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National plan for increasing the number of nearly zero-energy buildings in Italy



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By: **Sven Schimschar, Nesen Surmeli, Andreas Hermelink**

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Table of contents

1	Starting point	4
2	Application of the definition of nearly zero-energy buildings	8
3	Intermediate targets for improving the energy performance of new buildings in order to ensure that by 31 December 2020 all new buildings are nearly zero-energy buildings	9
4	Intermediate targets for improving the energy performance of new buildings in order to ensure that by 31 December 2018, new buildings occupied and owned by public authorities are nearly zero-energy buildings	11
5	Policies and measures for the promotion of all new buildings being nearly zero-energy buildings after 31 December 2020	14
6	Policies and measures for the promotion of all new buildings occupied and owned by public authorities being nearly zero-energy buildings after 31 December 2018	16
7	Policies and measures for the promotion of existing buildings undergoing major renovation being transformed to nearly zero-energy buildings	17
8	Additional Information	19
9	Possible improvements	20
	Annex- Definition of nZEB	21

1 Starting point

Please give a short overview of your national building stock. Describe the most important characteristics and emerging needs. Additionally, illustrate the chronological development of national requirements on the energy performance of buildings (for an example, see guidance document)

NATIONAL BUILDING STOCK

The official data from the last ISTAT nationwide census of 2010 and those from the latest surveys carried out by ENEA, ANCE and CRESME permit analysis of the situation of the built stock existing in Italy, starting from buildings in urban and suburban areas. As concerns buildings in rural areas, only those used for housing purposes have been identified.

There are about 13.6 million buildings in Italy. Of these, more than 87% are for residential use. The number of dwellings exceeds 32 million; about 80% are occupied by residents. Approximately 13 million of these dwellings are concentrated in just five regions: Sicily, Lombardy, Veneto, Puglia and Piedmont. Alone, Sicily and Lombardy account for 24.5% of the country's dwellings. The buildings for housing use are about 11 million; the rest are non-residential (hotels, offices, commercial use etc.). More than 400 000 buildings host recreational and sports activities, schools, hospitals and churches. Lastly, there are nationwide about 700 000 buildings not currently in use, either because they are undergoing refurbishment or because they are unsafe.

MOST IMPORTANT CHARACTERISTICS

In view of the larger comparative size of the residential built stock and the increasing attention focused since the 1980s on this especially important and varied sector in terms of energy efficiency and technical-economic solutions to be applied, more detailed data are available for this type of building.

Recent studies conducted by ENEA show that from the viewpoint of structural materials 61.5% of residential buildings are made of load-bearing masonry walls, 24.7% of reinforced concrete and 13.8% of other materials such as wood, steel or mixed structure. More than 50% of residential buildings are separate from other buildings, whereas the rest are flanked by other structures on one or more sides.

Approximately 20% of the national built stock was constructed before 1919, numbering about 2.15 million. The period between the two World Wars saw a decline in building activity and accounts for only 12% of the current residential buildings dating from those years. On the other hand, the period from the end of World War II to the early 1980s recorded an upsurge in building activity, producing some 50% of the present-day built stock. Lastly, from the early 1980s to the present time building activity has once again decreased.

The majority of the current residential buildings were constructed from the second post-war period to the present time. Specifically, 15.5% of the population lives in dwellings built between 1946 and 1961, 21.7% in dwellings built between 1962 and 1971, and 20.1% in buildings constructed from 1972 onwards. About 43% of buildings were constructed before 1972; 46% between 1972 and 2001 and slightly more than 10% after 2001. Building types are quite varied: the most frequent is the single-family house (26%), followed by small multi-storey buildings (21%); tower-style apartment blocks are 18% while horizontal apartment blocks are 15% of the total.

As to number of floors, 40% of buildings have from three to five, 37% have two floors and about 14% more than five.

Almost 46% of buildings have a pitched roof with non-habitable attic; about 23% have pitched roof with habitable attic, whereas 32% of buildings have flat roofs, most of them walk-on. The ground floor is closed by masonry or glass walls in more than two-thirds of buildings; the remaining third are equally divided between “fully open” (with supporting pillars, “*pilotis*”) and “partly open”. About 43% of buildings have basement floors. In 48% of cases, open or partly closed ground floors are used as garages. In 11% of buildings, there are commercial activities.

Nationwide, there are about 51 000 buildings entirely or partly reserved for use as schools. As to location, 30% of school buildings are concentrated in the 10 largest provinces (the top three being Rome, Milan and Naples). More than half (51%) are located in the 24 largest provinces. About 29% of schools are located in municipalities with low population (up to 5 000 inhabitants), and an equal percentage in medium-small municipalities. The area covered by school buildings is 73.2 million m² and their total volume is 256.4 million m³. The largest share of school buildings (39%) occupy an average area of 1 819 m².

As concerns shopping malls, according to estimates and interviews carried out on a representative sample, there are 1 114 such centres with unitary organisation, for a gross area available to the different retail operators of slightly more than 16 million m².

In the national territory, 25 845 buildings are entirely or partly reserved for use as hotels. Of these, 30% are concentrated in the six top-ranking provinces, in order: Rimini, Bolzano, Venice, Naples, Trento and Rome. The top 17 provinces account for 50% of all hotels in Italy. About 30% of hotels are located in municipalities with a small population (up to 5 000) and 64% in municipalities with up to 20 000 inhabitants. In the last 8 years, the average annual addition of new [hotel] buildings has been substantial: about 1.4% of the total [hotel] stock.

Italy has 76 banking groups, with 33 727 branches, scattered throughout the country. Many of these branches occupy portions of buildings, mostly on the ground floor. Buildings wholly or largely housing banking operations number 1 469, with a total [floor area] of 5.5 million m².

DEVELOPMENT OF NATIONAL REQUIREMENTS ON THE ENERGY PERFORMANCE OF BUILDINGS

Requirements for new buildings

Under Italian legislation, new buildings must comply with the energy performance index for heating set out in Legislative Decree No 192 of 2005 as amended, with reference to Presidential Decree No 59 of 2 April 2009 and to the National Guidelines for the energy certification of buildings of June 2009. These Decrees constitute the national transposition of Directive 2002/91/EC and have recently been updated to align them with the contents of Directive 2010/31/EU.

