aspects are not considered.

– CEN/TC 89 : Thermal performance of buildings and buildings components

This TC is working on tools and calculation methods for the evaluation of the thermal behaviour of the buildings and its components.

– CEN/TC 110 : Heat exchangers

This TC is working on the definition of tests for the exchangers of air-conditioners. It could be concerned for the maintenance of the exchangers.

– CEN/TC 113 : Heat-pumps and air-conditioners

This TC is working on tests and minimum performances specification of heat pumps and air-conditioners.

– CEN/TC 156 : Ventilation for buildings (specially WG 7 ?)

This TC is working on the design criteria for the indoor environment. It is working in conjunction with ISO/TC 205 "building environment design"

– CEN/TC 182 : Refrigerating systems, safety and environmental requirements

This TC is working on security aspects of refrigerating systems, apparently including heat pumps.

– CEN/TC 195 : Air filter for air cleanness

This TC seems to be at the very beginning of its activities. Its aim is to develop tests methods for air filters used inside air-conditioners.

– CEN/TC 264 : Air quality

This TC is developing a method to evaluate the air quality, including inside buildings. It is working in conjunction with ISO/TC 146 "air quality". It is not working on the impacts of poor air quality but on the quality of measurements and information.

– CEN/TC 299 : Gas-fired sorption appliances and domestic gas-fired washing and drying

appliances.

This TC is working on equipments using sorption cycles, including air-conditioners and heat-pumps. It could be consulted to check if this type of equipment could have specific impact on health.

For the certification aspect, two elements are reported:

- Eurovent is a European certification company based on a voluntary adhesion of its members to submit their materials to tests. The purpose is to verify the conformity of the units to the performance announced by the constructor, to be able to guarantee to the users that the product is good and conforms to specification. The Eurovent certification label covers air-conditioners up to 100 kW.
- In Sweden, a certification organization (SP) covers the indoor environment of buildings and probably has proposals on the impact of air-conditioners on the quality of the indoor atmosphere. A system of classification, called Ventilation and Air-conditioning class, also enables them to classify the different systems, considering their efficiency.

Identified standardisation work relevant to the subject : standardisation structure and purpose of standardisation

A list of the different standards that may be useful for the project is given hereafter:

IEC & CENELEC standards:

- EN 60335-2-40:2003: Household and similar electrical appliances – safety – Part 2-40 : Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers
- EN 60335-2-88:2002: Household and similar electrical appliances – safety – Part 2-88 : Particular requirements for humidifiers intended for use with heating, ventilation or air-conditioning systems
- IEC 60335-2-104 (2004-01): Household and similar electrical appliances – safety – Part 2-104 : Particular requirements for appliances to recover and/or recycle refrigerant from air-conditioning and refrigeration equipments.

ISO standards :

- ISO 13253:1995 : Air-conditioners and heat pump air/air connected. Tests and determination of performance characteristics.
- ISO 13261-1 & -2 : 1998 : Determination of acoustic levels due to air-conditioners and air heat-pumps. Part 1 : external unit not connected. Part 2 : internal unit not connected
- ISO 5151:1994 : Air-conditioners and heat-pumps not connected. Tests and determination of performance characteristics.

CEN standards :

- NF EN 255 series : Heat pumps. Heat pump units with electrically driven compressors for heating or for heating and cooling.
- EN-378 1, 2 & 4 : Refrigerating systems and heat pumps – Safety and environmental requirements. This standards covers the complete system from its definition to its maintainability.
- EN 814 serie: Air-conditioners and heat pump with electrically driven compressors. Cooling mode.
- EN 1822 serie: High efficiency air filters
- NF EN 12055 : Liquid chilling packages and heat pumps with electrically driven compressors. Cooling mode.
- EN 12309 1 & 2 : Gas-fired absorption and adsorption air-conditioning and/or heat pump appliances with a net heat input not exceeding 70 kW.
- EN 14511 serie: Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling
- EN 13313 : Refrigerating systems and heat pumps – Competence of personnel. This standard is intended to develop the competence of persons designing, installing, operating & maintaining the

systems with regard to the health, safety, environmental protection and energy conservation aspects.

– EN 13779 : Ventilation for buildings – Performance requirements for ventilation and air-conditioning systems.

National reports:

Based on the national reports, the following standards or elements have also been noted. This is only a summary of what is reported in the reports and no further check of the relevance to the subject has been made. It only gives some trails that may be followed for the project.

- Swiss report:

- SIA V382-1 to 3 : Ventilation and air-conditioning : Determines the required technical performance for ventilation and air-conditioning.

- SIA 380/4 : It determines the electrical needs of a building in matter of lighting, air-conditioning and ventilation.

According to the Swiss report, no standards exists with regard to buildings dedicated to economic activity.

- Sweden report:

- SS 2648 : Air-conditioning plants – Pattern for preparation of operating instructions.

- Sweden has developed some guides and methods to promote energy efficient equipment and systems. For instance, there is a suggested maximum specific comfort cooling load due to office equipment, lighting and solar load.

- SS 62 77 50 : Energy Management Systems specification. The purpose of this standard is to promote and develop the technical skills , to secure the optimal operation of systems with regard to energy efficiency.

- Italian report:

- A ministerial decree was issued on 02/01/2003 in order to implement the European directive on the energy labelling of households air-conditioners.

- UNI 10963-2001 (national basis) : Air-conditioners, liquid chilling packages and heat pumps – Performance tests at partial loads. This standard consists in a test method to determine the efficiency of the systems working at partial loads.

- Suggestion to base the standardisation effort regarding air-conditioning on the ASHRAE standards. (ASHRAE = American Society of Heating, Refrigerating & Air-conditioning Engineers www.ashrae.org)

- Austria report:

- OENORM H 6000-3 : Ventilation and air-conditioning plants : basic rules, hygienic and physiological requirements for the environment of persons → This standard could be useful for the present project.

- OENORM H 6016 Ventilation and air-conditioning plants : leakage of components.

- Denmark report :

- DS 447:1981 Code of practice for ventilation installations (under revision to be aligned with European standards) : A set of requirements which aims to secure a technically and hygienic sound arrangement, design and execution of ventilating plants.

- German report :

- DIN 1946-2 : Ventilation and air-conditioning : technical health requirements. Specification of the needs of ventilation and/or air-conditioning with regard to the comfort of persons.

- WI DIN 1946-6 : Ventilation and air-conditioning – Part 6 : Ventilation for residential buildings ; requirements, performance, acceptance. This project of standard specifies requirements

for the natural and mechanical ventilation for residential buildings with regard to health and constructional aspects → This standard could be useful for the present project.

Overall benefits / Impact on energy management :

Based on the preceding elements, it appears that there is very little works ongoing on the topic of air-conditioning energy efficiency and health aspect standardisation. Nevertheless, this is of a very great importance because the market is growing quickly and the impact on environment and energy consumption will be very important. In France, only for the tertiary sector, the growth in electrical consumption from 2002 to 2010 is expected to be of 30 % if no measures are taken.

Furthermore, the market is growing, particularly in commercial buildings where it is seen as a tool for good production efficiency. Air-conditioners constructors are indeed reporting up to 10% of productivity increase and 50% of turnover increase. In these commercial buildings where a lot of people can pass through, it is very important to consider the health aspect, as air-conditioners can have a bad impact on them.

Thus, it is important to control and, at least, to monitor the development of air-conditioning in EU. This project could be the first step by focusing on the commercial buildings where the market is growing the faster.

Annex 1 to priority 4

Proposal on priority n°4 for standardisation bodies

Priority	Standardisation fields proposal	Stakeholders	Relevant committee	Target	Stakes
a) Building design considering the reduction of air-conditioning needs. <u>Level of priority</u> : A	Guideline	DGTREN, National regulations and policy makers	CEN/TC 89 CEN/TC 156	Architect, design team, master builder	Thermal loads √ → Energy consumption and CO ₂ emission √
b) Retrofit of existing building considering the reduction of air-conditioning needs. <u>Level of priority</u> : A	Guideline	DGTREN, National regulations and policy makers	CEN/TC 89 CEN/TC 156	Architect, design team, master builder	Thermal loads √ → Energy consumption and CO ₂ emission √
c) Standard implementing a minimum performance for air-conditioners <u>Level of priority</u> : A	Standard	Air-conditioners manufacturers, Eurovent	CEN/TC 113 CEN/TC 299	Design team, project owner	Energy consumption √ CO ₂ emission √
d) Improving technical skill of craftsmen (installation and maintenance) <u>Level of priority</u> : A	Guideline	Air-conditioner professional unions, health association	CEN/TC 113 CEN/TC 182	Air-conditioner craftsmen	Quality ↗ Energy consumption √ CO ₂ emission √ Fluid losses √ Health impact √ Lifetime ↗
e) Calculation method of energy consumption and energy saving <u>Level of priority</u> : A	Standard	Air-conditioner professional unions and manufacturers	CEN/TC 89 CEN/TC 113 CEN/TC 299	Design team, Air-conditioner craftsmen and manufacturers	Adequation to the need ↗ → Energy consumption √ CO ₂ emission √
f) Developing air-conditioners energy audit methodology (mandatory in EPBD) <u>Level of priority</u> : A	Standard	DGTREN, National regulations and policy makers	CEN/TC 113 CEN/TC 156	Air-conditioner craftsmen, building owner, audit companies	Energy consumption √ CO ₂ emission √
g) Qualification scheme for independent	Guideline	DGTREN,	CEN/TC 113	Audit companies	Energy consumption √

controller of air-conditioning systems (mandatory in EPBD) <u>Level of priority</u> : A		National regulations and policy makers	CEN/TC 156		CO2 emission ↘ Fluid losses ↘ Health impact ↘ Lifetime ↗
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Annex 2 of priority 4

Extract of the final report of a strategic group set up by AFNOR in 2003 on Energy regarding the topic "Air conditioning especially in commercial buildings with the health aspect" that was identified as an emerging one. This document is translated from French to English hereafter.

Air-conditioning in commercial buildings with the health aspect

Issue description:

The extreme heat wave conditions experienced during summer 2003 have dramatically put at fault the main function of buildings which is to provide a shelter and a thermal comfort for its inhabitants. This has set a major sanitary crisis. Without concluding that these phenomena are the results of the climatic change, they nevertheless enable to foresee the consequences expected by scientists. They also highlight several consequences linked to the change of our way of living and habitation, with for instance the concentration of built-up areas, the poor, or even no consideration of the buildings adequacy for the local climatic conditions, the high price of accommodation leading to smaller apartments, not travelling and uncomfortable during summer...

Faced with these stakes, it is necessary to react by proposing evolutionary possibilities of conduct, buildings and building rules with regard to climatic phenomena. The purpose being to ensure inhabitants ' security and comfort without increasing or at least limiting the environmental impacts.

Discussion – Problems – Stakes:

The current market of air-conditioning is mainly focussed on the tertiary sector with about 171 millions square meters of air-conditioned area in 2002 (CEREN data), almost evenly distributed between new and existing buildings. The energy consumption of air-conditioning for the tertiary sector is around 10 TWh to be compared with a yearly energy consumption of 77 TWh for this sector. This is a low value. However, the development potential is considered very high with a progression rate above 10% per year. It can be foreseen, with the noted effects of summer 2003 heat wave, this spreading rate will increase considerably in the years to come. A quick evaluation of the air-conditioned area and corresponding energy consumption for year 2010, in the frame of a "business as usual" scenario, leads to 350 millions square meters of air-conditioned area and a yearly energy consumption of 13 TWh.

Heat wave periods have another energy consequence directly linked to the electrical system operating conditions, that must face simultaneously, the power needs from air-conditioning systems, ventilation appliances, and domestic and professional cooling appliances. These systems are needed simultaneously, while at the same time, the electricity generating plants must slow down for yearly maintenance reasons (periodic maintenance), operating conditions security (regulation and operation monitoring tools temperature limit), environmental impact (maximum temperature for the cooling water of the generating plants rejected in rivers), and while also the hydraulic generated electricity production can decrease considerably due to a low pluviometry and a high evaporation.

Moreover, the environmental stakes of air-conditioning, in terms of greenhouse effect, are high due to the cooling fluids losses in the atmosphere. The greenhouse effect gas emissions are currently evaluated to 2.6 million CO₂ equivalent tonnes. They were evaluated, prior to summer 2003, at 3 million CO₂ equivalent tonnes in 2010, based on a total sales increase of 20 % for the last 10 years. These emissions represent around 8% of the current emission of greenhouse effect gas of all the tertiary sector buildings together. Let's remember that the national objectives for the fight against the climatic change have been set by the State to : for the short term, to recover in 2010 the emission level of greenhouse effect gas existing in 1990 ;and for the long term, to divide by 4 or 5 the French greenhouse effect gas emissions by 2050.

Finally, in the field of air pollution, the heat wave resulted in an increase of the rate of pollutants in air (Ozone, NO₂, suspended particles, sulphur,...) and resulted in an increase of the salting-out of volatile organic component by desorption in the indoor air. Undergoing studies aim at evaluating the impact directly linked to this pollution during the extreme heat wave of august 2003. Indeed, if

currently, the impact of heat on the increase of pollutants rate in indoor atmospheres is widely demonstrated, very few studies enable us to evaluate truly the epidemiological consequences of a long exposure of people to high rate of pollutants. Let's remember that summer 2003 has beaten records in the field of ozone pollution, and this is in every major city of France.

It seems thus necessary :

- first, to limit the spreading of air-conditioning systems for environmental reasons, by providing some answers enabling us to satisfy the inhabitants without the systematic use of air-conditioners.
- and secondly, for buildings where this equipment could be essential (hospitals, old people's homes,...) to provide decision-making aid tools to builders, in order to direct their choice toward systems of quality, energetically and environmentally efficient, and by removing every risk of negative impacts on health.

The answers to limit the heat waves ' effects have first to be modulated to avoid any systematic use of air-conditioning, whose energetic and environmental impacts would be against the national objectives of fight against climatic change.

Furthermore, air-conditioning systems need a regular follow-up because failures can occur when maintenance is neglected, leading to dissatisfactions and even, illnesses for the inhabitants of the buildings concerned.

Article 9 of the European directive on the energy efficiency of buildings, that implements a periodic check of air-conditioning systems of more than 12 kW, considers this constraint.

The undergoing work on the commissioning of climatic appliances also aims for progress in this field.

Facts, information, factors & figures; actors :

Elements (related to the standardisation topic) from the proposition "working plan on summer comfort, aiming to limit the energetic and environmental impacts of buildings equipment with air-conditioning, as a follow-up of the August 2003 heat wave", proposed by ADEME and CSTB, and validated by DGEMP, DGUHC and MIES :

➤ Tests campaign and measurements campaign

- Test campaigns performed in laboratory to determine the performances of fixed and mobile air-conditioners ;
- Measurement campaigns on building equipped by the Indoor Air Quality Observatory to determine the links between outdoor temperature and indoor pollutant levels.

➤ Regulatory or inciting actions :

- Design of a "summer comfort" diagnostic tool for air-conditioned or to be air-conditioned buildings and support to these decision-making aid studies ;
- Translation of the European directive on the energy efficiency of buildings in terms of requirements, first for new buildings, and second, for already existing buildings ;
- Implementation of a very restrictive regulation that considers the passive cooling systems and focusing on maximum energy consumption for air-conditioned buildings in the frame of RT 2005 & 2010 ;
- Regulation of the minimum efficiency of air-conditioning systems ;
- Implementation, in the short term, of certifications qualifying energetically and functionality, the complete set of available solar masks, fans, air-conditioning and ventilation systems... ;
- Voluntary agreements with manufacturers and importers in order to remove from the market the less efficient air-conditioning systems ;
- Serious control and on a large scale, of the respect of the RT 2000 requirements in the field of summer comfort.

➤ Spreading actions :

- Support to a large expand of efficient and well-tried technical solutions (fixed or mobile solar masks, Provence wells, passive cooling systems, over-ventilation systems, beams, cooling floors and ceilings, reversible heat pumps with buried probes) ;
- Support to the expand of photo-voltaic systems, connected to the grid to limit the mid-day consumption peak during summer.

➤ Research and Development actions :

- Research and development of new technical solutions such as heat storage systems, variable properties glazing, active shells, passive air-conditioning, solar air-conditioning,... , in particular by the mean of the yearly tender ADEME-PUCA "Bâtiment 2010" ;
- Research and applications of new building design rules such as high inertia buildings, with ventilated double shell, with reflecting walls, with variable properties walls,..., by the means of demonstrative operations ;
- Research and development of energetic and environmental very high efficiency air-conditioning systems.

Structures where the topic is discussed / **Conclusion** of the discussions:

Work to be considered.

Benchmarking in industry (Priority n°5)

Proposals for future work:

A standardised method for benchmarking energy use and green house gas emissions would be valuable in order to increase energy efficiency and reduce climate change. Comparable indicators and standardised calculation methods should be developed. The method should be useable for all industry sectors and for all type of production at site level.

