



HIGH-QUALITY ENERGY PERFORMANCE
ASSESSMENT AND CERTIFICATION IN EUROPE
ACCELERATING DEEP ENERGY RENOVATION

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Horizon 2020 research and innovation programme under grant
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Introduction to QualDeEPC

Introduction to QualDeEPC

- High-**quality** **E**nergy **P**erformance Assessment and **C**ertification in Europe Accelerating **D**eep Energy Renovation
- Horizon2020 project
- Project duration from September 2019 - February 2023
- Project coordination by Wuppertal Institut, Germany
- Project partners from Belgium, Bulgaria, Germany, Greece, Hungary, Latvia, Spain, and Sweden
- Please visit our website for further information:
www.qualdeepc.eu



QualDeEPC partners

- Wuppertal Institut for Climate, Environment, Energy (DE)
- FEDARENE – European Federation of Agencies and Regions for Energy and the Environment (BE)
- BME - Budapest University of Technology and Economics (HU)
- CIT Energy Management (SE)
- CRES – Centre for renewable energy sources and saving (GR)
- DENA – German Energy Agency (DE)
- EAP – Energy Agency Plovdiv (BG)
- EKODOMA (LV)
- ENERGIACLUB – Climate Policy Institute and Applied Communications (HU)
- ESCAN (ES)
- E-P-C – EPC project corporation for Climate. Sustainability. Communications (DE)

Objectives of QualDeEPC

- Enhance EPC assessment, certification, and verification, regarding
 - (1) the **quality and cross-EU convergence of Energy Performance Certificate (EPC) schemes**, including building assessment and EPC issuance, design, verification, and use;
 - (2) the **link between EPCs and deep renovation**.

QualDeEPC— 7 development priorities

Developed practical concepts, proposals, and tools for an enhanced EPC scheme linked to deep renovation based on the identified priorities QualDeEPC:

- A. Improving the recommendations for renovation, provided on the EPCs, towards deep energy renovation
- B. Online tool for comparing EPC recommendations to deep energy renovation recommendations
- C. Creating Deep Renovation Network Platforms
- D. Regular mandatory EPC assessor training (on assessment and renovation recommendations) required for certification/accreditation and registry
- E. High user-friendliness of the EPC
- F. Voluntary/mandatory advertising guidelines for EPCs
- G. Improving compliance with the mandatory use of EPCs in real estate advertisements

An nZEB-based approach for defining deep energy renovation

An approach based on four staged criteria:

- For those member states that have their objective or legal *nZEB definitions/ standards for existing buildings*, QualDeEPC proposes to link **deep energy renovation with these definitions of nZEB**; and define deep energy renovation as 'renovation achieving *component energy standards* equal to at least those that are usually required to meet nZEB requirements for existing buildings'.
- For countries that only have nZEB definitions for new build but not existing buildings, and in which the *nZEB requirements for new build* are not so ambitious and *would be achievable through renovation*, QualDeEPC proposes to define deep energy renovation as 'renovation achieving *component energy standards* equal or close to those that are usually required to meet nZEB requirements for new buildings'.
- In countries that only have nZEB definitions for new build but not existing buildings, and in which the *nZEB requirements for new build are too ambitious to reach through renovation*, QualDeEPC proposes to define deep energy renovation as 'renovation achieving component energy standards close to nZEB requirements for new buildings, when possible'. QualDeEPC partners have been asked to present values for improved component energy standards that are better than the legal requirements in case of a major renovation, and are often proposed in practice by energy consultants. It can be assumed that these are somewhat accepted and available in the market, and not considered too far outside of cost-effectiveness considerations. They could be adopted as component energy standards for deep renovation.
- In countries *without* current availability of such improved component energy standards *or with very lax nZEB definitions*, QualDeEPC recommends **adopting best practices and component improvements in deep energy renovation from other member states with similar climates**, and where such standards exist.



Proposals and tools for an enhanced EPC scheme linked to deep renovation based on the identified priorities QualDeEPC

A) Deep energy renovation recommendations by QualDeEPC adapted to country's context

- *Presentation of country-specific proposed values and development needs (if any)*

	Specific recommendation	Value	Source of information
External wall insulation	Wall with enhanced thermal insulation properties (nZEB for renovation standard or similar)		
	Wall with exceptional thermal insulation properties (nZEB for new buildings standard or similar)		

E) High user-friendliness of the EPC

- Adapted enhanced EPC form
(nuevo modelo de certificado)

Four pages with:

- ✓ Main building & certifier data, energy class. & performance
- ✓ Before ee measures (recommendations) implementation in envelope and technical systems
- ✓ Including costs after implementation ee measures
- ✓ Other data
- Nationally adapted definition of the “Energy rating” indicator for building envelope components and technical systems
- Creation of the indicator as 3 -colours for better understanding and priorities of measures

EPC form for residential buildings
in accordance with Building Energy ACT XYZ

Climatic area:	Normative	Number ref. cadastre
(if this EPC form is available in website please include here website link)		