The target values have been updated and gradually made more ambitious, over the years, to raise the energy performance of buildings. New requirements again in the direction of heightened performance, will be introduced starting from 2015 and will be revised in 2017 and 2020, to move towards nearly zero energy buildings.

The following table sets out, by way of example, the minimum energy performance requirements for the heating of residential buildings, broken down by climate zone and shape of the building, and the annual changes required in order to achieve higher energy efficiency levels.

2 – Residential buildings: minimum energy performance values for winter heating. expressed in kWh/m²*year

	Building surface area to volume ratio (s/v)	Climate zone											
		A			B		C		D		E		F
		Up to 600 HDDs	to 601 HDDs	to 900 HDDs	to 901 HDDs	to 1400 HDDs	to 1401 HDDs	to 2100 HDDs	to 2101 HDDs	to 3000 HDDs	more than 3000 HDDs		
Prior to 2008	≤0.2	10	10	15	15	25	25	40	40	55	55		
	≥0.9	45	45	60	60	85	85	110	no	145	145		
From 1 Jan 2008	≤0.2	9.5	9.5	14	14	23	23	37	37	52	52		
	≥0.9	41	41	55	55	78	78	100	100	133	133		
From 1 Jan 2010	≤0.2	8.5	8.5	12.8	12.8	21.3	21.3	34	34	46.8	46.8		
	≥0.9	36	36	48	48	68	68	88	88	116	116		

HDDs = heating degree days

The obligation to include renewable energy sources in new buildings and buildings undergoing major renovations is equal to 50% of the expected consumption for hot water and to 20% of total consumption for heating, cooling and hot water. This latter share has been increased to 35% from the beginning of 2014 and will be brought to 50% from the beginning of 2017. These obligations cannot be met by means of installations powered by renewable energy sources generated exclusively by electricity which in turn powers devices or systems for the production of hot water, heating and cooling.

As concerns electricity it is compulsory to install power from renewables which varies according to the area of the building multiplied by a coefficient which will increase in three bands from the present time to 2017: 1 kW every 80 m² for building applications submitted by 31 December 2013, 1 kW every 65 m² for applications submitted between 31 December 2013 and 31 December 2016, and 1 kW every 50 m² from 2017.

The obligation to include renewable energy sources in buildings under Legislative Decree No 28 of 2011 applies not only to new buildings, but also to existing buildings having a useful floor area of more than 1 000 m² undergoing full refurbishment (and demolished and entirely rebuilt buildings). For public buildings the obligation of including renewables is 10% higher.

The EPBD was updated by Directive 2010/31/EU which, among other things, introduced a comparative analysis mechanism to determine optimal cost levels to be used as a benchmark

for establishing energy requirements in the building sector. The Directive also establishes that by the end of 2020 (and two years earlier for public buildings) all new buildings should be nearly zero-energy. It also introduced the energy performance certificate (EPC) and has provided for the development of a comparative methodology to check the effectiveness of the measures and standards promoted by the Member States. In Italy, as stated, Legislative Decree No 192 of 2005, which transposed Directive 2002/91/EC was recently amended by Decree Law No 63 of 2013 to take on board the new provisions introduced by Directive 2010/31/EU. Decree Law No 63 of 2013, converted into Law No 90 of 2013, lays the groundwork and sets the new criteria for updating and programming performance standards for buildings (shell, equipment and renewable energy sources) in order to achieve the EU targets under the nearly-zero energy building policy. This will require the development of calculus codes and analysis models and the use of tools such as the comparative methodology sent to the European Commission in July 2013. The minimum performance requirements for buildings will take into due account the winter and summer conditioning period, the climate zone and the other performance standards established by the regulatory framework. In compliance with Directive 2010/31/EU, Decree Law No 63 of 2013 also provides that all buildings should be nearly zero-energy by December 2020 (two years earlier for new public buildings).

Requirements for existing buildings

Under Legislative Decree No 192 of 2005 as amended, and with reference to Presidential Decree No 59 of 2 April 2009, for all upgrading works not involving demolition and rebuilding or major works covering 25% of the area of the building shell, existing buildings must comply with the minimum performance values set out in the Decree (transmittance and generation performance), divided by climate zone. The target values have been updated and gradually made more ambitious, over the years, to raise the energy performance of buildings. New requirements again in the direction of heightened performance, will be introduced starting from 2015 and will be revised in 2017 and 2020, to move towards nearly zero energy buildings. The following table sets out, by way of example, the minimum requirements for the transmittance of windows, inclusive of frames and shadings and the annual changes required in order to achieve higher energy efficiency levels.

3 - Thermal transmittance of windows inclusive of frames and shading

Windows inclusive of frames and shadings			
Legal limits (U limit in W/m ² K)			
Climate zone	From 1 Jan 2006	From 1 Jan 2008	From 1 Jan 2010
A	5.5	5.0	4.6
B	4.0	3.6	3.0
C	3.3	3.0	2.6
D	3.1	2.8	2.4
E	2.8	2.4	2.2
F	2.4	2.2	2.0

2 Application of the definition of nearly zero-energy buildings

Please indicate how a nearly zero-energy building is defined within national context and explain underlying assumptions and factors that provide the rationale for the chosen definition.

For reporting the detailed application in practice of the definition of nearly zero-energy buildings, the table presented in the Annex is to be used.

If a national definition of nearly zero-energy buildings does not exist yet in your country, please indicate here whether precise plans are already under development and if so, please describe these plans. Please also describe if any currently used non-governmental definitions will be considered in these plans and/or a future directive.

The current national legislation provides for updating of the regulatory limit values which will be made gradually more restrictive over the years, based on the benchmark values of certain parameters set for a reference buildings. The current limits and those soon to be set are in line with the results of the study of the cost-optimal method. It will be possible to establish primary energy consumption stated in kWh/m² per year, differentiated by building type, location and use.