Level of priority:

Priority level A

Description of the subject:

Energy is an important resource used by industry. It is one of the main aspects in a sustainable society both from a resource perspective and from an environmental perspective. Therefore there is a need to monitor and report on all levels, global as well as local, from an industry sector as well as from a specific site.

Energy is of complex nature and there is no uniform and well-defined way to report use. Energy can be heat or electricity, renewable or non-renewable. Sometimes it is internally generated and sometimes purchased depending on which type of industry sector it is. There are even variations within an industry sector.

Energy saving and efficiency programmes are developed in many countries and most industries are involved in one or more way. Energy use must be monitored and the information is essential internally as well as in negotiations with authorities. Information is of use for increased energy efficiency, investment plans and policy makers.

All use of energy implies environmental impact; the most obvious and current is climate change caused by carbon dioxide from incineration of fossil fuels. From 1 January 2005 the EG emission trading has started. Some big industry sectors are involved in the trading. Benchmarking has been discussed as a basis for allocation of allowances for the period 2008-2012 according to the Kyoto Protocol. A tool for this does not exist.

Stakeholders (industrial sectors, European associations, ...)

Industry

Identified standardisation work relevant to the subject: standardisation structure and purpose of standardisation

Information from country reports:

Austria (2.1.3): "Benchmarking - In a number of Austria's provinces energy efficiency benchmarking projects have already been initiated. In a first step, industry branches are carefully analysed with a view to assessing their energy efficiency standards and potential for improvements. Based on this know-how, companies can compare their own performance against industry leaders and can derive valuable information on how to increase their energy efficiency."

Switzerland (2.1.3): "The Benchmarking Model: It calculates the improvement of specific energy (ratio of energy per unit of service) in an economic sector."

Overall benefits / Impact on energy management:

Benchmarking can be used to develop strategies for improvement of energy efficiency as well as for reductions of the emissions of green house gases in industry. A reliable and relevant methodology is however needed to get comparable results. A standard should contain indicators that could be sector specific or generic for all kinds of activities.

Goods transportation on road and intermodal modes (Priority n°6)

Proposals for future work :

6a. Initiating a strategic dialogue with relevant EU bodies to further identify the need of a CEN standardisation process to support the practical implementation of maximum total vehicle length (25,25 m) and total weight (60 tonnes). Level of priority C. CEN TC 320 would be the suitable platform for a future standardisation process.

6b. Initiating a strategic dialogue with relevant EU bodies to further identify needs of a CEN standardisation process to support a modified EU-Directive (2003/0056 COD). Level of priority C. CEN TC 320 would be a suitable platform for a future standardisation process.

6c. Initiating a standardisation process on Programs for Eco Driving including drivers training and fuel consumption monitoring and reporting. It would probably be the best solution to form a new WG for this standardisation process. There is no obvious CEN TC to administrate a relevant WG for this subject. Level of priority A.

6d. Initiating further investigation of the possibilities of turning into engine-fuel solutions based on renewable and non-polluting energy carriers including analysis on the need of standards to support development and implementation of new technologies. CEN/CLC JWG might be a relevant platform for administrating this further investigation and reviewing ongoing research and development. Level of priority B. This priority is strongly linked to priority No 8.

6e. Initiating a standardisation process on Programs for Energy Saving and CO2 Reduction for transports by truck. This subject of standardisation would require a new TC or WG. Level of priority A.

6f. Initiating further investigation and a dialogue with CEN TC 320 and Dr Rayner Mayer, Society Projects, UK ("Environmental footprints for vehicles" at the CEN/CENELEC/ETSI Conference in Brussels 3-4/11 2004) to identify the full scope of a future standardisation process on Methods for Calculation, Declaration and Reporting on Energy Efficiency and Environmental Performance in Transport Chains. There are no obvious TC:s or WG:s to deal with this subject and it would require cooperation with stakeholders from all transport modes. CEN/CLC JWG might be a relevant platform to initiate a relevant TC/WG and the necessary cooperation partners. Level of priority B.

6g. Initiating a standardisation process on Transport Logistics Programs (CAD). There are no obvious TC:s or WG:s to deal with this subject. CEN/CLC JWG might be a relevant platform to initiate a relevant TC and WG. Level of priority A.

6h. Initiating further investigation and cooperation between parties involved to clarify the possibilities to standardise Systems for Intermodal Cargo Exchange. CEN/CLC JWG might be the relevant forum for initiating further investigation and cooperation needed. Level of priority B.

6i. Initiating a standardisation process on Systems for Goods Tracking. CEN/CLC JWG might be the relevant forum for identifying a relevant standardisation body. Level of priority A.

6j. Initiating a process to develop Guidelines on Transport and Logistics Aspects of Energy Efficiency in Management Systems. CEN TC 320 might be the relevant forum for this subject. Level of priority A. This subject is linked to priority No 19.

6k. Initiating a process and cooperation between parties involved to develop a Guideline on Models for Mobility Management. No obvious forum identified for administrating this process. Level of priority A.

6l. Initiating further investigation of the possibilities to gather data and calculation models in various existing LCA Models and to develop a standardised model on transport and logistics. No obvious forum identified for administrating this investigation process. Level of priority B.

Description of the subject :

It is of utmost importance to identify improved ways of cooperation between parties involved in development and standardisation in the transport sector as a whole. BT would preferably initiate further cooperation based on a common goal for improved energy efficiency.

6a. Maximum vehicle length (25,25 m) and total weight (60 tonnes) for trucks.

6b. Optimized Intermodal Loading Units.

6c. Eco Driving Programs with Training and Fuel Consumption Monitoring/Reporting.

6d. Energy Efficiency in Truck Engines.

6e. Energy Saving and CO2 Reduction Programs for Transports by Truck.

6f. Methods for Calculation, Declaration and Reporting on Energy Efficiency and Environmental Performance in Transport Chains.

6g. Transport Logistics Programs (CAD).

6h. Systems for Intermodal Cargo Exchange.

6i. Systems for goods tracking.

6j. Transport and Logistics Aspects of Energy Management Systems.

6k. Mobility Management Model.

6l. LCA Model for Transport and Logistics.

Regulatory situation (Available legislation or under preparation at EU level and key aspects from national level)

6a. Sweden and Finland have legal requirements accepting 25,25 m total length and 60 tonnes total weight for trucks and Denmark is on its way to implementing equivalent national legislation. EU has been involved for many years in a process of evaluating and implementing equivalent legislation.

6b. Directive of the European Parliament and of the Council on Intermodal Loading Units (2003/0056 COD) have been proposing dimensions (length x height) on loading units that would decrease the loading possibilities on trucks and not fully use the truck capacity. There is no national legislation relevant to this subject.

6c. No legislation identified relevant for this subject.

6d. No legislation identified relevant for this subject.

6e. No legislation identified relevant to this subject.

6f. No legislation identified relevant to this subject.

6g. No legislation identified relevant to this subject.

6h. No legislation identified relevant to this subject.

6i. No legislation identified relevant to this subject.

6j. No legislation identified relevant to this subject.

6k. No legislation identified relevant to this subject.

6l. No legislation identified relevant to this subject.

Stakeholders (industrial sectors, European associations, ...)

6a. Truck manufacturers and the road haulage industry and transport services buyers in Europe would support and participate in the development of a CEN Standard on allowed maximum road vehicle length (25,25 m) and total weight (60 tonnes).

6b. Truck manufacturers, the road haulage industry and buyers of transport services would support a frame work EU-legislation allowing CEN Standards to solve the practical solutions on Intermodal

Loading Units. The same actors would participate in a standardisation process.

6c. The road haulage industry, buyers of transport services, national road admin/agencies, truck and private car manufacturers, drivers licensing/training providers and fuel distributors/producers would support and participate in a standardisation process.

6d. The road haulage industry, buyers of transport services, truck and private car manufacturers, national road admin/agencies, buyers of private cars and fuel distributors/producers would support and participate in a standardisation process.

6e. Governments, agencies and public opinion are demanding further energy efficiency and reduced emissions of CO₂ from the transport sector. Buyers of transport services, the road haulage industry, truck manufacturers, fuel producers/distributors, national agencies within the transport sector would support the standardisation of program activities on various levels of society.

6f. Road haulage industry and other transporting providers, buyers of transport services and government agencies would support the standardisation of Methods for Calculation, Declaration and Reporting on Energy Efficiency and Environmental Performance in Transport Chains.

6g. Transport services buyers, road haulage industry and other transporters, consultancy firms and CAD Program designers/producers would support a standardisation on Transport Logistics Programs (CAD).

6h. Transport services buyers, road haulage industry and other transporters and manufacturers of vehicles and equipments would support a standard on Systems for Intermodal Cargo Exchange.

6i. Transport services buyers, insurers, road haulage industry and other transporters, manufacturers of tracking equipment would support a standard on goods tracking.

6j. Road haulage industry, other transporters, transport services buyers and government agencies would support a specific standard on energy management in transports and logistics.

6k. Stakeholders within the transport sector, municipality planning, transport services buyers, public in general, manufacturers and designers of transport systems, vehicles, etc, government agencies, researchers would support a model standardisation process in the field of mobility management.

6l. Stakeholders within the transport sector, municipality planning, transport services buyers, public in general, manufacturers and designers of transport systems, vehicles, etc, government agencies, researchers would support a model standardisation process in the field of LCA Model for Transport and Logistics.

Identified standardisation work relevant to the subject : standardisation structure and purpose of standardisation

6a. No standards identified relevant for this subject.

6b. No standards identified relevant for this subject.

6c. No standards identified relevant for this subject.

6d. No standards identified relevant to this subject.

6e. No standards identified relevant to this subject.

6f. No standards identified relevant to this subject.

6g. No standards identified relevant to this subject.

6h. No standards identified relevant for this subject.

6i. No standards identified relevant for this subject.

6j. Some national standards exist on Energy Management Systems in general. No specific standard exists on energy management in transport and logistics.

6k. No standards identified relevant for this subject.

6l. EU Model for LCA on Transport Chains would form a basis for further standardisation.

Overall benefits / Impact on energy management:

6a. The total loading capacity for road transport in Europe would increase by approximately 40 % without increasing the number of vehicles on the roads. The increasing need of road transports to support further economical development in EU would be satisfied without excessive costs. Congestion problems would be reduced and fuel consumption and environmental impacts would be minimized. Costs for implementing a standard or legislation on allowed maximum road vehicle length (25,25 m) and weight (60 tonnes) would be very low in comparison to the overall and long term economical and environmental benefits for Europe.

6b. A relevant CEN-standard on Intermodal Loading Units allowing optimised usage of truck loading capacity and of railroad wagons loading capacity would strongly support energy efficiency and environmental protection in terms of reduced transport costs, reduced road and railroad congestion, reduced emissions of air pollutants, reduced consumption of fuels and electricity, etc.

6c. A relevant CEN-standard on programs for "eco-driving" and fuel consumption monitoring would support further implementation of "eco-driving" in Europe and lower transport costs, less fuel consumption, less emissions of air pollutants and less traffic accidents.

6d. Truck and car engines are very efficient in using conventional fossil- based fuels. The overall and long term need to find engine-fuel solutions based on renewable energy carrier would increase the overall energy efficiency in road transport. A standardised set of parameters and models for evaluating engine energy efficiency in using conventional and alternative fuels would support a relevant engine/fuel development and future policy making e.g. taxation on fuels and engines/vehicles.

6e. Truck engines are very efficient in using conventional fossil-based fuels. The overall and long term need to find engine-fuel solutions based on renewable energy carrier would increase the overall energy efficiency in road transport. Further improved transport planning and logistics together with transport services procurement procedures to increase loading factor and groupage (combined goods loading) would make a great difference in energy saving and CO2 reduction. Product packaging and production strategies e.g. "just in time" are equally interesting to further identify and standardise in order to improve the overall energy efficiency. Standards would support further and more efficient program activities on company level and on various society levels and enhance dialogue and cooperation between stakeholders involved in solving the energy efficiency and climate problems.

6f. Standards would support relevant energy and environmental management in the road haulage industry and in organisations buying transport services. The procurement procedures would be more relevant to support further energy efficiency and environmental protection.

6g. Standardised CAD programs for transports including relevant parameters for energy efficiency and environmental protection would support further improvement of energy and environmental management.

This subject is linked to 6f.

6h. Standardised equipment and methods for intermodal cargo exchange would support further energy efficiency within transport chains.

6i. Standards would support further development and implementation of systems for goods tracking. Further use of goods tracking would support improved transport logistics, efficiency and reduce goods losses and damages.

6j. Standardised transports and logistics specified procedures to manage energy efficiency within management systems based on e.g. ISO 14 001 and 9000 would improve the energy management.

6k. Knowledge and experience from many national and international projects and research institutions are becoming quite significant and the basis for standardised mobility management models are growing stronger. Standardisation of concepts and models on mobility management would support further development and implementation of mobility management.

6l. A relevant LCA Model for Transport and Logistics would support analysis and decisions on allocation of energy use in society in general and for transport purposes in specific. Relevant comparisons between different transport systems alternative and society planning would be possible to a larger extent.

Alternative fuels (Priority n°8)

Proposals for future work :

8a. Initiating, with high priority (A), a standardisation process on Integrated Set of Energy Efficiency and Environmental Parameters for Fuels. This standardisation process would preferably include fuels for both vehicle and stationary usage. There are no relevant TC:s or WG:s relevant to this subject. CEN/TC 19 and WG 149 do not cover this subject. CEN/CLC JWG might initiate or propose the establishment of a new TC/WG combination to give relevant coverage of this subject.

8b. Initiating, with priority (B), investigations and research to clarify potential standardisation subject on Internalising External Costs into Fuel Pricing. A new CEN/CLC TC might be a relevant forum for initiating further investigation on this subject. Some of the results from 8a can be used in this work..

8c. Initiating, with long term priority (C), investigations to clarify potential standardisation subject on Models for Steady and Common increasing of Energy Prices. In this work calculation methods and tools for analysing the effects of increasing energy prices and how this affects energy efficiency and fuel choices should be developed. No relevant existing structure has been found and a future new TC might be a relevant forum for initiating further investigation on this subject.

8d. Initiating, with long term priority (C), investigations to clarify potential standardisation subject on Differentiated Taxes to Support Further Energy Efficiency. It must be noted that standardisation of the taxation levels is not proposed, that is an issue for the politicians within EU and the Member States. What is proposed is to find standardised models and calculations methods to study the effects on energy efficiency of different taxation levels and differentiation. No relevant existing structure has been found and a future new TC might be a relevant forum for initiating further investigation on this subject.

8e. After an evaluation of the achieved results of WG 149 and what CEN/TC 19 will take on board in its scope of work, it can be determined by interested stakeholders if there is a need for further standards or guidelines for testing, sampling and calculation methods for alternative fuels. This should be done with priority A. For solid biofuels the work of CEN/TC 335 should be checked. For example, there is a need for a definition that makes clear the difference of renewable wood and waste wood.

Level of priority : For subjects 8a and 8e there should be priority level A since the work should be performed after analysing the work result of WG 149 and other relevant standardisation groups such as CEN/TC 19 and CEN/TC 335, CEN/TC 343.

Subject 8b is priority B and 8c – 8d are long term priority (level C).

Description of the subject :

In this priority subject is included alternative fuels for use in stationary installations (mainly power plants) as well as vehicles such as cars, trucks and buses (often called automotive applications). There is already a "standardisation" group working with this subject, CEN/BT/WG 149, and most of the necessary work in the area of alternative fuels will be performed by this WG (WG 149 is an advisory and not a real standardisation group) or other standardisation groups in this area such as CEN/TC 19 and CEN/TC 335 (solid biofuels and therefore for stationary applications) and CEN/TC 343 Solid recovered fuels. WG 149 had its last meeting on 15 November 2004 and a draft final report has been written. It should be noted that WG 149 deals with liquid and gaseous alternative fuels, not any solid fuels. Therefore the information given in this report for priority 8 should be considered as proposals of further work to be done and presentation of some relevant information from the country reports that have been provided by the CEN/CLC BT/JWG Energy Management.

There might be different definitions of what is included in the expression "alternative fuels". In the draft report from CEN/BT/WG 149 the following definition can be found: "*In the work of*

CEN/BT/WG 149 and also in this report, the wording "alternative fuels" has been/will be used for all kinds of fuels for automotive (except diesel and gasoline) and stationary applications (except natural gas, heating fuel oil and diesel). "Bio fuels" will be used for fuels originating from biomass and waste (used pure or in blends) while "renewable fuels" will be used for other fuels produced with renewable electricity (such as hydrogen). This definition will be used in this document as well. It can be noted that including natural gas as an alternative fuel for transportation is not in line with definitions in many major policies and law making processes or in the sustainability debate and process in general. However, in the DG TREN Alternative Fuels Contact Group report published in December 2003 natural gas is included as an alternative fuel.