Building data		Picture of building
Name of building		
Address		
City/Country		
New/Existing Building		
Residential/Non residential		
Single house/Block of building / 1 apartment		
Building construction year		
Heated area (m2)		

Energy classification and performance					
Min Primary energy consumption [kWh/m²·yr]	Max Primary energy consumption [kWh/m²·yr]	Energy class	Primary energy consumption [kWh/m²·yr]	Final energy consumption [kWh/m²·yr]	Final energy consumption "improved value" of Option*
0	37.5	A			
37.5	57.7	B			
57.7	86.1	C			
86.1	128.2	D			
128.2	271.9	E			
271.9	318.1	F			
>=318.1		G			

* The underlain renovation recommendations and implementation scheme for Option 1 are given on p. 3 & 4.

Issuer	Signature
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Date of visit: Date of Certificate issued: Enhanced EPC

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E) High user-friendliness of the EPC

Energy consumption**		measured:			modelled:		Other:
No.	Period of measurement (from – to)	Energy source	Energy consumption for space heating and domestic hot water (DHW) [kWh/yr]			Electricity [kWh/yr]	
			Total	Heating	DHW		
1							
2							
3							

**measured energy consumption depends on the energetic profile of building occupant, the number of occupants and weather conditions during the period of measurement; modelled energy consumption may differ from actual use

Assessment of building envelope and technical system

Building envelope	Area [m²]	Description or Avg. U-value	Energy rating
Roof or ceiling to attic			
External walls			
Windows			
Doors			
Ground floor or floor to unheated basement			

Technical systems	Year of construction/ installation	Energy source, provided power, EU energy label	Energy rating
Heating system			
Domestic hot water			
Ventilation system			
Cooling system			
Renewable energies			
Lighting			

Building envelope	Recommendation	"new" avg. U-value	New Energy rating	Cost effectiveness (e.g. pay-back time)	Included in Option 1?
Roof or attic					☐
External walls					☐
Windows					☐
Doors					☐
Ground floor or floor to unheated basement					☐

Technical systems	Recommendation	Energy source, provided power, EU energy label	New Energy rating	Cost effectiveness (e.g. pay-back time)	Included in Option 1?
Heating system					☐
Domestic hot water					☐
Ventilation system					☐
Cooling system					☐
Renewable energies (outside of other systems)					☐
Other: e.g. Lighting					☐

Potential energy savings when Option 1 is implemented:	XYZ	kWh/yr
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Description of useful combination of renovations and stepwise implementation for Option 1:

Option 1 meets requirements for:

- nearly zero energy buildings in case of renovation: ☐
- Air tightness: ☐
- Reduced thermal bridging: ☐
- Min. 50% RES or equivalent measures: ☐

Description of useful combination of renovations and stepwise implementation for further renovation options not included in Option 1:

Further information

The following link(s) provide further information on energy performance certification, use of EPCs and renovations to improve energy performance including financial assistance programmes:

- Website A
- Website B
- Website C

E) High user-friendliness of the EPC – proposed template – current energy performance

- Energy consumption table with measured or modelled data
- Color coded of current status of building components and technical systems
 - Values for “green”, “yellow” and “red” are determined on national level

Energy consumption**			measured:			modelled:	
No.	Period of measurement (from – to)	Energy source	Energy consumption for space-heating and domestic hot water (DHW) [kWh/yr]			Electricity [kWh/yr]	Other: _____
			Total	Heating	DHW		
1							
2							
3							

**measured energy consumption depends on the energetic profile of building occupant, the number of occupants and weather conditions during the period of measurement; modelled energy consumption may differ from actual use

Assessment of building envelope and technical system			
Building envelope	Area [m²]	Description or Avg. U-value	Energy rating
Roof or ceiling to attic			  
External walls			
Windows			
Doors			
Ground floor or floor to unheated basement			

Technical systems	Year of construction/ installation	Energy source, provided power, EU energy label	Energy rating
Heating system			  
Domestic hot water			
Ventilation system			
Cooling system			
Renewable energies			
Lighting			

E) High user-friendliness of the EPC – proposed template – renovation recommendations

- Color coded evaluation of renovation recommendations for building components

Building envelope	Recommendation	"new" avg. U-value	New Energy rating	Cost effectiveness (e.g. pay-back time)	Included in Option 1?
Roof or attic					☐
External walls					☐
Windows					☐
Doors					☐
Ground floor or floor to unheated basement					☐

Technical systems	Recommendation	Energy source, provided power, EU energy label	New Energy rating	Cost effectiveness (e.g. pay-back time)	Included in Option 1?
Heating system					☐
Domestic hot water					☐
Ventilation system					☐
Cooling system					☐
Renewable energies (outside of other systems)					☐
Other: e.g. Lighting					☐