The definition of “nearly zero-energy building” will be applied to buildings meeting specific technical requirements and using a specific share of energy from renewable sources. Either of the following indices: energy performance for heating (EPH), energy performance for cooling, including humidity control (EPC), or global energy performance, expressed in non-renewable primary energy (EPglnr), or again global energy performance expressed in total primary energy (EPgl), must be lower by a certain value than the values of the same indices calculated for a reference building (as an indication, the global energy performance index expressed in non-renewable primary energy, must be 30/35% lower than the value of the reference building in 2020). The reference building is a virtual building geometrically equivalent to the planned one, but meeting the energy parameters and minimum thermal characteristics (thermal transmittance and conversion performance) to be achieved by the year 2020. On the basis of this criterion and of the minimum energy performance requirements which, for the year 2020, will be validated on the basis of the results of the cost-optimal method, it will also be possible to establish a range for primary energy consumption expressed in kWh/m²*year, differing according to building type, location and use.

3 Intermediate targets for improving the energy performance of new buildings in order to ensure that by 31 December 2020 all new buildings are nearly zero-energy buildings

Please report the 2015 targets ensuring that by 31 December 2020 all new buildings are nearly zero-energy buildings. Also explain how they relate to and help to ensure that all new buildings are nearly zero-energy buildings by 31 December 2020.

What are the qualitative and quantitative 2015 targets for all new buildings?

To improve the energy efficiency of buildings, the current minimum energy parameter values and thermal characteristics (transmittance and conversion performance values) will become more demanding. The minimum transmittance values required for building elements will be lowered by 15% compared to their current value from 1 January 2016 and by another 15% from 1 January 2021. A similar improvement will apply to the minimum performance of heating and conditioning systems. For public buildings, in line with current national legislation, the minimum requirements will be made 10% more demanding. Moreover, verification of the requirements for nearly-zero energy buildings will be applied starting from 2018.

Please note that the above-mentioned reduction coefficients are based on the results of the comparative methodology, in order to optimise them with reference to costs in accordance with Directive 2010/31/EU.

3.1.1 Qualitative 2015 targets: Interim energy related requirements for new residential and non-residential buildings

Requirements on fraction of renewable energies:

For all new buildings and buildings undergoing major refurbishments, both residential and non-residential, the legislation currently being drafted provides for gradually increasing shares of energy from renewable sources (gradual reduction of the EP_{nren}/EP_{tot} ratio). The reduction shall be carried out in three stages:

- Stage I - (2015): in force from 1 January 2015 with limit values for all buildings;
- Stage II - marked 2017: in force from 1 January 2017 with limit values for all buildings;
- Stage III - marked 2019/2021: in force from 1 January 2019 for public buildings and private buildings for public use and from 1 January 2021 for all other buildings as well.

By way of example, see the following table which sets out minimum EP_{gl,nren} requirements for new buildings and buildings undergoing major refurbishments, for years 2015, 2017 and 2021. The reduction coefficients are calculated on the basis of the results of the comparative analysis.

From 1 January 2015	From 1 January 2017	From 1 January 2021
EP_{gl,nren} (2015)	EP_{gl,nren} (2017)	EP_{gl,nren} (2021)
0.75 EP _{gl,tot} (2015)	0.70 EP _{gl,tot} (2017)	0.65 EP _{gl,tot} (2021)

The advisability of differentiating this requirement according to climate zone is also being assessed.

Requirements on useful energy demand:

The legislation currently being drafted provides for verification of compliance with the following minimum parameters and indices:

- the H'T parameter i.e. the average transmittance of the dispersing shell, according to climate zone and type of building;
- the *Asol,est/Asup* parameter, i.e. the ratio of the buildings' summer solar radiation surface to useful surface area in relation to the summer climate zone;
- the EPH,nd and EPC,nd indices, i.e. the demand of useful thermal energy for heating and cooling, which must be lower than the values of the corresponding indices calculated for the reference building.

Requirements on primary energy demand:

The legislation currently being drafted provides for verification of compliance with the following minimum values for:

- EP_{tot} (total primary energy) for the following services: winter-time space heating, summer-time space cooling, the production of hot water, ventilation and lighting, calculated on the basis of the reference building;
- EP_{nren} (non-renewable primary energy) i.e. progressively increasing shares of total energy which must be met using renewable sources.

3.1.2 Quantitative 2015 targets: Share of nZEB according to official nZEB definition on all newly constructed buildings (define reference parameter e.g. number of buildings, floor area, volume etc.):

At the present time there is no official definition. However, it is believed that on the basis of the current share of 1.6% of new buildings, 20% of them can be ranked as nZEB, if the requirements described in paragraph 3.1.1 are confirmed.

Miscellaneous:

From your point of view, how close is your country at the moment in achieving this target? In case there is no target defined yet, please indicate when it is expected to have such a target.

We believe it will be possible to set the target when publishing the final criteria for setting the new legal limits and the nZEB, i.e. in the last quarter of 2014.

4 Intermediate targets for improving the energy performance of new buildings in order to ensure that by 31 December 2018, new buildings occupied and owned by public authorities are nearly zero-energy buildings

Please report here the 2015 targets ensuring that by 31 December 2018 all new public buildings are nearly zero-energy buildings. Also explain how they relate to and help to achieve that by 31 December 2018, all new public buildings are nearly zero-energy buildings

What are the qualitative and quantitative 2015 targets for all new buildings occupied and owned by public authorities?

Despite the difficult economic environment and budget constraints, the public sector is moving in the direction of low-consumption buildings with part of the energy coming from renewable energy sources.

The current regulations on minimum requirements for new buildings and refurbishments of any kind sets out for public authorities requirements which are 10% more stringent than those applying to the private sector. This difference will be maintained in the planned updates.

We should mention briefly the tools put in place by the Italian government to favour energy efficiency in public administration buildings.

The Ministerial Decree of 28 December 2012 introduced a new incentive system for actions to improve energy efficiency and generate thermal energy from renewable sources. This incentive mechanism, dubbed Thermal Account, is the first nationwide direct incentive scheme for the generation of renewable thermal energy, as well as being the first scheme encouraging public administrations to implement energy efficiency improvement actions in buildings and technical installations. The Thermal Account became operational in July 2013. The Thermal Account is intended for actions implemented in the civil sector, which covers housing, services/commercial and the public administration. The incentive supports actions to improve the energy performance of the envelope of existing buildings and the energy performance of conditioning, heating and cooling systems and for the production of sanitary hot water.

