Italian National Agency for New Technologies, Energy and Sustainable Economic Development

ODYSSEE-MURE

ODYSSEE-MURE fit4-55 (2022-2025)

PREPAC, the Programme for the Energy Renovation of the central PA buildings

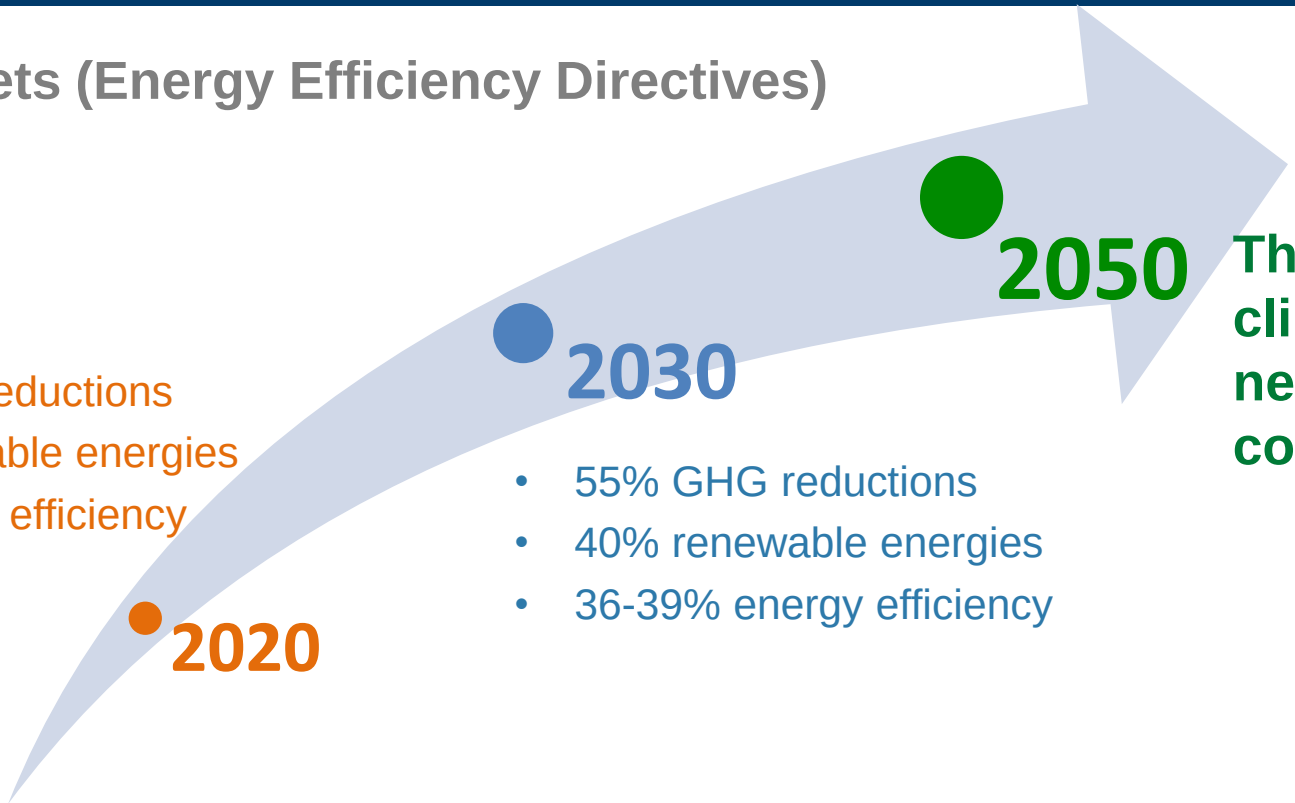
Webinar 17 April 2024

Laura Ronchetti - Department Unit Energy Efficiency (DUEE)

This project has received funding from the European Union's LIFE programme under grant agreement No. 101075902

The EU context

EU targets (Energy Efficiency Directives)



- 20% GHG reductions
- 20% renewable energies
- 20% energy efficiency

- 55% GHG reductions
- 40% renewable energies
- 36-39% energy efficiency

The first climate neutral continent

The EU context

Buildings sector

Image souce: JRC, 2023

Despite the ongoing process of decarbonization, considerable efforts are still needed.

- 40% of the final energy consumption;
- 36% of GHG emissions;
- 75% of energy-inefficient buildings.

(source: International Energy Agency, 2023)

Image souce: IESIS GROUP

The Italian context

Buildings sector

	2022 vs 1990	2022 vs 2005	2022 vs 2021
Power Industry	-21%	-39%	+5%
Industrial Combustion and Processes	-44%	-45%	-4%
Buildings	-8%	-23%	-6%
Transport	-2%	-23%	+5%
Fuel Exploitation	-41%	-32%	0%
Agriculture	-19%	+3%	0%
Waste	-50%	-48%	-4%
All sectors	-23%	-32%	0%

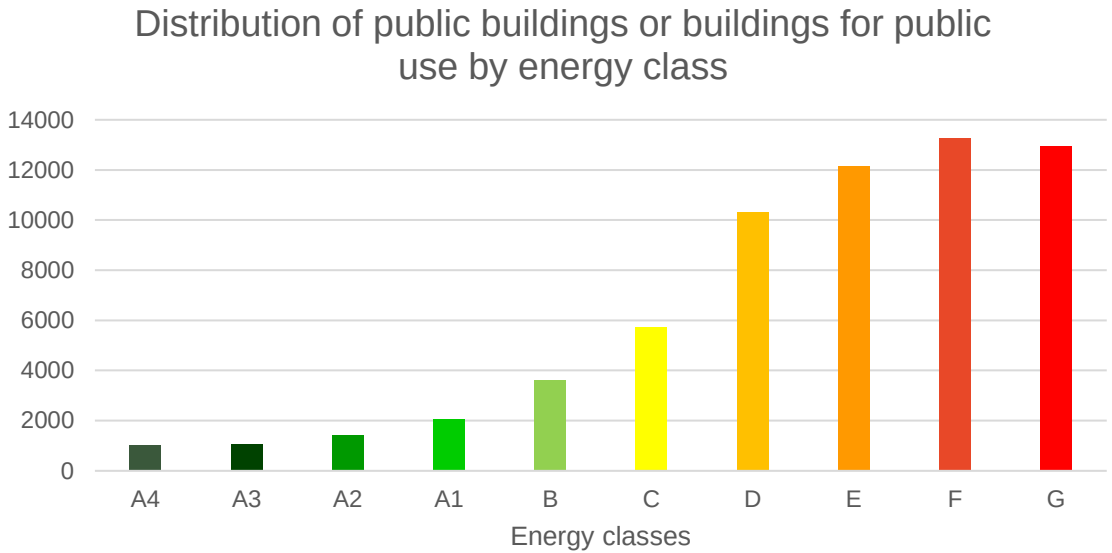
Image souce: JRC, 2023

In 2022, Italy's GHG emissions accounted for approximately **8.9% of the European Union's total emissions.**

Significant progress recorded during the period 2005-2022.

The Italian context

Buildings sector



Souce: ENEA, December 2023

In Italy **60% of public or publicly used buildings** are classified in energy classes E, F, and G.

(based on a sample of ≈63.5 thousand EPC)

The PREPAC Programme

EED 2012 + EED 2018 → DLgs 102/2014 + DLgs 73/2020 (art. 5)

- **2014-2030:** a Programme for the **Energy Renovation** of buildings owned (and occupied) by **Central Public Administration**.

- **yearly Energy Renovation** of at least **3%** of the heated and/or cooled total floor area.