Potential energy savings when Option 1 is implemented: XYZ kWh/yr

E) High user-friendliness of the EPC – proposed template – renovation concepts

- Description of useful combinations and stepwise implementation of renovation recommendations
- Overview of met requirements
- Further information via links (future: deep renovation network platform)

Description of useful combination of renovations and stepwise implementation for Option 1:

Option 1 meets requirements for:

<i>nearly zero energy buildings in case of renovation:</i>	☐
<i>Air tightness:</i>	☐
<i>Reduced thermal bridging:</i>	☐
<i>Min. 50% RES or equivalent measures:</i>	☐

Description of useful combination of renovations and stepwise implementation for further renovation options not included in Option 1:

Further information

The following link(s) provide further information on energy performance certification, use of EPCs and renovations to improve energy performance including financial assistance programmes:

- *Website A*
- *Website B*
- *Website C*

E) High user-friendliness of the EPC – proposed template – “Energy rating” indicator adapted to the Country’s context

- The 3 scale scheme definition carried out at National level
- Bulgarian case used as example

The 3-scale scheme related to the “Energy rating” indicator for the Bulgarian context can be defined as follows:

	Green: Reaches the minimum standards set by the national the regulation/legislation
	Yellow: Just below the minimum standards set by the national the regulation/legislation
	Red: Significantly below the minimum standards set by the national the regulation/legislation

	Red		Yellow			Green	
	Minimum-Value	U-value	Minimum-Value	Maximum-Value	U-value	Maximum-Value	U-value
Building envelope							
Roof or ceiling to attic	>0,35	[W/m²K]	0,22	0,35	[W/m²K]	<0,22	[W/m²K]
External walls	>0,5	[W/m²K]	0,22	0,5	[W/m²K]	<0,22	[W/m²K]
Windows and Doors/Gates	>2,0	[W/m²K]	1,1	2,0	[W/m²K]	<1,1	[W/m²K]
Ground floor or floor-to-unheated basement	>0,5	[W/m²K]	0,25	0,5	[W/m²K]	<0,25	[W/m²K]
Technical systems	Minimum-Value	Energy source, provided power, EU energy label	Minimum-Value	Maximum-Value	Energy source, provided power, EU energy label	Maximum-Value	Energy source, provided power, EU energy label
Heating system	D	EU energy label	B	C	EU energy label	A	EU energy label
Domestic hot water	D	EU energy label	B	C	EU energy label	A	EU energy label
Ventilation system	D	EU energy label	B	C	EU energy label	A	EU energy label
Cooling system	D	EU energy label	B	C	EU energy label	A	EU energy label
Renewable energies (outside of other systems)			B	C			
Other: e.g., Lighting	D	EU energy label	B	C	EU energy label	A	EU energy label

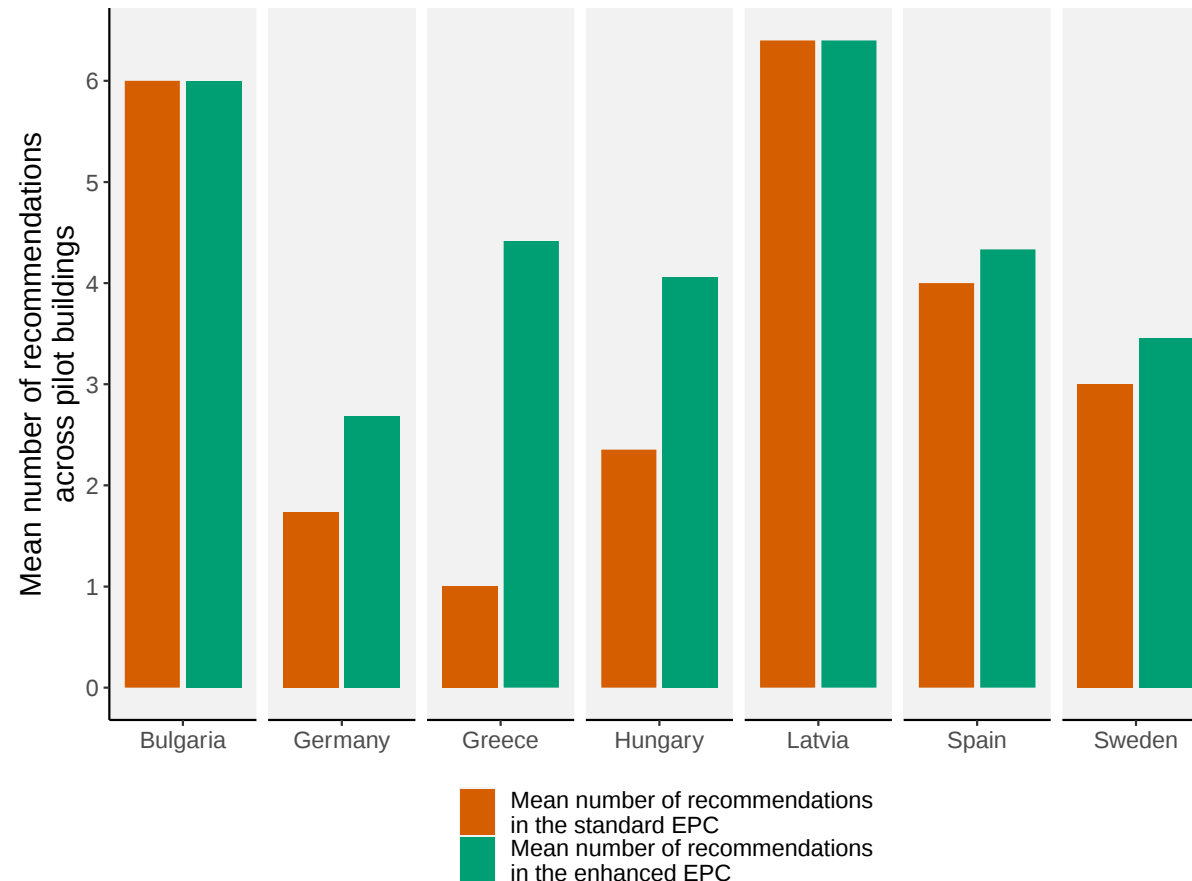
E) High user-friendliness of the EPC – proposed template – results of testing

