



UNIVERSITÀ  
DEGLI STUDI  
DI TRIESTE

# Regulatory Framework and Building Energy Design

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# Italian interministerial Decree 26 June 2015 – Annex I

## Technical requirements for new buildings and major first level renovations

The designer shall certify compliance with the obligations to integrate renewable sources according to the minimum principles and effective dates set forth in Annex 3 of Legislative Decree ~~28/2011~~ 199/2021:

- 60% of expected consumption for domestic hot water production (65% for public buildings)
- 60% of the sum of the expected consumption for domestic hot water production, winter air conditioning and summer air conditioning (65% for public buildings)

This obligation does not apply if the building is connected to an efficient district heating/cooling system

System that uses at least:

- 50 percent of energy from renewable sources
- 50 percent waste heat
- 75 percent cogenerated heat
- 50 percent of a combination of the above

[Definition from Legislative Decree 102/2014, article 2, comma 2, letter tt]



Annex 3 of Legislative Decree 28/2011 was abolished by Legislative Decree 199/2021



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## Technical requirements for new buildings and major first level renovations

The designer shall certify compliance with the obligations to integrate renewable sources according to the minimum principles and effective dates set forth in Annex 3 of Legislative Decree ~~28/2011~~ 199/2021:

- the electrical power of systems powered by renewable sources that must be installed above or inside the building (P), measured in kW, is calculated as:

$$P = k \cdot S$$

where:

k = 0,025 for existing buildings and 0,05 for new buildings

S = building's floor area at ground level or the projection of the building's outline onto the ground, measured in m<sup>2</sup>

For public buildings the aforementioned minimum threshold is increased by 10%

The technical impossibility of complying with the obligations set out in Annex 3 of L.D. 199/2021 is highlighted by the designer in the technical report and detailed by examining the non-feasibility of all the different technological options available

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## Technical requirements for Nearly-Zero Energy Buildings

All buildings, both new or existing, are Nearly-Zero Energy Buildings if they fulfill:

- the aforementioned conditions regarding the parameters:
  - $H't$
  - $A_{sol,est}/A_{sup,utile}$
  - $EP_{H,nd}$ ,  $EP_{C,nd}$  and  $EP_{gl,tot}$
  - $\eta_H$ ,  $\eta_C$  and  $\eta_w$
- the obligations to integrate renewable sources in compliance with the minimum principles referred to in Annex 3 of Legislative Decree ~~28/2011~~ 199/2021, *valid for new buildings*

*The share from renewable sources must be evaluated:*

- *for the entire building if the individual summer and winter air conditioning energy services and winter and domestic hot water production of all real estate units are satisfied exclusively from centralized heating systems*
- *for a single real estate unit if such services are satisfied only or also from systems serving, exclusively, individual real estate units*

# Italian interministerial Decree 26 June 2015 – Annex I ↔ Appendix A (B)

## Technical requirements for major second level renovations

For all buildings subject to major second level renovations:

- shall be verified the compliance with the requirements and provisions set out for interventions of energy requalification, except for the specific exceptions specifically indicated
- ~~the  $H't$  parameter, determined for the entire portion of the building envelope subject to the intervention (vertical wall, roof, floor, windows, etc.), including all the components on which the intervention has been carried out, must be lower than the values of the last row of Table 10 of Appendix A, for all categories of buildings~~
- *the thermal transmittance of the portion of the building subject to intervention, including the thermal bridges, shall be computed with the formula reported in Appendix B:*

$$\frac{\sum A * U + \sum \psi * L}{\sum A}$$

where:  $A$  = area of intervention [ $m^2$ ]  
 $L$  = length of thermal bridge [ $m$ ]

$U$  = design transmittance of the element section [ $W/(m^2 K)$ ]  
 $\psi$  = linear transmittance of the thermal bridge [ $W/(m K)$ ]

Climatic zone				
A and B	C	D	E	F
0,73	0,70	0,68	0,65	0,62

# Italian interministerial Decree 26 June 2015 – Annex I ↔ Appendix A (B)

## Technical requirements for major second level renovations

The threshold of the thermal transmittance of the portion of the building subject to intervention, including the thermal bridges, shall be computed with the formula reported in Appendix B:

$$\frac{\sum A * U_{lim} + \sum \psi_{tab} * L}{\sum A}$$

where:  $A$  = area of intervention [ $m^2$ ]