EXEMPLARY ROLE of CENTRAL GOVERNEMENT

The PREPAC directors

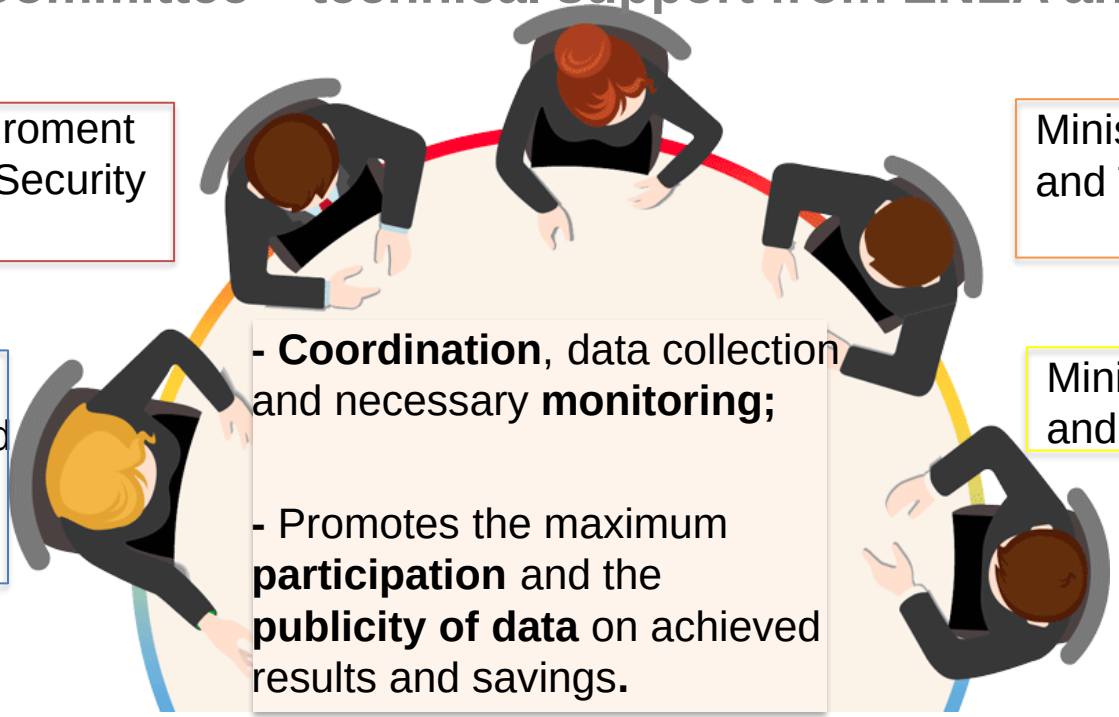
Steering Committee + technical support from ENEA and GSE

Minister of Enviroment and Economic Security (MASE)

Minister of Infrastructure and Transport (MIT)

Minister of Enterprises and Made in Italy (MIMIT)

Minister of Economy and Finance (MEF)



- **Coordination**, data collection and necessary **monitoring;**

- Promotes the maximum **participation** and the **publicity of data** on achieved results and savings**.**

Who PREPAC is addressed to

Central Public Administration

1. Constitutional bodies,
2. Central government authorities.

Prime Minister's Office

Ministries

Law Enforcement Agencies

Financial administration

(Others…)

DATABASE and **MAPPING** of public buildings

Total area of central PA around **16 Million square meters**

Who PREPAC is not addressed to

a) Buildings with a total useful **covered area of less than 250 m²**;

b) Buildings **protected** under the provisions of the Code of Cultural Heritage and Landscape (DLgs 42/2004), **if the compliance with the minimum energy performance requirements is not compatible** with their character, appearance, or context, or detrimental to their conservation;

c) Buildings intended for **national defense purposes**, except for buildings used as service housing or offices for the armed forces;

d) Buildings used as places of worship and for conducting religious activities.

What is the amount?

Financial resources

PREPAC 2014-2020	Total 355 million €
PREPAC 2021-2030	75 million €/year

“The implementation of interventions included in the programme is managed, without new or additional charges to public finance, by the **Interregional Superintendencies for Public Works** of the **Ministry of Infrastructure and Trasports**, by the relevant administrations, and by the **State Property Agency**, in order to promote forms of rationalization and coordination among interventions, including among multiple administrations, fostering economies of scale and contributing to cost containment.”

Implementation modalities

Ministerial Decree 16 September 2016 (D.M. PREPAC):

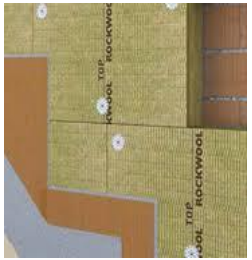
The implementation modalities of the intervention programme for improving the energy performance of buildings owned by the central public administration.

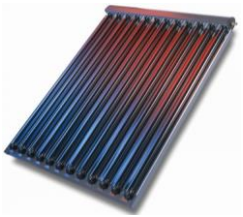
art. 3 Allowed types of interventions;
art. 4 Allowed expenses;
art. 5 Minimum contents of intervention proposals;
art. 6 Presentation methods of the proposals;
art. 7 Evaluation criteria of the proposals;
art. 8 Exemplary projects.

Interventions allowed into the Programme

D.M. PREPAC (art. 3)

a) Opaque / transparent envelope and **technical systems**

b) Electricity and thermal **energy production systems**

c) Other actions for energy services to reduce energy consumption

- HVAC
- internal lighiting
- elevators
- DHW

Allowed expences

D.M. PREPAC (art. 4)

a) **Implementation of energy efficiency interventions, including VAT** (supply and installation of materials, systems, and devices for monitoring, including related construction works, as well as expense for startup and testing);

b) **Professional services** related to the implementation of interventions, the drafting of the energy performance certificate, as well as pre-intervention energy diagnoses of the building;

c) **Training and information programs** on behavioral norms for energy savings, addressed to the users of the buildings subject to intervention, up to a maximum of 5% of the total project amount.

Minimum contents of the proposals

D.M. PREPAC (art. 5)

a) **Energy assessment**, that identify actions that can lead to a **reduction in energy consumption** and have a **good cost-effectiveness ratio**,

b) **Accurate description of the building** and its systems before and after intervention,

c) **Estimated costs** for the implementation and management of the intervention,

d) **Estimated times** for the start and completion of the intervention,

e) **Co-financing** presence,

f) List of any **authorizations** required for the implementation of the intervention, such as in case of historical and artistic preservation restriction.

g) […]

Presentation methods and evaluation criteria

D.M. PREPAC (articles 6 and 7)

The central PA that intend to participate to the program **must submit** their proposal **by the 15th of July** to the Minister of the Environment.

The feasible proposals from a technical-economic standpoint are placed in a **merit ranking**, established according to specific evaluation criteria:

1. the **ratio between total cost and estimated energy saving**, 60%
2. the presence of **co-financing**, 30%
3. the **estimated time for the implementation** of the intervention. 10%

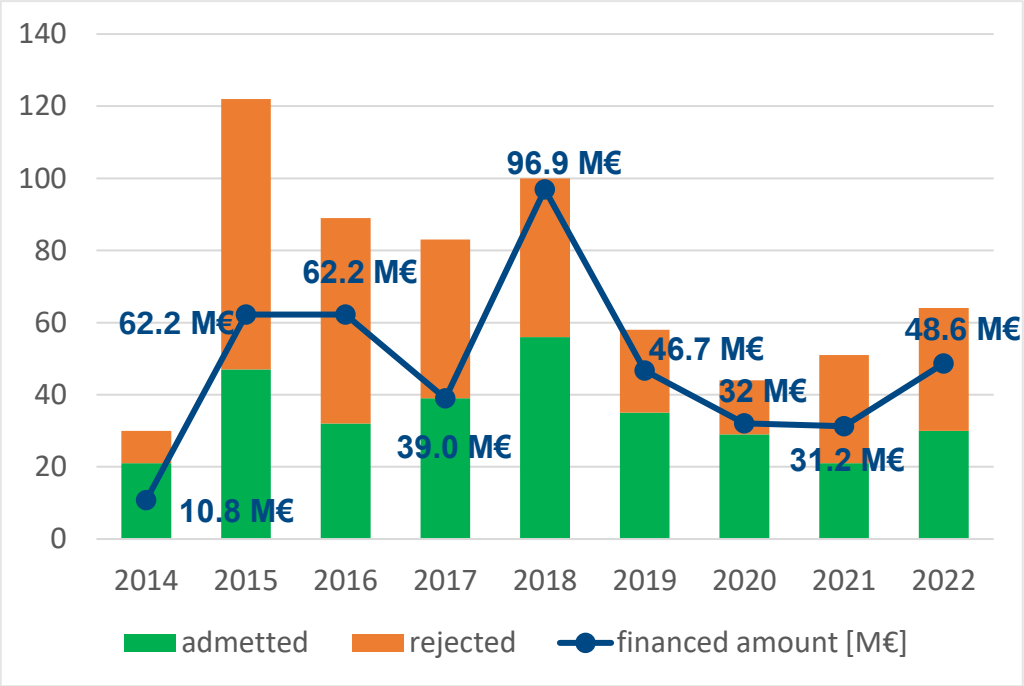
Exemplary projects

D.M. PREPAC (art. 8)

