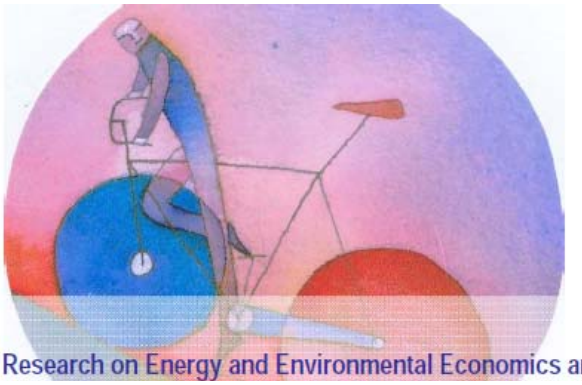

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Status-quo Analysis of Energy Efficiency Policies in 8 EU Countries – National Report for Italy

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STATUS-QUO ANALYSIS OF ENERGY EFFICIENCY POLICIES IN 8 EU COUNTRIES

D 1.2.

PART OF WORK PACKAGE 1: MAPPING OF ENERGY EFFICIENCY POLICY INSTRUMENTS AND AVAILABLE TECHNOLOGIES IN BUILDINGS AND TRANSPORT

NATIONAL REPORT FOR ITALY

DATE

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GLOSSARY

ACRONYMS

AEEG: Italian Regulatory Authority for Electricity Gas and Water.

AMAT: Agenzia Mobilità Ambiente Territorio (Agency for Mobility Environment Territory).

ASSTRA: Associazione Trasporti (Transport Association).

BEEM: Building Energy Management System.

CEER: Catasto Energetico Edifici Regionale (Regional Energy Cadastre of Buildings).

CEI: Comitato Termoelettrico Italiano (Italian Electrotechnical Committee).

CoM: Covenant of Mayors.

CNR: Consiglio Nazionale delle Ricerche (National Research Council).

CURIT: Catasto Unico Regionale Impianti Termici(Unique Regional Cadastre of Heating Plants).

D.I.: Decreto Interministeriale (Inter-ministerial Decree).

D.L.: Decreto Legge (Law Decree).

Dlgs: Decreto Legislativo (Legislative Decree).

D.M.: Decreto Ministeriale (Ministerial Decree).

D.P.R.: Decreto del Presidente della Repubblica (Decree of the President of the Republic).

DSO: Distributors System Operators

EIB: European Investment Bank.

ELENA: European Local ENergy Assistance.

EME: Energy Management Expert.

ENEA: Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile (Italian National Agency for New Technologies, Energy and Sustainable Economic Development)

EPBD: Energy Performance of Buildings Directive.

EPC: Energy Performance Contracting.

ESCO: Energy Service Company

EU: European Union.

GME: Gestore dei Mercati Energetici (Energy Market operator)

GPP: Green Public Procurement.

GSE: Gestore dei Servizi Energetici (Energy Service Operator).

IEA: International Energy Agency.

IRPEF: Personal income tax

IRES: Corporate income tax

ITS: Intelligent Transport System

L.: National Law.

LEED: Leadership in Energy & Environmental Design.

LPG: Liquified Petroleum Gas.

MATTM: Italian Ministry for the Environment and the Protection of Land and Sea.

MISE: Italian Ministry of Economic Development.

MIT: Italian Ministry of Infrastructures and Transport.

NEEAP: National Energy Efficiency Action Plan

PAE: Piano d'Azione per l'Energia (Energy Action Plan).

PEAR: Programma Energetico Ambientale Regionale (Energy and Environmental Regional Programme).

PIDEE: Piano integrato di diffusione dell'efficienza energetica (Integrated plan for the uptake of energy efficiency).

PNIRE: Piano Nazionale Infrastrutturale per la ricarica dei veicoli alimentati ad energia elettrica (National infrastructure plan to set up electric vehicle charging points).

RSE: Ricerca sul Sistema Energetico (Research on the Energy System).

R&D: Research and Development.

SEAP: Sustainable Energy Action Plan.

SME: Small and Medium-sized Enterprise.

SUMP: Sustainable Urban Mobility Plan.

