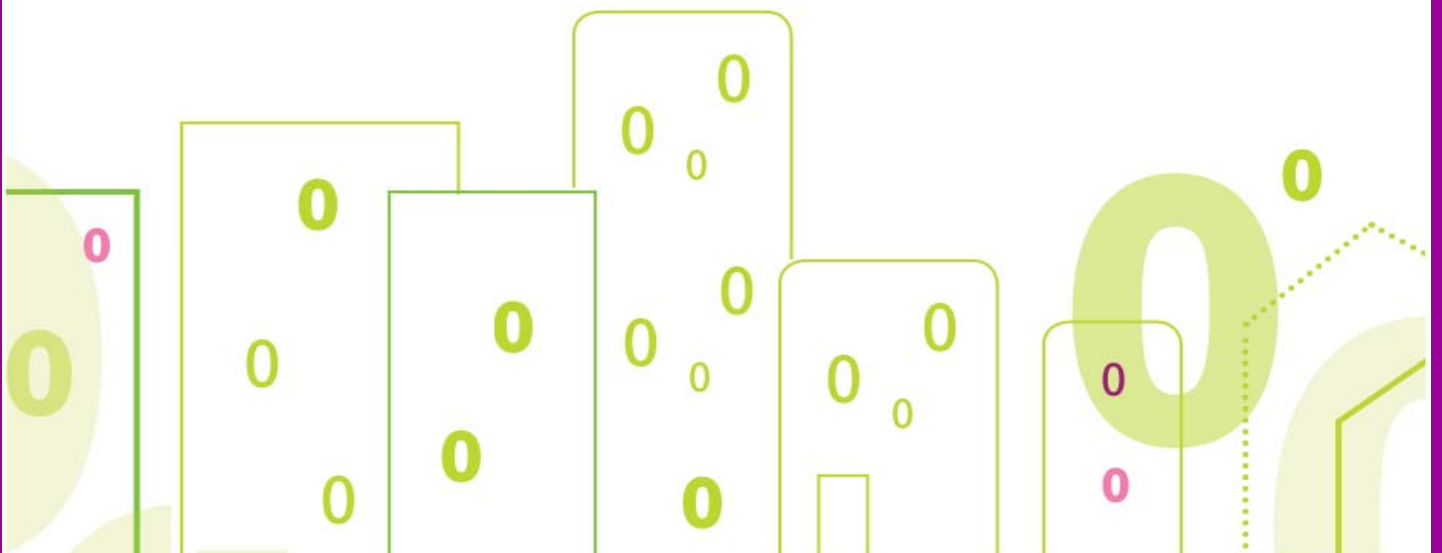


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## NEARLY-ZERO ENERGY BUILDINGS IN DIVIDED/COOPERATIVE OWNERSHIP

TaskForce Needs Analysis & Work Programme  
including nZEB Legislation Review



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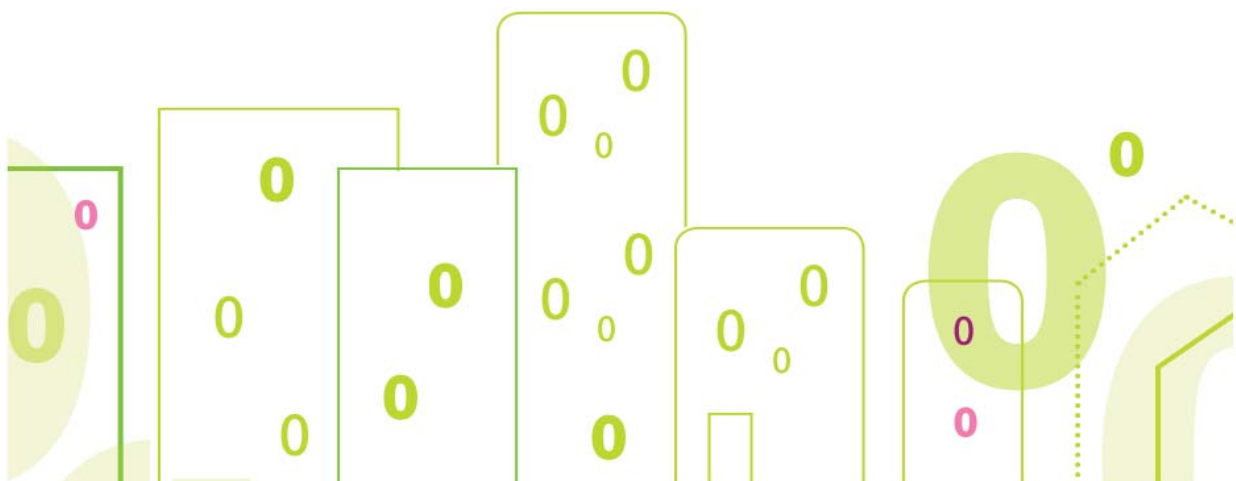
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## 1 Introduction

Nearly-Zero Energy is a new low energy housing standard, a “European brand” we could say which has still to find its way into all Member States regulations and then down to construction and refurbishment practices. Finally, also housing managers and households will have to learn how to operate and live in a nearly-Zero Energy Building, if estimated consumption values have to be also “real consumption” values.

The scope of this Taskforce is to investigate what the new standard means, in practice, in the social and cooperative sector, and facilitate the adoption of the standard by the social and cooperative housing association. The focus of the Taskforce is the divided and cooperative property housing, where residents play a major role in the decision making process, especially for what concern the renovation of existing buildings.

## 2 TaskForce Needs Analysis

### 2.1 TaskForce Theme

Incentivising and implementing nearly-Zero housing strategies in private/ divided ownership requires an adapted financial, legal and organisational framework. Private ownership includes:

- Individually owned homes in multi-apartment buildings,
- single family homes,
- cooperative housing in its different forms and
- multi-apartment buildings with mixed tenures.