20% of the annual available resources are allocated to projects defined as **exemplary**, meaning eligible proposals that include:

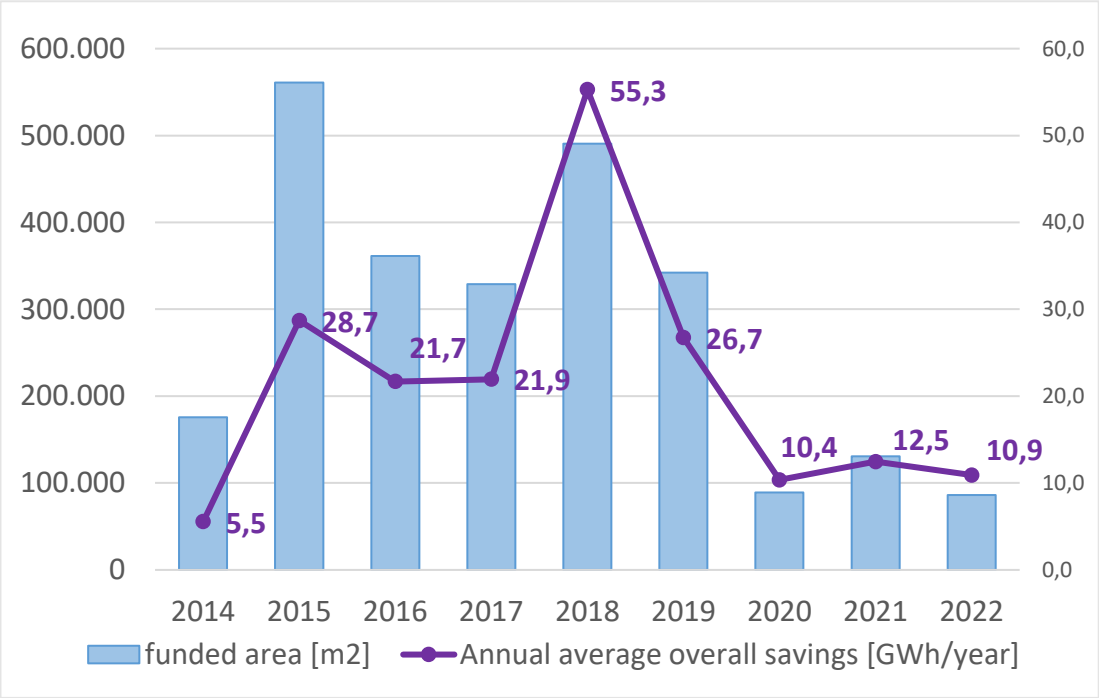
- interventions on the **building envelope,**
- interventions on **technical systems**,
- primary energy **savings of at least 50%** compared to current consumption.

PREPAC 2014-2022: summary of the results (1/2)



- **641 proposals** evaluated, 310 financed, with a value ranging from a few thousand to a few million euros;
- **The average project amount is around 1.4 million €;**
- Total financed amount **around 430 million €**.

PREPAC 2014-2022: summary of the results (2/2)



- The surfaces subject to financed were around **2.6 million m²**;
- The **average saving per proposal** is 620,000 kWh/year;
- **96% of the proposals** were submitted by four ministries (**Defense, Economy, Internal Affairs,** and **Justice).**

Main activities of ENEA & GSE

- Provide **general criteria and operational indications** for the preparation and presentation of project proposals for the admission to the Programme (Guidelines to the PREPAC);
- **Technical-economic examination of proposals;**
- Provide **information, training, and assistance** to facilitate the acquisition of specific know-how.

Link to Report PREPAC: [Il Programma per la Riqualificazione energetica degli Edifici della Pubblica Amministrazione Centrale (enea.it)]

1. Villa Lubin, headquarters of CNEL in Rome

Laura Ronchetti
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2. Ducal Palace of Modena

THANK YOU

3. Palace of the Navy in Rome

Images sources:
1. ENEA;
2. Wikipedia;
3. luceperladidattica.com;
4. Ministero della Cultura.

4. National Library of Genoa

ODYSSEE-MURE fit4-55 (2022-2025)

THIS PROJECT HAS RECEIVED FUNDING FROM THE EUROPEAN UNION'S LIFE PROGRAMME UNDER GRANT AGREEMENT NO. 101075902

17.04.2024

OUTLINE

- GSE activities
- UE targets on energy production and consumption
- «Thermal Account» scheme
  - ✓Goals
  - ✓Ways of access
  - ✓Subject requesting
  - ✓Interventions
- Results
- Examples
- Question

GSE ACTIVITIES

ENERGIE
IN MOVIMENTO

«GSE» - The Energy Service Operator: role and main activities

GSE PROMOVES THE DEVELOPMENT OF **RENEWABLE ENERGY** SOURCES AND **ENERGY EFFICIENCY** IN ITALY, MAINLY BY GRANTING ECONOMIC INCENTIVES AND SUPPORTING THE POLICY MAKERS**.**

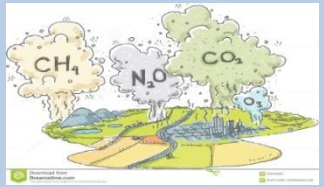
GSE SUPPORTS **PUBLIC ADMINISTRATIONS** AND **PRIVATE PARTIES** TOWARDS SUSTAINABLE DEVELOPMENT

MANAGES OVER 20 SCHEMES
RENEWABLE ENERGY AND ENERGY EFFICIENCY

AIMS TO ENERGY EFFICIENCY
THERMAL ACCOUNT, WHITE CERTIFICATE

INVOLVED IN SECTORIAL STUDIES
DRAWS UP STATISTIC WORKS ON SUSTAINABLE DEVELOPMENT

UE targets

TARGET 2020	SECTOR	TARGET 2030
20%	RENEWABLE ENERGY SOURCES 	27%
20%	ENERGY EFFICIENCY 	30%
20%	GREENHOUSE GAS EMISSION SAVING 	55%

Italian instruments: support schemes (1/2)

SUPPORT SCHEMES: LEGISLATIVE DECREE 102/2014

TAX DEDUCTION

- Government provides a tax detraction
- Energy efficiency improvement actions
- Interventions of energy re-qualification

THERMAL ACCOUNT

- Grant to support part of investiment costs
- Energy efficiency improvement actions
- Technical installation for the generation of renewable thermal energy

WHITE CERTIFICATES

- Tradable instrument
- Achievement of end use energy saving through energy improvement projects (sector industrial, civil, illumination, trasport)

OTHER SUPPORT SCHEMES

PREPAC

- Central Public Administrators
- Funds
- Energy efficiency improvement actions
- Technical installation for the generation of renewable thermal energy

REVOLVING FUNDS

- National Efficiency Fund (2014), Kyoto Fund (2006)
- Kyoto Fund for schools in 2014, € 350 million at a subsidized rate (0.25 %), cumulative with other incentives

STRUCTURAL FUNDS (PON, POR PSR)

- European Regional Development Fund
- European Social Fund.

THERMAL ACCOUNT: MAIN CHARACTERISTICS

ENERGIE
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“Thermal Account“: regulatory framework

Directive 2012/2027/UE

Decree Legislative 102/2014

Ministerial Decree DM 16.02.2016

The **«Thermal Account»** (Ministerial Decree 16.02.2016): incentive scheme to encourage Public Administrations and private parties to implement energy efficiency improvement actions in buildings and technical installations as well as for the generation of renewable thermal energy

Yearly cumulative spending limit **900 € mln**: incentives support part of investment costs up to **65%**.

500 mln €
Private parties

Generation of renewable thermal energy

400 mln €
Public Administrations

Generation of renewable thermal energy

Energy efficiency actions

Main characteristics (1/2)

- **GRANT** to support part of investment costs
- **Driver for building redevelopmet interventions wider than efficiency energy**

Main characteristics (2/2)

INCENTIVE

Grant to support part of investment costs eligible

→ The incentive varies from 45% to 65% of the expenditure incurred, considering maximal costs

SCOPE

Energy efficiency improvement actions
System for the generation of renewable thermal energy

WHO IS IT FOR?

