



# Towards a low energy building stock... how to achieve a major decrease in energy consumption

Workshop organised by Enper Exist with the  
support of EURIMA

Brussels, June 27th 2007



# Applying the EPBD to improve the **EN**ergy **PER**formance requirements to **EXIST**ing buildings

## **ENPER-EXIST**

## **[www.enper-exist.org](http://www.enper-exist.org)**

Number of Grant Agreement : EIE/04/096/S07.38645

Duration : January 2005 – June 2007 (30 months)

Project supported by the « Intelligent Energy-Europe » programme of the European community



# Dissemination within Enper Exist



◆ 12 news letter



◆ 1 web site : [www.enper-exist.org](http://www.enper-exist.org)



◆ 5 Workshops :





# Workshop program



- ◆ 2:30 PM Introduction of the workshop; JC Visier – H. David
- ◆ 2:45 - 3:15 A global vision of the Enper Exist project JC Visier – K E Thomsen
- ◆ 3:15 - 3:30 A road map for existing buildings  
Presentation by Ecofys and/or EURIMA of recent ECOFYS papers
- ◆ 3:50 - 4:30 Presentation of the report: Roadmap for energy efficiency within the Enper Exist project P Wouters, X Loncour BBRI
- ◆ 4:30 Discussion
- ◆ 5:30 Drinks and informal exchanges



# ENPER EXIST

## A Global vision of the project

June 2006

Disclaimer:

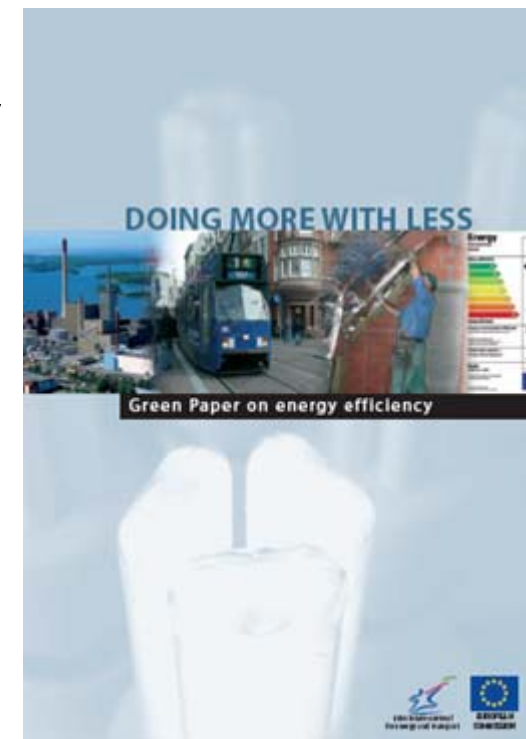
ENPER-EXIST has received funding from the Community's Intelligent Energy Europe programme under the contract EIE/04/096/S07.38645. The content of this document reflects the authors' view. The authors and the European Commission are not liable for any use that may be made of the information contained therein.

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  - [www.cstb.fr](http://www.cstb.fr)
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- ◆ United Kingdom: Energy for Sustainable Development Ltd. (ESD)
  - Robert Cohen
  - [www.esd.co.uk](http://www.esd.co.uk)

# Enper Exist, Why ?



The challenge is to divide by a factor 4 the CO<sub>2</sub> emissions of the building sector by 2050





# A roadmap is needed



We need to make a major change in the retrofit of existing buildings

The EPBD is making a first step, .... But is far from being sufficient

We need a roadmap for actions going beyond the EPBD





# A roadmap is needed



- ◆ If we want to reach a factor 4 decrease
  - We need synergetic actions from all the stake holders
  - The roadmap shall be a common development of the decision makers

One of the goal of Enper Exist is to support Brain Storming regarding future actions for existing buildings



# Enper exist focus



Roadmap for actions going beyond the limits of the EPBD

Technical tools application

Legal, economical,  
organisationnal issues

Building stock knowledge



# Technical Tools Application



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# CEN has produced technical tools

- ◆ Most countries have a lot of experience with the energy assessment of new buildings
- ◆ CEN has produced a huge amount of work to produce common standards
- ◆ Due to lack of time, priority has been given to new buildings