Article 22 of Legislative Decree No 28 of 3 March 2012 provided for the establishment of a guarantee fund to support the installation of district heating networks. The Fund, set up at the Equalisation Fund for the Electricity Sector (Cassa Conguaglio per il Settore Elettrico - CCSE), is financed with a share of the proceeds from the sale of methane gas, which amount to about EUR 50 million.

Article 5 of Decree Law No 63 of 4 June 2013, as converted by Law No 90 of 3 August 2013, extended the scope of the guarantee fund to support energy efficiency improvement projects in public buildings, especially schools and hospitals.

The Interregional Operational Programme for Renewable Energy and Energy Saving (IOP Energy) 2007--2013 supported energy efficiency, energy saving and renewable energy projects in Calabria, Campania, Puglia and Sicily. The IOP Energy programme is funded by EU and national sources and is a joint effort of the Ministry of Economic Development, the Ministry of

the Environment, the Italian Regions under the “Convergence” objective and a broad partnership of economic and social stakeholders.

The objective for the period 2007-2013 was to increase the share of energy consumed coming from renewable energy sources and to improve energy efficiency while promoting local development opportunities.

The IOP Energy covered actions relating to public buildings, businesses engaged in the renewables sector, public administrations and the private sector to improve the power distribution network, and research institutes for developing and collating knowledge of geothermal resources in the Convergence regions.

As concerns programming period 2014-2020, the actions of the National Operational Programme (NOP) in the energy sector will cover four main areas:

1. energy efficiency and energy saving actions in public or public-use buildings and facilities, both residential and not, owned by the central State authorities;
2. actions on the networks: strengthening of smart networks mainly in the framework of urban development projects, also integrated with sustainable collective transport projects and transport information services;
3. actions to support the sustainable energy and energy efficiency supply chain;
4. outreach, support, training and promotion of employment opportunities linked to sustainable energy.

As part of its transposition of Directive 2012/27/EU on energy efficiency, the Government is studying a mechanism to implement the obligation to upgrade each year the energy performance of 3% of the total floor area of buildings occupied by its central government, under Article 5 of the Directive. The idea is to appoint a central coordination body to manage the programme for the upgrading of the State administration buildings, similarly to the present arrangements for planning extraordinary maintenance. Those public authorities which retain their statutory independence in this area will be required to submit their own upgrading plans. To boost the effectiveness of the actions, the programmes are prepared on the basis of criteria for the actions, or of possible priorities between several actions, based on cost-efficiency and time to recover costs, having regard to the use of the building, climate zone, and effectiveness in terms of time to completion.

Emphasis is placed on monitoring results obtained and on providing information and technical support to the public authorities concerned.

Again in order to add new tools for implementing the EED, the Government is designing new financial schemes to support energy efficiency in the building industry, specifically the energy upgrading of public buildings, especially whole buildings.

Furthermore, implementation of the EED is planned to include an awareness-raising and training programme for civil servants, to spread energy-saving behaviours.

Again in the framework of transposition of Directive 2012/27/EU on energy efficiency and, specifically, as concerns the obligation for each Member State to upgrade each year the energy performance of 3% of the total floor area of buildings occupied by its central government, the Ministry of Economic Development has signed a memorandum of understanding with the State Property Agency (*Agenzia del Demanio*). The first output of this agreement will be the

drafting of an inventory of buildings occupied by the central government including floor area and energy data, a key step towards developing a comprehensive strategy for the upgrading of public buildings.

4.1.1 Qualitative 2015 targets: Interim energy related requirements for new public buildings

Requirements on fraction of renewable energies:

For all public or public-use buildings which are either new or undergoing major refurbishments, both residential and non-residential, the legislation currently being drafted provides for gradually increasing shares of energy from renewable sources (gradual reduction of the EP_{nren}/ EP_{tot} ratio).

Similarly to other buildings, the reduction is in three steps, with the difference that stage three becomes effective for private buildings in 2021 whereas for public buildings it is brought forward to 2019:

- Stage I: in force from 1 January 2015;
- Stage II: in force from 1 January 2017;
- Stage III: in force from 1 January 2019.

See paragraph 3.1.1.

Requirements on useful energy demand:

See paragraph 3.1.1.

Requirements on primary energy demand:

See paragraph 3.1.1.

4.1.2 Quantitative 2015 targets: Share of public nZEB according to official nZEB definition on all newly constructed public buildings (define reference parameter e.g. number of buildings, floor area, volume etc.):

See paragraph 3.1.2.

Miscellaneous:

From your point of view, how close is your country at the moment in achieving this target? In case there is no target defined yet, please indicate when it is expected to have such a target.

See paragraph 3.1.2.

5 Policies and measures for the promotion of all new buildings being nearly zero-energy buildings after 31 December 2020

5.1 Residential buildings
<p>5.1.1 Relevant regulations Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU</p>
<p>5.1.2 Relevant economic incentives and financing instruments White certificates incentive scheme (Ministerial Decree of 28 December 2012)</p>
<p>5.1.3 Energy performance certificates' use and layout in relation to nZEB standard Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU</p>
<p>5.1.4 Supervision (energy advice and audits) Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU Implementation of Directive 2012/27/EU on energy efficiency planned for June 2014.</p>
<p>5.1.5 Information (tools) Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU Implementation of Directive 2012/27/EU on energy efficiency planned for June 2014.</p>
<p>5.1.6 Demonstration n.a.</p>
<p>5.1.7 Education and training Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU Implementation of Directive 2012/27/EU on energy efficiency planned for June 2014.</p>
5.2 Non-residential buildings
<p>5.2.1 Relevant regulations Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU</p>
<p>5.2.2 Relevant economic incentives and financing instruments White certificates incentive scheme (Ministerial Decree of 28 December 2012)</p>
<p>5.2.3 Energy performance certificates' use and layout in relation to nZEB standard Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU</p>
<p>5.2.4 Supervision (energy advice and audits) Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU Implementation of Directive 2012/27/EU on energy efficiency planned for June 2014.</p>
<p>5.2.5 Information (tools) Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU Implementation of Directive 2012/27/EU on energy efficiency planned for June 2014.</p>
<p>5.2.6 Demonstration n.a.</p>
<p>5.2.7 Education and training Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU Implementation of Directive 2012/27/EU on energy efficiency planned for June 2014.</p>
5.3 From your point of view, how would you evaluate the current measures that are in force? Please also try to describe the existing gap between what is in force and what should be in force in order to ensure that after 31 December 2020, all new buildings are nearly zero-energy buildings. Are there precise measures planned for the future?
<p>From the viewpoint of minimum standards, at the present time, as described above, Italy is defining under Law No 90/13 a new system for calculating regulatory limits and a new building classification system. The new provisions will mark the regulatory stages for transition to nearly zero-energy buildings in compliance with the sustainability</p>



criteria based on cost-benefit analysis. The Italian Government's National Energy Strategy published in 2012 set ambitious energy savings targets for 2020 - one of the Strategy's pillars is regulation, especially in the building sector.