The common element of this taskforce is the role of the resident, who is directly owner of the dwelling (divided ownership) or has a stronger right of occupation (cooperative ownership) than in the case of a normal renting contract. The resident is called to participate actively to the decision making process for what concern the management of the building or its eventual renovation, and has also a direct or indirect role in the choices which concern the construction of a new building where he is going to leave.

The type of project/ type of property matrix helps us to divide the object of the work into a limited number the scenarios; the hot topics of the taskforce will be analysed in consideration of the different scenarios.

	Renovation	New built
Divided	X	X
Cooperative	X	X

#### Type of project:

- New built: a building of new construction within the nZEB or low energy standard
- Renovation: refurbishment of an existing building which brings to a significant reduction of the energy consumption

#### Type of property:

- Divided property: in the building there is more than one owner and each of them has a right to participate in the decision process. The case of cooperatives of owners, common in East European Countries, belongs to this category.

- Cooperative property: a housing company own the whole building, but the residents are involved in the decision process, for example because they are members of the Cooperative which own the building, or because they have a special renting contract (permanent).

## 2.2 Taskforce hot topics

The key themes which have been selected by Partners to be examined by the Taskforce are:

- ✓ **Definition of nZEB standards in new buildings and renovation projects.**

It is essential to define what is a nZEB in new build and renovation projects, as the member States has not, in most cases, yet come up with a clear definition. This activity will be linked to the EU concerted action. First results have been presented by Participants already at the kick of meeting in Dresden in May 2012. The annex “Legislation report” includes an overview of the definition and roadmap to nZE in Bulgaria, Estonia and Italy. WP 6 will also deal with the regulation of nZE for the entire project duration.

- ✓ **Obstacles to the nZEB housing**

Obstacles will be identified and described, underlining the differences between the 4 cases defined by the project/ property type matrix. Taskforce partners will discuss this issue at the 1<sup>st</sup> taskforce workshop in Madrid and results will be presented in Deliverable 3.2 “Introducing the multi-owners buildings obstacles to nZEB housing”

- ✓ **Financing of the nZEB**

nZEB have higher construction costs and lower energy costs than a normal building. The same is true in case of a renovation project. In addition, nZEB might have higher maintenance costs, especially in the case where new technologies are used improperly. An accurate budgeting is then necessary to demonstrate the feasibility of the project. This issue will be discussed at the second taskforce workshop; the selected test cases will be investigated also for what concern financing, and this will be reported in Deliverable 3.4.

✓ **RES**

Usage of Renewable Energy System are essential for nZEB. In different Countries there are significantly different experiences concerning the integration of RES, especially solar and geothermal energy, into residential buildings. Being a relatively new phenomenon, local legislation is currently under a quick development and adaptation in Member states. Results in terms of effectiveness of these technologies will be evaluated also thanks to the monitoring of real data in Case studies which incorporate these technologies and this will be reported in Deliverable 3.4. This issue will be discussed at the second taskforce workshop.

✓ **Legal and organizational framework**

Rules which are applied in different Countries and which regulate the decision making process will be investigated, along with the organizational solution which can be used to gather the approval to a refurbishment project which lead to improve energy efficiency in a multi-owners building. The situation will be described in detail for Italy, Estonia and Bulgaria and an overview of the situation in other member States will also be presented interviewing Cecodhas Members. This issue will be discussed during the third taskforce workshop. Outcomes will be reported in Deliverable 3.5, where it will be shown also how these issues have affected the selected test cases.

✓ **Communication and marketing**

nZEB has to be seen not only as a merely restriction, but instead as an opportunity to enhance competitiveness of those housing companies which will be able to develop new housing models (also as result of renovation works) in low energy and nZEB standard. But a good product is not enough: communication and marketing strategy should help to add value and create a positive image of these buildings type. This topic will be discussed in the 3<sup>rd</sup> taskforce workshop. Outcomes will be reported in Deliverable 3.5, where it will be shown also how these issues have affected the selected test cases.



### 3 Work Programme

The Work Programme is based on the Description of Action. Annex 2 – calendar provides dates of events and deadlines for deliverables. The main elements of the task force work program are described in this chapter.

#### ✓ **Taskforce Workshops**

3 Taskforce workshops will be organised during the project. During the workshops, the participants will have the opportunity to discuss the themes of the taskforce and plan the next steps. The workshops will be open to all Cecodhas Housing Europe members and their members, and will aim to incorporate their experience into the taskforce work results. The first WS will be held in Madrid, jointly with the Project General Meeting, while the second and third workshop will be joined to the study visits planned in Italy (May 2013) and Estonia (2014). External experts will be invited to the WS to bring their contribution.

Each taskforce will focus on one or two hot topic identified for the taskforce:

1<sup>st</sup> WS: Obstacles to nZEB in divided and cooperative ownership, with a special focus on need for training of all actors involved (designers, managers, maintenance operators and households)

2<sup>nd</sup> WS: Financing of the nZEB + RES

3<sup>rd</sup> WS: Legal and organizational framework, with special focus on the process of gathering the approval of property owners + communication and marketing, how to make of nZEB standard an opportunity to beat the competitors

#### ✓ **Existing resources**

Existing resources will be analysed and best studies, practices and tools will be made available though the Power House website, in the Resources page ([http://www.powerhouseeurope.eu/cases\\_resources/resources/](http://www.powerhouseeurope.eu/cases_resources/resources/)) and the BUILD UP website. The results of this activity will be reported in the Deliverable 3.8: Use of Plug-into POWER HOUSE / resource section of POWER HOUSE EUROPE website and the 'BuildUp' Community to disseminate summaries of a maximum number of resources of interest identified through the work of this taskforce.