Public Administrations or Private parties

→ The actions may be carried out via ESCO UNI CEI 11352 certified by signing an energy performance contract (PA) or through an energy service contract

WHEN?

- Completed works (request by 60 days from the end of the works)
- Programmed works, just only with energetic diagnosis)

PAYMENT

PRIVATE PARTIES: granted over a 2 to 5 year period, unless the total incentive exceeds € 5.000, in which case it is issued in a single sum

PA : granted in a single sum

Cumulation with other grants

PUBLIC ADMINISTRATION : on Public buildings, incentives can be combined with other state and non-state incentives up to 100% of the costs — 100%

PUBLIC ADMINISTRATION: on Private buildings, incentives can be combined with other non-state incentives up to 100% of the costs — 100%

COMPANIES: can be combined with other non-state incentives, in compliance with European Community guidelines on size company — 45%-65%*

NATURAL PERSON: incentives can be combined with other non-state incentives up to 100% of the cost — 100%

Maximum percentage accumulation on eligible costs

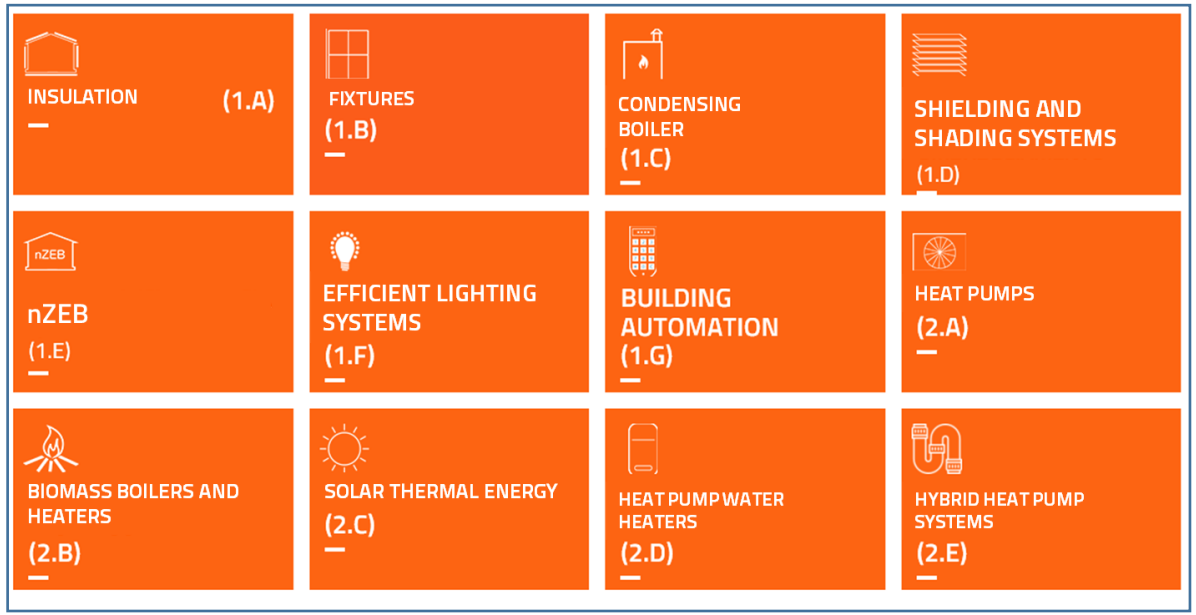
* The incentive limits on the value of expenditure are laid down in the Community Guidelines on State aid in relation to the size of the holding - COMMUNICATION 2014/C 200/01

Incentives

INTERVENTIONS = 40-65%

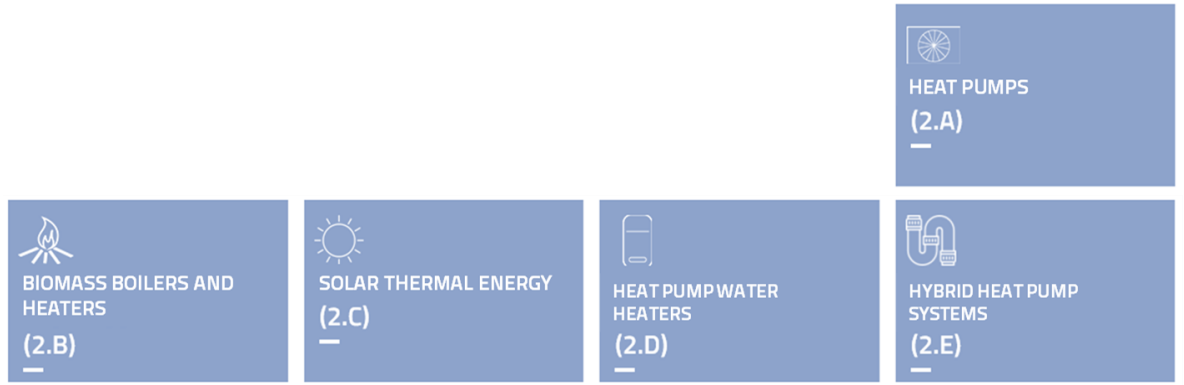
COMBINATED INTERVENTIONS = 55%

Incentivezed interventions



Cluster 1:
Public Administrations

Cluster 2:
Public Administrations and Private parties



The building: scope

STACKED

AIR CONDITIONED

«To be eligible, works must involve existing air conditioned buildings »

IDENTIFICATION OF THE BUILDING

- Avoid segregation
- Stacking
- Air conditioned

ENERGY AUDIT

- ALWAYS suggested
- COMPULSORY for Energy Efficiency improvement actions or for size of technologies over 200 kW

Subjects requesting

SUBJECTS ADMITTED

Subjects who have the availability of the property on which the intervention is carried out because:

- **owners of property rights** (including bare property) of the building/property
- **availability of the building/property** as holders of real or personal right of enjoyment

«RESPONSIBLE» SUBJECTS

- Subjects **directly responsible for expenditure** on operations
- **Apply for recognition** incentives to the GSE

The Admitted Subjects

ESCO

Incentivezed interventions

Public Administrations (PA)

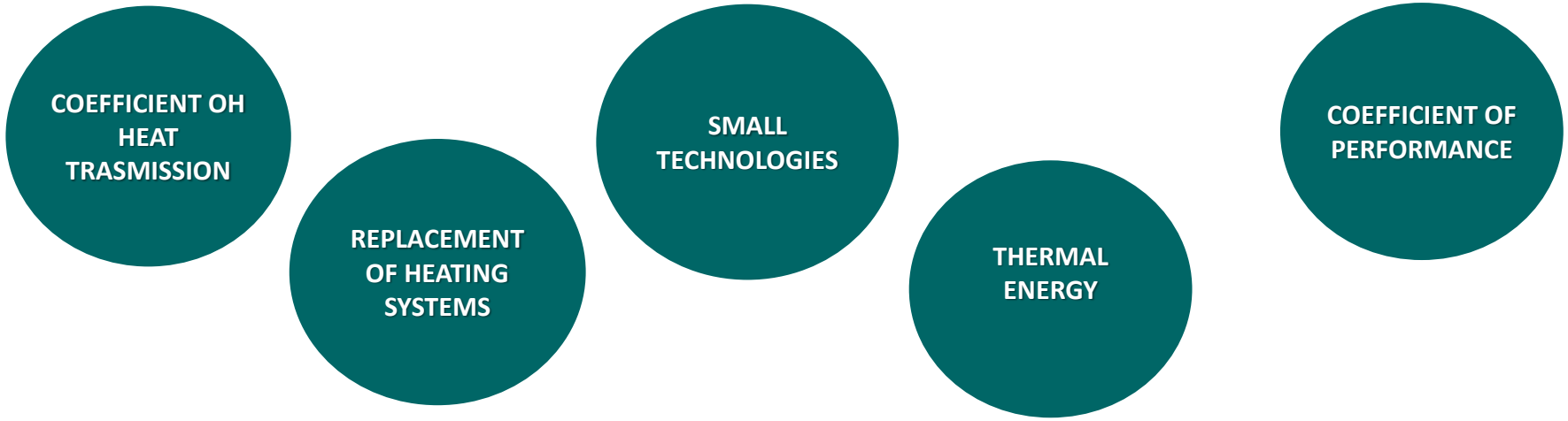
Energy Efficiency
(Cluster 1)
Art. 4 paragraph 1

a) Thermal insulation of walls
b) Replacement of windows
c) Replacement of heating systems with condensing boilers
d) Installation of screening and shading systems
e) Nearly Zero Energy Building (NZEB)
f) Replacement of lighting bodies
g) Installation of building automation system related to thermal and electrical