In addition to what has been handled by WG 149 there are some areas regarding the use of alternative fuels where a standard or guidelines might be suitable and desirable. It has to be taken into account that WG 149 does not consider itself to be responsible for the overall energy efficiency in fuels technology and for creating common sets of parameters to allow comparisons between conventional and alternative fuels and various mixtures and other energy carriers such as H₂. Not even CEN TC 19 has this role. Therefore the following areas for further work have been identified for stationary and automotive applications For more details, please see the chapters in this document about benefits and proposals for future work:

8a. Integrated Set of Energy Efficiency and Environmental Parameters for Fuels. Calculation methods (such as Life Cycle Analysis) for the whole chain from the raw material to the fuel ready for use (and perhaps even its performance in the conversion to electricity, heat or mechanical work).8b. Internalising External Costs into Fuel Pricing (methods and parameters).

8c. Models for Steady and Common increasing of Energy Prices (calculation methods and analysis of effects of increasing energy prices).

8d. Differentiated Taxes to Support Further Energy Efficiency (models and calculation methods for studying the effects of different taxation levels).

8e. Testing, sampling and calculation methods for alternative fuels not covered by WG 149 or other standardisation groups such as CEN/TC 19 and CEN/TC 343 and CEN/TC 335 (for stationary applications).

Regulatory situation (Available legislation or under preparation at EU level and key aspects from national level)

The country reports and some searching have revealed national legislation that might cover some of the subjects 8a – 8e. However, without reading all the legislation text it is very difficult to judge to what extent the legislation will cover the proposed subjects or where standards and/or guidelines might be developed. All the national legislation that might be relevant is listed in annex 1.

At EU level there are three documents in particular that are relevant for priority 8. They are:

- The Council resolution of 8 June 1998, 98/C 198/01 on renewable sources of energy
- The Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity
- The Directive, 2003/30/EC of 8 May 2003 on the promotion of the use of biofuels or other renewable fuels for transport

Based on the legislation listed in annex 1, the conclusion regarding the existing legislation and its relevance for the proposed subjects is the following:

8a. There is no legislation relevant to this subject. Current and planned legislation is very comprehensive and specific for each fuel/type of fuel on national and EU level.

8b. There is no reported legislation relevant to this subject.

8c. There is no reported legislation relevant to this subject.

8d. Most countries in Europe have implemented various types of legislation on this subject.

8e. Some national legislation seems to touch upon these subjects.

Stakeholders (industrial sectors, European associations, ...)

There are many stakeholders besides CEN/CLC/ISO/IEC and the national standardisation institutes who would be interested in standards for alternative fuels. Basically all producers/distributors of the alternative fuels and the manufacturers of the equipment to be used in connection with the alternative fuels might be interested in the standardisation process. Even the consumers of alternative fuels (owners of cars/trucks/buses and power/heat plants) and their organisations such as EURELECTRIC, EUROHEAT & POWER and COGEN EUROPE could be interested. Since natural gas is considered to be an alternative fuel for automotive applications, the organisations EUROGAS and MARCOGAZ should be interested. Finally governments, universities and environmental organisations should show interest in alternative fuels and its potential for improving the environment and replacing fossil fuels. More specifically the following groups should be more interested in the subjects 8a - 8e:

8a. Governments, agencies, consumers of fuels including the road haulage industry, car manufacturers, manufacturers of the equipment to be used in connection with the alternative fuels, fuel producers/distributors, universities, etc would support and participate in a standardisation process on a common set of parameters on fuels for vehicles. For stationary installations the manufacturers and owners of power/heat plants and their organisations should be interested.

8b. Researchers and government bodies are investigating this subject area. It is difficult to identify any business or industry groups that would participate in a standardisation process for the time being.

8c. Researchers and government bodies are investigating this subject area. It is difficult to identify any business or industry groups that would participate in a standardisation process for the time being.

8d. Politicians and government bodies are experimenting in this subject area and sometimes they base their decisions on scientific results. It is difficult to identify any business or industry groups that would participate in a standardisation process for the time being.

8e. Especially certification and standardisation bodies but also car manufacturers, fuel producers/distributors, producers of electricity and heat, manufacturers of equipment for producing, distribution and storing alternative fuels would be interested.

Identified standardisation work relevant to the subject : standardisation structure and purpose of standardisation

According to the country reports performed in this project (CEN/CLC BT/JWG Energy Management) the following existing national standards that have some connection to the subject have been identified (but no standards on EU level). The fact that only two countries are listed here does not mean that other countries do not have relevant standards in this area. It just shows that information from the other countries has not been provided and should be added later on, or that the draft standards are only at level of company standards or consortia standards:

Austria:

OENORM M 7132 Energy-economical utilization of wood and bark as fuel - Definitions and properties

OENORM M 7133 Chipped wood for energetic purposes - Requirements and test specifications

Sweden:

Title : SS 187106 Solid biofuels and peat fuels - Terminology

Title : SS 187123 Biofuels and peat - Fuel briquettes - Classification

Title : SS 187113 Biofuels and peat - Sampling

Title : SS 187120 Biofuels and peat - Fuel pellets

Title : SS 187170 Biofuels and peat - Determination of total moisture content

Title : SS 187174 Biofuels and peat - Determination of size distribution

From another source the information that the following documents have been published in the Netherlands has been provided:

NTA 8200 Best practice list for biomass fuel and ash analysis

NTA 8201 Solid recovered fuels - Quality assurance

NTA 8202 Solid recovered fuels and biomass - Sampling and sample preparation

NTA 8203 Solid recovered fuels and biomass - Specification and classification

NTA 8204 Solid recovered fuels and biomass - Determination of the biomass content

Some more existing standards are identified in the report from CEN/BT/WG 149.

Identified on going standardisation work are these projects:

Liquid and gaseous alternative fuels, CEN/BT/WG 149

Scope: CEN/BT/WG 149 is designed to initiate a European collective view of the general strategy for improvement of standardisation on liquid and gaseous alternative fuels and to set an agreement between all European stakeholders on the objectives to achieve.

This means that the WG will:

- act as a forum for dialog between the stakeholders,
- investigate the need of European standards for liquid and gaseous alternative fuels over the next 5-10 (or longer) years period.

Content of work: Acting as forum for dialog the WG aims primarily at:

- delineating a European standardisation strategy for supporting the increase of production, distribution and use of liquid and gaseous alternative fuels to be approved by CEN/BT,
- strengthening the relation with the European stakeholders and the international stakeholders
- allowing CEN members and others to express their view on the current national and European situation as well as on the foreseeable impact of the European standardisation.

Acting as an investigation group the WG aims primarily at:

- analysing and listing the need of European and global standards regarding specifications, classification systems, test methods, etc for fuels given priority to,
- making an inventory of which specifications, classification systems, test methods, etc already exist in CEN, ISO, national standardisation bodies and other international and national organisations (one of these organisations is IEA), and last but not least in industry,
- analysing from this inventory the possibility to use wholly or partially existing specifications, test methods, etc. and
- analysing and listing the need of future research development regarding test methods and proposing how to solve this need

The WG has had four meetings (the last one on 15 November) since it was created in December 2002 and a draft final report has been written. Then the WG will recommend CEN/BT to disband the WG 149.

The main result of the work in CEN/BT/WG 149 according to the draft report (not yet approved) is an overview of priorities in standardisation of liquid and gaseous alternative fuels for the coming 5 years. These priorities are listed below, per category. The four categories are:

Liquid alternative automotive fuels.

Gaseous alternative automotive fuels.

Liquid alternative fuels for stationary applications.

Gaseous alternative fuels for stationary applications.

The liquid alternative automotive fuels with the highest priority for standardisation are:

Fatty Acid Ethyl Esters (FAEE), both pure (100%) and for blends in diesel oil up to 5%.

Alcohol and alcohol derivatives in diesel fuel.

Gasoline with 10% ethanol (revised EN 228).

Ethanol for diesel engines (E95).

The gaseous automotive fuel with the highest priority for standardisation is:

Compressed biogas.

The liquid alternative fuels for stationary applications with the highest priority for standardisation are:

Methanol

Ethanol and ethanol blends

FAEE.

Tall pitch oil.

The gaseous alternative fuels for stationary applications with the highest priority for standardisation is:

Biogas.

WG 149 further recommends to the CEN Technical Board and to CEN/TC 19 to:

- Extend the work of CEN/TC 19, as soon as possible, to establish standards for the liquid and gaseous alternative fuels for automotive use that are mentioned above.
- Either to revise the title and scope of TC 19 to explicitly include alternative fuels for stationary applications or to establish a dedicated TC (or BT Task Force) for alternative fuels for stationary applications.
- Take further necessary measures to establish standards on liquid and gaseous alternative fuels for stationary applications that are mentioned above.

CEN/BT is further recommended to request CEN/TC 19 to start working on the following standards on alternative automotive fuels in the longer term:

- Compressed natural gas
- DME
- E 15 (ethanol blended up to 15% in gasoline)
- FAME in diesel fuel (30%)
- Liquefied biogas
- Methanol (M100)
- Methanol blends in gasoline (M85)
- Synthetic diesel produced from natural gas and gasified biomass

In the longer term, CEN is also recommended to prepare to start working on the following standards on alternative fuels for stationary applications:

- DME

- Hydrogen
- Methanol blends
- Pyrolysis oil

It should be noted that the above listed result of the work in CEN/BT/WG 149 is still preliminary until the final report has been approved.

Transportation fuels, CEN/TC 19

Works basically with transportation fuels such as gasoline and diesel, but also with LPG (EN 589), biodiesel and ethanol. For biodiesel a specification for heating purposes (EN 14213) and for cars (EN 14214) have been published

Solid biofuels, CEN/TC 335

Scope: The standardisation work on solid biofuels shall be within the following scope, in line with the EC mandate:

- products from agriculture and forestry
- vegetable waste from agriculture and forestry
- vegetable waste from the food processing industry
- wood waste, with the exception of wood waste which may contain halogenated organic compounds or heavy metals as a result of treatment with wood preservatives or coating and which includes in particular such wood waste originating from construction and demolition waste
- cork waste

Work program: See Annex 2

Hydrogen technologies, ISO/TC 197

Scope: Standardisation in the field of systems and devices for the production, transport, measurement and use of hydrogen.

Technical program (from ISO web site 2004-03-30):

ISO/DIS 13985.3	Liquid hydrogen -- Land vehicle fuel tanks
ISO 14687:1999/AWI	Amd 1
ISO/PRF PAS 15594	Airport hydrogen fuelling facility
ISO/DIS 15869-1	Gaseous hydrogen and hydrogen blends -- Land vehicle fuel tanks – Part 1: General requirements
ISO/DIS 15869-2	Gaseous hydrogen and hydrogen blends -- Land vehicle fuel tanks – Part 2: Particular requirements for metal tanks (Type 1)
ISO/DIS 15869-3	Gaseous hydrogen and hydrogen blends -- Land vehicle fuel tanks – Part 3: Particular requirements for hoop-wrapped composite tanks with metal liner (Type 2)
ISO/DIS 15869-4	Gaseous hydrogen and hydrogen blends -- Land vehicle fuel tanks – Part 4: Particular requirements for fully wrapped composite tanks with metal liner (Type 3)
ISO/DIS 15869-5	Gaseous hydrogen and hydrogen blends -- Land vehicle fuel tanks – Part 5: Particular requirements for fully wrapped composite tanks with non-metallic liner (Type 4)

ISO/CD 16110	Hydrogen generators using fuel processing technologies
ISO/AWI 16111	Transportable gas storage devices -- Hydrogen absorbed in reversible metal hydride
ISO/DIS 17268	Compressed hydrogen surface vehicle refuelling connection devices
ISO/AWI TS 20012	Gaseous hydrogen -- Service stations
ISO/CD 22734	Hydrogen generators using water electrolysis process

Fuel cell gas appliances, CEN/CLC JWG

Other standardisation projects which could be relevant are:

Fuel cell technologies, CEI/TC 105

Scope: To prepare international standards regarding fuel cell technologies (FC) for all FC applications such as stationary FC power plants, FC for transportation such as FC propulsion systems and auxiliary power units and portable FC power generation systems.

Natural gas for vehicles, CEN/TC 326

Work plan: See enclosed Business Plan of CEN/TC 326 "Gas supply for Natural Gas Vehicles (NGV)"

Road vehicles ISO/TC 22

CEN Workshop Agreements (CWAs)

A CEN Workshop was launched on 12 June 2003 for the creation of a CEN Workshop agreement specifying the requirements on E85 Bio-ethanol as automotive fuel.

A CEN Workshop was launched on 15th March 2004 for the creation of a CEN Workshop agreement specifying the requirements and test methods for the chemical and physical properties of water in diesel emulsions (also referred to as "Emulsion Fuels") used in internal combustion engines.

In addition to the above mentioned standardisation work going on, the European Commission has set up a Contact Group for alternative fuels in order to advice on technical and economic status and developments of alternative fuels for road transport. In December 2003 a report with the title "Market development of alternative fuels" was presented.

Considering all the work going on regarding alternative fuels the following conclusions regarding subjects 8a – 8e seem possible:

8a. There are no standards relevant for this subject. A list of standards on each type of fuel respectively will be delivered from WG 149 Liquid and gaseous alternative fuels.

8b. There are no standards relevant for this subject.

8c. There are no standards relevant for this subject.

8d. There are no standards relevant for this subject.

8e. Some useful standards might still be missing when CEN/BT/WG 149, CEN/TC 343, CEN/TC 335 and CEN/TC 19 have finished their work..

Overall benefits / Impact on energy management :

Besides the general benefits of having standards and harmonisation of rules, technical design, calculation methods etc. there can also be mentioned some particular benefits for subjects 8a – 8e that are linked to energy management.

8a. A standardised set of common parameters as far as this is possible on conventional fuels, alternative fuels and mixtures would support a relevant comparison between various fuels in terms of energy efficiency and environmental impact. Governments, taxation agencies, fuel consumers, car and truck manufacturers and buyers of cars/trucks would be able to make relevant choices on fuels and fuels/engines alternatives. This would support further energy efficiency in both the short and long run. The same kind of benefits would apply in the power and heat sector (stationary

applications).

8b. Standardised parameters and calculation models for including external costs into fuel pricing would be of great value in the long term process for energy efficiency. This is a step further than 8a and requires some additional research before environmental impact can be transposed into external costs. (Compare with the externE-project that has been going on for many years).

8c. Standardised models and calculation methods for studying how a steady and common increasing of energy prices on non-renewable energy carrier could give the answers how this would affect the fuel choice and if it would support a common and competition neutral change into renewable energy resources utilisation.

8d. Standardised parameters, calculation methods and models for studying if differentiated taxes could support further energy efficiency would be of great value for stakeholders within the business and industry sector to be able to forecast future costs and to develop alternative technologies to avoid taxation.

8e. Standardisation of testing, sampling and calculation methods for alternative fuels would facilitate the establishment of an infrastructure for alternative fuels.

Standardisation of energy systems for tomorrow (Priority n°9)

Proposals for future work :

In summary the future European standardisation work could be focused on the following:

- A guideline giving key data for all equipment and how to calculate and simulate a complex energy system with highest possible efficiency and environmental performances.
- A recommendation on how the LCA and LCC methods could be used to optimise the process could be an important part of such a guideline.
- Guidelines or standards for measuring and judging the system approach in order to improve and achieve the highest possible overall performance for an energy system.
- Guidelines or standards for monitoring and calculating efficiency and environmental performances during operation could be developed.

Level of priority :

Level A : for work that can be incorporated in the ongoing work of CENELEC/TC 8x

Level B : for all the proposed work to be done since the development of the future energy systems need to start relatively soon.

Description of the subject :

In this priority subject is included all energy and environmental as well as technical and economical aspects that should be considered while developing the energy systems of tomorrow but with a special focus on sustainability. Almost certainly, standardisation could play an important role in designing and optimising the energy systems that will be used in the future. Everything from monitoring, calculating, testing, manufacturing, operating and finally disposal of an energy system could be done in a more efficient and sustainable way if guided by standards. This is a very broad approach and one key issue for this priority should be to better define the possible standards to develop and their contributions to higher efficiency and sustainability.

Considering that within the project Energy Management there are other priorities dealing with consumption as well as small-scale production of heat and electricity inside or directly adjacent to buildings, some limitations in the area of interest have been introduced in this priority. As a general rule only production of power and heat in power plants bigger than ca 1 MWe is included. Small-scale production (<1MWe), performed in plants normally located inside the buildings, which are supplied by the electricity and heat produced, is basically not included in this priority. Also consumption issues regarding heat and electricity are excluded here but transmission/distribution of electricity and heat might be included.