During each taskforce workshop, each partner will present 2 selected resources which could bring added value to discussion on the focus theme of each workshop.

✓ **External experts**

nZEB standard is a new standard which has not yet been defined with clear rules and thresholds in most of the EU Countries. For this reason, we decided to consult external experts who can contribute to compensate the lack of information and understanding which is always associated to new standards and practices. Relevant experts will be identified during the first stages of the project by each Partner and will then be consulted when needed by mean of questionnaires and interviews. In addition, one or more experts will be invited to participate to each taskforce workshop to discuss and bring their own experience and views on the workshop focus theme. Experts' contributions will be particularly important to complete deliverable 3.1 Needs Analysis and Work Programme (for what concern the nZEB Legislation report), 3.2 Status report "Introducing the multi-owners buildings obstacles to nearly-zero energy housing refurbishment" and 3.7 Guidelines/Recommendations "nZEB-divided home-ownership- Lessons learned" and Strategy document "Core elements for national nZEB 2020 road maps".

A detailed list of external experts is provided in Deliverable 3.2 Annex 1.

✓ **Local members' experience**

Great importance is given to the experiences already matured in new built and renovation projects. These will be used to demonstrate what has been already done and in this field. Test cases detailed information will be publically accessible (Deliverable 3.3) on the Power House website

([http://www.powerhouseeurope.eu/nc/cases\\_resources/case\\_studies/search\\_form/](http://www.powerhouseeurope.eu/nc/cases_resources/case_studies/search_form/)).

Selected test cases will be presented in Deliverable 3.3, while results will be presented in 3 separate reports: D3.4 "Financing the nZE project and RES specifics in Divided and Cooperative Property", D3.5 "Legal and organizational framework and communication and marketing of nZE in Divided and Cooperative Property" and D3.6 "Cost-effectiveness in Divided and Cooperative Property in practice".

Test cases from local members will be presented by partners according to the following table:

Partner	Test cases
Finabita, WP leader	5, documentation and monitoring
Ekyl, WP co-leader	5, documentation and monitoring
CAC	5, only documentation
CasaQualità	0
Total	15, 10 with monitoring, 5 without

Test cases real consumption data will be monitored and will be made publically available through an energy tracking tool, Sole, which is accessible at the URL [www.sole-project.com](http://www.sole-project.com).

Test cases information material will focus on the taskforce issues described in the chapter above and will be used as leading examples of what can be done to achieve the nZEB standard in new built and renovation projects. Test cases will be selected according to Needs Analysis results; they won't necessarily fulfil the nZEB standard, but they will contain elements which are evaluated as extremely significant for the achievement of the nZEB standard in future projects together with other measures.

### ✓ **Study Visits**

2 international study visits of 2 days will be organized in Italy (May 2013) and in Estonia (2014); during the visits the hosting organisations will present their 2020 strategy and roadmap towards nZEB standard, and it will be possible to visit a selection of the best case studies presented within this WP. The visits will be open to all Cecodhas Members and their Members.

Local members will be involved in the taskforce activity since the early stages of the project and will occasionally be used to add value to the documentation produced by the taskforce partners, for example by mean of questionnaires and interviews.

### ✓ **EPBD: nZEB and Cost Optimality**

The recast of the Energy Performance of Buildings Directive (EPBD) introduced, in Article 9, "nearly-Zero Energy Buildings" (nZEB) as a future requirement to be implemented from 2019 onwards for public buildings and from 2021 onwards for all new buildings. The EPBD defines a nearly zero energy building as a constructions that have "a very high energy performance",

and that any energy that they require should come "to a very significant extent" from renewable energy sources.

Acknowledging the variety in building culture and climate throughout the EU, the EPBD does not prescribe a uniform approach for implementing nearly-Zero Energy Buildings and neither does it describe a calculation methodology for the energy balance. To add flexibility, it requires Member States to draw up specifically designed national plans for increasing the number of nearly-Zero Energy Buildings reflecting national, regional or local conditions. The national plans will have to translate the concept of nearly-Zero Energy Buildings into practical and applicable measures and definitions to steadily increase the number of nearly Zero-Energy Buildings.<sup>1</sup>

Task force leader will gather information from taskforce partners to be reported in WP6. Taskforce partners will establish links with those experts responsible for drawing up the action plans for nZEB in partners Countries and report back to taskforce leaders. This activity will be linked with WP6, where results of this activity will be reported.

### ✓ **Taskforce work results**

Taskforce work results will be summarized in Deliverable 3.7 Guidelines/Recommendations "NZEH-divided home-ownership- Lessons learned" and Strategy document "Core elements for national nZE 2020 road maps", where a report of workshops and study visits will also be included.

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<sup>1</sup> BPIE 2011

## 4 Deliverables

Compared to the original titles, some changes to the original titles have been proposed to describe better the sector we are focusing on (which includes the cooperative housing) and to redistribute the importance of topics in the test cases according to the results of the needs analysis for this Task Force.