- Enhanced template is considered an improvement in almost all 7 countries



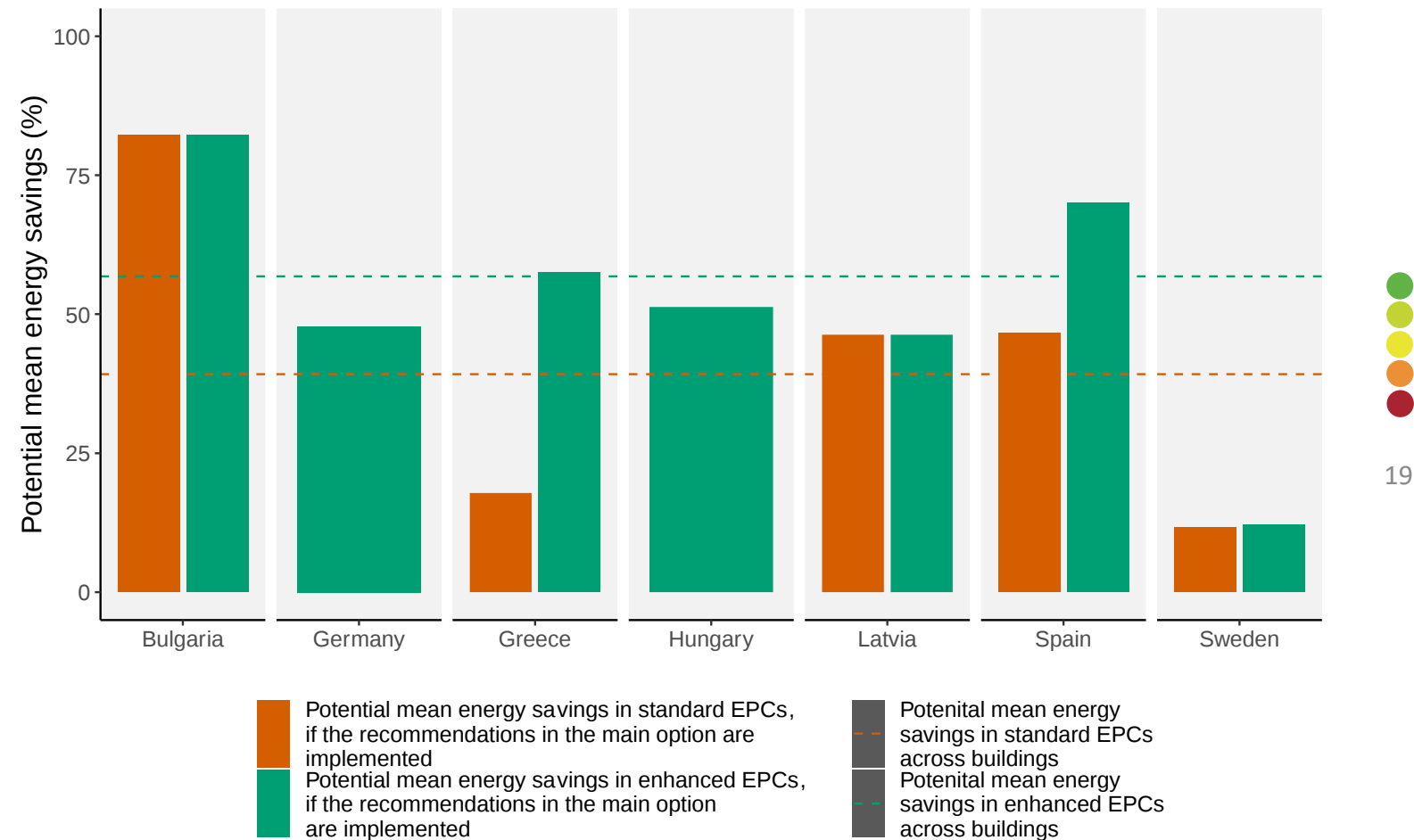
E) High user-friendliness of the EPC – proposed template – results of testing (3)