**more than 30 standards**  
**and**  
**2000 pages produced**



# Assesment of differences between certification based on measurement and certification based on calculation

## ◆ Certification based on measurement

+ Cheap

+ Easy to apply

- Difficult to assess best measures for improvement

## ◆ Certification based on calculation

+ Generally more complex and more expensive

- Easy to assess impact of improvement measures

## ◆ Mix of both approach sometimes relevant

1. Measurement of large building stock

2. Determination of poorest buildings

3. Calculations to define measures to apply to poorest buildings



# Some differences between new and existing buildings



- ◆ the goal of the assessment is different
  - Proving compliance to regulation for new buildings
  - Providing information on actual energy use and possible improvement
  
- ◆ More attention shall be paid to small energy flows in energy efficient building
  - Lot of details shall be assessed in new buildings
  - One can focus on major flows in existing ones
  
- ◆ Data acquisition is very different
  - Data comes from descriptions and drawings
  - Data comes from observations



# Enper Exist has applied draft standards to buildings throughout Europe





# Suggestions for improvement



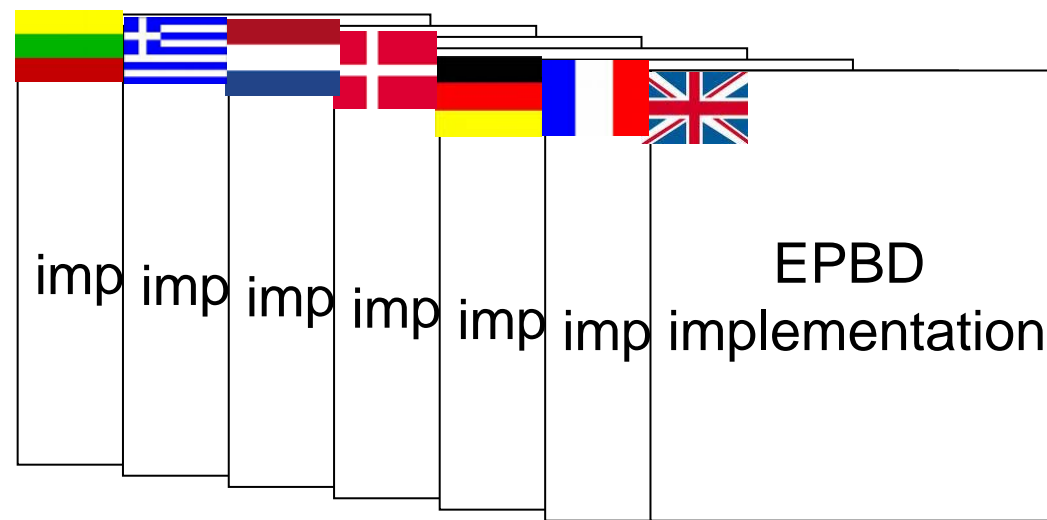
- ◆ Modifications of CEN draft standards
- ◆ Proposal of alternative methods which can be included in european standards or national guidelines

**ENPER-EXIST**

Applying the EPBD to improve the Energy Performance Requirements to Existing Buildings – ENPER-EXIST

WP1: Usability of CEN Standards for existing buildings. An analysis  
Work document 1, January 2007

Author(s): Marleen Splekman & Hans van Wolferen & Dick van Dijk, TNO  
Jean-Christophe Visier, CSTB









# Deliverables



## ◆ Report :

- WP1:
  - 1 synthetic report
  - 4 specific reports





**ENPER-EXIST**

Applying the EPBD to improve the **Energy Performance Requirements to Existing Buildings – ENPER-EXIST**

WP1: Final report  
March 2007

Author(s): Marleen Spiekman TNO





**ENPER-EXIST**

Applying the EPBD to improve the **Energy Performance Requirements to Existing Buildings – ENPER-EXIST**

WP1: Investigation of alternatives  
Work document 4,  
January 2007

Author(s): Marleen Spiekman TNO,  
Gerelle van Cruchten EBM,  
Saren Aggerholm SBI,  
Rofaida Lahrech &  
Ahmad Husaunndee CSTB,  
Mat Santamouris NKUA,  
Robert Cohen, ESD





**ENPER-EXIST**

Applying the EPBD to improve the **Energy Performance Requirements to Existing Buildings – ENPER-EXIST**

WP1: Pilot tests of data acquisition  
Work document 2,  
January 2007

Author(s): Marleen Spiekman TNO





**ENPER-EXIST**

Applying the EPBD to improve the **Energy Performance Requirements to Existing Buildings – ENPER-EXIST**