Del	Original name	Reviewed name
3.1	Needs Analysis and Work Programme	No changes
3.2	Status report "Introducing the multi-owners buildings obstacles to nearly-zero energy housing refurbishment"	No changes
3.3	Divided home-ownership Test Cases "Documentation of technical and financial and legal key characteristics of at least 5-10 demonstration sites per country (exemplary projects that delivered) (appr. 7 new/3 renovation)	Divided and Cooperative Property Test Cases: technical solution and construction/retrofitting/ management costs documentation
3.4	Report "Operating costs and quality assurance"	Test Cases: Financing the nZE project and RES specifics in Divided and Cooperative Property
3.5	Report "Usability" with partly quantified data on additional/less effort for property administration	Test Cases: Legal and organizational framework and communication and marketing of nZE in Divided and Cooperative Property
3.6	Report "Cost-effectiveness in divided home-ownership in practice"	Report "Cost-effectiveness in Divided and Cooperative Property in practice"
3.7	Guidelines/Recommendations "NZEH-divided home-ownership-Lessons learned" (appr. 25 pages) and ppt-slides (in English) and Strategy document "Core elements for national nZE 2020 road maps"	Guidelines/Recommendations "NZEH-Divided and Cooperative Property - Lessons learned"
3.8	Use of Plug-into POWER HOUSE / resource section of POWER HOUSE EUROPE website and the 'BuildUp' Community to disseminate summaries of a maximum number of resources of interest identified through the work of this taskforce.	No changes

## Annex 1: Legislation Report

### ✓ **Bulgaria**

#### ✓ **Description of the existing building stock**

Most of the EPBD requirements were transposed in the Bulgarian legislation in 2004, via the newly established Energy Efficiency Act. In the same year, several regulations related to this Act were published, covering energy characteristics of buildings, energy audits and certification of buildings, eligibility of auditors, etc. During the period 2005 – 2011 the legislation and regulations related to EPBD were continuously updated. As a result currently they are completely harmonized with EPBD.

Energy certificates indicate the specific energy consumption [kWh/m<sup>2</sup>], the annual energy consumption [MWh], CO<sub>2</sub> emissions [t/y], and the energy class on a scale from “A” to “G”. The certification must be preceded by an energy audit. The energy efficiency measures prescribed by the audit are obligatory and must be implemented in a three-year term.

In Bulgaria, certification is mandatory for all buildings in operation with surface area larger than 1000 m<sup>2</sup>. The deadlines set for conduction of the audits of the buildings vary as follows: for the public buildings - end of 2011 or end of 2013 depending on the ownership, for industrial enterprises - end of 2011. The deadlines for residential buildings are diverse.

Approximately half of the public buildings have been audited (as of end of 2011). On the other hand, the share of audited industrial enterprises has remained quite low. In the residential sector, there are only few examples of certification of existing residential buildings. The audit, certification, and renovation of multifamily residential buildings are still facing serious regulatory, financial, and administrative barriers.

The legislation requires that for each rented or sold building (or a part of it) an energy certificate should be made available to the new tenant / owner. However, the compliance with this requirement is still negligible.

In Bulgaria energy minimum requirements for energy performance of buildings were set as follows:

Climatic zone: Sofia	Residential building 5 storey apartment block		Residential building 14 storey apartment block	
	kWh/m <sup>2</sup>	W/m <sup>2</sup>	kWh/m <sup>2</sup>	W/m <sup>2</sup>
1. Heating	33,3	39,0	30,5	33,0
2. Ventilation	24,0	24,0	30,0	31,0
3. DHV	55,6	7,0	49,6	7,0
4. Fans & pumps	5,3	1,0	6,3	1,0
5. Lighting	14,2	4,0	14,2	4,0
6. Others	14,2	3,0	14,2	3,0
7. Cooling	-	-	-	-
<b>Total</b>	<b>146,5</b>		<b>144,7</b>	

NZEB standard is not regulated yet in Bulgaria by the existing energy efficiency norms.

#### ✓ Legal (national/regional) framework and relevant stakeholders

According to the Recast EPBD - article 9, paragraph 1, National plans for increasing the number of nearly-Zero Energy buildings must be delivered by end of 2012. However the investigations of CAC have shown that by 20 of September the Bulgarian Agency for Sustainable Energy Development (<http://www.seea.government.bg>) that is responsible for transposition of the EPBD in Bulgaria has not yet prepared the document. The expectations are to have this done by the end of the year 2012. However, the amended Second National Energy Efficiency Action Plan (2011-2013) from June 2011 considers a Strategy for the increase of nearly zero energy buildings. According to this Strategy:

“In line with the requirements of Directive 2010/31/EU, Bulgaria will endeavour to support the construction of new nearly zero energy buildings and the achievement of this level of energy performance in the refurbishment of existing buildings. The legislation in force will be analysed and amended in order to transpose the harmonised European energy performance requirements for nearly zero energy buildings. Reference numerical values are envisaged to be established as national parameters for the annual energy consumption indicators, which will help to formulate statutory energy performance requirements for this type of buildings.

On this basis, a national plan to increase the number of nearly zero energy buildings will be drawn up. The plan will include an analysis of the situation in the construction sector (construction growth, business environment, financial and administrative barriers, socioeconomic conditions, market principles, etc.), establish a baseline year for measuring the fulfilment of the targets sought and will define the national targets for nearly zero energy buildings.”

The relevant stakeholders in the policy process are architects, engineers, scientists, local and central authorities, energy services companies, property developers, etc.

At this stage in Bulgaria is not yet available an evaluation procedure which involves interest groups like the housing sector.

### ✓ **Status of the process and time schedule**

The amended Second National Energy Efficiency Action Plan (2011-2013) from June 2011 considers a Strategy for the increase of nearly zero energy buildings. In setting the national target for nearly zero energy buildings, Bulgaria adheres to the two-step approach to target setting proposed by the European Commission.

The planned implementation schedule is fully coinciding with the period of operation of the second National Energy Efficiency Action Plan 2011-2013. The basic target is to define the national parameters for nearly zero energy buildings. The 2 step procedure is described below.

#### A. First step

Is preparatory and includes two interim preparatory periods.