In optimising the energy systems for tomorrow it is very important to take a system approach, which means that all aspects of a sustainable energy system including all kind of emissions, economy, efficiency, other environmental impacts such as emissions, security of supply, general opinion, social impact, lead time for permits and construction, future development etc. must be considered, taking into account that, in some cases, an improvement in one area might result in worse performance in another area. To achieve the best overall performance should be the goal. However, comparing performances in different areas is extremely difficult but might, at least in some cases, be facilitated by good standards. Besides standards, EU and national legislation and different types of certificates (see priorities 10, 14 and 20) will play an important role in the optimising process.

Regulatory situation (Available legislation or under preparation at EU level and key aspects from national level)

On EU level there is some legislation that is relevant for the design of future energy systems. Some more such as the proposed Directive for security of electricity supply could also affect this priority.

Some examples are the following:

- The councils Directive on CHP, KOM 2002/0415 final - COD 2002/0185
- The Directive on trade with exhaust permits, KOM (2001) 581
- The council Directive 96/61/EC concerning Integrated Pollution Prevention and Control (IPPC) including the Large Combustion Plant Directive 2001(80) EC
- The Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources

At a national level some legislation that could be relevant has been found within the work of the Energy Management project. Below are some illustrative examples from selected countries are listed. Naturally there is similar legislation in the other European countries but details are not available at this stage. In the progress of further activities in this priority, other member countries should be contacted for providing respective information on country specific legislation:

The Czech Republic:

- National Law N°458 of 28 November 2000 on Business Conditions and Public

Administration in the Energy Sectors (the “Energy Act”)

- National Law N°406 of 25th October 2000 on Energy Management
- Decree N° 151/2001 Coll. of the Ministry of Industry and Trade of 12 April 2001, laying down details of efficiency of energy use for heat energy distribution and interior heat energy distribution
- Decree N°153/2001 Coll. of the Ministry of Industry and Trade of 12. April 2001, laying down the details of determination of energy use efficiency for transmission and distribution systems and internal distribution systems of electric energy
- Decree N°212/2001 Coll. of the Ministry of Industry and Trade of 14 June 2001, laying down the details for preparation and implementation of combined power and heat generation
- Decree N° 213/2001 Coll. of the Ministry of Industry and Trade of 29 June 2001 introducing details with respect to energy audit requirements

Denmark:

- Act no. 376 of June 1999 on CO2 Quotas for Electricity Production
- Act no. 772 of 24 July 2000 The Heat Supply Act
- Act no. 449 of 31 May 2000 The Natural Gas Act
- Act no. 151 10 March 2003 The Electricity Supply Act

Germany:

- Energy Management Act, Article I of the law of 24 April 1998 (BGBl. I S. 730), last amended by Art. 1 of the law of 20 May 2003 (BGBl. I S. 686) (also serving for the national implementation of the European Directive 98/30/EC)
- Act for the Promotion of Combined Heat and Power Generation of 19 March 2002 (BGBl. I S. 1092)

Sweden:

- The National Planning and Building Act 1998:811. The act manifests that municipalities are obliged to make a survey plan co-ordinating the general interests regarding the use of natural resources and the environment
- General Electricity Act, 1997:857 Specifies the roles of the corporate bodies for network and electricity trading operators.
- National decree of electricity, 1997:863 regulates delivery concessions and network concessions,

Stakeholders (industrial sectors, European associations, ...)

There are many stakeholders besides who could be interested in standards (or guidelines) for designing and evaluating the future energy systems. Basically all manufacturers of power (heat) plants and equipment for transmission/distribution of electricity and heat might be interested in the standardisation process. Naturally the electricity companies and other owners of power (heat) plants including their organisations such as EURELECTRIC, EUROHEAT & POWER and COGEN EUROPE are very interested. Perhaps even organisations for fuel suppliers such as EUROGAZ might be interested as well as MARCOGAZ. Finally governments, politicians, national energy authorities, research institutes, researchers and environmental organisations should show interest in designing the future energy systems with the aim to improve energy efficiency and environmental performances thus contribution to a more sustainable electricity and heat production/transmission/distribution.

Identified standardisation work relevant to the subject : standardisation structure and purpose of standardisation

According to the country reports performed in this project (CEN/CLC BT/JWG Energy Management) there are some existing standards and standardisation activities going on that might be relevant for this priority (but no standards at EU level). This list should only be considered as an example since information from many countries is lacking :

Austria:

OENORM M 7780 Combined heat and power units – Terms with definitions

OENORM M 7781 Combined heat and power plants with internal combustion engines - Requirements, layout, operation and economics

Germany: There might be a link to

DIN 6280-14 Generating sets - Reciprocating internal combustion engines by driven generating sets - Part_14: Combined heat and power systems (CHPS) with reciprocating internal combustion engines; basics, requirements, components and application.

This document applies to combined heat and power systems (CHPS) with reciprocating internal combustion engines for generating a.c. current and usable heat. This applies to single and multi-production CHPS-modules. It lays down common definitions and requirements which are needed for the operation of the consumer installation taking into account the characteristics and demands with regard to the voltage and frequency behaviour, temperature level and power requirement, and which shall guarantee at any time the function of the protection devices.

Italy: There might be a link to

CEI 11-20: Electric energy production systems and uninterruptible power systems connected with LV and MV networks

CEI 11-32: Electric energy production systems connected with HV networks.

CEI 13-35: Guide to the application of the standards on the measurement of electric energy

Other:

Title : **SS-ISO/IEC 15288** Systems engineering – System life cycle processes

Title : **SS-ISO 13601** Technical energy systems - Structure for analysis - Energyware supply and demand sectors

Title : **SS-ISO 13600** Technical energy systems - Basic concepts

Identified on going standardisation:

Fuel cell technologies, IEC/TC105 Scope: To prepare international standards regarding fuel cell (FC) technologies for all FC applications such as stationary FC power plants, FC for transportation such as FC propulsion systems and auxiliary power units and portable FC power generation systems.

CEN/CENELEC Workshop on 'Manual for Calculating Combined Heat and Power (CHP)'

EUROHEAT and POWER, the international association for combined heat and power, has developed guidelines for the calculation of the share of CHP electricity produced in CHP plants, formulated with the development. Other initiatives/research have served as a basis to these guidelines.

The aim of the CEN Workshop is:

- to further enlarge the communication process
- to allow for justified adjustments
- to take into account results from pilot testing and
- to achieve widest possible acceptance.

The kick-off meeting of this CEN Workshop was held on 5 May 2003 and a proposal was ready in spring 2004.

IEC/TC 2 Rotating machinery

System approach for electrical, motor: work in progress

IEC/TC20 Electric Cables

IEC 60287-3-2 - Electric cables - Calculation of the current rating - Part 3: Sections on operating conditions - Section 2: Economic optimization of power cable size

IEC/TC 111 Environmental standardisation for electrical and electronic products and systems

This TC has recently been set-up by IEC. The draft term of reference has been adopted and the standardisation work will start soon.

Ongoing discussions

A Mandate has been addressed to CEN, CENELEC and ETSI for the elaboration of a feasibility study in the area of hydrogen and fuel cells, by the EC (c.f. Committee On Standards And Technical Regulations (98/34 COMMITTEE), Doc.10/2004 – EN)

Scope: This mandate concerns the elaboration of a feasibility study of standardisation activities (at European and international level) in the area of hydrogen and fuel cells technology. The study will cover existing and future standardisation activity.

Overall benefits / Impact on energy management :

The aim for the design of the future energy systems is to achieve the best possible overall performance taking into account the system approach. As mentioned already there are many factors and aspects to consider and the level of importance for different types of performance is not the same but could be difficult to judge. One example of a key issue is to ensure a successful development of new energy systems that could produce electricity and heat in a more efficient way and to some extent using renewable energy sources since this would help solving some environmental problems and improve the security of supply by sparing limited energy resources. Relevant standardisation and guidelines could facilitate this development and lead to a more sustainable energy system including transmission/distribution. It is important to consider the whole system and develop standards/guidelines that take LCA aspects into account.

Proposals for future work :

According to all estimations there will be an increased need for electricity production within EU in the future. A need for new capacity of 500-600 GW between 2000 and 2030 is predicted, which will cover an increased consumption and retirement of some old power plants. Therefore it is very important to design these power plant so that the highest possible efficiency will be achieved and the whole system including transmission/distribution will operate in an optimised way. To bring in more renewable energy sources and to combine conventional systems with new technical solutions will be a necessary challenge. To monitor and calculate environmental impacts and communicate this to authorities and the general public will be another concern. All this could be facilitated if suitable standards/guidelines are developed. In the country reports performed in this project (CEN/CLC

BT/JWG Energy Management) there are some proposals for standards and standardisation activities that might be relevant for this priority:

EU: There are no real proposals for future standardisation regarding priority 9 expressed in the report about European standardisation. Some work in this field might be on its way in the groups:

- CEI/TC 8 and CLC/TC 8X “Systems aspects for electrical energy supply”,
- CEN/TC 312 “Thermal solar systems and components”,
- CEI/TC 82 and CLC/TC 82 “Solar photovoltaic energy systems” and
- CEI/TC 88 “Wind turbines”.

Perhaps even the work in the following TCs could be of interest

- CEI/TC 13 and CLC/TC 13 “Equipment for electrical energy measurement and load control”
- CEN/TC 237 “Gas meters”.

We will have to take into account in the near future, the work launched by :

- CEI/TC111 and CENELEC/TC111x “**Environmental standardisation for electrical and electronic products and systems**”

The Czech Republic: There are no real proposals for future standardisation except a wish to harmonize their standards with EU-standardisation.

Denmark: There might be a link to the proposed estimation of potential energy saving in the Danish industry by switching to energy efficient drives.

Italy: There might be a link to the “Motor Challenge” European Program for the electric motor system (pumps, fans, compressors, VSD) performance and efficiency.

Sweden: The design and construction of energy systems is a long-term investment. Therefore it is important to have well documented studies, descriptions and evaluations of future energy system in order to obtain and possess as much information as possible when planning for future investments. This kind of document describes the energy system EU might build in 10 – 30 years. Such documents are possible to find at national level but are not common on a EU/international level. In Sweden the most recent paper is a report from IVA called “Energiframsyn”. An international example is the description of possible hydrogen societies.

A combined system is a system where several sources such as solar heat, photovoltaic, oil, bio fuels, wind power etc. are combined into one system. For this type of system it is useful to calculate the system efficiency, but the by far most important task is to accurately optimise the design of each part of the entire system. Today there are no standards or guidelines concerning combined systems. These standards or guidelines would have to describe how to design and optimise those systems since they are costly and have to work in a reliable way for many years under harsh conditions.

United Kingdom: Some of the proposed changes in the UK energy systems could be facilitated by relevant standard. See the published white paper.

Green certificates (Priority n°10)

Proposals for future work :

Create an EU standard for definition and methodologies for issuing, auditing, monitoring, trading, banking, redemption and consumption of certificates in order to make them tradable between different countries. The standardisation work must be performed in line with the legislation and serve as a complement. The created system should be designed in a way that minimum distortion of the liberalised market takes place. Further it is crucial that the system established is credible and reliable. For example double counting must be prevented.

The aim should be to also include transportation and heat only production in the green certificate system.

Level of priority:

Level A :Some work can start at once such as establishing definitions since green certificate systems are already in operation in some countries.

Some material for the work could perhaps be found within ISO/TC 207 but most likely a new body should be created.

Description of the subject :

In this priority subject is included the relatively new support system for renewable energy sources (RES) that is called "green certificates". This kind of system has recently been introduced in some European countries and some others are considering to introducing it soon. So far green certificates have been used only to stimulate investments in stationary installations for production of electricity and heat by using RES but in theory it should be implemented in the transportation sector and heat production as well.

Green certificate systems are now in operation in Austria, Belgium (there are different systems in Flanders, Wallonia and the region of Brussels), Italy, Sweden, the Netherlands and UK. These national systems are all based on quotas in order to create enough demand for certificates. In this case the governments set mandatory rules for how large a portion of the electricity production must be based on RES. In Belgium the systems for green certificates are combined with a system of certificates for promoting high efficiency CHP (Combined Heat and Power).

The basis of a RES green certificate system is that each approved RES facility produces two products, tradable commodity electricity (or other form of energy) and tradable certificates, and the two products are traded separately. The green certificates can be traded in specially created market places or separately on the electricity exchanges that have been established in some European countries. Together with the payment for the produced electricity, the revenues from sale of properly issued and audited RES certificates are supposed to cover the total production costs for the RES facility. In this way incentives are created to invest in RES plants which are cost effective. In a liberalised electricity market (all EU countries will have fully liberalised electricity markets no later than 1 July 2007) this market-based way to support investments in RES is a better method than feed-in tariffs or direct investment support since it does not distort the market.

The practical application is normally that a producer of RES electricity has to register its production at an authorised company/ministry/authority in order to receive certificates. These certificates can be issued for each MWh of RES electricity. At the same time a demand for certificates is created by the quota with an obligation for the end-user or producer of electricity to consume/produce a certain percentage of RES electricity, for example 8%. If the obligation is put on the end-user, especially regarding households, it is common that the electricity supplier will handle the actual work to buy enough of the green certificates in order to fulfil the quota. The certificates can either be traded directly between the RES electricity producer and the supplier/end-user or via an exchange. Depending on the balance between production of RES electricity (number of certificates) and the

demand of certificates, the price of the certificates will vary. Finally the supplier passes on the costs for buying the certificates to the electricity consumer as a fee on the electricity bill. After each period the correct number of certificates must be sent into the authorities for redemption, otherwise a penalty will apply.

Besides the introduced national green certificates systems, there is also a voluntary system called RECS which is not a national system but open for international trade of certificates. There are more than 100 members of RECS International from 18 European countries. After a two year test phase sponsored by the European Commission, the system has now been operational for almost two years.

In order to establish an effective trading of green certificates with stable prices giving the right investment signals, there is a need to achieve a high liquidity. To reach an appropriate level of trading over the year can be difficult in the beginning of the system and in small countries. Therefore it would be useful if green certificates from different national systems could be traded over the country borders. This would also encourage and locate investments in RES where the conditions for each type of technology are the best. Since the national systems have different rules for issuing and trading the green certificates, international trading is not possible today. With standardisation of the rules for green certificates a wider trade of certificates could be achieved. However, it must be noted that the general opinion is that the decision to introduce green certificates in each country and setting the quota for RES production can hardly be an issue for standardisation even if this possibility exists. The decision to introduce a green certificate system should be left to the Member States or through a Directive from the European Commission. But once the decision to introduce green certificates has been taken, standardisation could be used for harmonisation of the detailed rules.

It is important to note that in some case, the benefit of one type of certificate or action to improve energy efficiency, may have an adverse effect on another topic covered by another type of certificate or action (e.g. the use of renewable energy may lead consumer to waste energy in the opposite direction of actions taken by Authorities to improve energy efficiency). Only a political decision giving a priority can solve the matter.

Regulatory situation (Available legislation or under preparation at EU level and key aspects from national level)

At EU level there is no legislation for trading of green certificates. However, in the Directive for RES (2001/77/EC) there is a definition for RES (article 2) and rules for how certificates for electricity produced by RES should be issued (article 5). These certificates are called "Guarantee of origin of electricity produced from renewable energy sources" and must be mutually recognised by the Member States.

At a national level all countries who have introduced green certificate systems do have a legislation for issuing, auditing, trading, possible banking, monitoring, redemption and consumption of certificates etc. but in the country reports provided within this project only the law in Sweden is mentioned. Through some other sources details about some of the other national laws have been found and are summarised below.

In Sweden, the law regarding electricity certificates is called (2003:113) with the aim to promote electricity production with renewable energy sources. This law will soon be revised in order to implement some of the results from the first 1,5 years of operation (the green certificate system started on 1 May 2003). Quotas for RES production will be set for years after 2010, thus ensuring the investors that the system is a stable and long-term market-based support system.

In Italy, there are mainly three different Decrees that regulate the system of green certificates. These are:

Legislative Decree no. 79 of 16 March 1999 (known as "Bersani Decree") that gives common rules for the internal market of electricity, defines RES and stipulates that 2% of the total amount of generated or imported electricity must be produced by RES.

The Decree of the Minister of Industry, Trade and Handicraft of 11 November 1999 (MICA Decree 11/11/1999) introduces the rules for a green certificate system that includes new, repowered, renovated or reactivated power plants fed by RES and commissioned after 1 April 1999.

The Decree of the Minister of Production Activities of 18 March 2002 (MAP Decree 18/03/2002) that supplements some aspects of MICA 11/11/1999.

Some updating of the above mentioned Decrees have been implemented recently.

In Flanders, the definition of the system of green certificates takes place in art. 21 to 25 of the Electricity Decree of 17 July 2000 and penalties for missing certificates are described in art. 37, §2. More execution rules were introduced in a decision of the Flemish government of 28 September 2001 but have been modified since 2 April 2004 by a decision of the government of 5 March 2004.

In Wallonia, rules for green certificates can be found in the Electricity Decree of 12 April 2001 (modified on 18 Dec 2003) and the Decree of the Walloon government on 4 July 2002.