TOE: Tonnes of equivalent oil.

UNI: Ente Italiano di Normazione (Italian Organization for Standardization).

Please note that throughout the report, "SEN, 2013" is used to refer to the following reference: Ministry of Economic Development. (2013). National Energy Strategy 2013. Available at: http://www.encharter.org/fileadmin/user_upload/Energy_policies_and_legislation/Italy_2013_National_Energy_Strategy_ENG.pdf

Please note that throughout the report, "NEEAP, 2014" is used to refer to the following reference: Ministry of Economic Development. (2014a). Italian Energy Efficiency Action Plan 2014. Available at: https://ec.europa.eu/energy/sites/ener/files/documents/2014_neeap_en_italy.pdf

EXECUTIVE SUMMARY

Italy has a wide and comprehensive set of energy efficiency policies in place, both in the buildings and transport sectors. In the present report, the most relevant Italian energy efficiency policies are analysed. The selection of these policies, both for buildings and transport sectors, are based on the relevance given to the policy in the national NEEAPs and on the expert assessment of Bocconi University-IEFE research team.

For the **building sector**, the following 10 most relevant policies are analysed:

- **Regulatory policy instruments**: set of national laws on the energy performance in buildings;
- **Dissemination and awareness instruments**: Electric Smart Meters and ENEA website "Obiettivo efficienza energetica" (Target: Energy Efficiency);
- **Economic Policy Instruments**: Tax deductions for improving the energy efficiency of buildings, Thermal Account, White Certificates and Kyoto Fund;
- **Capacity Building and Networking:** ENEA training platform and e-learning courses for experts on energy efficiency in buildings;
- **Policy instruments for the promotion of energy services**: Voluntary national certification scheme for ESCOs;
- **Policy Instruments for Research and Development and Best available Technology (BAT) Promotion**: National Electric System Research.

For the **transport sector**, the following 5 most relevant policies are analysed:

- **Planning Instruments**: National infrastructural plan to set up electric vehicle charging points;
- **Regulatory Policy Instruments**: Obligation to input into consumption biofuels;
- **Financial Policy Instruments**: Government subsidies for the purchase of low emission vehicles and funds related to the "Five-year bus fleet renewal plan";
- **Dissemination and awareness instruments**: National Logistic Platform UIRNET;
- **Policy Instruments for Research and Development**: National Electric System Research.

Where available, quantitative data on the energy efficiency/energy saving results obtained by the policy instruments are provided.

1. POLICY INSTRUMENTS ON THE NATIONAL LEVEL

1.1 POLICY INSTRUMENTS IN THE BUILDINGS SECTOR

Based on the relevance given in the national NEEAPs and on the expert assessment of Bocconi University-IEFE research team, 10 key policy instruments among those in force for energy efficiency in the buildings sector have been selected for a deeper description and analysis.

They are presented in the following paragraphs divided according to policy type (regulatory policy instruments, dissemination and awareness, economic policy instruments, capacity building, Policy instruments for the promotion of energy services, Research and Development and BAT promotion).

1.1.1 REGULATORY POLICY INSTRUMENTS

General description of the different policies that are described in this chapter

Italy has several regulatory policy instruments related to the buildings sector. The main regulatory policy instruments in the building sector are:

- Energy performance in buildings. Transposition of EPBD and EPBD recast EU directives (Dlgs. 19 August 2005, n. 192, modified with Dlgs. 30 May 2008, n. 115; L. 3 August 2013, n. 90);
- Transposition of the Energy Efficiency Directive 2012/27/EU (Dlgs. 4 July 2014, n. 102);
- Rules for implementing the national energy plan in the field of rational use of energy, energy saving and development of renewable energy sources (L. 9 January 1991, n. 10);
- Regulation on Accreditation of Italian Energy Certifiers (D.P.R. 16 April 2013, n. 75);
- Green Public Procurement. Minimum Environmental Criteria for several appliances related to buildings, in particular public lighting and energy services for buildings (D.M. 25 February 2011, D.M. 25 July 2011, D.M. 7 March 2012);
- Energy labelling of households appliances (Dlgs. 28 June 2012, n. 104);
- Simplification/exemption of authorization procedures for some energy efficiency measures (municipal level);
- Regional Regulatory Schemes on energy efficiency in buildings (regional level);
- Municipal buildings regulations (municipal level).