WP1: Detailed calculations  
Work document 3,  
January 2007

Author(s): Marleen Spiekman TNO  
Rofaida Lahrech CSTB  
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WP1: Investigation of alternatives  
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# Enper exist focus



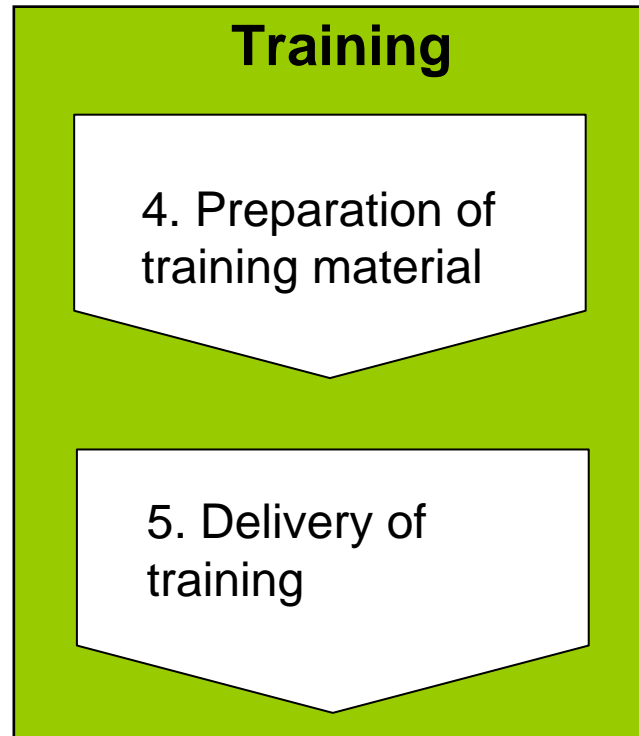
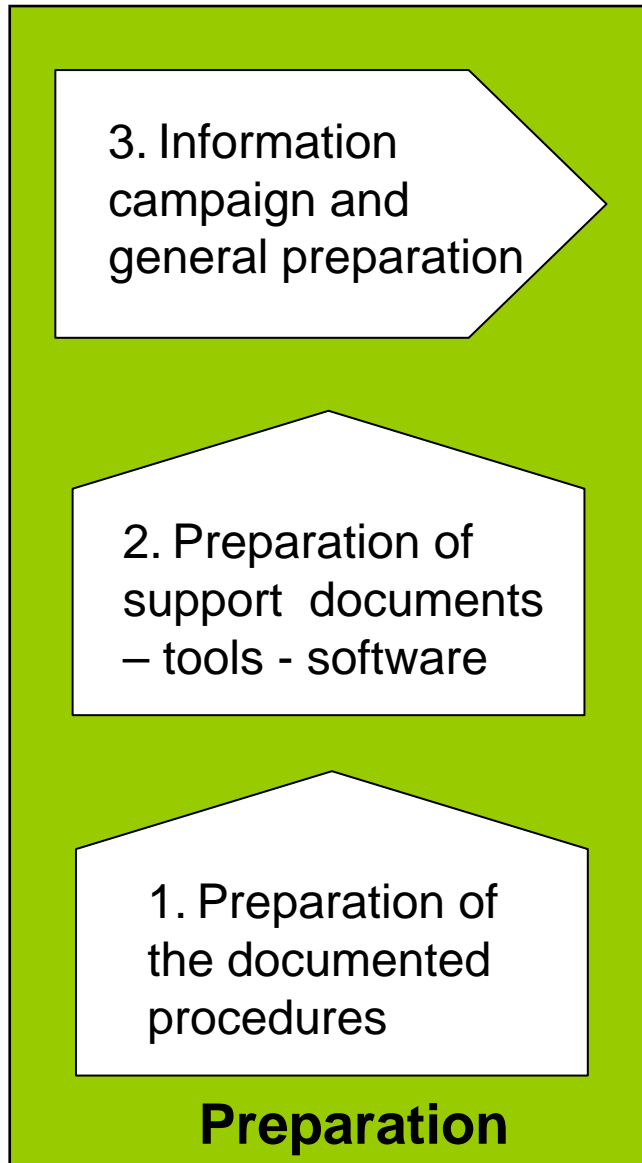
Roadmap for actions going beyond the limits of the EPBD

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Building stock knowledge

# A global vision of actions to be performed





# Keys for success in certification



## Help people to become interested in certification

- schemes are designed so that they **add value to users** of the information/scheme, they obtain benefits from their involvement/payment.
- the **motivation among users** is one of the most important factors for successful implementation, **avoid rigid legal enforcement** which might cause resistance
- dissemination of knowledge is important : design and contents of labels and reports, which have to target the users, i.e. be understandable but at the same time well documented and professionally presented.