In the Region of Brussels, some basic rules for the electricity market are established in a government decision from 19 July 2001. Promotions of green energy (and high efficiency CHP) are added in a decision by the Brussels government on 6 May 2004. Some more rules are to be found in a Ministry decision of 12 May 2004.

Stakeholders (industrial sectors, European associations, ...)

There are many stakeholders besides CEN/CLC/ISO/IEC and the national standardisation institutes who could be interested in standards for trading of green certificates. Basically all producers/distributors of RES technologies and fuels as well as the manufacturers of power plants which can be converted to use RES fuels might be interested in the standardisation process. Naturally the electricity companies and other owners of power plants using RES including their organisations such as EURELECTRIC, EUROHEAT & POWER and COGEN EUROPE are very interested. Organisations for producers of other fuels than RES, such as natural gas (EUROGAS, MARCOGAZ), coal and oil will follow the process closely. Some of the existing power exchanges such as Nord Pool have shown interest in green certificates and an increased trading of them. Finally governments and environmental organisations (including the national regulators) show interest in trading green certificates and its contribution for improving the environment and replacing fossil fuels. If standardisation of green certificate systems is to take place, the work and experiences gained by the organisation RECS should be considered and used in relevant cases.

Identified standardisation work relevant to the subject : standardisation structure and purpose of standardisation

According to the country reports performed in this project (CEN/CLC BT/JWG Energy Management) there are no standardisation activities going on regarding green certificates.

In practise all Member States have to implement the RES Directive and transform article 5 into national legislation where a first step towards standardisation of green certificates has been taken. In theory standardisation could be the driving force to introduce a harmonised green certificate system within the whole EU, but as already mentioned above it might be better if decisions regarding introduction of green certificates, obligations, quotas etc. are left to EU or the Members States. Standardisation could instead play a big role in the design of the detailed rules. But it should be mentioned that some people would prefer to use standardisation as a tool to introduce green certificate systems in more countries than today.

The organisation RECS is active in creating guidelines and voluntary common rules for green certificates.

White certificates (energy savings) have some similarities with green certificates, although there are important differences and stakeholders, and some standardisation work might be developed in parallel. Within the CEN/CLC BT/JWG Energy Management project white certificates are handled in priority 20.

Overall benefits / Impact on energy management :

If an overall European legislation for green certificates is created then detailed standardisation of green certificates in order to make them tradable between different countries would widen the market for the certificates and increase the liquidity. The whole trading system would be more efficient and incentives for investments in RES could increase. RES facilities would be built where conditions are the best and would not be restricted by regional policies and borders.

CO₂ capture and storage (Priority n°11)

Proposals for future work :

As stated already it might be too early with a “normal” standardisation process but for this long term technology development the future standardisation work could be focused on the following:

Monitoring the whole development and be prepared to quickly create standards when suitable.

A guideline describing the overall process and pointing out important key factors when calculating and simulating a system with CO₂ capture and storage would be useful.

A recommendation on how the LCA and LCC methods could be used to optimise the process could be an important part of such a guideline.

Guidelines or standards for calculating possible leakage from the storage of CO₂ could be developed.

Guidelines or standards for estimations of available storage capacity could be developed.

In a speech by Dr. Kamel Bennaceur, Schlumberger, at the IEA/CSLF Workshop in Paris on 12-13 July 2004 it was proposed to standardise integrated static and dynamic workflows and develop standard testing procedures for injectors and standard methodology for wellborn isolation (cementing).

Level of priority :

Level B : Some preliminary work could be done

Level C : Most of the development work must be considered as a long term

When work is to be performed this could be within a new body. Some parts could perhaps be handled by CEN/TC 234.

Description of the subject :

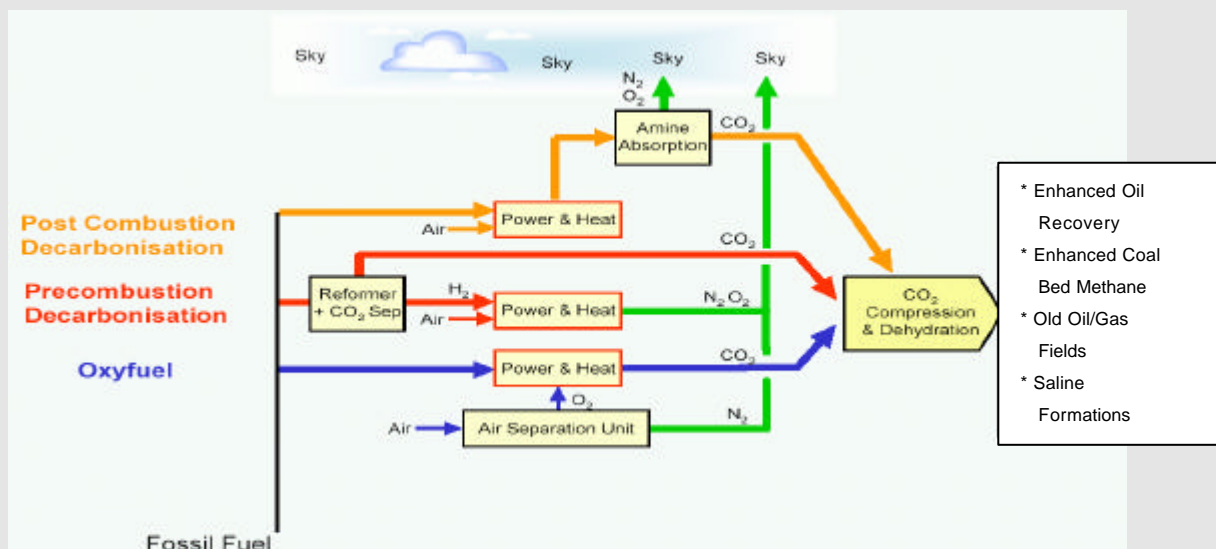
In this priority subject is included the research and development work going on with the aim of finding commercially acceptable methods to capture and store the CO₂ emissions from power (and heat) plants burning fossil fuels. If this development turns out to be successful it would make a huge contribution in the attempt to fulfil the Kyoto agreement.

Since EU will depend on fossil fuels for a long period it is important to find a sustainable solution to cut the CO₂ emissions from power and heat plants using fossil fuels. Besides increasing the efficiency, the most promisingly method is to capture the CO₂ emissions and then store it, as liquid CO₂ in aquifers at a depth where the CO₂ would remain liquid due to the surrounding pressure. Studies indicate that there is enough storage capacity within Europe to store a continued use of fossil fuels for 300 years or more (at the present consumption level). A large disadvantage of the technology is the efficiency drop in power generation which is why the most efficient process and equipment must be found.

Technically there are already methods available to capture and store CO₂ but they are not optimised for power plant purpose and costs are still too high. Large scale storage of CO₂ has been tested for some years in the North Sea where the CO₂ is pumped into saline aquifer and oil wells and contributes to increased oil production. Monitoring programs are performed to study long term effects of CO₂ storage. There is an uncertainty regarding leakage that is not acceptable. There are several possible methods for CO₂ capture but they all add rather high costs to the production costs of electricity and the efficiency of the power plants decreases. Total cost for capture and storage of CO₂ is estimated to be below 50 EUR/ton CO₂ including transportation. The potential to reduce costs is considered to be large which means that a coal-fired power plant operating with this type of equipment could be cheaper than many technologies using renewable energy sources for producing electricity. However, in the final decision regarding installation of new power plants it is important to

take a system approach and consider all relevant factors such as economy, efficiency, environmental impact, security of supply, general opinion, lead time for permits and construction, future development etc.

CO₂ Capture Technologies



There is a great interest in developing the technology for capturing and storing CO₂ and many research projects and demonstration facilities are planned or are in the implementation phase. Any standardisation of the technologies or the testing methods seems to be missing so far. Although it might be too early to introduce standardisation in this field right now, it should be considered if guidelines and later on standardisation might play a role in finding and encouraging the use of the best technology.

It is important to note that, the benefit of the actions concerning the capture and the storage of CO₂ has the consequence to decrease energy efficiency. Only a political decision giving a priority can indicate the priority between the maximum action on CO₂ capture and storage, the maximum energy efficiency or a mix between the two actions and their levels.

Regulatory situation (Available legislation or under preparation at EU level and key aspects from national level)

On EU level no legislation that is relevant for CO₂ capture and storage has been found. That does not mean that there is no legislation affecting part of the equipment (such as pipelines), testing and calculation methods in the research and demonstration projects, but nothing has been found that is especially designed for these type of activities.

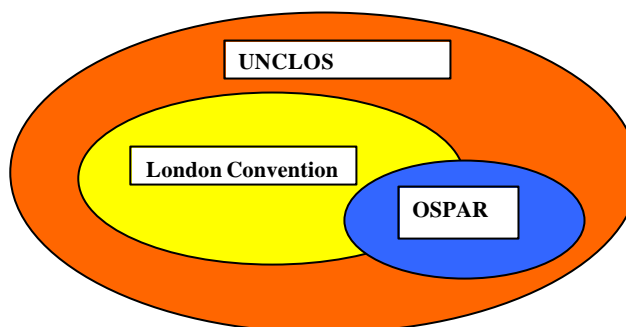
There is some international legislation for the utilisation of the ground where the CO₂ is supposed to be stored. In the IEA/CSLF workshop on legal aspects of storing carbon dioxide in Paris on 12-13 July 2004 there were many presentations describing all the international conventions and rules that might hinder or at least regulate the storage of CO₂, especially in sub seabed geological formations. Some examples of conventions and rules are these:

- OSPAR Convention, that originates from the Oslo Convention on Dumping (1972) and Paris Convention on Land-Based Sources (1974) and became a convention in 1992. Different rules apply regarding whether the CO₂ is brought out to the storage place by pipeline or by a vessel and for what purpose the CO₂ will be stored.
- London Convention, (the Convention on the Prevention of Marine Pollution by Dumping of

Wastes and Other Matter) is from 1972 and has been in force since 1975. Totally there are 80 states as parties to the Convention. In 1996 a Protocol to the Convention was developed with the aim to modernise and eventually replace the London Convention. This Protocol might enter into force in 2005.

- UNCLOS (1982) is a global framework convention relying on other subject-specific or regional marine treaties agreed among its State Parties to provide more detailed regulation.

The relation between the OSPAR and London Conventions and UNCLOS can be illustrated this way:



Source: Tony Espie, BP
at the IEA/CSLF Workshop in Paris

Besides the above mentioned conventions and rules there are others such as the Basel Convention (a global agreement from 1989 addressing the problems and challenges posed by hazardous and other waste), the Convention on Biological Diversity, the Antarctic Treaty and Madrid Protocol, the Espoo Convention and Kiev Protocol that might effect the storage of CO₂. Then of course the Kyoto Protocol is the reason for all these activities in finding technologies for capturing and storing CO₂.

At a national level no specially designed legislation for this type of research and demonstration projects has been found. However, there are many national laws that can affect the CO₂ capture and storage, especially if CO₂ is classified as waste.

Stakeholders (industrial sectors, European associations, ...)

There are many stakeholders who could be interested in standards (or guidelines) for capturing and storing of CO₂ from power or heat plants. Basically all producers/distributors of fossil fuels as well as the manufacturers of power (heat) plants burning fossil fuels might be interested in the standardisation process. This also includes their organisations such as EUROGAS, MARCOGAZ and EURISCOAL. Naturally the electricity companies and other owners of power (heat) plants using fossil fuels including their organisations such as EURELECTRIC, EUROHEAT & POWER and COGEN EUROPE are very interested. Finally governments, politicians, national energy authorities, research institutes, researchers and environmental organisations should show interest in CO₂ capturing / storing and the contribution for reducing/avoiding the greenhouse effect and fulfilling the Kyoto agreement despite using fossil fuels for producing electricity and heat.

Identified standardisation work relevant to the subject : standardisation structure and purpose of standardisation

According to the country reports performed in this project (CEN/CLC BT/JWG Energy Management) there are no standardisation activities going on regarding CO₂ capture and storage.

According to a study from the Swedish research institute Elforsk there is an EU standard for storage of gas, EN 1918-1 Gas supply systems. Underground gas storage, that has been in effect since February 1998. In the part 1 (functional recommendations for storage in aquifers) of this standard,

there are some recommendations regarding storage of gas in aquifers.

Check also with CEN/TC264/WG 24 GHG quantification

Overall benefits / Impact on energy management :

A successful development of methods for capturing and storing CO₂ from power and heat plants would solve one of the biggest environmental problems on earth and make it possible to increase the use of coal. Once the technologies reach a stage close to commercial status there will be a need for standardisation of the equipment in order to make the whole process as efficient as possible from a technical and economical point of view. Minimising the efficiency losses in the power plant is one of the key challenges for this whole technology. Even if the increased costs can be managed, it is not acceptable from a security of supply point of view that the fuel consumption goes up dramatically. Another key issue is to clarify the risks for leakage of CO₂ from the storage. However, right now in the research and development phase it might be too early with standardisation (except for calculation, testing and monitoring) while it could be more suitable with guidelines and recommendations.

CO₂ emissions trading directive, measurement of energy use, end-use product (Priority n°14)

Proposals for future work:

The standards of measurements are the subject of preliminary studies within CEN. They are related to the emissions of particular sectors. To note that a recent project of guide of measurement was proposed by the European Commission.

Level of priority :

Priority level A

Description of the subject :

The directive establishing a scheme for greenhouse gas emission allowance trading within the Community was definitively adopted on 13 October 2003 and enters into force immediately. The market will be effective at January 1, 2005. During the period 2005-2007, the market will relate only to Carbon dioxide (CO₂). The market will be increased with the other greenhouse gases under the next market period, 2008-2012, mentioned by the protocol of Kyoto (Methane (CH₄), Nitrous Oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur Hexafluoride (SF₆)) but will interest only the largest installations (thresholds are fixed) of four industrial sectors (energy activities, production and processing of ferrous metals, mineral industry, paper and board), as well as the installations of combustion of a calorific power higher than 20 MW (except municipal dangerous waste). There should be a little more than 10 000 active factories site on the market, representing approximately 46 % of the total carbon dioxide emissions of the European union. The Member States had until December 31, 2003 to adopt their legislative and lawful apparatus and until March 31, 2004 to work out their national plan of allowance.

Some standardisation work is under the way at ISO level (ISO 14064) for the quantification and at CEN level for the measurement.

The standards of quantification and measurement of the emissions (and collecting) of greenhouse gases are essential tools with the recognition of the efforts carried out in this field.

Available legislation or under preparation at EU level and key aspects from national level :

CO₂ emissions trading directive : Directive 2003/87/EC

Stakeholders (industrial sectors, European associations, ...)

Identified standardisation work relevant to the subject : standardisation structure and purpose of standardisation

ISO/TC 207/WG 5 "Climate change" for the quantification and CEN/TC264/WG 24 GHG quantification and CEN structure for the measurement

Overall benefits / Impact on energy management :

The standards of quantification and measurement of the emissions (and collecting) of greenhouse gases are essential tools for the recognition of the efforts carried out in this field.

Thus it is advisable to distinguish the standard from quantification (ISO 14064) making it possible to enter the emissions of GES and to submit a report of it, of the physical standards of measurements of the emissions. The stake primarily is to allow for dialogue on the total trade of units of reduction of the emissions of GES. Secondly should be to allow the development of harmonized technical tools.

Energy efficiency and saving calculation (Priority n°15)

Proposals for future work :

Need for common methods of calculation of energy consumption, energy efficiencies, and energy savings, for a common measurement and verification protocol, and methodology for energy use indicators

These needs refers to two different fields:

- a. Standards on specific technologies or “systems” (rather than “products”) to be developed by the relevant committees;
- b. General Standard or Guidelines giving the general rules for calculation and measurements.

Further investigation is needed to clarify the title, scope and possible content of the general Standards and / or Guidelines, and to define the specific "system" Standards required, with the needed priority.

Level of priority :

Defining a detailed programme and starting the work should be a high level of priority A, also because of the extensive work needed.

Description of the subject :

The need for common methods of calculation of energy consumption, energy efficiencies, and energy savings, for a common measurement and verification protocol, and methodology for energy use indicators, comes from many sources.

- The **EPBD** requires “methods of calculation of energy consumption and efficiencies of buildings” (art. 3) and “reference value bench marks (art. 7.1)”.
The DG TREN Mandate M343, april 2004, asks CEN – CENELEC for standardisation work for such related Standards.
- The **ESD**, establishing “mandatory targets for cumulative annual energy savings” (art. 4 and 5) to be achieved by energy distribution and sales companies through energy services, will also require energy saving calculation methodologies.
- The **Italian “Energy Efficiency Decrees – 24.4.01”** (recently replaced by new DM 20.7.04) already need Standards for evaluating and validating the results of improvement projects to get the “White Certificates”.