All the Italian regulatory standards on buildings, based on NEEAP 2014 prevision data, are foreseen to produce a total final energy savings in 2020 of 5.23 Mtoe/year.

1.1.1.1 Energy performance in buildings (Dlgs. 19 August 2005, n. 192 and consecutive updating)

a) General information

The national legislative framework for increasing the energy efficiency in the buildings sector is quite varied (NEEAP, 2014) as during the years several national laws determined a large amount of amendments. One of the main critical aspects in the implementation of the European directive on Energy performance in buildings in Italy was related to the relevant delay in the adoption of EU legislation. In fact Directive 2002/91/EC (EPBD) was implemented in Italy by Dlgs. 19 August 2005, n. 192[1], three years after the adoption of the EU Directive. Directive 2010/31/EU (EPBD recast) was transposed in Italy by D.L. 4 June 2013, n. 63[2], converted into law by L. 3 August 2013, n. 90[3], also in this case three years after the adoption of the EU Directive. For these reasons, the European Commission asked Italy to take action and ensure that the Energy efficiency in buildings directive is fully transposed into national law (DG Energy)[4].

b) Type of policy instrument

The set of laws on "Energy performance in buildings" belongs to the policy type "Regulatory policy instruments". It defines energy efficiency compulsory targets for new and existing buildings.

c) Objectives

In line with the EU Directives, the objectives of the set of laws on "Energy performance in buildings" are to promote the construction of new and retrofitted nearly-zero energy buildings by 2020 (2018 in the case of Public buildings), and the application of a cost-optimal methodology for setting minimum requirements for both the envelope and the technical systems.

d) Target group

Target groups of the set of laws on "Energy performance in buildings" are buildings owned both by private citizens and public authorities.

e) Rules and influencing mechanisms

The "Energy performance in buildings" legislative framework in Italy foresees a clear different competence repartition among the national and regional levels. In particular the main functions of the national level in the buildings sector are:

- Defining the overall energy efficiency objectives and strategies;
- Defining energy efficiency technical regulation;
- Monitoring the results of policies and measures;

Instead, the main roles of Italian Regions in the buildings energy efficiency legislative framework are:

- Technical definition and monitoring of regional energy efficiency certification schemes;

[1] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto.legislativo:2005-08-19;192!vig=

[2] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto.legge:2013-06-04;63!vig=

[3] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:2013-08-03;90!vig=

[4] https://ec.europa.eu/energy/en/april-2015-energy-efficiency-buildings-commission-asks-italy-netherlands-and-poland-comply-eu-rules

- Training and accreditation of operators realizing energy efficiency certifications;
- Monitoring and control (through inspections) of buildings energy efficiency certifications and qualified energy efficiency operators.

f) Implementation network

The implementation network of the energy performance in buildings legislation in Italy is very complex. In fact in Italy energy issues are governed under a system of "concurrent legislative powers". This means that the Regions have legislative powers over energy matters, except for the fundamental principles, which are determined by central Government. The application of this constitutional provision has caused considerable difficulty in terms of harmonizing legislation on energy efficiency in buildings among different Regions.

g) Outcomes

Based on NEEAP 2014 data, the Italian energy performance in buildings scheme achieved in the period 2005-2012 a final energy saving of 2.32 Mtoe/y.

Forecast of final energy savings according to the NEEAP:

Programme	Savings 2005-2012	Savings total 2014-2020
On-site energy consultation	2.16 Mtoe/y	Not available

1.1.2 DISSEMINATION AND AWARENESS INSTRUMENTS/ INFORMATIVE POLICY INSTRUMENTS

General description of the different policies that are described in this chapter

Italy has several dissemination and awareness instruments/informative policy instruments related to the buildings sector. The main national dissemination and informative policy instruments in the building sector are:

- Pilot Projects on multi service smart metering (Deliberation 19 September 2013, 393/2013/R/gas of the AEEG)[5];
- Transparent billing methods (Deliberation 18 November 2008 – ARG/com 164/08 of the AEEG)[6];
- National Green Procurement Plan ("Piano d'Azione Nazionale per il GPP") (D.M. 11 April 2008[7], updated with D.M. 10 April 2013[8]);

[5] http://www.autorita.energia.it/allegati/docs/13/393-13.pdf

[6] http://www.autorita.energia.it/allegati/docs/08/164-08arg.pdf

[7] http://www.minambiente.it/sites/default/files/archivio/allegati/GPP/all.to_3_DI_135_11.04.08_PAN.pdf

- ENEA website "Obiettivo efficienza energetica" (Target: energy efficiency) [9];
- Several dissemination/awareness campaigns on specific energy efficiency themes (all experiences are mapped in the NEEAP – National Energy Efficiency Action Plan 2014);
- Buildings energy efficiency voluntary certification schemes and environmental voluntary certification schemes (Casa Clima[10], Protocollo Itaca[11], LEED….);
- Sustainable Energy Action Plans (SEAPs) (municipal level).

1.1.2.1 Electric Smart Meters

a) General information

In Italy, the replacement of the traditional electricity meters with a wide national smart metering infrastructure started in 2001. Italy (NEEAP, 2014) launched the adoption of smart metering in electricity sector on a voluntary basis, driven by the initiative of national Distribution Service Operators (DSOs), in particular "ENEL Distribuzione" (an Italian state-controlled power provider). The replacement of the traditional electricity meters later became mandatory under a Decision of the Electricity, Gas and Water Authority (AEEG). The Smart Meters national infrastructure was completed on the initiative of "ENEL Distribuzione" which implemented a plan for the installation of about 36.7 million meters between 2001 and 2011 (NEEAP, 2014), well in advance of the mandatory regime. For all these reasons Italy is today a pioneer country at World level in digital electricity metering (ENEL)[12]. These efforts have driven to install electric smart meters in more than 90% of Italian households (Reuters, 2013).

b) Type of policy instrument

The "Electric Smart Meters" measure belongs to the policy type "Dissemination and Awareness instruments". In fact electric smart meters system aim "to provide households with a user-friendly tool that improves awareness of energy behaviour in homes, enabling better management via the visualization of consumption and persuasive tailored information on domestic electricity use" (NEEAP, 2014).

c) Objectives

The "Electric Smart Meters" measure objective is to add functions to electricity and gas meters that can help distributors and sellers to improve their energy services and users to use supply data to improve management of off takes, in line with the "Smart Grid" paradigm. The final objective is to substitute all the Italian electric meters with a smart one (NEEAP, 2014).

d) Target group

[8] http://www.sviluppoeconomico.gov.it/images/stories/normativa/decreto_ministeriale_10aprile2013.pdf

[9] http://www.efficienzaenergetica.enea.it/

[10] http://www.agenziacasaclima.it/it/casaclima/1-0.html

[11] http://www.itaca.org/index.asp

[12] https://www.enel.it/it-IT/eventi_news/news/la-rivoluzione-dei-contatori-elettronici/p/090027d981930477

The “Electric Smart Meters” measure targets groups, within the building sector, are both the final energy users and the Italian Distribution Service Operators (DSOs).

e) Rules and influencing mechanisms

Italian DSOs used their own financial resources for implementing such a system, with remuneration from network tariffs introduced at a later stage. In Italy the tariff system for metering (introduced in 2004) has enabled full recovery of DSOs investments (NEEAP, 2014).

f) Implementation network

The adoption of electric Smart Meters started on a voluntary basis and it was conducted by national DSOs. In a second moment, due to an AEEG decision, smart electric meters became a mandatory roll-out.

g) Outcomes

A study conducted in 2013 on smart meters’ impacts on Italian citizens, found that energy related persuasive communication provided by Italian Smart Meters is effective in reducing electricity consumption in dwellings on average by −18% and up to −57% (D’Oca S., Corgnati S., Buso T., 2013). Moreover, with more than 36 million of installed smart meters in the country (NEEAP, 2014), Italy is the leading European country in this field.