6 Policies and measures for the promotion of all new buildings occupied and owned by public authorities being nearly zero-energy buildings after 31 December 2018

6.1 All new buildings occupied and owned by public authorities	
6.1.1	<p>Relevant regulations Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU</p>
6.1.2	<p>Relevant economic incentives and financing instruments White certificates incentive scheme (Ministerial Decree of 28 December 2012)</p>
6.1.3	<p>Energy performance certificates' use and layout in relation to nZEB standard Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU</p>
6.1.4	<p>Supervision (energy advice and audits) Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU Implementation of Directive 2012/27/EU on energy efficiency planned for June 2014.</p>
6.1.5	<p>Information (tools) Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU Implementation of Directive 2012/27/EU on energy efficiency planned for June 2014.</p>
6.1.6	<p>Demonstration n.a.</p>
6.1.7	<p>Education and training Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU Implementation of Directive 2012/27/EU on energy efficiency planned for June 2014.</p>
6.2 From your point of view, how would you evaluate the current measures that are in force? Please also describe the existing gap between what is in force and what should be in force in order to ensure that after 31 December 2018, all new public buildings are nearly zero-energy buildings. Are there precise measures planned for the future?	
<p>From the viewpoint of minimum standards, at the present time, as described above, Italy is defining under Law No 90/13 a new system for calculating regulatory limits and a new building classification system. The new provisions will mark the regulatory stages for transition to nearly zero-energy buildings in compliance with the sustainability criteria based on cost-benefit analysis.</p> <p>From the viewpoint of incentives aimed at favouring the increase in renovations designed to convert existing buildings into NZEB, the Italian Government's National Energy Strategy published in 2012 sets out an ambitious plan confirming and strengthening incentives for the energy upgrading of buildings. Furthermore, through transposition of Directive 2012/27/EU, more strengthening measures and financial instruments are being put in place to foster transition towards NZEB. Certain of these financial measures are tailored specifically for public buildings.</p>	

7 Policies and measures for the promotion of existing buildings undergoing major renovation being transformed to nearly zero-energy buildings

7.1 Residential buildings	
7.1.1	Relevant regulations Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU
7.1.2	Relevant economic incentives and financing instruments White certificates incentive scheme (Ministerial Decree of 28 December 2012) Thermal account scheme (Ministerial Decree of 28 December 2012) Tax deductions for energy efficiency Guarantee fund for energy efficiency projects Structural funds
7.1.3	Energy performance certificates' use and layout in relation to nZEB standard Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU Thermal account scheme (Ministerial Decree of 28 December 2012)
7.1.4	Supervision (energy advice and audits) Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU Implementation of Directive 2012/27/EU on energy efficiency planned for June 2014.
7.1.5	Information (tools) Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU Implementation of Directive 2012/27/EU on energy efficiency planned for June 2014. Thermal account scheme (Ministerial Decree of 28 December 2012)
7.1.6	Demonstration n.a.
7.1.7	Education and training Legislative Decree No 192 of 19 August 2005, as amended by Law No 90 of 3 August 2013 to transpose Directive 2010/31/EU Implementation of Directive 2012/27/EU on energy efficiency planned for June 2014.
7.2 Non-residential buildings	
7.2.1	Relevant regulations See paragraph 7.1
7.2.2	Relevant economic incentives and financing instruments See paragraph 7.1
7.2.3	Energy performance certificates' use and layout in relation to nZEB standard See paragraph 7.1
7.2.4	Supervision (energy advice and audits) See paragraph 7.1
7.2.5	Information (tools) See paragraph 7.1
7.2.6	Demonstration See paragraph 7.1
7.2.7	Education and training See paragraph 7.1
7.3	From your point of view, how would you evaluate the current measures that are in force? Please also try to describe the existing gap between what is in force and what should be in force in order to stimulate the transformation of buildings that are refurbished into nZEB. Are there precise measures planned for the future?
	From the viewpoint of minimum standards, at the present time, as described above, Italy is defining under Law No 90/13 a new system for calculating regulatory limits and a new

building classification system. The new provisions will mark the regulatory stages for transition to nearly zero-energy buildings in compliance with the sustainability criteria based on cost-benefit analysis.

From the viewpoint of incentives aimed at favouring the increase in renovations designed to convert existing buildings into NZEB, the Italian Government's National Energy Strategy published in 2012 sets out an ambitious plan confirming and strengthening incentives for the energy upgrading of buildings. Furthermore, through transposition of Directive 2012/27/EU, further strengthening measures and financial instruments are being put in place to foster transition towards NZEB.

8 Additional Information

Please fill in any additional information on actions taken to increase the number of nearly zero-energy buildings in your country.

A number of measures have been implemented to promote energy efficiency in new buildings and the generation of energy from renewables. The most significant are listed below.

Decree Law No 40 of 2010 allocated EUR 60 million to facilitate the purchase of high energy efficiency new buildings. Class A buildings (energy performance 50% better than the minimum requirements set out in the Decree) are granted a contribution of EUR 116 per m², up to a ceiling of EUR 7 000. Class B buildings (energy performance 30% better than the minimum requirements set out in the Decree) are granted a contribution of EUR 83 per m², up to a ceiling of EUR 5,000. This facility remained in force until its funds were fully used up.