$U_{lim}$  = limit value of the design transmittance of the element section defined in Tables 1 to 4 of the Appendix B [ $W/(m^2 K)$ ]

$L$  = length of thermal bridge [ $m$ ]

$\psi_{tab}$  = linear transmittance of the thermal bridge defined in Tables 5 to 7 of the Appendix B [ $W/(m K)$ ]

# Italian interministerial Decree 26 June 2015 – Annex I ↔ Appendix B

## Technical requirements for energy requalifications - envelope

**U value** of vertical opaque surfaces toward outside or unheated spaces, if subject to requalification, must be lower or equal to the values reported in Table 1 of Appendix B

Climatic zone	U [W/(m <sup>2</sup> K)]
A and B	0,40
C	0,36
D	0,32
E	0,28
F	0,26

**U value** of horizontal or tilted opaque surfaces toward outside, if subject to requalification, must be lower or equal to the values reported in:

- Table 2 of Appendix B, for roof structures (excluded buildings in category E.8)
- Table 3 of Appendix B, for floor structures

Climatic zone	U [W/(m <sup>2</sup> K)]
A and B	0,42
C	0,38
D	0,32
E	0,29
F	0,28

Climatic zone	U [W/(m <sup>2</sup> K)]
A and B	0,32
C	0,32
D	0,26
E	0,24
F	0,22

# Italian interministerial Decree 26 June 2015 – Annex I ↔ Appendix B

## Technical requirements for energy requalifications - envelope

**U value** of openable glazed and opaque elements toward outside or unheated spaces, comprehensive of the frames and not taking into account possible shading devices, if subject to requalification, must be lower or equal to the values reported in Table 4 of Appendix B (excluded buildings in category E.8)

Climatic zone	U [W/(m <sup>2</sup> K)]
A and B	3,00
C	2,00
D	1,80
E	1,40
F	1,00

In case of structures delimiting the heated space towards unheated spaces, the transmittance values of Tables 1 to 5 are divided by the correction factor of heat exchange between heated and unheated environments, as indicated in the UNI/TS 11300-1 regulation

The transmittance values in the previous tables are considered to include the effect of thermal bridges

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## Technical requirements for energy requalifications - plants

~~For buildings equipped with a centralized heating system,~~ in the event of:

- energy requalification of the building envelope
- insulation of the walls
- installation of new transparent, openable and similar technical closures

delimiting the air-conditioned volume towards the outside or unheated spaces, in addition to compliance with the previous requirements, is mandatory to install thermostatic valves, or another thermoregulation system for each single room or single real estate unit, assisted by climatic compensation of the generator, is added

The latter may be omitted where the system technology provides for equivalent or more efficient control systems or where it is not technically feasible.

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## Technical requirements for energy requalifications - plants

If a renovation or new installation of heating systems with a nominal generator power greater than or equal to 100 kW is carried on, including the disconnection of even a single user from the centralized system, an energy audit of the building and the system must be conducted, comparing different compatible system solutions and their effectiveness in terms of overall costs (investment, operation, and maintenance)

The chosen design solution must be justified in the technical report based on the audit results

The energy audit must consider at least the following options:

- centralized system with a condensing boiler with heat monitoring and temperature control for each individual residential unit
- centralized system with an electric or gas fueled heat pump with heat monitoring and temperature control for each individual residential unit
- possible integration of the aforementioned systems with solar thermal systems
- centralized cogeneration system
- district heating station connected to an efficient network as defined in Legislative Decree 102/2014
- for non-residential buildings, installation of BACS systems

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## Technical requirements for energy requalifications – heating plant

In the case of new installation of winter heating systems in existing buildings, or renovation of such systems or replacement of heat generators, including hybrid systems, the following rules apply:

- the average seasonal efficiency of the heating system must be higher than the limit value calculated using the efficiency values provided in Appendix A for the reference building (Tables 7 and 8)
- individual room or individual real estate unit control systems, assisted by climate compensation, must be installed
- for systems serving multiple real estate units, direct or indirect heat metering system that allows for the allocation of consumption to each individual real estate unit must be installed