Figure 1: Comparison among smart meters projects in 3 European countries

MS already completed roll-out	Metering points in the Country		Roll-out period Start Date	Roll-out period End Date	Penetration rate by 2020 (%)	SM lifetime (years)
Finland	3 300 000		2009	2013	97%	15 - 25
Italy	36 700 000		2001	2011	99%	15
Sweden	5 200 000		2003	2009	100%	10
MS already completed roll-out	**Investment (CAPEX + OPEX, € mn)**	**Total Benefit (€ mn)**	**Consumers' benefit (%)**	**Energy savings**	**Peak Load shifting**	**Discount rate used**
Finland	692	NA	NA	1-2%	2.0%	NA
Italy	3359	6398	NA	NA	NA	4.5%
Sweden	1500*	1677	19.7%	1 - 3%	NA	NA

Source: NEEAP, 2014

Data on “electric smart meters” final energy savings are not available.

1.1.2.2 ENEA website "Obiettivo efficienza energetica"

a) General information

The ENEA website "Obiettivo efficienza energetica" (Target: Energy Efficiency)[13] was created by ENEA in June 2015 in order to gather all the different thematic webpages created during the years by ENEA in relation to the different energy efficiency policies and measures.

b) Type of policy instrument

The ENEA website "Obiettivo efficienza energetica" belongs to the policy type "Dissemination and awareness instruments". It provides to final users (both private and public authorities) all the required information and links to the main Italian energy efficiency laws and economic supporting schemes.

c) Objectives

The ENEA website "Obiettivo efficienza energetica" objective is to collect in a single website several Italian and European energy efficiency thematic websites. Moreover ENEA website intends to improve the widespread of an energy efficiency culture among different private and public subjects.

d) Target group

The ENEA website "Obiettivo efficienza energetica" target groups are private citizens, business operators and public authorities. In order to target in a more efficient way the different website information, three specific thematic areas were created. Each thematic area has a specific focus based on the needs of the selected target groups.

e) Rules and influencing mechanisms

The ENEA website "Obiettivo efficienza energetica" brings together these thematic ENEA websites:

- Website dedicated to the 65% fiscal deduction for energy efficiency interventions;
- White Certificate Blog;
- Youtube Channel dedicated to energy efficiency in buildings;
- Website for the promotion of energy efficiency in buildings envelopes;
- Website "Obiettivo Efficienza", a general ENEA energy efficiency information webpage.

A specific section is dedicated to energy efficiency news and to the dissemination of thematic contents developed in European and national energy efficiency research projects.

f) Implementation network

The website is fully financed and managed by ENEA. In particular ENEA manages this website through their dedicated energy efficiency information office "Energy Efficiency National Agency" (Agenzia Nazionale Efficienza Energetica)[14]. Public and private energy efficiency subjects participate to the platform sharing their specific news and disseminating their activities and thematic publications.

g) Outcomes

No data on final energy savings related to ENEA website "Obiettivo efficienza energetica" are available.

[13] http://www.efficienzaenergetica.enea.it/

[14] http://www.agenziaefficienzaenergetica.it/

1.1.3 ECONOMIC POLICY INSTRUMENTS

General description of the different policies that are described in this chapter

Italy has several economic policy instruments related to the buildings sector. The main national economic policies in the building sector are:

- Thermal Account (D.M. 28 December 2012[15]);
- Tax deductions (introduced with L. 27 December 2006, n. 296, namely the Budget Law 2007[16] – "Legge finanziaria 2007", and renewed several times with modifications);
- White Certificates (or Energy Efficiency Certificates) scheme and Obligation for national energy distributors (D.M. 20 July 2004[17]);
- Kyoto Fund (introduced with L. 27 December 2006, n. 296, namely the Budget Law 2007 – "Legge finanziaria 2007", and implemented through following acts);
- National Fund for Energy Efficiency ("Fondo Nazionale per l'Efficienza Energetica") (Dlgs. 4 July 2014, n. 102[18]);
- Measures for the energy efficiency in schools ("Misure per l'efficientamento energetico degli edifici scolastici") (D.I. 14 April 2015, n. 66[19]);
- Fund for home purchase and/or renovation ("Plafond Casa")(Cassa Depositi e Prestiti) (D.L. 31 August 2013, n. 102[20], converted into L. 28 October 2013, n. 124[21]).