# Keys for success in certification



## ◆ Get reliable certificates

- a coherent **quality assurance system** is important : avoid the reliability of certificate to be questioned in media
- **selection and training of consultants** including establishing of training activities ,and measures addressing the outcome of their work such as random checking of reports,
- **Keep it stupid simple**: It has been found in Denmark that very complex methods do not raise the quality of the label, as detailed information on e.g. thermal conditions is not accessible during an inspection.

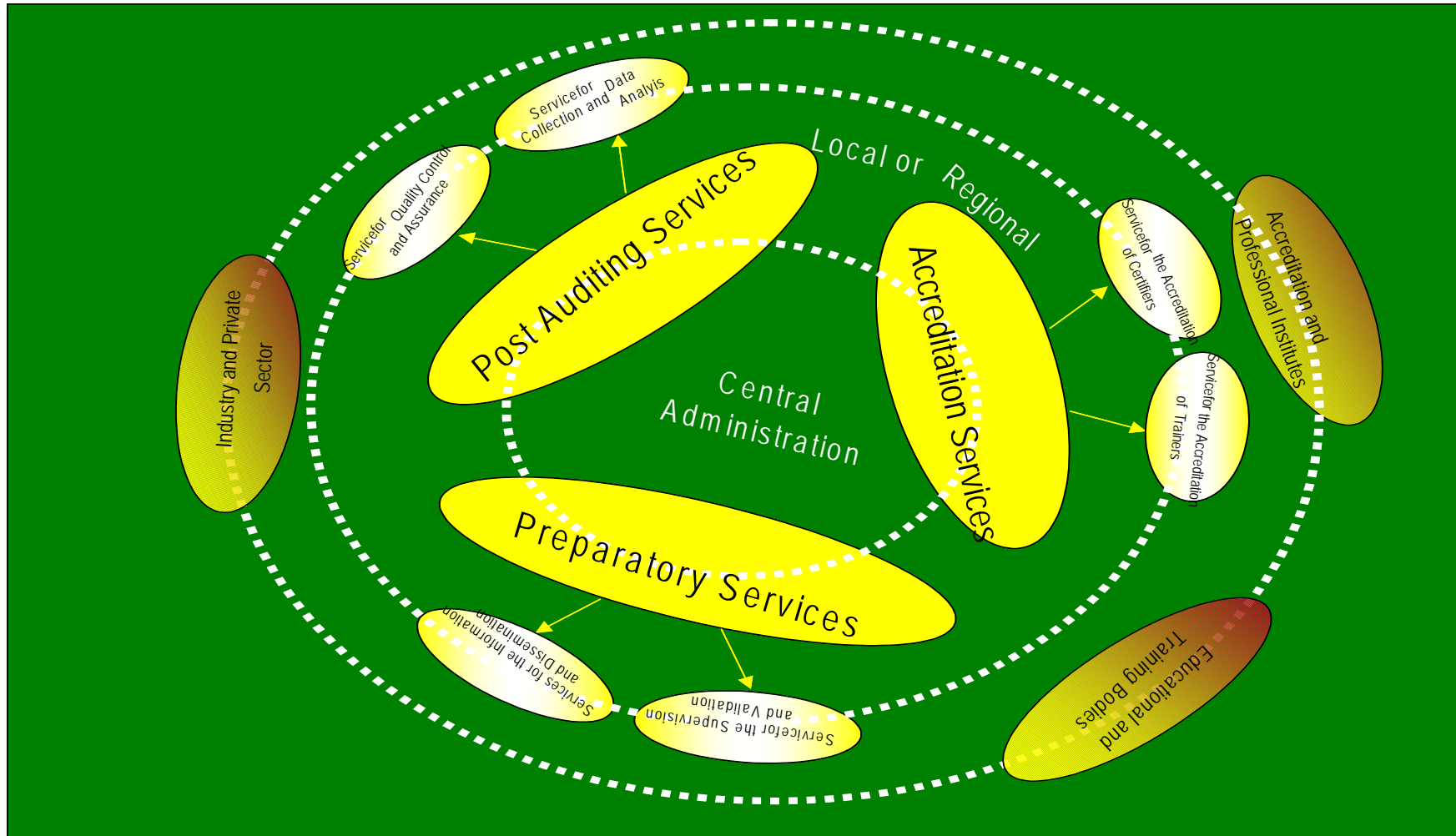