- Number of renovation recommendations increased towards level in Bulgaria and Latvia (which have thorough energy audit for EPCs), despite little guidance to EPC assessors



E) High user-friendliness of the EPC – proposed template – results of testing (4)

- Potential for energy savings identified above 50% on average, and often higher than for standard EPCs
- Bulgaria&Latvia: standard EPCs already based on energy audit
- Sweden: cautious interpretation of cost-effectiveness
- Germany, Hungary: no total energy savings given on standard EPCs



B) Online tool for deep energy renovation recommendations

- Master tool based on the Greek Home Energy Check tool
- Aim:
 - User-friendly user interface for building owners: allowing “2nd opinion” on recommendations from an EPC, or „1st opinion” if no EPC exists
 - Estimating the energy demand of a specific building
 - Suggestions for renovation recommendations towards deep energy renovation (based on the list from *priority A*)
 - Comparison between current and renovated state
 - Recommendation to obtain energy audit to validate energy demand and recommendations



https://www.buildingcert.gr/qualdeepc_tools/master_tool/

C) Creating Deep Renovation Network Platforms

- Deep Renovation Network Platform (DRNP)= One-stop shop for building owners willing to renovate *plus* Networking Platform for renovation supply-side actors and their joint communication/marketing
- Information at National level (one platform per country)
- Can take different forms
- Will help building owners take the steps needed for renovation after/based on the EPC

NOTE: A **One-Stop-Shop** should offer all the products and services that customers need. Depending on the initial situation in each sector and country, the product range for a complete solution can look very different.

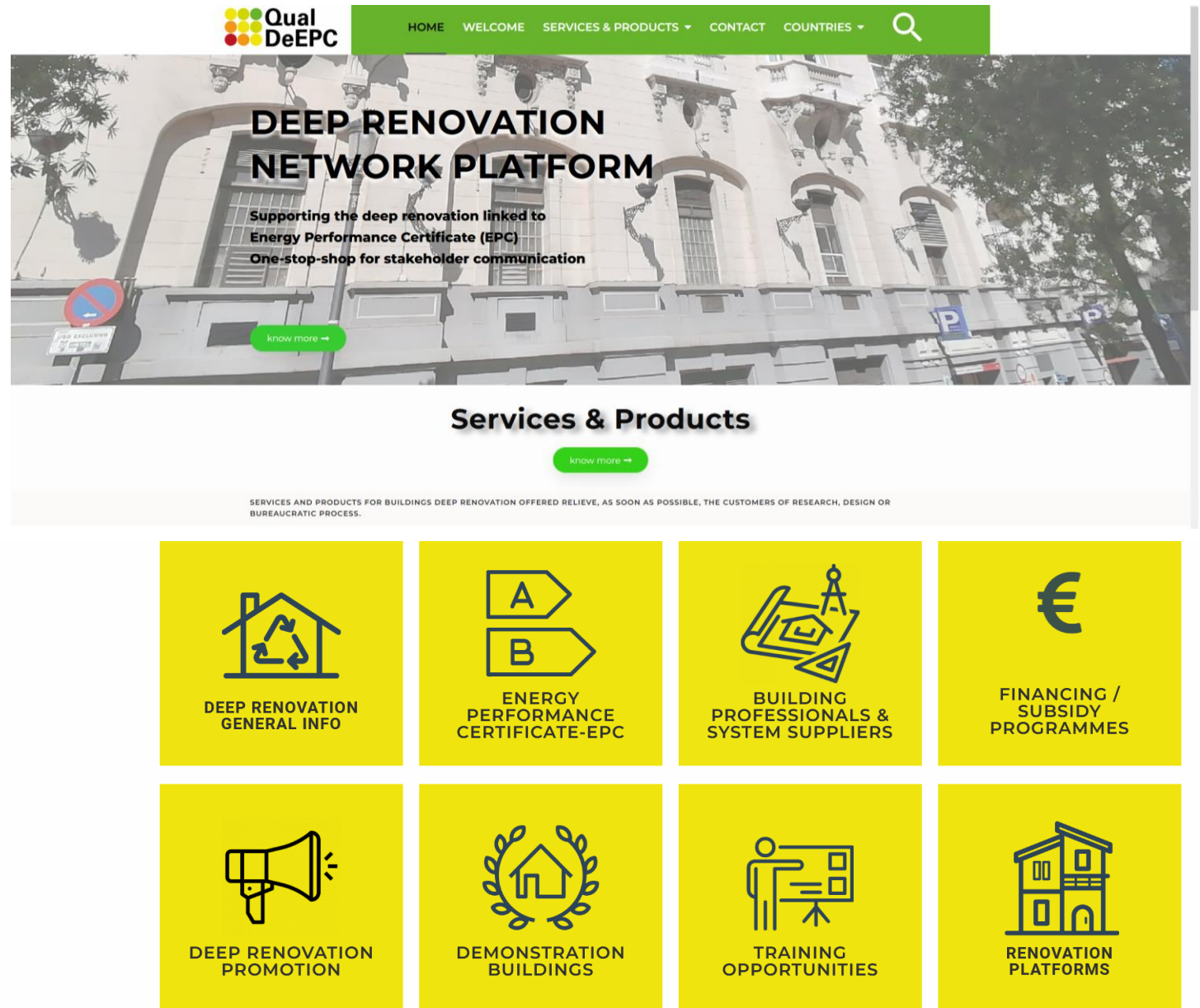
In most cases, the task is to relieve the customer of research, design or bureaucratic processes.