All of these required Standards refer to **specific** technologies, and therefore “systems” (rather than “products”), attributable to the specific Sectors.

As an example the list of eligible technologies taken from the Annex of the Italian Decrees include among others:

- | | |
|---|------------------------------------|
| - Building Insulation | - Double pane windows |
| - Solar radiation protection on windows | - Boiler substitution |
| - DHW conversion electric to gas | - Solar collectors |
| - Heating controls | - Heat metering and billing |
| - Heat recovery | - CHP |
| - Heat pumps | - Air conditioning improvements |
| - High efficiency motors | - Variable speed drives |
| - High efficiency lamps | - Lighting efficiency improvements |

<ul style="list-style-type: none"> - Lighting controls - Higher efficiency office equipment - Higher efficiency appliances <p>However there could be the need for general Standards or Guidelines giving general rules on calculations and measurements of efficiencies and savings, which nevertheless still require beforehand a good understanding of the purpose and means to achieve it, and an appropriate definition.</p> <p>Such Standards and / or Guidelines could also be a useful instrument and guide for Energy Audits. Excellent indications and examples are given by the:</p> <ul style="list-style-type: none"> - “International Performance Measurement and Verification Protocol - IPMVP” (see www.impvp.org), and - ASHRAE Guidelines 14 – 2002 – “Measurement of Energy and Demand Savings”.
<p>Regulatory situation (Available legislation or under preparation at EU level and key aspects from national level)</p> <ul style="list-style-type: none"> - “Energy Performance of Buildings” Directive 2002/91/EC (EPBD) - “Energy End-use efficiency and Energy Service” Directive (ESD) proposed (COM (2003) 739 – final – 10.12.2003) - Italian Energy Efficiency Decrees – 20.7.2004
<p>Actors (industrial sectors, European associations, ...)</p> <p>Governments, agencies, energy users, energy services providers, ESCOs, utilities and energy distributors and sellers required to reach energy consumption reduction targets, certification bodies, energy using products manufacturers and energy systems providers.</p>
<p>Identified standardisation work relevant to the subject : standardisation structure and purpose of standardisation related to the</p> <ul style="list-style-type: none"> - “International Performance Measurement and Verification Protocol - IPMVP” - ASHRAE Guidelines 14 – 2002 – “Measurement of Energy and Demand Savings”. - OENORM M 7140: “Economic comparison calculation of energy systems” (?) - ISO 13600 “Technical energy systems” (?)
<p>Overall benefits / Impact on energy management :</p> <p>Among many other obvious benefits these Standards are needed for the evaluation and validation of the energy saving projects for the release of the “White Certificates”. White Certificates are dealt within CEN/CLC/EM in Priority 20.</p>

Energy Service Companies (ESCO) definition : requirements and qualification procedure (Priority n°16)

Proposals for future work :

- 1 – Define the proposed Standard structure and contents.
- 2 – Identify the CEN – CENELEC Technical Committee, Working Groups or Task force, who should implement the Standard.
- 3 – Issue a CEN – CLC – BT Mandate to the Committee in charge to prepare the Standard
- 4 – Define the stakeholders and participants in the Working group for developing the Standards.

In defining the desired quality level of ESCOs it would also be advisable to include the adoption of a certified Energy Management System, and the use of certified Energy Experts competencies.

Also it would be advisable that the CEN – CLC – BT JWG – EM evaluate whether further Standardisation Work is needed on some specific related subjects, such as “Energy Performance Contracting”, “Third Party Financing”, “Model Contract”.

Level of priority :

It should be a high level of priority A (within one year) as:

- the Italian Decrees establishing the EE Certificates Trading mechanism, where the Certificates can be released, beside the Distributors, also to “energy service companies”, without defining them, need urgently such Standard, preferably on a commonly shared European basis;
- the ESD is approaching in a short time;
- the energy service providing business is just starting now in Europe and it therefore need appropriate supporting instruments for guaranteeing their quality.

Description of the subject :

The Energy Service Companies (ESCO) play a very important role in the energy saving and efficiency promotion, and for project implementation, to support energy Users and enterprises who do not have adequate capacity, and energy Distributors and suppliers for DSM actions.

The ESCOs have been promoted for some time by the EC, but do not have yet the scope and weight that is needed and expected.

Various types of ESCOs and energy service providers (ESP) already exist in many European countries with different characteristics and levels of developments. However there is a need for a common definition of the energy service companies, identifying their possible roles and characteristics.

Also some specific contract mechanisms they may offered to their customers, such as: Energy Performance Contracting (EPC) of Third Party Financing (TPF), need a better common definition and understanding. The International Energy Agency (IEA) in its DSM Implementing Agreement has established a Task force (X) on EPC for a better development and diffusion of such mechanisms as a support for the ESCO promotion.

The recently proposed **Energy Service Directive** (ESD) recognize the great importance of ESP and ESCO (art. 6 and 7) and asks (art. 8) for “appropriate **qualification, accreditation** and / or **certification schemes** for market players delivering energy services, with a view to maintaining a high level of technical competence of personnel, and quality and reliability of energy services offered.”

In Italy the tradable **White Certificates** (WC) process, based on the Decrees 24.4.01 (recently replaced by new DM 20.7.04) and Energy Authority (AEEG) Guidelines of 1.10.03, is starting in 2005,

opening the way for a possible extension in Europe (see ESD art. 4.7). The Decrees and related AEEG Guidelines establish that the WC can be issued, besides the Distributors, also to "**Energy Services Companies**", without however giving any definition or requisites for them, thereby causing confusion in the market.

It is therefore necessary to publish a **Standard** defining role, characteristics and requirements of the ESCOs.

In Austria an ESCO qualification scheme, called "Thermo-profit" has been developed in previous years by Graz Energy Agentur.

A 3 year project "EUROCONTRACT" will be implemented by 8 European Energy Agencies with the EC EIE/SAVE cofunding, starting 2005 to promote the development of EPC and ESCO and define a qualification/certification process for the ESCOs.

The Standard

- The Standard to be issued should provide the definition, the characteristics, the services offered, and the minimum requirements of the Energy Service Company.
- The Standard would also be the basis for the common public certification process.

Regulatory situation (Available legislation or under preparation at EU level and key aspects from national level)

- The proposed "**Energy end-use efficiency and Energy Service**" – **Directive** (COM (2003) 739 final – 10.12.2003) asks of **art. 7** that "Energy services, programmes and other measures be delivered and implemented by "**qualified bodies**" such as: energy services companies, installers, energy **advisors** and energy **consultants**". Also stated at **art. 8** that there shall be "**qualification, accreditation** and / or **certification** schemes for market players delivering energy services, with a view of maintaining a high level of technical **competence of personnel** and quality and reliability of energy services offered." Here again there is consequently a need for a Standard.
- In Italy the E. E. Decrees 20.7.04 state that the "Energy Efficiency ("White") Certificates can be released to "**energy service companies**", however without giving any definition of such companies, thereby causing confusion in the market; nor is any definition given in the accompanying Guidelines issued by the Energy Authority (AEEG).
- It appears that no other legislative documents are available at national level in other European countries.

Stakeholders (industrial sectors, European associations, ...)

The main stakeholders are the **companies who** already provide, or plan to **provide, various kinds** of energy services, including equipment installers and facility management companies.

Other interested parties are the energy service companies customers, such as:

- Energy **Users**, mainly medium / large size, especially the **Public Administrations** that generally lack the resources needed for an appropriate Energy Management;
- Energy **Distributors** and selling companies, who should provide energy service, according the ESD and EE Decrees, through other energy services providers.
- The qualified Energy **Experts** that can be employed by the Energy Service Companies.

Other institutional organisations are also interested, such as:

- The **Accreditation and Certification Organisations**
- National and local **Governments** and Energy Authorities, to use qualified energy service providers as an important instrument to implement the energy efficiency policies.
- The National and Local **Energy Agencies**, to promote energy efficiency activities through qualified energy service providers.

Identified standardisation work relevant to the subject : standardisation structure and purpose of standardisation

No Standards relevant to the Subject appear to exist.

Overall benefits / Impact on energy management :

- To establish the basis for the qualification, certification, accreditation process of **Energy Service Companies**, requested by the ES Directive, and needed to satisfy the demand of energy services of energy Users and Distributors.

Energy Managers and experts : roles, professional requirements and qualification procedure (Priority n°17)

Proposals for future work :

- 1 – Define the proposed Standard Structure and contents
- 2 – Identify the CEN – CENELEC Technical Committee, Working Group or Task force, who should implement the Standard
- 3 – Issue a CEN – CLC – BT Mandate to the Committee in charge to prepare the Standard
- 4 – Define the stakeholders and participants in the Working group for developing the Standards.

It would also be advisable that the CEN – CLC – BT JWG EM evaluate whether further Standardisation work is needed on Training Course quality level Standard.

Level of priority :

It should be a high level of priority A (within one year) as:

- the EPBD should be adopted by Member States, defining the regulatory details by the end of 2005;
- the Italian EE Decrees 24.4.01 introducing the “White Certificates” urgently need evaluation capacities;
- the ESD is approaching in a short time;
- it foregoes further Standards on Energy Management Systems and ESCOs.

Description of the subject :

The actions aimed at energy saving and efficiency improvement can be done by various stakeholders:

the Users, mainly the large consumers, Energy Service Companies (ESCO), Utilities, with DSM measures, et. al. **All** these stakeholders need, to devise and implement energy efficiency projects of the expected quality and quantity, adequate human resources with appropriate professional capabilities and expertise to manage the energy uses; these are professionals usually defined as **Energy Managers (EM)**.

Such Energy Experts may have different roles for example: efficiently managing the energy use inside an organisation; performing energy audits; verifying and certifying energy efficiencies, in particular of buildings; contribute to developing and monitoring energy efficiency programmes. However the professional competencies required are basically the same.

In many countries in Europe such Energy Experts are already present and recognised with various roles and denominations. There is an obvious need to have common definitions and professional requisites specification.

Background

Italy has established by Laws 308/1983 and 10/1991 the obligation for users of more than 1'000 toe to appoint an “Energy Manager” and communicate his name every year to the Ministry. FIRE, the Italian Association of the Energy Managers, has been endorsed by the Ministry to collect the nomination, maintain a national data base of EM, and publish every year the list of nominated EM; there are currently around 2'000. There are no specific requirements on their characteristic, nor qualification. The Italian Ministry of Welfare has recently assigned a 3 year “EQUEM” contract (2005 – 2007) to FIRE to define and recommend a qualification/certification process for the EM, and develop an appropriate on-line modular training course.

Portugal requires by the “Regulation of Energy Consumption Management (RGCE)” of 1982 that all

users of more than 1'000 toe take an "Energy Audit" and prepare a "rationalisation plan" done by "individuals" or "consulting companies **"recognised"** by the Ministry (DGE).

Romania, by Law 199/2000 on Energy Efficiency, recognise the EM profession, whose role, characteristic and professional requisites are established by Ministry Order 245/2002 together with the qualification and accreditation procedure.

Denmark has established, over many years, its Building Energy Labelling Schemes where the Energy Labels are prepared by **"certified Consultants"**. There are today more than 600 certified Consultants.

Finland has established mandatory Energy Audits which are done by **Energy Auditors** certified by the national energy agency Motiva.

Also in **Czech Republic** in its "Energy Efficiency Act"/2000 requires Energy Audits to be done by **Energy Auditors** registered by the Ministry.

There could also be other similar examples in other European countries which we are not yet aware of.

The SAVE 2 **"EUREM – European Energy Manager"** project, presently running, cofinanced by the E. C. include four country organisations: the Nürnberg Chamber of Commerce in Germany; the Austrian Chamber of Commerce; the German - Portuguese Chamber of Commerce in Portugal; and the Energy Institute in the UK. The purpose is to provide adequate training to prepare Energy Managers and release a **"qualification"** mutually agreed.

The Standard

- The Standard to be issued should define the possible roles, the characteristics, and the minimum professional requirements of the **Energy Management Expert**.
- The Standard would be the basis for the common public **certification** process.
- The definition of the professional requirements would also be the basis for the **training** process and contents.

There could also be the need to define a **Standard** for the **training courses** to also allow the certification of the training courses.

Regulatory situation (Available legislation or under preparation at EU level and key aspects from national level)

- The **"Energy Performance of Buildings" - Directive – 2002 / 91 / EC** requires at **art.10** that the certification of the buildings, the drafting of the accompanying recommendations and the inspections of the HVAC systems, are carried out in an independent manner by **"qualified and/or accredited Experts"**, either as sole traders or employed by public or private enterprise bodies. Such a qualification / accreditation process obviously requires the existence of a Standard defining the common requirements for the accreditation. Such a Standard could possibly be the objective of a specific E. C. Mandate, as it has not been included in the EC – EPBD present Mandate.
- The proposed **"Energy end-use efficiency and Energy Service" – Directive** (COM (2003) 739 final – 10.12.2003) asks at **art. 7** that "Energy services, programmes and other measures be delivered and implemented by **"qualified bodies"** such as: energy services companies, installers, energy **advisors** and energy **consultants"**. Also states at **art. 8** that there shall be **"qualification, accreditation and / or certification** schemes for market players delivering energy services, with a view of maintaining a high level of technical **competence of personnel** and quality and reliability of energy services offered." Here again there is a consequent need of a professional Standard.
- As stated above, various national laws and regulations are already existing requiring "Energy Experts" with various roles and definition. Obviously the definition of a common EN Standard on "Energy Management Expert" would help the harmonisation process.

One key aspect emerges at national level in Italy from the “**White certificates**” process introduced by the “Energy Efficiency” Decrees - 24.4.2001 (recently replaced by new DM 20.7.2004), which is however in perspective of more general European interest. That is the procedure for the evaluation and **validation of the energy efficiency projects results** in order to allow the release of the Certificates. This procedure is not yet clearly defined and it is therefore one of the many difficulties and reasons that are delaying the real start of the “White Certificate” process. The Certified Energy Experts could obviously be endorsed for the evaluation and validation for the release of the WC.

Stakeholders (industrial sectors, European associations, ...)

The interested partners are on one side (offer) the **engineers** and technical **professionals** interested in getting a specific recognised qualification to offer their services, either as a sole trader (consultant, advisor, auditor, verifier) or employed by private or public bodies.

On the other side (demand) there are stakeholders interested in using the specific competencies of the Energy Management Experts either as an employee or external consultant.

These could be:

- **Energy User**, mainly medium / large size, both industrial and building owners.
- **Energy Service Companies**, to provide qualified energy services to their customers.
- **Energy Distributors** or selling companies, to define and implement DSM programmes.
- National and Local **Energy Agencies**, to design and implement energy efficiency programmes.
- The **Accreditation and Certification Organisations**
- The **Training** organisation, Universities, et al.
- Institutions such as national and local **Governments** and Energy Authorities, to properly design, implement and control energy efficiency policies and regulations.

Identified standardisation work relevant to the subject : standardisation structure and purpose of standardisation

No Standards relevant to the Subject appear to exist.

Overall benefits / Impact on energy management :

- To establish the basis for the qualification, certification, accreditation process of “**Energy Management Experts**” professionals, requested by the European EPBD; and ES Directive, needed for EE project evaluation and validation for the White Certificates, and of fundamental importance for all the energy efficiency improvement and promotion activities.

Eco-design requirements for energy using products (Priority n°18)

Proposals for future work :

As far as CEN is concerned, the first step will be carried out by CMC, in close co-operation with the Technical Bodies concerned. If CENELEC and ETSI decide to perform similar inventories for their sectors, the available inventories will be compiled to a common first deliverable (comprehensive list of relevant standards/ documents). This consultation was launched by CMC on 14 January 2005.

As a second step, gaps between the standards needed to implement the EuP Directive and the existing standards/documents will be identified leading to a joint document outlining a standardisation work programme as second deliverable. For the second phase, a new CEN/CLC/ETSI Joint Working Group on Energy using Products with a programming function could be established if needed (e.g. to get further expertise from experts within the European standardisation community).

CMC proposed to keep the WG informed so the WG members can contribute to the work to be done

Level of priority :

Level A as CEN and CENELEC BT have approved the programming mandate M/341 - Eco-design of Energy using Products (EuP)

Description of the subject :

The EuP Directive establishes a framework for the integration of environmental aspects in product design and development to ensure the free movement of energy-using products within the internal market. Means of transport for persons or goods by inland, sea and air are excluded.

For the explanation of the subject, the following definition are given :

“Eco-design” means the systematic integration of environmental aspects into product design with the aim to improve the environmental performance of the EuP throughout its whole life cycle

“Energy-using Product (EuP)” means a product which is dependent on energy input (electricity, fossil and renewable fuels) to work as intended and a product for the generation, transfer and measurement of such energy, including parts which are intended to be incorporated into EuP which are placed on the market as individual parts for end-users, the environmental performance of which can be assessed independently

Extract from Mandate M/341 for programming of standardisation work in the field of eco-design of energy-using products

The production, distribution, use and end of life management of energy-using products (EuP) are associated with a number of important environmental impacts. It is estimated that over 80% of all product related environmental impacts are determined during the product planning phase; integration of environmental considerations as early as possible into the product development process appears therefore the most effective way for introducing changes and improvements to products.