# Keys for success in certification

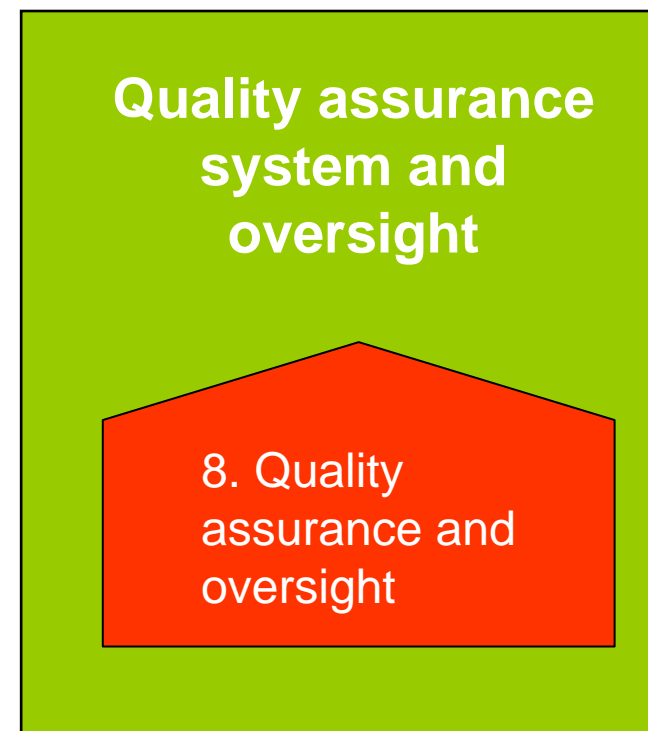
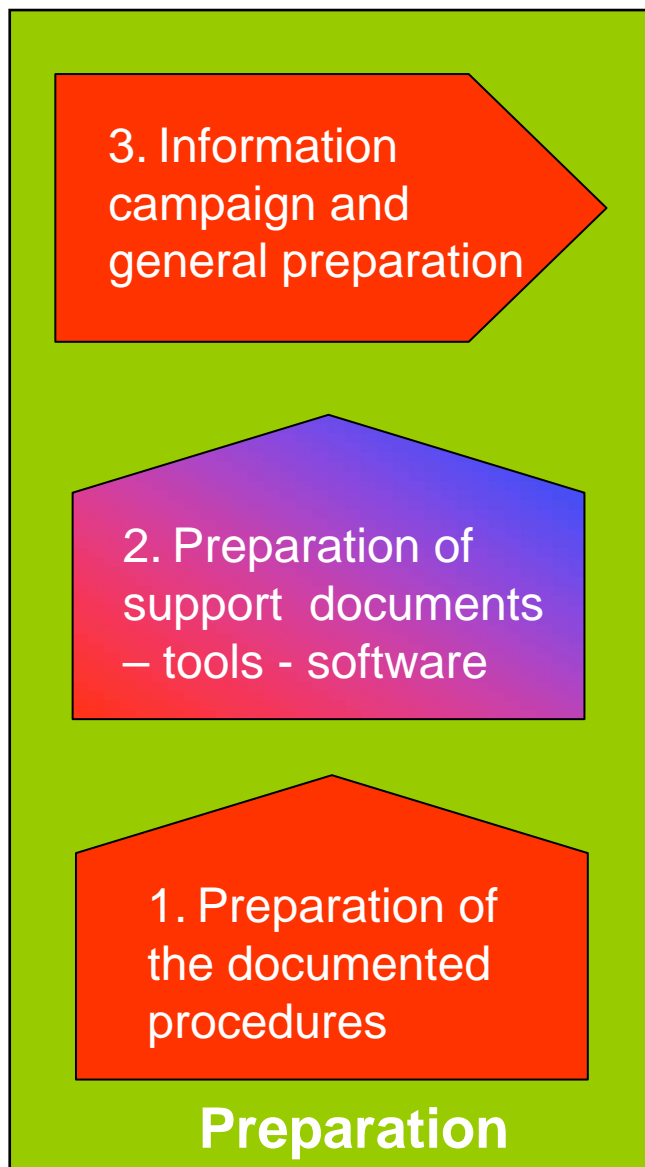


- ◆ Adjust the scheme to improve it
  - **Continuous adjustments** of the scheme should be expected and must be considered already at the designing phase of the scheme.
  - When setting up a labelling scheme, one should already from the beginning **plan on carrying out evaluations** which can be used in the continuous improvement of the scheme, administration, tools, dissemination, scope, etc.
  - As part of this process, it is recommended that **realistic and measurable goals and objectives are defined**, and that the set-up is designed so that the impact can be evaluated.