Private parties and Public Administration (PA)

Generation of thermal energy from renewable sources
(Cluster 2)
Art. 4 paragraph 2

a) Replacement of heating systems with electrical and gas heat pumps up to 2.000 kW
b) Replacement of heating systems with biomass boiler and appliances up to 2.000 kW
c) Installation of solar thermal up to 2.500 mq
d) Replacement of heating systems with heat pump water heaters
e) Replacement of heating systems with hybrid heat pumps



Energy efficiency improvement interventies: the contribution

Incentives support part of investment costs up to **40%**, in accordance with:

- maximum unit costs (Cmax), for each type of intervention
- ceilings established for each type of intervention (Imax)

Incentives cover up to **:**

- **50 % for thermal insulation interventions in climatic zones E/F**
- **55 % for combined interventions;**
- **65 % fot the Nearly Zero Energy Building (nZEB)**

Incentives cover up to 55% :

- **Thermal insulation+ installation of one of the following systems 1.C, 2.A, 2.B, 2.C, 2.E;**
- **Replacement of window + thermal insulation + one of the following systems 1.C, 2.A, 2.B, 2.C, 2.E;**
- **Condensing boiler+ thermal insulation.**

100% SCHOOLS AND NATIONAL HOSPITALS

Generation of thermal energy from renewable sources : the contribution

Incentives are calculated according to the following parameters and in any case up to **65%** of investiment costs:

- **size** of heating system;
- **Presumed producibility** of thermal energy of the installed system, dependent on technologies, size and climatic zone;
- **Adjustment coeffcient** of the energy produced, as set out in the tables annexed to Decree;
- **Reward coefficients (+20% or +50%)** in the case of biomass generators with low emissions

Ways of access

COMPLETED INTERVENTIONS: PA AND PRIVATE PARTIES

ACCESS TIME

Request forms to send within 60 days at the end of interventions, by «Portaltermico»

PROVISION OF INCENTIVES

❑ **Private parties**

Incentives provide in a single sum up to **5.000 €**

Otherwise

Incentives granted over a 2 to 5 year period, considering type and size of technologies:

Pn ≤ 35 kW o ≤ 50 mq: 2 years

Pn > 35 kW o > 50 mq: 5 years

❑**Public Administrations:** Incentives provide in a single sum

PROGRAMMED INTERVENTIONS : PA

ACCESS TIME

Request forms to send in case of :

a. Energy Audit and an administrative act certifying the planning of the work analyzed by Energy audit
b. Energy Performance Contract (EPC) or other Energy Service contract
c. Administrative act certifying the assigning work

PROVISION OF INCENTIVES

Incentives granted under an advance payment mechanism:

- Down payment (2/5 or 50 % of investment costs programmed), within 60 days after the start of works
- Balance at the end of works

Programmed works: ways of access

SUBJECTS REQUESTING: PUBLIC ADMINISTRATIONS

A

Energy Audit + **Administrative act certifying the planning of the work**

SUBJECTS REQUESTING: PUBLIC ADMINISTRATIONS OR ESCO

B

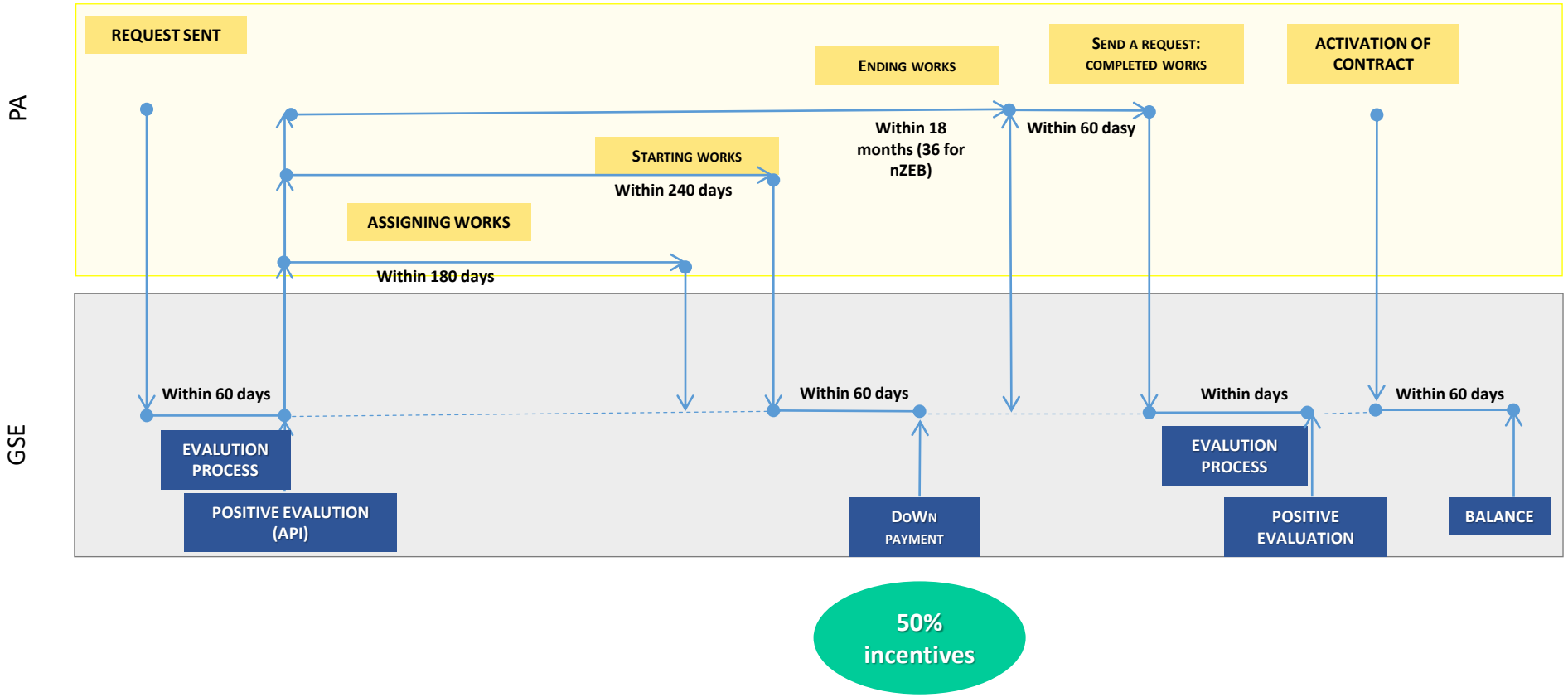
EPC or **Other Energy Service Contract**