C) Creating Deep Renovation Network Platforms

Elaboration a new online platform DRNP with information for deep renovation of buildings :

<https://qualrenovate.eu/>

Latvian, Spanish and Bulgarian languages



C) Creating Deep Renovation Network Platforms -Examples of information in platforms

Qual DeEPC
HEATING SYSTEMS PRINCIPLES

HOME WELCOME SERVICES & PRODUCTS CONTACT COUNTRIES

The most relevant advantages and heating systems purposes are shown below with their A or superior label concerning condensing boilers, heat pumps and district heating.

CONDENSING BOILERS

Condensing boilers work by heating water through diesel combustion or natural gas and take advantage of the water vapor condensation contained in the fumes, therefore, they are more efficient than a conventional boiler. Their efficiency is over 97%. They can be used for only heating or for heating and DHW (mixed boilers) and they can be wall mounted (installed on the wall, usually in the kitchen) for an apartment or flat. In the case of a larger house or block of flats, standing boilers will be used instead, as shown in the image.

H1-CONDENSING BOILERS

MORE INFORMATION

HEAT PUMPS

A heat pump is a device that takes energy from the air, eg., and sends it to another habitat or uses it to heat a fluid. The most efficient and commonly used heat pumps are inverter pumps. Their performance is the following: instead of frequently starting and stopping to obtain the desired average temperature, thanks to the inverter system, the compressor changes its speed and power, which helps to keep the comfort temperature constant and programmed for a room. In addition, it saves part of the

H2- HEAT PUMPS

Qual DeEPC

HOME WELCOME SERVICES & PRODUCTS CONTACT COUNTRIES

R1-SOLAR THERMAL

La instalación tradicional para generar el agua caliente sanitaria se basa en hacer pasar el agua fría por un sistema de calentamiento (termo eléctrico, caldera a Calderas de Condensación, calentador modulante a gas...) usando combustibles fósiles, como el butano o gas natural. Si se incorporan paneles (captadores) solares térmicos, el agua fría mediante un sistema de bombeo circula por el captador solar y se calienta el fluido caloportador. A continuación, el agua sale a mayor temperatura y es conducida al acumulador; normalmente en el acumulador dentro del serpentín transfiere el calor al exportador con líquido.

R1-SOLAR TERMICA

MÁS INFORMACIÓN

R2-SOLAR PHOTOVOLTAIC

La energía fotovoltaica es la transformación directa de la radiación solar en electricidad. Esta transformación se produce en unos dispositivos denominados paneles fotovoltaicos. La radiación es aprovechable en sus componentes directa y difusa, o en la suma de ambas. Seguir leyendo La radiación directa es la que llega directamente del foco solar sin reflexiones o refracciones intermedias. La difusa es la emitida por la bóveda celeste diurna gracias a los múltiples fenómenos de reflexión y refracción solar en la atmósfera, en las nubes y el resto de los elementos atmosféricos y terrestres.

R2-SOLAR PHOTOVOLTAIC

MÁS INFORMACIÓN

R3-GEOTHERMAL

Es la energía almacenada en forma de calor por debajo de la superficie de la tierra, engloba el

Qual DeEPC

HOME WELCOME SERVICES & PRODUCTS CONTACT COUNTRIES

SEARCH FINANCING / SUBSIDY PROGRAMMES

Name: Search Type: Search Nation/Region: Search

Name
Edificios de uso residencial

Type
Financial Incentives

Objective
Convocatoria estará destinada a edificios de uso residencial. Financiará entre 10.000 y 12.000 euros por vivienda en una intervención global para todo el edificio (la antigüedad mínima requerida para el inmueble se reduce de los 25 años de las ayudas ordinarias a los 20 años) en actuaciones de mejora de la eficiencia energética o la envolvente térmica.

[See more..](#)

Name
Ayudas para la elaboración del Libro del Edificio existente. Comunidad Foral de Navarra.