The first preparatory period covered the years 2010-2011. The second preparatory period covers the years 2011-2012. The following measures are planned to be implemented in this period:

- Formulating, assigning and performing applied research tasks to determine the national parameters (numerical reference values for the annual energy consumption indicators) in order to establish statutory energy performance requirements for nearly zero energy buildings.
- The measure includes coordinated inter institutional action for:
  - review and evaluation for use of the comparative methodological framework for calculating cost-optimal levels of minimum energy performance requirements for buildings and building elements, which the Commission should establish by means of delegated acts in accordance with Articles 23, 24 and 25 of the Directive by 30 June 2011. This evaluation will be



carried out at expert level in the light of national conditions regarding the technical, environmental and economic feasibility of actions to increase the number of nearly zero energy buildings; national parameters for nearly zero consumption;

- refining the classification of buildings into categories, which has already been transposed into the existing Bulgarian legislation in a manner that is fully consistent with the Directive but needs to be reviewed for the purposes of the calculation of energy performance of nearly zero energy buildings;
- systematic analysis of the data contained in the information system of the EEA to determine the current level of energy consumption of existing buildings;
- collection and systematisation of reliable data at project level in numerical terms of the energy consumption of new buildings;
- preparing an expert assessment of the quality level of energy efficiency audits and selecting reliable energy audit reports in terms of verifiability and feasibility of the results. On the basis of the energy consumption levels achieved after implementing energy saving measures and actually renovating the buildings, the experts will make a representative sample of reference buildings, comprised of not less than 10 % of the best performing (including residential) renovated buildings in the national building stock for the period 2005-2010, grouped by category and climatic zone;
- carrying out the necessary calculations and measurements of the reference buildings, taking into account: the European technical standards, the rules of the national methodology for calculating the energy consumption indicators and energy performance of buildings in Bulgaria and the national requirements on the use of renewable energy, the level of technology and quality management of energy in the reference buildings;
- calculating and analysing the cost-optimal levels of minimum energy performance requirements during the economic lifecycle of reference buildings on the basis of the comparative methodological framework of the Commission and forecasting the levels of social and economic expediency at which these levels may be exceeded under the local conditions. Comparing the sustainability indicators for buildings from the most applicable certification systems in Europe with the criteria and their weighting;

- based upon the fulfilment of the package of research and expert tasks, setting numeric values for the national parameters through the practical application of the definition for nearly zero energy buildings in the specific national context and taking into account local weather conditions;
- supplementing the national calculation methodology for annual energy consumption with new elements from the applicable European standards for the design of sustainable and intelligent buildings, taking into account the standards for passive buildings and the level of technology of heating, cooling and air-conditioning systems supplied with energy from conventional or renewable sources.

#### B. Second step

The second step is based on binding measures relating to the first step and covers the period 2012-2013. On the basis of the overall preparation at the first step and the consistent implementation of the targets sought within its duration, an intermediate target may be set in the second step for around the end of 2015 to improve the energy performance of certain categories of buildings to levels corresponding to nearly zero energy consumption, consistent with the nationally defined parameters (in kWh/m<sup>2</sup>) at the first step. In the best case scenario for attainment of the targets sought during the preparatory stage, the national intermediate target for 2015 may amount to 1-1.5 % of the total floor area of new buildings occupied by central and local government authorities with a selected baseline year for measuring the results. The baseline year may be determined more accurately at the beginning of the second step. After assessing the impact of the plan, where necessary, the national or intermediate target may be adjusted.

The target roughly determined for 2015 is based on the European Commission's analysis of the refurbishment rate of buildings in the EU-27, presented in its Communication "Energy Efficiency Plan 2011" on 8 March 2011, and the exemplary leading role of the public sector in the field of energy performance of buildings.

The following measures are envisaged at the second step of defining the targets:

Measure 4: Developing a draft national plan for increasing the number of nearly zero energy buildings. The measure includes coordinated action for:

- analysing the situation in the construction sector, construction growth, business environment, financial and administrative barriers, socio-economic conditions, market principles, relationships between entities along the supply chain: construction products of the requested quality used, suppliers of facilities and equipment, fuel and energy suppliers, efficiency of services, incentives, using an integrated approach in the design of sustainable, safe, affordable and energy efficient buildings, renewable energy use, level of technology used, quality of the construction and installation work

carried out, documenting the construction process, implementing the financial stabilisation policies after the economic crisis, data reliability, level of qualification of specialists with higher education, installers and construction workers in the entire process of design, conformity assessment, construction and supervision of the construction of the new nearly zero energy buildings, level of environmental impact and protection, level of CO<sub>2</sub> emissions from low energy buildings, etc.;

- establishing a baseline year for measuring the fulfilment of the targets sought;
- defining the national targets, depending on the categories of buildings, for the periods 2011-2013, 2013-2016 and 2016-2020, implementation mechanisms, reporting actions, documenting and reporting of the results.

Measure 5: Implementing pilot projects for new nearly zero energy public-sector buildings in the period 2011-2013 and reporting on their contribution to the attainment of the intermediate target set for 2015.

#### ✓ **Preliminary results: nZEB definitions and cost optimality**

Currently in Bulgaria there is no available definition of nZEB but according to the opinion of the State Agency for Sustainable Energy Development it will be approved in line with the common definition proposed by EU Directive 2010/31/EU. The cost optimality method proposed by the Commission has not yet been transposed to national level.

#### ✓ **Estonia**

##### ✓ **Description of the existing building stock**

Most of the building stock in Estonia are built during 1950-1990 and needs renovation now. Most of the building stock in Estonia are built during 1950-1990 and needs renovation now. Most buildings in Estonia are energy inefficient and the average annual heating energy used in the buildings is 200-400 kWh/m<sup>2</sup>. Large amount of blocks of flats are heritage from soviet time and have now degraded, have insufficient insulation and abnormal energy consumption. The economical boom years in 2007-2008 added a number of often low quality buildings, which also increase the demand on housing sector. Estonian housing stock needs reconstruction and renovation.