C

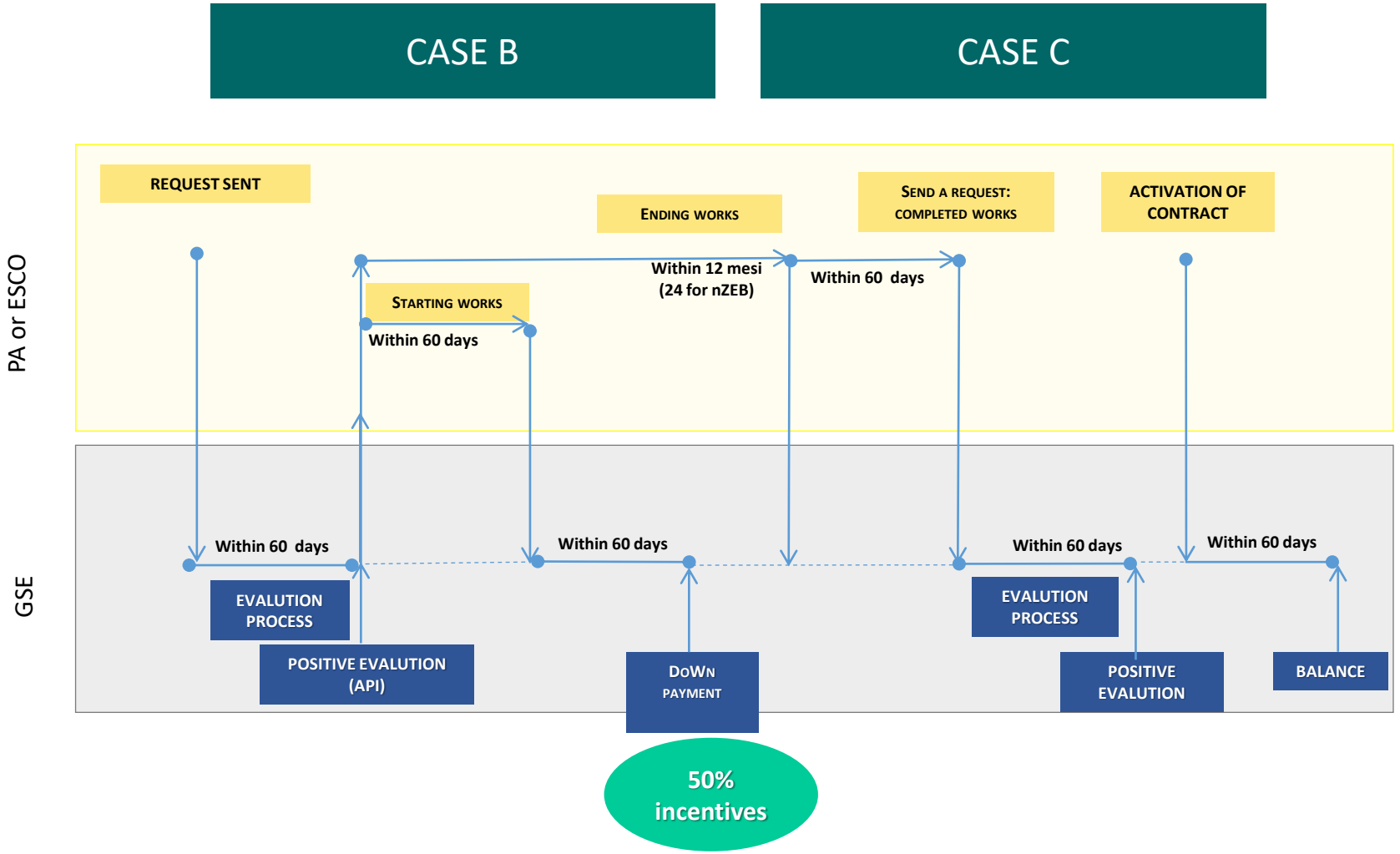
Administrative act certifying the award of the work + work delivery report

Complete a programmed work request: Deadline

CASE A



Complete a programmed work request: Deadline



Public Administrations (PA) and ESCO

If the PA does not have the resources to carry out the interventions or wish to engage specialist expertise in energy efficiency,

may enter into an "Energy Performance Contract" (EPC) with an ESCo and delegate it to request on its own account incentives in Thermal Account.

Through an EPC contract (Requirements D.Lgs 102/2014):

- **the PA agrees with an ESCo the achievement of some energy efficiency targets against a fee**
- **ESCo provides capital and assumes the risk of the investment against a return generated by the energy savings obtained.**

To allow access of the ESCo to the Thermal Account on behalf of a PA, the EPC must:

- To include an economic framework from which one can deduce the costs foreseen for the incentives
- Be effective at least up to 5 years after the date of payment of the last instalment of incentives
- Clarify how the Thermal Account acts to reduce the fee due by the PA

Energy Performance Contract (EPC): requirements

- **Requirement a):** a clear and transparent list of efficiency measures to be implemented (indication of actions, timing, costs)
- **Requirement b) and j):** quantification and verification of savings in both economic and energy terms:
  - ✓ algorithms related to energy parameters
  - ✓ baseline reference
  - ✓ planning of measures and checks
- **Requirement e):** reference dates for the quantification of savings
- **Requirement i):** clear and transparent indication of the financial implications and the share of the two parties in the financial savings made
  - ✓ Clarification of the canon
  - ✓ Loan guarantee in case of default

REQUIREMENTS
Annex 8
Decree legislative
102/2014

INTERVENTIONS

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Nearly Zero Energy Building (*n*ZEB) – (Intervention 1.E)

INTERVENTION

Conversion of air conditioned existing buildings into a **nearly zero energy building**" (*n*ZEB)

RELAZIONE DI DIAGNOSI ENERGETICA
(rapporto finale)
secondo UNI CEI EN 16247-1-2, UNI CEI/TR 11428 ed il progetto di linee guida CTI per le diagnosi energetiche degli edifici

Committente
Nome
Indirizzo

Edificio / condominio
Descrizione
Indirizzo

Studio tecnico
Nome

Indirizzo

Volumes
Heat exchange
Energy efficiency
Energy performance
Obbligo FER

REQUIREMENTS APPLIED

- Compliance with the ***energy performance requirements*** of buildings *n*ZEB provided by Decree Minister (DM 26 giugno 2015), calculated in relation to «reference building»:

✓ H'_T Global heat exchange coefficient

✓ $A_{sos,est}/A_{sup\ utile}$

✓ $\eta_H\ \eta_w\ \eta_c$ Energy efficiency

✓ $EP_{H,nd}\ EP_{c,nd},\ EP_{gl,tot}$ Energy performance indices

✓ Use of energy from renewable energy

- Building restructuring that includes the expansion of volume up to **25%**
- Demolition and reconstruction of air conditioned existing buildings
- Draw up Energy Audit and Energy Performace Certificate

Nearly Zero Energy Building (*n*ZEB) – (Intervention 1.E)

CALCULATION OF THE INCENTIVES

Incentives cover up to 65% of investment costs, in accordance with:

- maximum unit costs (C_{max})
- ceilings established for each type of intervention (I_{max})

$I_{tot} = 65\% \cdot C_s \cdot S_{int}$ $\quad I_{tot} \leq I_{max}$

C_S = investment costs/S_{int} $\quad C_s \leq C_{max}$

S_{int} = usable floor area

Climatic zone

WHAT CAN BE ENCOURAGED

- Supply and installation of all materials and technologies to achieve energy performance requirements of buildings *n*ZEB
- Potential seismic adptation
- Potential demolition and reconstruction
- Professional services

[Tabella 5 – Allegato II - DM 16.02.16]		
Tipologia di Intervento	**Costo massimo ammissibile (C_{max})**	**Valore massimo dell'incentivo I_{max} [€]**
Trasformazione di edifici esistenti in "edifici a energia quasi zero nZEB" – zona climatica A, B, C	500 €/m²	1.500.000
Trasformazione di edifici esistenti in "edifici a energia quasi zero nZEB" – zona climatica D, E, F	575 €/m²	1.750.000

Cmax

Imax

Nearly Zero Energy Building (*n*ZEB): overview of requirements

SUMMARY OF REQUIREMENTS:

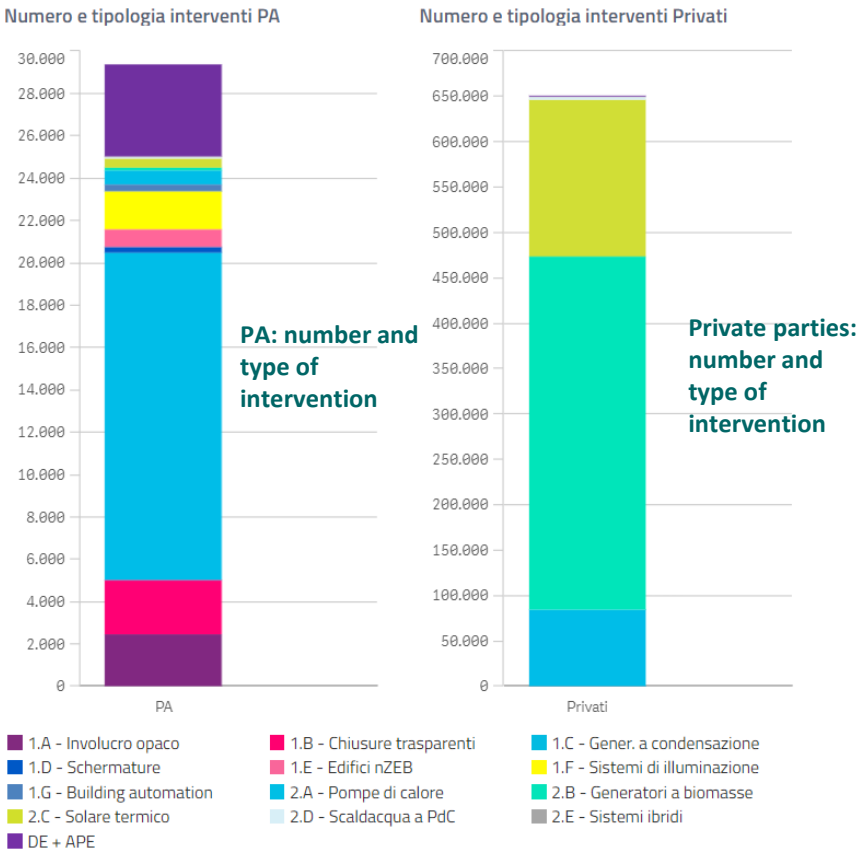
Parameter	Definition	Requirements	Note
ENVELOPE OF BUILDINGS			
H'_T [W/m^2K]	Global heat exchange coefficient, per unit dispersing area.	$H'_T < H'_{T,limit}$	Tabulated limit values depending on shape ratio and climate zone (Table 10 - Appendix A)
$A_{sol,est}/A_{sup\ usable}$ [-]	Equivalent solar area per unit usable area	$(A_{sol,est}/A_{sup\ usable}) \leq (A_{sol,est}/A_{sup\ usable})_{limit}$	Tabulated limit values depending on the intended use (Table 11 – Appendix A)
ENERGY EFFICIENCY OF SYSTEMS			
η_H [-]	Average seasonal efficiency of the winter air conditioning system	$\eta_H > \eta_{H,limit}$	Calculated limit values for the reference building (Chapter 1- Appendix A)
η_W [-]	Average seasonal efficiency of the DHW systems	$\eta_W > \eta_{W,limit}$	
ηC [-]	Average seasonal efficiency of the summer air conditioning system	$\eta_C > \eta_{C,limit}$	
ENERGY PERFORMANCE INDICES			
EPH,nd [kWh/m2]	Energy performance index for heating	$EP_{H,nd} < EP_{H,nd,limit}$	Calculated limit values for the reference building (Chapter 1-Appendix A)
$EP_{C,nd}$ [kWh/m^2]	Energy performance index for cooling	$EP_{C,nd} < EP_{C,nd,limite}$	
$EP_{gl,tot}$ [kWh/m^2]	Overall Energy performance index .	$EP_{gl,tot} < EP_{gl,tot,limit}$	

Minimum fraction of energy requirement for DHW production, heating and cooling	Minimum fraction of energy requirement for DHW production	Electrical power of plants powered by renewable energy to be installed [kW]
50%	50%	1/50 x building's footprint

THERMAL ACCOUNT: RESULTS

ENERGIE
IN MOVIMENTO

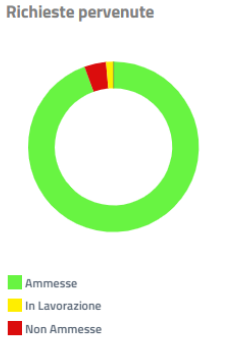
Year 2024: Thermal Account Counter



PA: number and type of intervention

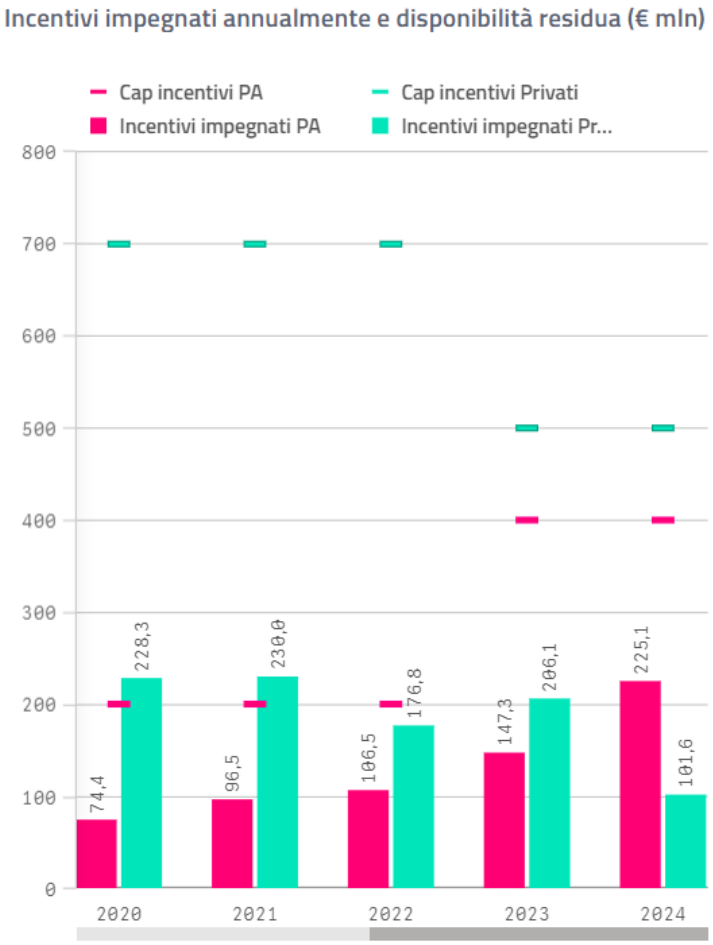
Private parties: number and type of intervention

Number of requests for incentives



Committed Incentives

Committed Incentives and yearly spending limit



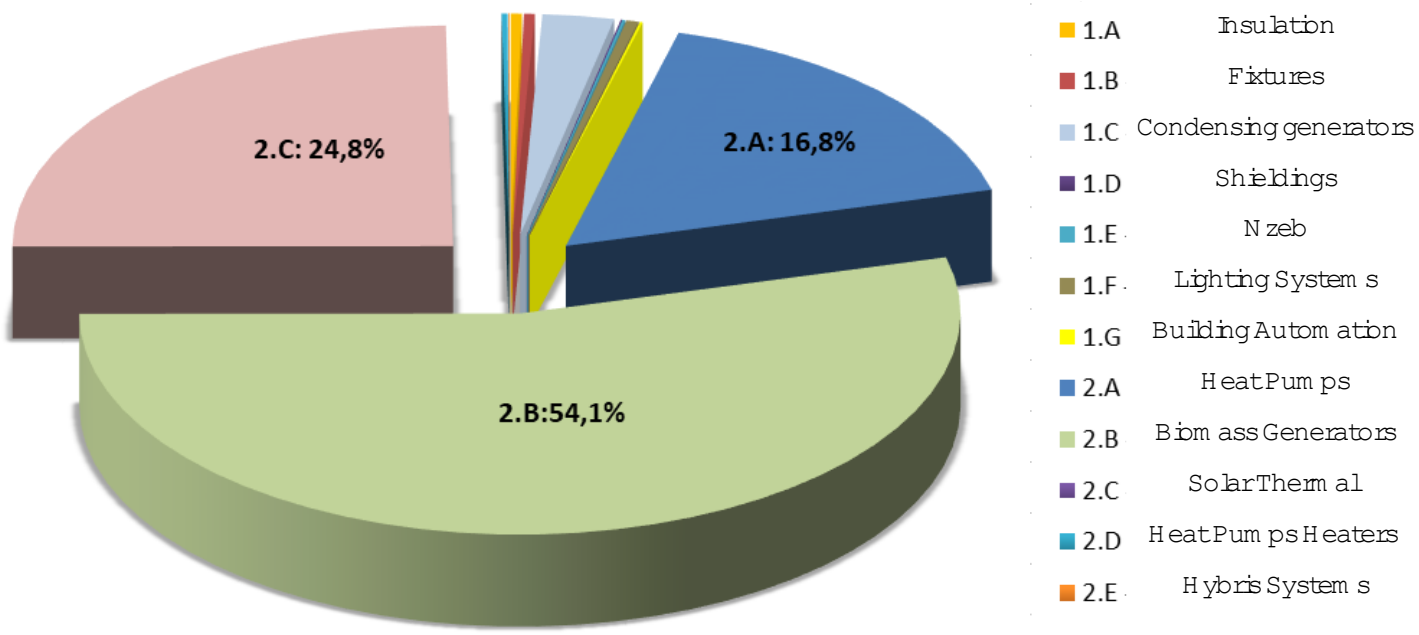
Data extracted from the thermal account counter published on the GSE website updated at 1st April 2024