Type
Financial Incentives

Objective
La ayuda se destinará a la elaboración del Libro del Edificio Existente (LEE), se trata de un instrumento que sustituye al actual Informe de Evaluación de Edificio (IEE) y que será obligatorio para todos los inmuebles de residencia colectiva a partir de 2023. El LEE tiene como finalidad que las comunidades vecinales sean capaces de conocer e interpretar cuál es el estado integral de su edificio, así como el margen de mejora y las actuaciones a llevar a cabo para conseguir dicha mejora.

INSERT FINANCING / SUBSIDY PROGRAMMES

Name of the Financing / subsidy programme

Location

Name of Nation/ Region/ Municipality/Other

Web / URL

Type

Objective

Beneficiaries

Quantity of incentive (€)

☐ No soy un robot

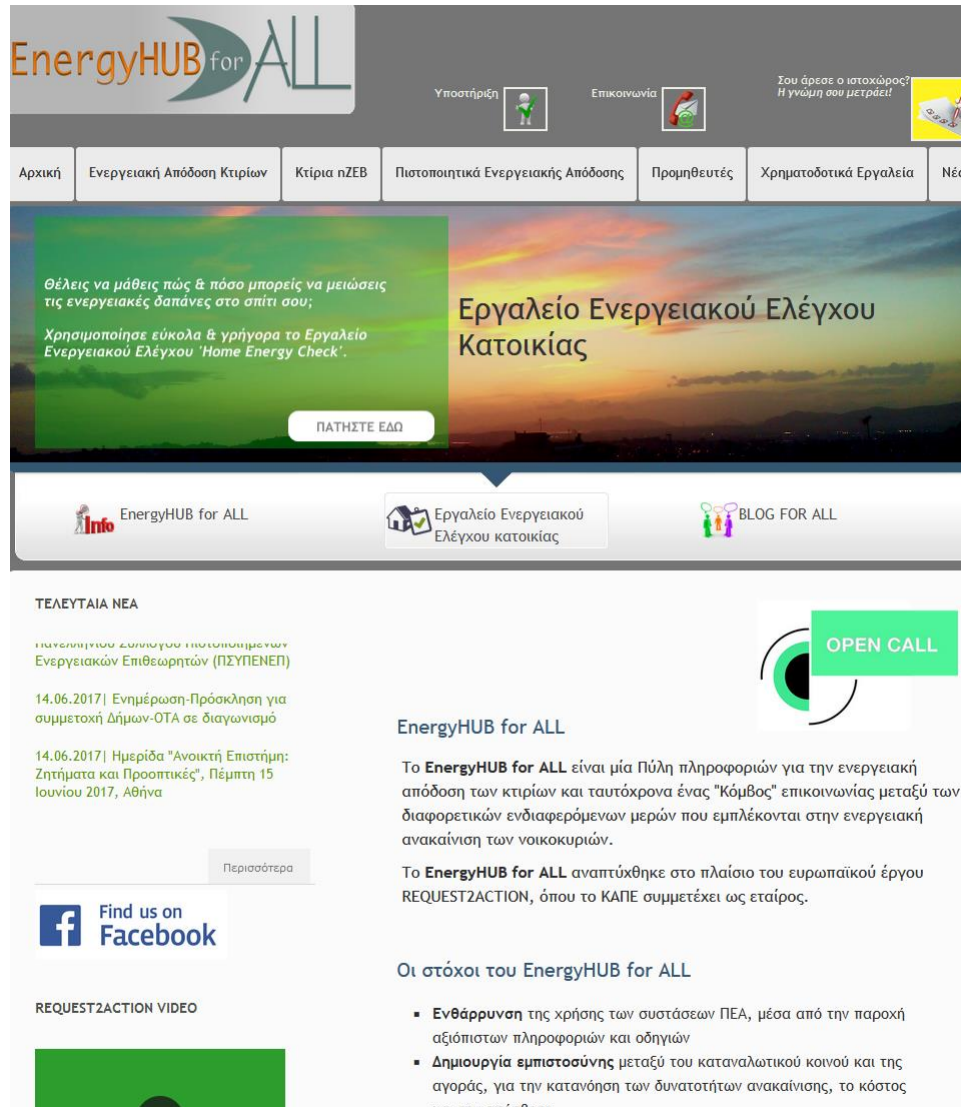
 hCAPTCHA
Proveedores - Términos

C) Creating Deep Renovation Network Platforms -Examples of information in platforms

Enhanced online platform with information for deep renovation of buildings:

<http://www.energyhubforall.eu/Greece>

Also enhanced online platforms DRNPs in Germany and Hungary
New platform in Sweden



The screenshot shows the homepage of the EnergyHUB for ALL website. The header features the logo and navigation links: Αρχική, Ενεργειακή Απόδοση Κτιρίων, Κτίρια nZEB, Πιστοποιητικά Ενεργειακής Απόδοσης, Προμηθευτές, Χρηματοδοτικά Εργαλεία, and Νέα. A main banner promotes the 'Εργαλείο Ενεργειακού Ελέγχου Κατοικίας' (Home Energy Check tool) with a 'ΠΑΤΗΣΤΕ ΕΔΩ' (Click here) button. Below the banner, there are links to 'EnergyHUB for ALL', 'Εργαλείο Ενεργειακού Ελέγχου κατοικίας', and 'BLOG FOR ALL'. The 'ΤΕΛΕΥΤΑΙΑ ΝΕΑ' (Latest News) section includes two articles from June 2017. A 'Find us on Facebook' link is also present. The 'REQUEST2ACTION VIDEO' section is partially visible at the bottom. A green 'OPEN CALL' button is prominently displayed on the right side of the page.