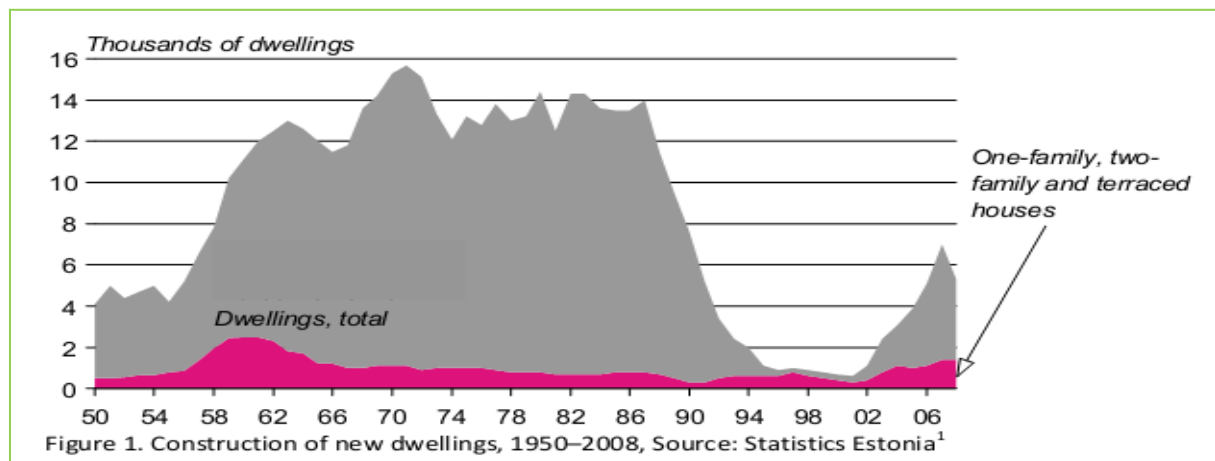
The building stock represented by EKYL is crosscut from the housing stock in Estonia. The quality and energy efficiency of housing stock in Estonia are very poor in comparison with

the more economically developed EU member states. The buildings' final energy consumption to the total energy consumption is 53%.

Specific problems rise due to the divided ownership of apartment blocks in Estonia. 96% of the housing available in Estonia is privately owned, every inhabitant owns his/her apartment, which makes renovation in blocks of flats very difficult. The rental market is marginal, most of the tenants are owners and responsible for the renovation. The income level of the bulk of the population will not allow everyone to move into new residential construction or renovate the existing building.

All roadmaps are based on the need to lengthen the lifespan of existing housing. It is inevitable that the new buildings do not make up for the residential buildings leaving the housing market at the end of their life. Today the average life expectancy of a dwelling is 70 years but the life expectancy of housing stock can be prolonged through renovation and repairs. Estonia foresees that in 2020 as well as in 2030 we have the same (continually renovated) housing stock as today with less than 1% new living space built each year.

The current renovation rate in Estonia is under 1% of existing housing stock. If we look at the figure of construction of new dwellings, we can predict that the next decade will bring up the need for reconstruction of several times, more than 8000 apartments annually, due to replacing outdated housing stock from 1950-1970. According to estimations more than 350.000 m<sup>2</sup> of living space needs renovation each year in Estonia.



EKYL and its members don't build new buildings but retrofit the existing housing stock. All the construction is managed by construction companies.

There are no arguments against energy efficient retrofit, but the problematic aspect for members of EKYL is long payback period of large investments needed for retrofit.

✓ **Legal (National/Regional) framework and relevant stakeholders**

Energy performance of buildings is regulated in Estonia with the government act on minimum requirements for energy performance. This act includes primary energy requirements for all common building types, mandatory input data for energy calculation (standard use of the buildings) as well as calculation rules and guidelines, and requirements for calculation tools. The framework and procedure is one of the most generic and flexible in EU and can be used as is for net zero energy building energy performance calculations. Energy certificate values for new buildings are also calculated with this act.

Regarding energy policy, The Ministry of Economic Affairs and Communications is the governmental institution directly responsible for energy related issues, including energy efficiency and conservation, also for the use of renewable resources in the energy sector. In the ministry, the Energy Department is responsible for regulations necessary for the functioning national fuel and energy sector. The main task of the department is to elaborate national development plans focused on the efficiency, competitiveness and environmental sustainability of fuel and energy management and to ensure their implementation, to arrange the information and administration and to prepare draft legal acts for regulating the field.

In Estonia, there is no national energy agency or any institution with similar tasks. Some aspects of efficient energy use in residential housing sector are dealt by the Credit and Export Guarantee Fund KredEx. KredEx is the implementing body of the policy on the energy performance of buildings. KredEx includes Housing and Energy Efficiency Division, that helps to alleviate housing-related financial problems and promotes energy efficiency in the existing housing stock in Estonia.

✓ **Status of the process and time schedule**

The national report is prepared by the ministry.

According to the second energy efficiency action plan of Estonia, energy performance requirements are made stricter gradually in Estonia, preferably each three years beginning in 2013. The changes in the minimum requirements for energy performance of buildings are significant and require long-term preparations.

On August 30 2012, Estonian government confirmed regulation establishing new minimum energy performance requirements for buildings in their construction and major renovations. Since the entry into force on 9 January 2013, the new homes will be an average of 20% more energy efficient than today. According to the new regulation, the efficiency coefficient for nearly zero-energy buildings would be 50-270 kWh/(m<sup>2</sup>a), depending on the type of the building.

Taking into account financial considerations (construction of a nearly zero-energy building is not yet cost-optimal), the 2015 target for nearly zero-energy buildings in Estonia is limited to construction of sample nearly zero-energy buildings in all regional centers in Estonia, at least 10 nearly zero-energy buildings.