Regional governments have issued provisions under their respective “Piani Casa” (Building Development Plans), complex sets of measures intended to re-launch the building sector. These regional provisions grant “bonuses” to high-energy performance buildings in the form of rebates on the building license applicable under municipal regulations, or increases in permissible volumes, in the event of demolition and reconstruction, without the obligation to maintain the shape of the demolished building, while complying with the applicable urban planning rules.

While it is not a financial measure in the strict sense of the word, the EPC contractual method is an essential enabling mechanism for promoting energy efficiency projects, with a focus on the public sector.

Under Directive 2012/27/EU, the energy performance contract can help spur demand and hence favour the development of the energy services market. Therefore, the Directive calls on Member States to prepare and disseminate model contracts.

In line with the Directive, pursuant to Article 7(12) of the Thermal Account and to Article 4-ter of Legislative Decree No 192 of 19 August 2005 as amended and supplemented, model energy performance contracts are being drawn up and disseminated, to improve the building's energy performance. These contracts are designed to identify and measure the elements confirming achievement of the energy saving obtained via the energy efficiency project, to favour the project's eligibility for financial support.

9 Possible improvements

Where do you see most room for improvement in order to increase the number of nearly zero-energy buildings in your country? Please also try to give examples for appropriate measures.

Once the final criteria for setting the new regulatory limits and the nZEB have been established, it will be possible to implement appropriate actions to increase the number of nZEB in Italy, in addition to the provisions currently in force on energy efficiency in buildings.

Annex- Definition of nZEB

1. General Information	
Country	Italy
Name of regulation, directive, certification scheme	<ol style="list-style-type: none"> 1. Decree Law No 63 of 4 June 2013, urgent provisions to implement Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010, on the energy performance of buildings, and extending tax deductions for energy efficiency projects. 2. Law No 90 of 4 August 2013, converting with amendments Decree-Law No 63 of 4 June 2013. 3. Legislative Decree No 192 of 19 August 2005, as amended and supplemented and as last amended and supplemented by Decree-Law No 90 of 3 August 2013, on urgent provisions for transposing Directive 2010/31/EU. 4. Presidential Decree No 59 of 2 April 2009 laying down the general criteria, calculation methods and minimum requirements for the energy performance of buildings. 5. Decree of 26 June 2009, on "National guidelines for the energy certification of buildings". 6. Decree of 22 November 2012, amending the Decree of 26 June 2012 laying down national guidelines for the energy certification of buildings, which removed the possibility of submitting self-declarations in energy certification procedures. 7. Decree of 22 November 2012, amending Annex A to Legislative Decree No 192 of 19 August 2005. 8. Presidential Decree No 74 of 16 April 2013, on "Regulation setting out the general criteria on the operation, management, control, maintenance and inspection of heating, air conditioning and hot water systems in buildings". 9. Presidential Decree No 75 of 16 April 2013, "Regulation laying down rules on the accreditation criteria to ensure the qualification and independence of the experts and bodies to be tasked with the energy certification of buildings". 10. Legislative Decree No 115 of 30 May 2008 - implementing Directive 2006/32/EC concerning efficiency of the final uses of energy and energy services and repealing Directive 93/76/EEC (Article 18(6)). 11. Legislative Decree No 28 of 3 March 2011 - Implementing Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC. 12. Ministerial Decree of 28 December 2012 introducing incentives for the production of thermal energy from renewable energy sources and small-scale energy efficiency projects. 13. Ministerial Decree of 28 December 2012 setting out the national quantitative targets for energy savings to be achieved by electricity and gas distributors in the years from 2013 to 2016 and upgrading the white certificate scheme.
Editor of regulation, directive, certification scheme	Government
Year of introduction of current version	Click and choose. 2013
benchmark of current version (Select one)	<input type="radio"/> Energy Autonomous building <input checked="" type="radio"/> Efficient buildings <input type="radio"/> Net zero energy buildings <input type="radio"/> Plus energy buildings <input type="radio"/> Nearly zero energy buildings <input type="radio"/> Zero energy buildings <input type="radio"/> Other
Integration and consideration in national directive BUIDE13616	considered

2. Field of Application		
2.1 Building category		
Select one and describe right. Is this typology included in the directive? Are special requirements or exceptions defined for this typology? If more than one definition exists, you can duplicate this appendix for each of them.		
<i>Member States shall ensure that all new buildings are nearly zero- energy buildings by 31 December 2020 respectively after 31 December 2018 (occupied and owned by public authorities). For the purpose of the calculation buildings should be adequately classified into the [...] categories. References: EPBD article 9.1a/b, EPBD Annex I.</i>		
Category		Industrial buildings, factories and rural buildings are not included.
<input type="radio"/> Residential		
<input type="radio"/> Non-residential		
<input checked="" type="radio"/> Residential and Non-residential		
single family houses	included in the directive	
apartment blocks	included in the directive	
offices	included in the directive	
educational buildings	included in the directive	
hospitals	included in the directive	
hotels and restaurants	included in the directive	
sports facilities	included in the directive	
wholesale and retail trade service buildings	included in the directive	
other types of energy-consuming buildings	included in the directive	
2.2 New/retrofit buildings		
Select one and describe right. If more than one definition exists, you can duplicate this appendix for each of them.		
<i>New, and existing buildings that are subject to major renovation, should meet minimum energy performance requirements adapted to the local climate. Member States shall furthermore [...] stimulate the transformation of buildings that are refurbished into nearly zero-energy buildings. Reference: EPBD preamble recital 15, EPBD article 9.2.</i>		
<input type="radio"/> New buildings		
<input type="radio"/> Retrofit		
<input checked="" type="radio"/> New and retrofit		
2.3 Private/public buildings		
Select one and describe right. If more than one definition exists, you can duplicate this appendix for each of them.		
<i>Member States shall ensure that by 31 December 2020, all new buildings are nearly zero- energy buildings and after 31 December 2018, new buildings occupied and owned by public authorities are nearly zero-energy buildings. Reference: EPBD article 9.1a/b</i>		
<input type="radio"/> Private		
<input type="radio"/> Public		
<input checked="" type="radio"/> Public and private		
3. Energy Balance and calculation		
3.1 Balance Type		
Describe how renewable energy is calculated / included in the energy balance (e.g. renewable heat from solar thermal collectors reduces energy use for heat and DHW; renewable electricity reduces/compensates delivered electricity). [...] The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on site Energy performance of a building means the calculated or measured amount of energy needed to meet the energy		