D) Regular mandatory EPC assessor training

- **General Policy proposal:** mandatory *periodic* training for *maintaining* certification and registration as an EPC assessor after a validity period

Type of Content	Included in the existing training programmes	Needs for development
Changes in national or European Building Performance Acts	Partially (at the moment of the training, but do not include the changes)	The initial training focuses on the actual at the moment of the training legislation, local and European. The regular mandatory trainings should focus on the recent changes of the national and European Acts related to the building and EE.
State-of-the-art technologies	YES	As the state-of-art technologies are developed very quickly, a year or two after the initial training they are not any more state-of-art, so an update should definitely be included in the regular trainings
Deep energy renovation recommendations	YES	These recommendations also change together with the development of the technologies, so the updates on them and their assessment must be part of the trainings
Common mistakes or errors in EPCs- Quality control of issued EPCs for learning	NO	This topic is missing in the initial training, but is very important and useful and should be included in the regular training. Moreover, a creation of database with the common mistakes and lesson learned might be very useful and appreciated.
Funding programs for renovation and their technical requirements	NO	This important information is missing in the initial training. Any actual available funding possibilities should be presented to the trainees as well as some examples for their application.
Consumer information and communication	NO	This part is missing in the initial training. Effective customer information and interaction should be included.
Contract design	NO	Some basic information on the contract should be included.
Further (soft) skills for EPC assessors	NO	Training on the EPC and the deep renovation software
Other		

D) Regular mandatory EPC assessor training

Policy proposal: mandatory *periodic* training or examination for *maintaining* certification and registration as an EPC assessor after a validity period

General framework

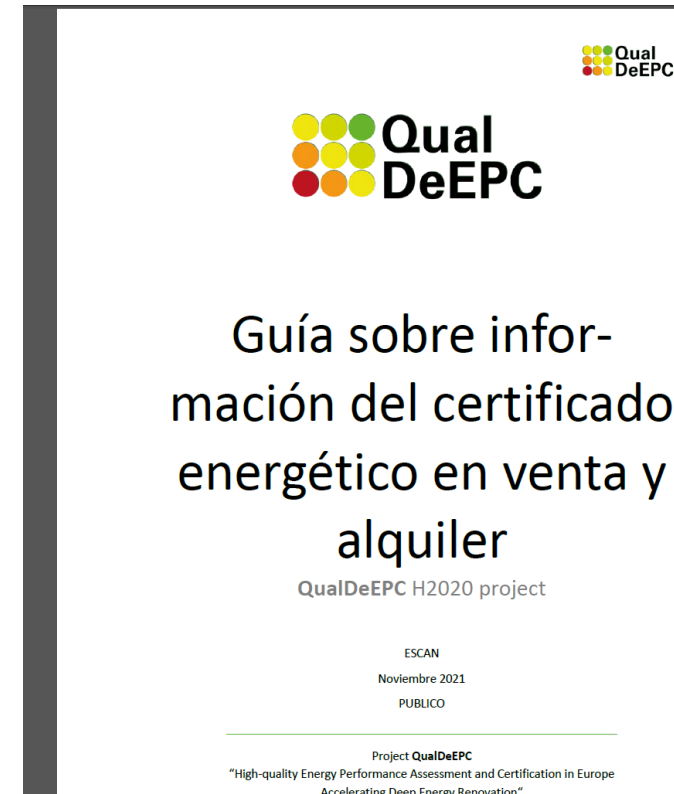
- Regularity: periods of 3-5 years
- Form:
 - Training courses
 - Workshops/ seminars
 - Verification of issued EPCs
- Workload to be determined on national level

Training content

- Changes in national or EU Building Performance Acts
- State-of-the-art technology, esp. deep energy renovation options
- Common mistakes, general learning
- Funding programs for energy-efficient renovations
- Contract design

F) Voluntary/mandatory advertising guidelines for EPCs & G) Improving compliance with the mandatory use of EPCs in real estate advertisements

- Nationally adapted proposal for voluntary advertising guidelines and their use
- Nationally adapted proposal for legislation making their use mandatory if Member States wish to do so
- Also, we elaborated a leaflet of information with the guidelines in Spain





HIGH-QUALITY ENERGY PERFORMANCE ASSESSMENT
AND CERTIFICATION IN EUROPE
ACCELERATING DEEP ENERGY RENOVATION

www.qualdeepc.eu

QUESTIONS?

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Thank You.

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