✓ **Preliminary results: nZEB definitions and cost optimality**

There is new nZEB definition available in Estonia. According to the new regulation, confirmed by the government 30.08.2012 (will enter into force 09.01.2013), the nZEB is a building which is built technically reasonably with best practice energy efficiency measures and renewable energy technologies, with energy use of primary energy<sup>2</sup> (which is a calculated numeric energy performance indicator, describing complex use of energy for heating, domestic water heating and for electrical equipment.) more than 0 kWh/ (m<sup>2</sup>a) but not more than:

- 50 kWh/ (m<sup>2</sup>a) in detached houses
- 100 kWh/ (m<sup>2</sup>a) in apartment buildings
- 130 kWh/ (m<sup>2</sup>a) in office buildings
- etc.

(This is unofficial translation as the definition is not available in English yet).

Estonia's goal is to increase renewable energy to 25% of final consumption of energy by 2020, which will require changes in all sectors.

In 2011, the technical report "Cost optimal and nZEB energy performance levels for buildings" was finished in Estonia by scientists from Estonia and Finland. This report proposes definitions for cost optimal low-energy buildings and nearly zero-energy buildings of selected building types. The cost optimal principle of EPBD recast with net present value calculation is used to derive the low energy performance level.

Cost optimal primary energy use was calculated for each building type based on solutions leading to minimum net present value with 30 years period. The net present value calculation included both investment and operation cost discounted with common real interest rate of 3%. To show the sensitivity to the interest rate, the inflation rate of the energy price was varied between 1 and 4%. For initial energy prices the current price data was used.

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<sup>2</sup> This is a calculated numeric energy performance indicator, describing complex use of energy for heating, domestic water heating and for electrical equipment.

As a result, in residential buildings, the cost optimal performance level (130) is reasonably lower than the current minimum requirement of 180, but in the office buildings sector the current requirement of 220 is much higher compared to cost optimal value (150). Because it is still far from zero energy, the cost optimal levels may be proposed for low energy building category B or C in the energy performance certificate scale. Nearly zero energy performance level is not yet cost optimal with current prices and is suggested to be defined through a technically reasonable achievable level with current best practices and renewable on site energy production.

Numeric results provided in the report are to be treated as country specific ones applying for Estonian markets with local energy, material and labour prices. The methodology presented, most likely applied first time for national cost optimal and nZEB calculations, provides valuable experience to be utilized for similar purposes European widely.

[http://www.mkm.ee/public/documents/energeetika/Cost\\_optimal\\_and\\_nZEB\\_energy\\_performance\\_levels\\_for\\_buildings.pdf](http://www.mkm.ee/public/documents/energeetika/Cost_optimal_and_nZEB_energy_performance_levels_for_buildings.pdf)

## ✓ Italy

When speaking about the implementation of EPBD2 in Italy, several factors must be taken into account. Some of them are the “engine” of the process, while others make it difficult to proceed.

Italian land develops between the 35<sup>th</sup> and the 47<sup>th</sup> North parallel and is characterised by a considerable coastal development. Such a range causes a great variability of the climate: it starts from the South with a subtropical climate (summer temperatures reach often 40°C) and arrives to the North, with a temperate continental climate (winter temperature sometimes around -12°C, in the Alps also -20°). Such variability provides a wide range in the calculation of the Degree Days. It is clear that the definition of a building standard and the creations of general issue for buildings solutions are a complex question.

On the other hand, in Italy, residential and tertiary (so called “civil” sector) passed from 42.8 Mtep (in 2007) of primary energy consumption to 46.9 Mtep in 2009: referring to the end-use, civil sector has an influence around 32% of the total, while industry influences for 28%, 30% transports and 2% agriculture<sup>3</sup>. It is clear that energy efficiency in the residential sector could play a strategic role in the Italian economy.

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<sup>3</sup> Editor: Giuliano Dall’O „Lo stato dell’arte dell’applicazione della certificazione energetica in Italia: presentazione del rapporto 2012“. Proceedings of the National Forum on Energy Certification. Milano 2012

Another important issue is that energy requirements of buildings in Italy is a shared question between the State and 21 Regions and Autonomous Provinces. Implementation of EPBD started in 2005, with a National transposition Decree, which established a transitional period during which:

- The minimum requirements were tightened by about 30% with respect to previous level;
- Methodologies for determining energy performance of buildings were confirmed. In reference to the already existing advanced regulations;
- Energy certification of buildings was replaced (in some Regions) by a statement produced by a professional designer.

At the end of 2010, the revision process of current legislation at the national level was completed, and a group of Regions implemented their transportation, according to the national model and guidelines, while the national rules still apply in the Regions that not yet published their legislation. The result is that every Region has its own procedures of buildings' energy performance calculation: implementation of EPBD2 should overcome these differences, probably introducing a "building reference" (and not simply a number or a class) with technical issues (e.g. transmittance of the walls, transmittance of glazing surfaces, etc.) to be considered as the minimum requirement for new constructions.

### ✓ Description of the existing building stock

As described in Figure 1, almost 48% of the Italian building stock has been constructed in the period 1946-1981. In this period, the input was to build up quickly new dwellings to satisfy the growing population demand; at this time, energy regulation was not yet implemented. Only in 1976, Italian Government issued the first law about energy performance in residential buildings for the new construction.

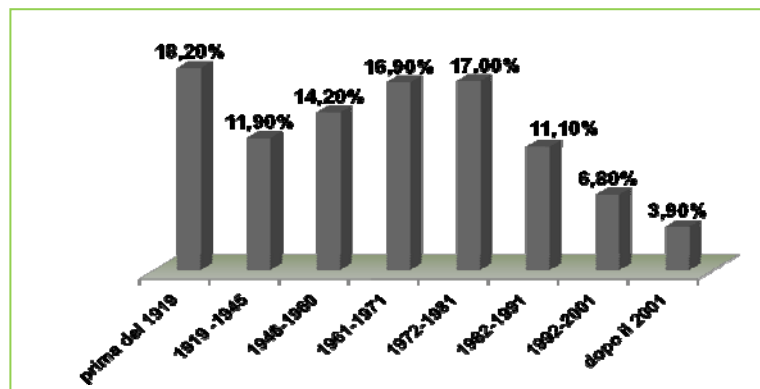


Figure 1 – ENEA, CRESME 2010: Existing residential building stock in Italy.