As for the preservation of the internal market, it is expected that due to the growing public awareness on environmental issues these products will be increasingly targeted with regard to their environmental aspects and performance by consumers and policy makers alike. If diverging legal requirements are set at a national level there is a risk of fragmentation of the internal market.

Furthermore it is important to increase security of energy supply, including through reduced demand, for example through improved energy efficiency of products.

In response to this situation the Commission has proposed a Directive establishing a framework for the setting of eco-design requirements for energy-using products ¹, aiming to ensure a free movement of these products, a high level of environmental performance and a contribution to security of energy supply in the EU. It foresees the possibility of introducing via implementing measures binding legal requirements which can be of a generic (aiming at the improvement of the

overall environmental performance, focusing on environmental aspects identified in the implementing measure, a list of which is given in Annex I of the Commission proposal) and/or specific (in the form of limit values for selected environmental aspects with a significant adverse impact on the environment).

The proposal is based on concepts of the New Approach and proposes implementation of European harmonised standards, the references of which have been published in the OJ, as one of the means for compliance. In the case of generic eco-design requirements, harmonised standards would help producers in taking decisions during the design process in accordance with the requirements of the applicable implementing measure and in facilitating the practical implementation of these decisions. Reference to these European standards would also contribute to more transparency and comparability in the evaluation of the environmental performance of products. Furthermore, in the case of specific requirements such standards would be essential in establishing measurement and testing methods.

Available legislation or under preparation at EU level and key aspects from national level :

EuP Directive and its implementing measures (Proposal for a directive of the European parliament and of the council on establishing a framework for the setting of Eco-design requirements for Energy-Using Products and amending Council Directive 92/42/EEC)

Identified standardisation work relevant to the subject : standardisation structure and purpose of standardisation

A two-step-approach is proposed to be applied: as the first step, an inventory of existing standards and other documents at European and international level (ISO, IEC) relevant for the scope of the EuP Directive will be performed. This includes both horizontal and product specific standards/documents. The product specific standards will be related to the three already existing Directives serving as future implementing Directives for the EuP Directive (minimum energy efficiency requirements for hot water boilers (Directive 92/42/EEC), household refrigerators/ freezers (Directive 96/57/EC) and ballasts for fluorescent lighting (Directive 2000/55/EC));

Overall benefits / Impact on energy management :

It is generally acknowledged that the production, distribution, use and end of life management of energy-using products ("EuP") is associated with a considerable number of important impacts on the environment such as climate change linked to energy consumption, consumption of other materials and natural resources such as water, waste generation and release of hazardous substances to the environment. It is estimated that over 80% of all product-related environmental impacts are determined during the product design phase. Integrating environmental considerations as early as possible into the product development process is therefore the most effective way of introducing changes and improvements to products. It is expected that with the wide dissemination and considerable environmental impacts of energy-using products, growing public awareness of environmental issues will result in the environmental aspects and performance of such products being increasingly targeted.

Energy management system (Priority n°19)

Proposals for future work:

Define a European Standard on “Energy Management System” similar to the Danish, Swedish and Irish Standards, or Guidelines to establish such system in a company or organization, either by itself, or integrated in other management systems like Quality or Environment.

There has been a debate inside the CEN/CLC/EM on whether the subject should be dealt in a Standard or by Guidelines. It has been agreed that such decision should be left to the ad hoc competent joint Working Group that CEN and CENELEC should establish for the implementation of the Standards on Energy Managers and Energy Service Companies, who should also deal the Energy Management.

Nevertheless CEN/CENELEC should **establish a new Technical Committee**/Working Group/Task Force with the purpose of preparing the Standards on Energy Managers, Energy Service Companies, and decide what to do on Energy Management, taking account of the existing Danish and Swedish Standards.

Level of priority :

It should be a high level of priority **A** (within one year) as:

- National Standards on the subject already exist;
- it can help in the implementation of the expected “**Energy Services**” and “**Energy using Products**” Directives and in general the E. U. energy efficiency diffusion policy;
- It could also be part of the Standard on ESCO minimum requirement, also proposed.

Description of the subject :

In order to achieve significant results in energy efficiency improvements, thereby reducing costs and increase productivity and benefits to the environment, the organizations need to introduce the **Energy Management** as a natural part of their general management system. Therefore, a standard or guideline dealing in the energy efficiency key aspects to be integrated into any management system (environmental (ISO 14000) or quality (ISO 9000) management system) will help in promoting and expanding the consciousness, and effectively implement the policies of the energy efficiency.

Such a Standard has already been issued in Denmark as **DS 2403 E** and **DS INF136**, and in Sweden as **SS 62 77 50**.

Regulatory situation (Available legislation or under preparation at EU level and key aspects from national level)

There are not specific Energy Management System requirements in the EU legislation; however the Standard would definitely help in the implementation of the expected “**Energy Services**” and “**Energy using Products**” Directives, and in general the E. U. energy efficiency diffusion policy.

A further reference could be the Danish and Swedish legislation which originated the EMS Standard.

Stakeholders

The main interested parties are:

- Energy **Users**, mainly medium / large size, both industrial and building **owners**, to improve their energy use efficiency, thereby reducing costs and environmental impacts.

But could also be:

- **Energy Service Companies**, to provide qualified energy services to their customer and efficiently manage their energy uses in outsourcing;

- Energy using products **Manufacturers**, to better understand and improve the energy efficiency of their products;
- **Energy Distributors and selling companies**, to better define and implement their DSM programmes.

On the other side could also be interested parties:

- The **Accreditation and Certification Organisations**;
- National and local **Governments** and Energy Authorities, as an important instrument to implement the energy efficiency policies
- The national and local **Energy Agencies** to promote energy efficiency activities.

Identified standardisation work relevant to the subject : standardisation structure and purpose of standardisation

- **DS 2403 E** – 17.8.2001 – “Energy Management - Specification”
- **DS INF 136** – 13.12.01 – “Energy Management - Specification”
- **SS 62 77 50** - 24.10.03 – “Energy Management System - Specification”

Overall benefits / Impact on energy management :

- The EMS Standard assists organizations in their efforts to pursue an approach where a sensible economy and a responsible attitude to the environment go hand in hand.
- Besides reducing costs and thereby strengthening competitiveness, Energy Management System offers a number of additional advantages. First and foremost the coming years will see increasing focus on the way in which products are made. Consumers in particular, turn their attention this way, but it will also manifest itself in the recruitment of staff in the sense that many competent employees make demands on the organizations' responsibility to the environment.
- The result of energy management is continual improvement in the form of a reduction of the emissions of CO₂ by using energy more efficiently. The organization undertakes to continue to reduce the relative consumption of energy, e. g. the energy consumption per unit produced. There is no requirement to reduce the absolute consumption of energy.
- It is synergic with the already well established Environment and Quality management systems ISO 9000 and 14000.
- It definitely helps in promoting and diffusing the consciousness, and effectively implement the policies of the energy efficiency.
- It allows the establishing of an Energy Management System certification process.
- The Energy Management System Standard could be part of the Standard on ESCO minimum requirement, also proposed.

White certificates (Priority n°20)

Proposals for future work :

Further investigation is requested inside the CEN/CLC/JWC – EM to define the Standardisation needs for the “White Certificates” and possibly their equivalence with other certificates in strict correlation with Priority 10 – “Green Certificates”.

Description of the subject :

The so called “White Certificates” are tradable Certificates of Energy Efficiency, released against proven energy savings obtained from efficiency improvement projects.

They are similar to the already existing “Green Certificates” for renewable energies, and have trading mechanism similar to the “Emission Trading”, or “Carbon Trading”, where they are also sometimes called “Black Certificates”.

The “White Certificates” (WC) have been introduced in **Italy** with the Energy Efficiency Decrees 24.4.2001 (recently replaced by new DM 20.7.04), and are expected to be operative starting 2005.

The WC will be issued by the GME “Gestore del Mercato Elettrico”, who already manage the electricity market place (IPEX) and the Green Certificates market place, following a mandate of the Energy Authority (AEEG), against evaluated and validated energy saving projects, to Distributors, who must reach definite yearly target of energy savings, and ESCO.

The Decrees have an Annex with a list of possible Energy Conservation Measures (ECM) considered for WC releasing.

The WC can be traded either by bilateral contracts or in the specific “Energy Exchange”.

The **UK** has a similar mechanism, the “Energy Efficiency Commitment”, simpler and less ambitious, administered by the OFGM, in operation for three years with quite good results.

France, Sweden and may be some other European countries like Norway and Belgium, are planning to introduce a WC mechanism.

The proposed European Energy Service Directive foresees at art. 4.7 a possible future Directive to introduce WC.

The main technical rules requested by the WC concern the methods to **evaluate the energy savings** and **validate the projects** for the Certificate release. This subject is therefore strictly connected to that of Priority 15 - “**Energy efficiency and saving calculation**”.

Another aspect to be taken into consideration is the possible equivalence between Green and White Certificates, and with the Emission or “Carbon” tradable allowances, through a predefined “CO₂ factor” (kg CO₂ /kWh).

Green Certificates (on renewables) have indeed some similarities with White Certificates, although there are important differences and stakeholders, and some standardisation work might be developed in parallel.

Within the CEN/CENELEC BT/JWG EM project Green Certificates are handled in priority 10.

On this subject the International Energy Agency has started a new Task XIV on White Certificates and their equivalence in its’ DSM Implementing Agreement to be completed by the end of 2005..

Also an EIE/SAVE “EuroWhiteCert” project, on the same subject cofinanced by the DG TREN, with the partnership of many European Agencies, will start in 2005.

Regulatory situation (Available legislation or under preparation at EU level and key aspects from national level)

- Italian Energy Efficiency Decrees – 20.7.2004
- “Energy End-use efficiency and Energy Service” Directive (ESD) proposed (COM (2003) 739 – final – 10.12.2003), art. 4.7
- UK – “Energy Efficiency Commitment” 1(2002-4) & 2(2005-7)

Identified standardisation work relevant to the subject : standardisation structure and purpose of standardisation

None

Communication standards on energy load and tariff management to enable a more efficient use and allocation of the electric energy in houses and buildings (Priority n°21)

Proposals for future work:

A proposal could be made to TC 8X of CENELEC to set up a specific Working Group with experts coming from TC 59X and TC 205 of CENELEC, from TC 13 and TC 57 of IEC and from the various ISO/IEC and CEN/CENELEC technical committees dealing with various types of appliances and applications in houses/buildings.

Level of priority :

level B

Description of the subject:

The rational and efficient use of the energy, in particular of the electric energy, including the allocation of the energy use in the various phases of the processes, is a fundamental issue for the coming years, particularly in houses and buildings.

While the energy efficiency of the appliances has registered significant improvements in the last decades, with a more efficient design and management of the process in each individual appliance, the way in which these products are used in most of the houses and buildings is still heavily influenced by existing habits, with limited attention to a more rational use and allocation of the electric energy.

The recent progress in Home and Building Automation opens a new perspective in the field of Building Energy Management. The coordination/integration of specific functions among appliances that belong to different application subsystems (clusters) of the house or building may generate further opportunity for a more efficient use of the energy (e.g. a refrigerator or a freezer could optimize its cold output with ambient temperature conditions from the heating system, or lighting/heating could be switched off/reduced if the security system does not detect any presence in the room for a certain period of time).

The following application clusters can be identified in a house or building environment: Lighting, Hygiene, Food conservation and preparation, Leisure, Security and control, Heating, Air Conditioning and Ventilation.

By an integrated control of the clusters and an enhanced synergy with the Electrical Utilities policies, it is possible to conceive an usage of the appliances that takes advantage of lower energy cost offered, while reducing the overall environmental impact.

Electrical Utilities try to flatten the load curve to be able to produce energy more efficiently, at lower cost and lower environmental impact. DSM strategy is based mainly on multi-tariff systems.

If the Electrical Appliances can be rated on the Tariff Profile, they could take advantage of more convenient tariffs, shifting when possible their operations to the cheaper periods: if, ideally, all electrical boilers, washing machines and dishwasher would shift their operations to the night hours it would be possible to significantly flatten the daytime peak demand and hence conserve the more valuable type of energy used to cope with it.

To enable this possibility is extremely important to have a common standard about the description of the Tariff Profile and a common way to convey it to all the applicable electrical appliances. In a multi-cluster architecture this means that such information is common to all applications and then delivered to all clusters

A possible activity could be organized between the Electrical Utilities and the involved Appliances

<p>Manufacturers to define such a common standard.</p> <p>A more sophisticated approach to Load Management would allow an active management of the individual loads in the residential sector. This would represent a second step in the development as it implies the definition of hierarchies and priorities in use, within all the electrical uses of the house, as well as the identification of new functions such as the control management⁵. To develop such an application, it is fundamental that the Electrical Utilities and the Appliances Manufacturers cooperate in defining load management strategies that will not negatively affect the performance of each single Electrical Appliance.</p> <p>A multi-cluster Standardization of the Load Management communication strategies is fundamental for the success of any related initiative.</p>
<p>Regulatory situation (Available legislation or under preparation at EU level and key aspects from national level)</p> <p>No legislation at EU level is available nor in preparation on this subject.</p>
<p>Stakeholders (industrial sectors, European associations, ...)</p> <p>Electricity Distributors, Electrical Appliance Manufacturer Organizations, Communication Associations, Final Client Organizations.</p>
<p>Identified standardization work relevant to the subject: standardization structure and purpose of standardisation</p> <p>There is not specific standardization work on the subject.</p>
<p>Overall benefits / Impact on energy management:</p> <p>The coordination/integration of specific functions among appliances that belong to different application subsystems (clusters) of the house/building may give an important contribution to a more efficient use and allocation of energy.</p> <p>In addition, an integrated communication system could manage the use of the various appliances in relation of the tariff profile, shifting, when possible, the operation of these appliances to the periods of the day with more convenient tariffs.</p>

⁵ An example of a critical management of the loads is to interrupt a washing cycle of delicate fabrics, to give priority other loads, just after the heating phase and leave it in such a condition for a long time. The result is a loss of energy and possible damage to the clothes

ANNEX VII – Overview of the work

The table below gives an overview of the results of the work. For each priority, it underlines the proposal(s) for future work, the stakeholders, the type of deliverable appropriate and the standardisation structure identified that are relevant to the subject if any.

Priority n°1	Tools for energy performance in building
Proposal	Promotion of the CEN standards at the ISO level Create standards to help designers and architects to improve energy efficiency for retrofitting (this subject will be discussed in ISO TC 205 WG2)
	Most of the proposals are already committed within CEN BTWG 173 - EPBD project group
Priority n°2	Harmonisation of Declaration environmental impact of energy use in building area
Proposal	Make an in-depth study of the state of the art. There are today several methodologies and databases, project results covering different parts of the building area and the normal energy carriers as district heating, electricity, oil, gas etc.
Level	A
Stakeholder	Socio-economic actors in construction sector (designers, architects, ...°°) Research institutes, Universities, Industries, national Agencies and National Standardisation Organisations
Deliverable	Standard
Relevant body	CEN BTWG 174 "Integrated Environmental performance of Building" with regard of the mandate M340 on environmental performance of buildings
Priority n°4	Air conditioning especially in commercial buildings with the health aspect
Proposal	Gather the existing data from the different TCs whose working fields are related to this topic and the best practices especially for installation and maintenance
Level	A
Stakeholder	Air-conditioner professional unions, manufacturers, users, installers
Deliverable	Standard
Relevant body	CEN/TC 113 "Heat-pumps and air-conditioners"
Priority n°5	Benchmarking in industry
Proposal	Establish a standardised method of benchmarking energy use and green house gas emissions in order to increase energy efficiency and reduce climate change
Level	A
Stakeholder	Industry

Deliverable	Guideline (other deliverable than standard)
Relevant body	No structure identified, Proposal: new body to be set up
Priority n°6	Goods transportation on road and intermodal modes
Proposal	Eco Driving Programs with Training and Fuel Consumption Monitoring/Reporting
Level	A
Stakeholder	The road haulage industry, buyers of transport services, national road admin/agencies, truck and private car manufacturers, drivers licensing/training actors and fuel distributors/producers.
Deliverable	Guideline
Relevant body	CEN/TC 320 "Transport - Logistics and services"
Proposal	Energy Saving and CO ₂ Reduction Programs for Transports by Truck
Level	A
Stakeholder	Governments, agencies and public opinion, Buyers of transport services, the road haulage industry, truck manufacturers, fuel producers/distributors, national agencies within the transport sector
Deliverable	Standard
Relevant body	CEN/TC 320 "Transport - Logistics and services"
Proposal	Transport Logistics Programs (CAD)
Level	A
Stakeholder	Transport services buyers, road haulage industry and other transporters, consultancy firms and CAD Program designers/producers
Deliverable	Standard
Relevant body	No structure identified, Proposal: new body to be set up within ETSI
Proposal	Systems for goods tracking
Level	A
Stakeholder	Transport services buyers, insurers, road haulage industry, other transporters, manufacturers of tracking equipment.
Deliverable	Standard
Relevant body	No structure identified. Need cooperation between the different transport modes
Proposal	Mobility Management Model
Level	A
Stakeholder	Stakeholders within the transport sector, municipality planning, transport services buyers, public in general, manufacturers and designers of transport systems, vehicles, etc, government agencies, researchers.
Deliverable	Guideline
Relevant body	No structure identified. Proposal: new body to be set up
Proposal	Take the opportunity to emphasise CEN and CENELEC as an actor to co-ordinate standardisation for the four transport fields.