demand [...]. Reference: EPBD article 2.2, EPBD article 2.4		
<input type="radio"/> energy demand vs energy generation <input checked="" type="radio"/> energy import vs energy export <input type="radio"/> virtual balance between demand and generation <input type="radio"/> not specified <input type="radio"/> other	The energy from on-site energy generation systems (defined as system inside building site) crosses the assessment boundary and compensates the energy needs of building (thermal compensates thermal needs and electricity compensates electrical needs). Surplus (only electricity is considered) is exported. The balance of primary energy is calculated as primary energy delivered minus primary energy exported.	
3.2 Physical boundary Select the widest possible boundary and describe right if/which further subdivisions are possible		
<i>This directive lays down requirements as regards the common general framework for [...] buildings and building units. [...] building' means a roofed construction having walls, for which energy is used to condition the indoor climate. Reference: EPBD article 1.2, EPBD article 2.1</i>		
<input type="radio"/> single building <input checked="" type="radio"/> building unit <input type="radio"/> building unit <input type="radio"/> building site <input type="radio"/> cluster of buildings <input type="radio"/> quarter or city <input type="radio"/> other	The assessment can be performed either for a single building unit (e.g. an apartment) or for a whole building (if the energy generation system is centralized)	
3.3 System boundary demand / energy uses included Define if this load sector is included in the energy balance calculation (other requirements like maximum consumption values can be described below under item 5, further requirements).		
<i>[...] energy performance of a building means the calculated or measured amount of energy needed to meet the energy demand associated with a typical use of the building, which includes, inter alia, energy used for heating, cooling, ventilation, hot water and lighting. Reference: EPBD article 2.4</i>		
space heating, domestic hot water	considered	
ventilation, cooling, air conditioning	considered	
auxiliary energy	considered	
lighting	considered	
plug loads, appliances, IT	considered	
central services	considered	Lifts and escalators are considered
electric vehicles	not considered	
embodied energy	not considered	
3.4 System boundary generation / renewable energy sources included Select and explain right (e.g. only in building's physical footprint, on-site, on-site incl. import of off-site renewables like pellets, wood chips, rape oil etc.). How is CHP (based on non-renewable energy carriers like natural gas or oil) included?		
<i>[...] The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby. [...] energy from renewable sources means energy from renewable non-fossil sources, namely wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases. [...] minimum levels of energy from renewable sources [...] to be fulfilled, inter alia, through district heating and cooling [...]. Reference: EPBD article 2.2, EPBD article 2.6, EPBD article 13.4</i>		
generation on-site	considered	For the renewable energy ratio the following are considered: on-site energy generation systems (e.g. PV), nearby generation systems (e.g. district heating if they use renewables) and the renewable

		part of energy flows and vector from distant [sic] (e.g. pellet).
generation near by	considered	
generation external	considered	
crediting	not considered	
3.5 Balance period / calculation step What is the defined period of time over which the balance is calculated? Is the calculation period divided into calculation steps (e.g. one hour, one month or one heating and/or cooling season)? <i>[...] The methodology for calculating energy performance should be based not only on the season in which heating is required, but should cover the annual energy performance of a building [...]. Reference: EPBD preamble recital 9</i> <i>[...] requirements should be set with a view to [...] the cost-optimal balance between the investments involved and the energy costs saved throughout the lifecycle of the building [...]. Reference: EPBD preamble recital 10.</i>		
<input type="radio"/> Life cycle balance <input type="radio"/> Yearly <input type="radio"/> Seasonal <input checked="" type="radio"/> Other	The indicators of energy performance of buildings are defined on a yearly basis (kWh/m ² per year) but the calculations of energy needs and the energy balance are performed on a monthly basis. Calculation period is the year but calculation step is the month.	
3.6 Monthly accounting limitation Is a monthly accounting limit defined? Is it based on end energy (e.g. monthly electricity generation compensates monthly electricity loads) or on primary energy (any monthly generation compensates any loads)? Are surpluses transferred to an annual balance?		
<input checked="" type="radio"/> monthly source based end energy crediting <input type="radio"/> monthly primary energy crediting <input type="radio"/> nothing defined <input type="radio"/> other	For electrical energy part of monthly surplus (which is exported) can be redelivered to compensate annual energy needs	
4. Accounting system		
4.1 Normalization <i>[...] including a numerical indicator of primary energy use expressed in kWh/m² per year. Reference: EPBD article 9.3a</i>		
<input type="radio"/> person <input type="radio"/> gross floor area <input checked="" type="radio"/> net floor area <input type="radio"/> gross volume <input type="radio"/> net volume <input type="radio"/> usable floor area <input type="radio"/> treated floor area <input type="radio"/> conditioned area <input type="radio"/> other		
4.2 Primary metric Indicate which metric is used for the energy performance calculation / energy balance and give input on (the source of) the conversion factors on the right. Possible sources are e.g. EN 15603 or national and regional codes. <i>The energy performance of a building shall be expressed in a transparent manner and shall include an energy performance indicator and a numeric indicator of primary energy use, based on primary energy factors per energy carrier, which may be based on national or regional annual weighted averages or a specific value for on-site production. Reference: EPBD Annex 1.</i>		