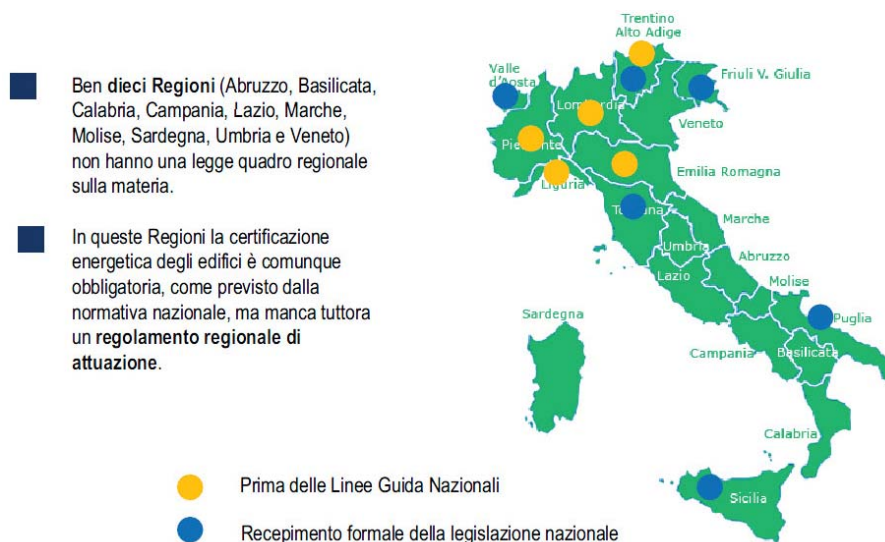
As a result, a significant part of the existing stock (except for historical buildings) has a high energy consumption rate, so, the energy refurbishment of existing buildings is a key theme to be considered in the implementation of EPBD2.

✓ **Legal (national/regional) framework and relevant stakeholders**

In Italy<sup>4</sup>, the Ministry of Economic Development, in collaboration with the Ministry of Environment and the Ministry of Infrastructure, are in charge of the regulation on Energy Conservation of Buildings (ECB). The opinion of the Committee of Region is required, because energy policy in Italy is partially delegated to Regions and Autonomous Provinces, leaving the drafting of the general framework to the central government while Regions have the final power to adapt their individual requirements. Regions are in charge of the entire certification system, which is based on regional registries and databases.

The most significant advancement in the new national regulation was made on the 25th July 2009, when a new Ministerial Decree entered into force, adopting the National Guidelines on Energy Certification of Buildings. The guidelines specify the procedures, the performance classes and the basic elements for energy certification, which has a legal value in all the Regions that have not yet produced their own legislation or until the date of issue of new regional laws.

In Figure 2, a picture about the situation of energy certification in Italy is reported.



<sup>4</sup> “Implementing the energy performance of Building Directive“ – featuring country reports 2010“ [www.epbd-ca.eu](http://www.epbd-ca.eu)

Only a part of the Regions/Autonomous Provinces have already adopted a regional regulation on energy certification: referring to Figure 2, they are indicated with a yellow/blue dot. The remaining ones have not already implemented their own regional regulation: energy certification is mandatory and follows the national regulation.

Nowadays, the national Decree is under revision by the Ministry of Economic Development because of the implementation of EPBD2.

✓ **Status of the process and time schedule**

In Italy, the calculation of cost-optimal level of minimum energy performance requirements is under discussion. According to ENEA (National Energy and Research Agency), these requirements shall take into account local conditions. This aspect could be crucial in Italy, due to the presence of different climates and therefore to different way of buildings (materials, etc). Furthermore, the costs for the elements of the envelope, the systems for heating and cooling, and labour costs are different from area to area. It is difficult to harmonize the different price lists coming from different Italian areas.

✓ **Preliminary results: nZEB definitions and cost optimality**

At present in Italy there is not yet a final and legally binding definition for nZEB. According to some experts contacted by Finabita in July 2012, a nZEB is characterized by very low energy consumption for heating, which should be satisfied by renewable energy sources. Standards are going to be fixed (e.g. thermal transmittance of glazing surfaces, etc.) and also the percentage of energy contribution from renewable energy. A National Decree is going to be prepared by the Ministry of Economic Development and it will explain the “nearly zero energy consumption standards”, fixing the minimum requirements and also the type of consumption considered to satisfied the requirements themselves (e.g.: only heating consumption, or heating and hot water, etc.). It will be clarified also the role of renewable energies. The text of the Decree will be produced in synergy between the Ministry of Economic Development, the Ministry of Infrastructures and the Ministry of Environment. Probably it will fix also the “intermediate requirements” for building energy efficiency until 2015. This step is necessary, in order to check the response of the stakeholders (building constructors, designers, tenants).

## Annex 2: Key Dates

### ✓ **2012**

02/03/04 May 2012 - Kick-off Project meeting, Dresden

26 September 2012 - Second Project meeting, Madrid

27 September 2012 - First TaskForce Workshop, Madrid

### ✓ **2013**

January 2013 - Start of two-year monitoring of identified pilots

21 May 2013 - Third Project Meeting, Dublin

11/12 June 2013 - Second TaskForce Workshop + Study visit, Milan

### ✓ **2014**

27/28 February 2013 - Fourth Project meeting, Wels



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