# Organisation to manage certification



# Direct / Indirect costs







# Impact of certification on the market



- ◆ the estimated direct cost for a certificate
  - 100 to 530 € for residential
  - 340 to 5000 € for non-residential buildings.
- ◆ The estimated indirect costs for a certificate
  - 1 to 40 € for residential
  - 15 to 40 € for commercial buildings.
- ◆ Certification cost per capita estimated
  - Between 3,5 and 10 € per person for residential buildings
  - Between 1 to 4 € per person for non residential buildings



# Deliverables



- 1 report
- 1 excel tool

ENPER-EXIST

**Applying the EPBD to improve the Energy Performance Requirements to Existing Buildings – ENPER-EXIST**

WP2: Intermediate Report of the Legal, Economical and Organisation Impact of the EPBD

Author: M. Santamouris  
NKUA, Greece

Table to estimate indirect cost of an energy certification scheme											
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total in 10 years
11 Number of buildings to be assessed per year by trained expert	4 000	6 000	8 000	10 000	12 000	14 000	16 000	18 000	20 000	22 000	78 000
12 Number of accredited assessors to be trained per year	40	70	90	120	160	200	250	300	350	400	200
13 Number of assessors retiring per year	0	10	25	35	25	25	25	24	23	22	0
14 Number of assessors available per year	40	100	125	140	135	99	94	91	88	86	0
15 Actual no. certificates to be issued per year per assessor	0	100	100	95	105	95	120	95	64	68	0
16 Utilisation of assessors (Actual/target)	100%	100%	95%	105%	95%	105%	105%	65%	65%	65%	0%
17 Number of self-certificates anticipated to be issued per year	4 000	12 000	14 400	14 400	12 000	12 000	9 600	7 200	7 200	93 600	14 000
18 Number of self-certifications to be verified per year	400	1 200	1 440	1 440	1 200	1 200	960	720	720	10 080	1 000
19 Number of verifiers required per year	1	3	4	4	3	3	2	2	2	2	0

Metric	Value	Employees for each task in each year (FTE)										
22 A government Ministry	Baseline no. officials	1	1	1	1	1	1	1	1	1	1	1
23 Ultimate responsibility for the scheme.	FTE/year	1	1	1	1	1	1	1	1	1	1	
24 Authorize the "rules"												
25 Decide how each activity will be organized												
26 More than one Ministry may cover dwellings and non-domestic												
27												
28 Task 1: Devise the national certification scheme	No. staff	FTE										
29 Produce national specification for methodology to be used	Years 1-3	3	3	3	2	2	1	1	1	1		
30 Define the format of energy certificates	Years 4-5	2										
31 Maintenance of scheme	Years 6-10	1										
32												
33												
34 Task 2: Central administration of the scheme	Baseline no. staff	2	2	2	2	2	2	2	2	2		
35	FTE/year	2	2	2	2	2	2	2	2	2		
36												
37 Oversee activities undertaken by other organisations												
38 Regulatory role?												
39												
40 Task 3: Develop tools eg software	Baseline no. staff											
41												



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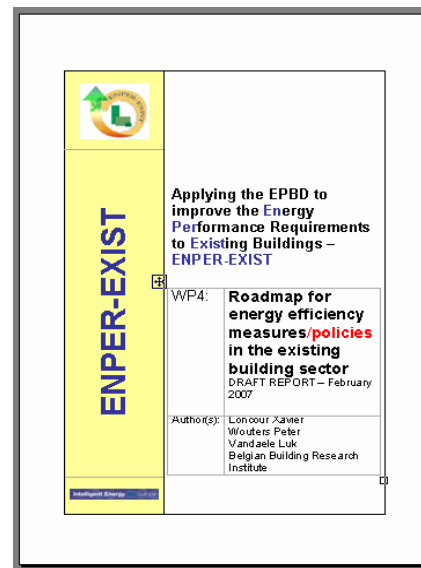


# Deliverables



## WP4

- 1 report (draft)



- 1 toolbox