<p>[...] including a numerical indicator of primary energy use expressed in kWh/m² per year. Reference: EPBD 9.3a [...] primary energy' means energy from renewable and non- renewable sources which has not undergone any conversion or transformation process. Reference : EPBD article 2.5</p>	
<ul style="list-style-type: none"> <input type="radio"/> energy need <input type="radio"/> energy use <input type="radio"/> delivered/site energy <input type="radio"/> primary / source energy (renewable part included) <input checked="" type="radio"/> primary / source energy (renewable part not included) <input type="radio"/> (equivalent) carbon emissions <input type="radio"/> exergy <input type="radio"/> energy costs <input type="radio"/> environmental credits <input type="radio"/> points (labeling system) <input type="radio"/> other 	<p>In the decrees under development both total primary energy and non-renewable primary energy will be indicated.</p>
<p>4.3 Secondary metric</p>	
<ul style="list-style-type: none"> <input type="radio"/> energy use <input type="radio"/> energy need <input checked="" type="radio"/> delivered/site energy <input type="radio"/> primary / source energy (renewable part included) <input type="radio"/> primary / source energy (renewable part not included) <input type="radio"/> (equivalent) carbon emissions <input type="radio"/> exergy <input type="radio"/> energy costs <input type="radio"/> environmental credits <input type="radio"/> points (labeling system) <input type="radio"/> other 	<p>Delivered energy will be added</p>
<p>4.4 Symmetric or asymmetric weighting</p>	
<ul style="list-style-type: none"> <input type="radio"/> symmetrical weighting <input type="radio"/> asymmetrical weighting 	<p>Exported energy is evaluated on the basis of the energy used by its generation systems</p>
<p>4.5 Time dependent weighting</p>	
<p>Static: no time dependent weighting (annual constant weighting/factors) Quasi-static: seasonal/monthly average weighting factors Dynamic: weighting factors based on shorter time periods /hourly basis (according to energy offer and demand in the grid)</p>	

<p>Primary energy factors [...] may be based on national or regional yearly average values and may take into account [...] European standards. Reference: EPBD 9.3a</p>	
<input type="radio"/> static conversion factors <input type="radio"/> quasi static conversion factors <input type="radio"/> dynamic conversion factors	Static conversion factors
<p>5. Further requirements</p>	
<p>5.1 Fraction of renewables Select and describe right if guidelines are given for any fraction of renewable energy and indicate how/at which level a certain fraction is calculated (e.g. solar thermal heat might be a fraction of energy use, electricity from PV a fraction of delivered energy.)</p> <p><i>Member States shall introduce [...] appropriate measures [...] to increase the share of all kinds of energy from renewable sources in the building sector [...]. By 31 December 2014, Member States shall [...] require the use of minimum levels of energy from renewable sources in new buildings and in existing buildings [...] Reference: RED article 13.4</i> <i>[...] The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources [...]Reference : EPBD article 2.2</i></p>	
<input type="radio"/> defined <input type="radio"/> not defined <input type="radio"/> defined in other regulation	RER requirements are currently defined in DLGS 28/2011. RER is the ratio between EP ren and EP tot. RER requirements will be re-defined in the decrees under development in the field of energy efficiency and nZEB
<p>5.2 Temporal performance Describe if any requirements are given for a temporal match between on-site energy load and on-site energy generation (load match) and which calculation procedures are applied.</p>	
<p><u>Load match</u></p> <input checked="" type="radio"/> defined <input type="radio"/> not defined	
<p><u>Grid interaction</u></p> <input checked="" type="radio"/> defined <input type="radio"/> not defined	
<p>5.3 Energy performance or rating requirements Are limitations given for a standard energy rating, an energy indicator or maximum demands for heating, cooling, embodied energy, demand of appliances, etc.? If yes, type the values and give explanations on the right</p> <p><i>nearly zero-energy building means a building that has a very high energy performance [...]. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources [...]</i> <i>The energy performance [...] shall [...] include an energy performance indicator and a numeric indicator of primary energy use [...]. Reference : EPBD article 2.2, EPBD Annex 1.</i></p>	
<p><u>Performance or rating</u></p> <input checked="" type="radio"/> defined <input type="radio"/> not defined <input type="radio"/> defined in other regulation	nZEB will be defined in the decree under development

<p>Energy Performance indicator Is an energy performance indicator defined? If yes, type the values and the according unit.</p>	<p>The Energy Performance indicator is the EP (Energy Performance) in kWh/m² per year</p>
<p>Numeric indicator of primary energy use Is a numeric indicator of primary energy use defined? If yes, type the values and the according unit.</p>	<p>kWh/m² per year</p>
<p>5.4 General framework / prescriptive requirements Describe which guidelines are given for: Thermal characteristics (insulation, thermal bridges, thermal capacity, passive heating, internal loads, solar protection) Efficiency of installations (hot water supply, air-conditioning, lighting fan power)</p>	
<p><i>The methodology shall [...] take into consideration: thermal characteristics (thermal capacity, insulation, passive heating, cooling elements, and thermal bridges), heating installation and hot water supply, air-conditioning installations, natural and mechanical ventilation, built-in lighting, the design, positioning and orientation of the building, outdoor climate, passive solar systems and solar protection, [...], internal loads. Reference: EPBD Annex 1</i></p>	
<p> <input checked="" type="radio"/> defined <input type="radio"/> not defined <input type="radio"/> defined in other regulation </p>	<p>All these features are considered in UNI EN technical standards</p>
<p>5.5 Definition of comfort level & IAQ requirements (for winter and summer season, beside other national directives) Describe which guidelines are given for indoor climatic conditions, minimum or maximum indoor temperature, minimum lighting levels/ daylight availability, minimum ventilation rates/ natural ventilation, indoor air quality, max. CO2 levels, etc.</p>	
<p><i>This Directive [...] takes into account [...] indoor climate requirements [...] Reference: EPBD article 1.1</i> <i>The methodology shall [...] take into consideration: [...] indoor climatic conditions [...]Reference: EPBD Annex 1</i> <i>That includes [...] indoor air-quality, adequate natural light [...].Reference:</i> <i>EPBD preamble recital 9</i></p>	
<p> <input checked="" type="radio"/> defined <input type="radio"/> not defined <input type="radio"/> defined in other regulation </p>	<p>Standard comfort level is defined by legislation and technical specifications</p>
<p>5.6 Monitoring procedure Describe if and how a monitoring mandatory is formulated; calculated or measured values are used; an evaluation of the indoor environmental quality is considered; which calculation step is used. <i>[...] energy performance of a building means the calculated or measured amount of energy needed [...] Reference: EPBD article 2.4</i> <i>Member States shall encourage the introduction of intelligent metering systems [...] and the installation of automation, control and monitoring systems [...]. Reference: EPBD article 8.2</i></p>	
<p> <input checked="" type="radio"/> defined <input type="radio"/> not defined </p>	<p>BACS will be encouraged by legislation for new buildings and substantial refurbishment</p>

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