For the year **2024**, based on the information available at 1st April, the meter estimates a total expenditure commitment of **327 € mln**, of which:

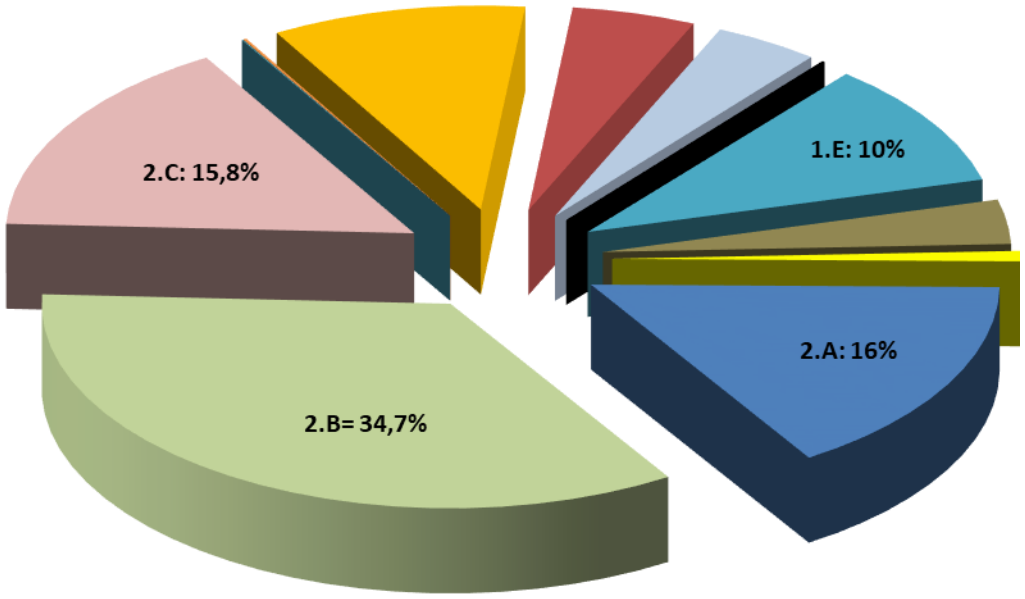
- **102 € mln** for private parties and **225 € mln** for Public Administration (**50 € mln** in programmed works).

Requests received and incentives: year 2023

Intervention realized _ Number of intervention



Intervention realized _ Incentives



Number of requests contractualized – completed works: 99.529

Incentives granted completed works: 327,42 M€

EXAMPLES

ENERGIE
IN MOVIMENTO

Primary School -Bergamo (BG)

INTERVENTION NZEB

Usable floor Area: 597,74 m²

Investment costs: 583.580 €
Incentives Thermal Account: 340.862 € = 58% of investment costs
POR FESR Region: 242.718€

Primary School «Umberto I» – Melzo (MI)

INTERVENTION NZEB

- Thermal insulation
- Replacement of windows
- Shading
- Building automation
- Illumination
- Photovoltaic system 21 kW

Results obtained: energy class improvement from G (440,95 kWh/m² year) to A4 (43,86 kWh/m² year)

SAVING: 90% OF ENERGY REQUIREMENTS

- Energy Diagnosis: 8.000 € - incentivo 2.800 €
- Investiment costs: 2.000.000 €
- Incentives : 424.000 € = **21 %** of investiment costs

Primary School «Benedetto Costa» – Sarnano (MC)

INTERVENTION NZEB

Demolition and reconstruction

Climatic zone : C
Usable floor Area : 1.239 m^2
Volumes Ex-Ante = 3.900 m^3
Volumes Ex-Post = 4.300 m^3

Compliance with the volume limit of the 25%

- **Investiment costs: 2.160.000 €**
- **Incentives: 465.800 € = 22 % of Investiment costs**

Municipal offices «Palazzo Mandela» – Asti (AT)

INTERVENTION NZEB

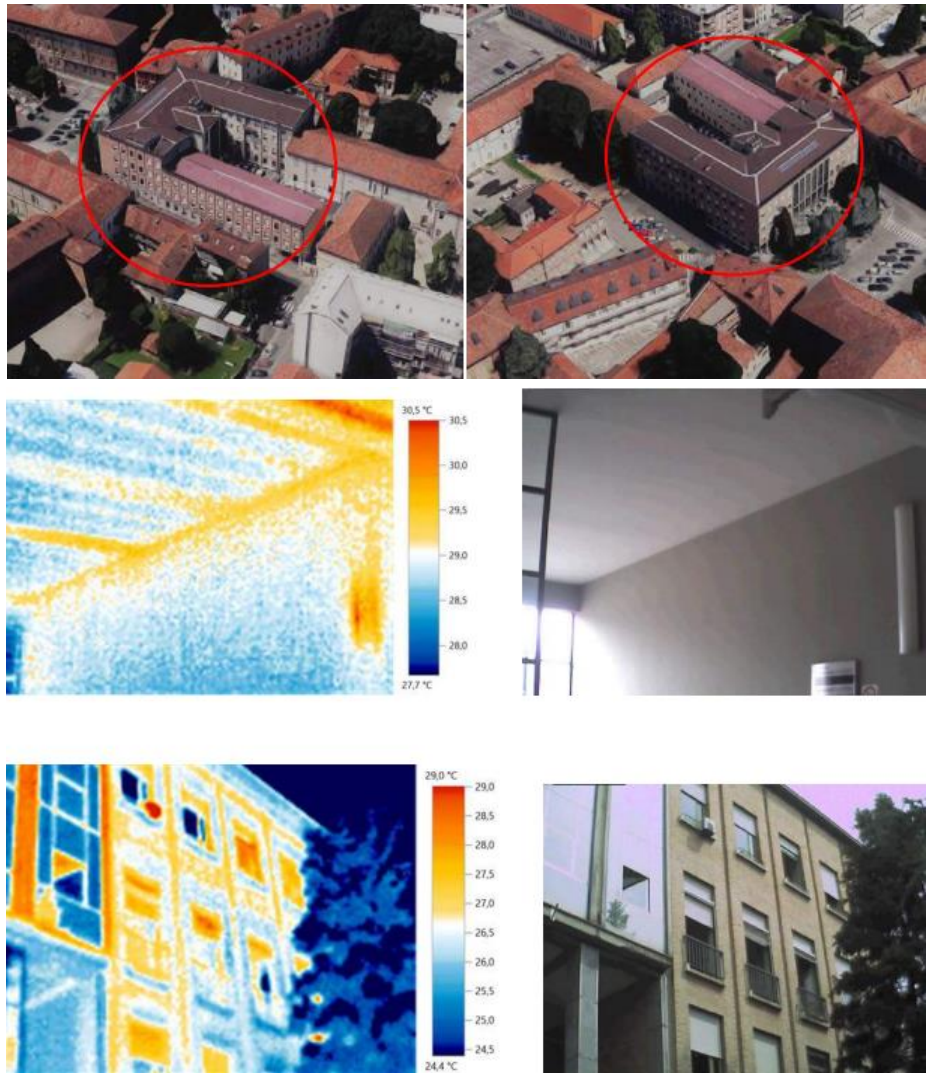
PROGRAMMED WORKS

- Thermal insulation
- Replacement of windows
- Shading
- Building automation
- Illumination
- Photovoltaic system

Results obtained: energy class improvement from E (201,95 kWh/m^2 year) to A4 (14,83 kWh/m^2 year)

- Energy Diagnosis: 4.500 € - incentives 100%

- Investiment costs : 2.400.000 €
- Incentives: 1.570.000 € = **65 %** of Investiment costs



Q&A

ENERGIE
IN MOVIMENTO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