Proposal	We recommend CEN and CENELEC BT to initiate a co-operation with organisations responsible for railway standardisation.
Proposal	Co-ordinate proposals from CENCLC BT/WG EM with the conclusion of the CEN/CENELEC/ETSI Conference "Transport Getting there with European Standards - The benefits of standardisation for a single market in transport " 2004 to continue future work within the transport field.
Proposal	Initiating a strategic dialogue with relevant EU bodies to further identify the need of a CEN standardisation process to support the practical implementation of maximum total vehicle length (25,25 m) and total weight (60 tonnes).
Level	C
Stakeholder	Truck manufacturers and the road haulage industry and transport services buyers in Europe would support and participate in the development of a CEN Standard on allowed maximum road vehicle length (25,25 m) and total weight (60 tonnes).
Relevant body	CEN TC 320 would be the suitable platform for a future standardisation process.
Proposal	Initiating a strategic dialogue with relevant EU bodies to further identify needs of a CEN standardisation process to support a modified EU-Directive (2003/0056 COD).
Level	C
Stakeholder	Truck manufacturers, the road haulage industry and buyers of transport services would support a frame work EU-legislation allowing CEN Standards to solve the practical solutions on Intermodal Loading Units.
Relevant body	CEN TC 320 would be the suitable platform for a future standardisation process.
Proposal	Initiating further investigation of the possibilities of turning into engine-fuel solutions based on renewable and non-polluting energy carriers including analysis on the need of standards to support development and implementation of new technologies. This priority is strongly linked to priority No 8.
Level	B
Stakeholder	The road haulage industry, buyers of transport services, truck and private car manufacturers, national road admin/agencies, buyers of private cars and fuel distributors/producers would support and participate in a standardisation process.
Relevant body	CEN/CLC JWG might be a relevant platform for administrating this further investigation and reviewing ongoing research and development.
Proposal	Initiating further investigation and a dialogue with CEN TC 320 and Dr Rayner Mayer, Society Projects, UK ("Environmental footprints for vehicles" at the CEN/CENELEC/ETSI Conference in Brussels 3-4/11 2004) to identify the full scope of a future standardisation process on Methods for Calculation, Declaration and Reporting on Energy Efficiency and Environmental Performance in Transport Chains.
Level	B

Stakeholder	Road haulage industry and other transporting Stakeholders, buyers of transport services and government agencies would support the standardisation of Methods for Calculation, Declaration and Reporting on Energy Efficiency and Environmental Performance in Transport Chains.
Relevant body	There are no obvious TC:s or WG:s to deal with this subject and it would require cooperation with stakeholders from all transport modes. CEN/CLC JWG might be a relevant platform to initiate a relevant TC/WG and the necessary cooperation partners.
Proposal	Initiating further investigation and cooperation between parties involved to clarify the possibilities to standardise Systems for Intermodal Cargo Exchange.
Level	B
Stakeholder	Transport services buyers, road haulage industry and other transporters and manufacturers of vehicles and equipments would support a standard on Systems for Intermodal Cargo Exchange.
Relevant body	CEN/CLC JWG might be the relevant forum for initiating further investigation and cooperation needed.
Proposal	Initiating further investigation of the possibilities to gather data and calculation models in various existing LCA Models and to develop a standardised model on transport and logistics.
Level	B
Stakeholder	Stakeholders within the transport sector, municipality planning, transport services buyers, public in general, manufacturers and designers of transport systems, vehicles, etc, government agencies, researchers would support a model standardisation process in the field of LCA Model for Transport and Logistics.
Relevant body	No obvious forum identified for administrating this investigation process.
Priority 8	Alternative fuels
Proposal	Integrated Set of Energy Efficiency and Environmental Parameters for Fuels
Level	A
Stakeholder	Governments, agencies, consumers of fuels including the road haulage industry, car manufacturers, manufacturers of the equipment to be used in connection with the alternative fuels, fuel producers/distributors, universities, etc would support and participate in a standardisation process on a common set of parameters on fuels for vehicles. For stationary installations the manufacturers and owners of power/heat plants and their organizations should be interested.
Deliverable	Standard
Relevant body	No structure identified. Proposal : new body to be set up
Proposal	Internalising External Costs into Fuel Pricing (methods and parameters)
Level	B
Stakeholder	Researchers and government bodies are investigating this subject area. It is difficult to identify any business or industry stakeholders that would participate in a standardisation process for the time being.

Deliverable	Standard
Relevant body	No structure identified
Proposal	Models for Steady and Common increasing of Energy Prices (calculation methods and analysis of effects of increasing energy prices)
Level	C
Stakeholder	Researchers and government bodies are investigating this subject area. It is difficult to identify any business or industry stakeholders that would participate in a standardisation process for the time being
Deliverable	Standard
Relevant body	No structure identified
Proposal	Differentiated Taxes to Support Further Energy Efficiency (models and calculation methods for studying the effects of different taxation levels)
Level	C
Stakeholder	Politicians and government bodies are experimenting in this subject area and sometimes they base their decisions on scientific results. It is difficult to identify any business or industry stakeholders that would participate in a standardisation process for the time being.
Deliverable	Standard
Relevant body	No structure identified
Proposal	Testing, sampling and calculation methods for alternative fuels
Level	A
Stakeholder	Especially certification and standardisation bodies but also car manufacturers, fuel producers/distributors, producers of electricity and heat, manufacturers of equipment for producing, distribution and storing alternative fuels would be interested.
Deliverable	Standard
Relevant body	To check CEN/TC 19 "Transportation fuels", CEN/TC 343 "Solid recovered fuels" and CEN/TC 335 "Solid biofuels"
Priority 9	Standardisation of energy system for tomorrow
Proposal	<p>A guideline giving key data for all equipment and how to calculate and simulate a complex energy system with highest possible efficiency and environmental performances.</p> <p>A recommendation on how the LCA and LCC methods could be used to optimise the process could be an important part of such a guideline.</p> <p>Guidelines or standards for measuring and judging the system approach in order to improve and achieve the highest possible overall performance for an energy system.</p> <p>Guidelines or standards for monitoring and calculating efficiency and environmental performances during operation could be developed.</p>
Level	<p>A : for work that can be incorporated in the ongoing work of CENELEC/TC 8x</p> <p>B : for all the proposed work to be done since the development of the future energy systems need to start relatively soon.</p>

Stakeholder	There are many stakeholders who could be interested in standards (or guidelines) for designing and evaluating the future energy systems. Basically all manufacturers of power (heat) plants and equipment for transmission/distribution of electricity and heat might be interested in the standardisation process. Naturally the electricity companies and other owners of power (heat) plants including their organisations such as EURELECTRIC, EUROHEAT & POWER and COGEN EUROPE are very interested. Perhaps even organisations for fuel suppliers such as EUROGAS might be interested as well as MARCOGAZ. Finally governments, politicians, national energy authorities, research institutes, researchers and environmental organisations should show interest in designing the future energy systems with the aim to improve energy efficiency and environmental performances thus contribution to a more sustainable electricity and heat production/transmission/distribution.
Deliverable	Concentration on guidelines rather than standards seems to be advisable.
Relevant body	CENELEC/TC 8X "Systems aspects for electrical energy supply".
Priority 10	Green certificates
Proposal	Create an EU standard for definition, obligations, and methodologies for issuing, auditing, monitoring, trading, banking, administration, redemption and consumption of certificates in order to make them tradable between different countries.
Level	Level A :Some work can start at once such as establishing definitions since green certificate systems are already in operation in some countries. Some material for the work could perhaps be found within ISO/TC 207 but most likely a new body should be created.
Stakeholder	Many stakeholders, basically all producers/distributors of RES technologies and fuels as well as the manufacturers of power plants which can be converted to use RES fuels might be interested in the standardisation process. Naturally the electricity companies and other owners of power plants using RES including their organisations such as EURELECTRIC, EUROHEAT & POWER and COGEN EUROPE are very interested. Organisations for producers of other fuels than RES, such as natural gas (EUROGAS, MARCOGAZ), coal and oil will follow the process closely. Some of the existing power exchanges such as Nord Pool have shown interest in green certificates and an increased trading of them. Finally governments and environmental organisations (including the national regulators) show interest in trading green certificates and its contribution for improving the environment and replacing fossil fuels. If standardisation of green certificate systems takes place, the work and experiences gained by the organisation RECS should be considered and used in relevant cases.
Deliverable	Standard or guidelines (other deliverable than standard)
Relevant body	No structure identified. Proposal: new body to be set up

Priority 11	CO2 capture and storage
Proposal	<p>As stated already it might be too early for a “normal” standardisation process but for this long term technology development the future standardisation work could be focused on the following:</p> <ul style="list-style-type: none"> - Monitoring the whole development and be prepared to quickly create standards when suitable. - A guideline describing the overall process and pointing out important key factors when calculating and simulating a system with CO₂ capture and storage would be useful. - A recommendation on how the LCA and LCC methods could be used to optimise the process could be an important part of such a guideline. - Guidelines or standards for calculating possible leakage from the storage of CO₂ could be developed. - Guidelines or standards for estimations of available storage capacity could be developed. <p>In a speech by Dr. Kamel Bennaceur, Schlumberger, at the IEA/CSLF Workshop in Paris on 12-13 July 2004 it was proposed to standardise integrated static and dynamic workflows and develop standard testing procedures for injectors and standard methodology for wellborn isolation (cementing).</p>
Level	<p>Level B : Some preliminary work could be done Level C : Most of the development work must be considered as a long term</p>
Stakeholder	<p>There are many stakeholders who could be interested in standards (or guidelines) for capturing and storing of CO₂ from power or heat plants. Basically all producers/distributors of fossil fuels as well as the manufacturers of power (heat) plants burning fossil fuels might be interested in the standardisation process. This also includes their organisations such as EUROGAS, MARCOGAZ and EURISCOAL. Naturally the electricity companies and other owners of power (heat) plants using fossil fuels including their organisations such as EURELECTRIC, EUROHEAT & POWER and COGEN EUROPE are very interested. Finally governments, politicians, national energy authorities, research institutes, researchers and environmental organisations should show interest in CO₂ capturing / storing and the contribution for reducing/avoiding the greenhouse effect and fulfilling the Kyoto agreement despite using fossil fuels for producing electricity and heat.</p>
Deliverable	Standard or guidelines (other deliverable than standard)
Relevant body	Some parts could perhaps be handled by CEN/TC 234
Priority 14	CO₂ emissions trading directive, measurement of energy use, end-use product
Proposal	<p>The standards of measurements are the subject of preliminary studies within CEN. They are related to the emissions of particular sectors. To note that a recent project of guide of measurement was proposed by the European Commission.</p>
Level	Level A
Deliverable	Standard
Relevant body	ISO/TC 207/WG 5 "Climate change" for the quantification and CEN structure for the measurement

Priority 15	Energy efficiency and saving calculation
Proposal	<p>Need for common methods of calculation of energy consumption, energy efficiencies, and energy savings, for a common measurement and verification protocol, and methodology for energy use indicators</p> <p>These needs refers to two different fields:</p> <p>c. - Standards on specific technologies or “systems” (rather than “products”) to be developed by the relevant committees;</p> <p>d. - General Standard or Guidelines giving the general rules for calculation and measurements.</p> <p>Further investigation is needed to clarify the title, scope and possible content of the general Standards and / or Guidelines, and to define the specific "system" Standards needed, with the needed priority.</p>
Level	A, also because of the long work needed.
Stakeholder	Governments, agencies, energy users, energy services providers, ESCOs, utilities and energy distributors and sellers required to reach energy consumption reduction targets, certification bodies, energy using products manufacturers and energy systems providers.
Deliverable	<p>a. Specific Standards for each technology</p> <p>b. General Standard or Guidelines for calculation and measurement. Excellent indications and examples are given by the:</p> <ul style="list-style-type: none"> - "International Performance Measurement and Verification Protocol - IPMVP" (see www.impvp.org), and - ASHRAE Guidelines 14 - 2002 - "Measurement of Energy and Demand Savings".
Relevant body	<p>a. The relevant committees for each technology</p> <p>b. No structure existing; a new one should be established.</p> <p>Already one applicant. Italy is ready to organise and coordinate the needed structure</p>
Priority 16	Energy Service Companies (ESCO) definition: requirements and qualification procedure
Proposal	Establish a standard defining role, characteristics and requirements of the Energy Service Companies
Level	A
Stakeholder	companies who already provide, or plan to provide, various kind of energy services, including equipment installers and facility management companies, energy service companies customers, energy users, energy distributors and selling companies, the qualified energy experts, the National and Local Energy Agencies and accreditations and certification organizations.
Deliverable	Standard
Relevant body	No structure identified, Proposal : new body to be set up, the one taking care of priority 16, 17 and 19. Already one applicant. Italy is ready to organise and coordinate the needed structure.

Priority 17	Energy managers and experts: roles, professional requirements and qualification procedure
Proposal	Define the possible roles, characteristics, and the minimum professional requirements of the Energy Management Expert.
Level	A
Stakeholder	Engineers and technical professionals interested in getting a specific recognised qualification to offer their services, sole trader (consultant, advisor, auditor, verifier) or employed by private or public bodies, stakeholders interested in using the specific competencies of the Energy Management Experts either as an employee or external consultant.
Deliverable	Standard
Relevant body	No structure identified, Proposal : new body to be set up, the one taking care of priority 16, 17 and 19. Already one applicant. Italy is ready to organise and coordinate the needed structure.
Priority 18	Eco-design requirements for energy using products
Proposal	<p>Work already started within CEN and CENELEC – CEN and CENELEC have approved the programming mandate M/341 - Eco-design of Energy using Products (EuP) and are preparing the answer to this mandate.</p> <p>As far as CEN is concerned, the first step will be carried out by CMC, in close co-operation with the Technical Bodies concerned. If CENELEC and ETSI decide to perform similar inventories for their sectors, the available inventories will be compiled to a common first deliverable (comprehensive list of relevant standards/ documents). This consultation was launched by CMC on 14 January 2005.</p> <p>As a second step, gaps between the standards needed to implement the EuP Directive and the existing standards/documents will be identified leading to a joint document outlining a standardisation work programme as second deliverable. For the second phase, a new CEN/CLC/ETSI Joint Working Group on Energy using Products with a programming function could be established if needed (e.g. to get further expertise from experts within the European standardisation community).</p> <p>CMC proposed to keep the WG informed so the WG members can contribute to the work to be done</p>
Level	A, as CEN and CENELEC BT have approved the programming mandate M/341 - Eco-design of Energy using Products (EuP)
Deliverable	Standard
Relevant body	CEN and CENELEC bodies
Priority 19	Energy management system
Proposal	Define a European Standard on “Energy Management System” similar to the Danish, Swedish and Irish Standards, or Guidelines to establish such system in a company or organization, either by itself, or integrated in other management systems like Quality or Environment.
Level	A
Stakeholder	The interested parties are: Governments and energy agencies, energy service companies, energy using products manufactures and installers, energy distributors and sellers, accreditation and certification organizations.

Deliverable	Guideline (other deliverable than standard) or standard
Relevant body	No structure identified, Proposal : new body to be set up, the one taking care of priority 16, 17 and 19. Already one applicant. Italy is ready to organise and coordinate the needed structure.
Priority 20	White certificates
Proposal	Further investigation is needed to define the Standardisation needs for the “White Certificates” and possibly their equivalence with other certificates in strict correlation with Priority 10 – “Green Certificates”
Level	B
Deliverable	Guideline (other deliverable than standard) or standard
Relevant body	No structure identified
Priority 21	Communication on Energy load and tariff management
Proposal	A proposal could be made to TC 8X of CENELEC to set up a specific Working Group with experts coming from TC 205 of CENELEC, from TC 13 and TC 57 of IEC and from the various ISO/IEC and CEN/CENELEC technical committees dealing with various types of appliances and applications in houses/buildings.
Level	B
Deliverable	Guideline (other deliverable than standard) or standard
Relevant body	CENELEC TC 8X

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