1.1.3.1 Tax deductions for improving the energy efficiency of buildings

a) General information

Tax deductions for improving the energy efficiency of buildings were introduced in Italy by the Budget Law 2007 (L. 27 December 2006, n. 296[22]) and are still in force since 2007. As tax deductions are not a permanent policy but need annual Parliament approval, their general functioning schemes

[15] http://www.gse.it/it/Conto%20Termico/GSE_Documenti/_DM_28_DICEMBRE_2012_CONTO_TERMICO.PDF

[16] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:2006-12-27;296!vig=

[17] http://www.autorita.energia.it/it/docs/riferimenti/decreto_040720fr.htm

[18] http://www.gazzettaufficiale.it/eli/id/2014/07/18/14G00113/sg

[19] http://www.gazzettaufficiale.it/eli/id/2015/05/13/15A03601/sg

[20] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto-legge:2013-08-31;102

[21] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:2013-10-28;124

[22] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:2006-12-27;296

have changed several times. As evidenced in the Italian NEEAP 2014, "the Government and Parliament have extended the action through 2015 (up to June 2016 for actions on the common parts of buildings) and have raised the tax deduction rate to 65% but have already decided to revise the scheme, with a view to rationalising expenditure, so as to transform the scheme into a structural incentive".

b) Type of policy instrument

"Tax deductions" belong to the policy type "Economic policy instruments". It is a policy recognising specific fiscal and tax benefits to all taxpayers implementing one of the energy efficiency action supported by national Laws.

c) Objectives

The tax deductions scheme aims to provide financial and economic support to families and companies improving energy efficiency of their existing buildings. In particular the Tax deductions scheme supports the following energy efficiency investments (NEEAP, 2014):

- Reduce heating demand by means of overall upgrading of the building's energy performance;
- Improve the building's thermal insulation (replacement of windows, including blinds or shutters, and insulation of roofs, walls and floors);
- Install solar thermal panels;
- Replace winter heating systems (with condensing boilers or heat pumps);
- Replace electrical water heaters with heat pump water heaters.

d) Target group

Target groups are all the Italian taxpayers, including natural persons, professionals, companies undertaking incurring costs for implementing energy efficiency actions in their existing buildings. Both commercial and residential buildings are granted.

e) Rules and influencing mechanisms

The tax deductions scheme (which are granted for both residential and commercial buildings) consists in a reductions of IRPEF (personal income tax) and IRES (corporate income tax) for subjects investing in actions aimed to improve the energy efficiency of an existing buildings. The access to the incentives is limited to those buildings provided with an energy certification. The 2015 tax deductions schemes define the following supporting measures:

- A **65% tax deduction (Ecobonus)** (to be repaid in 10 annual rates) for energy upgrading of existing buildings. It was 55% tax deduction until the end of 2013;
- A **Tax bonus** consisting of a further deduction of 50% for a maximum cost of € 10,000, for the purchase of furniture and appliances with high efficiency, but only for the furnishing of properties subject to deduction of 50% for restructuring.

Since 1 January 2016 tax benefits will be lowered to 36%[23], in line with the spending review process launched at national levels in the last years.

The monitoring system and sanctionary regime are managed by the Italian Revenue Agency[24], which other than guaranteeing the reliability of the applicant documentation, performs randomly-distributed controls and applies monetary fees to non-compliant subjects.

[23] http://www.agenziaentrate.gov.it/wps/content/Nsilib/Nsi/Home/CosaDeviFare/Richiedere/Agevolazioni/Detrazione+riqualificazione+energetica+55/Scheda+informativa+riqualificazione+55/

f) Implementation network

Several national institutions are involved in the tax deductions implementation network. As the tax deductions scheme is not a permanent policy, each year the national Parliament has to agree the continuation of this program and the amount of dedicated money. The savings reported in the application for tax deductions are checked for congruity by ENEA. On its part, the Revenue Agency (Agenzia delle Entrate) performs tax spot-checks to verify the correctness of the tax deductions claimed against invoiced expenses (NEEAP, 2014).

g) Outcomes

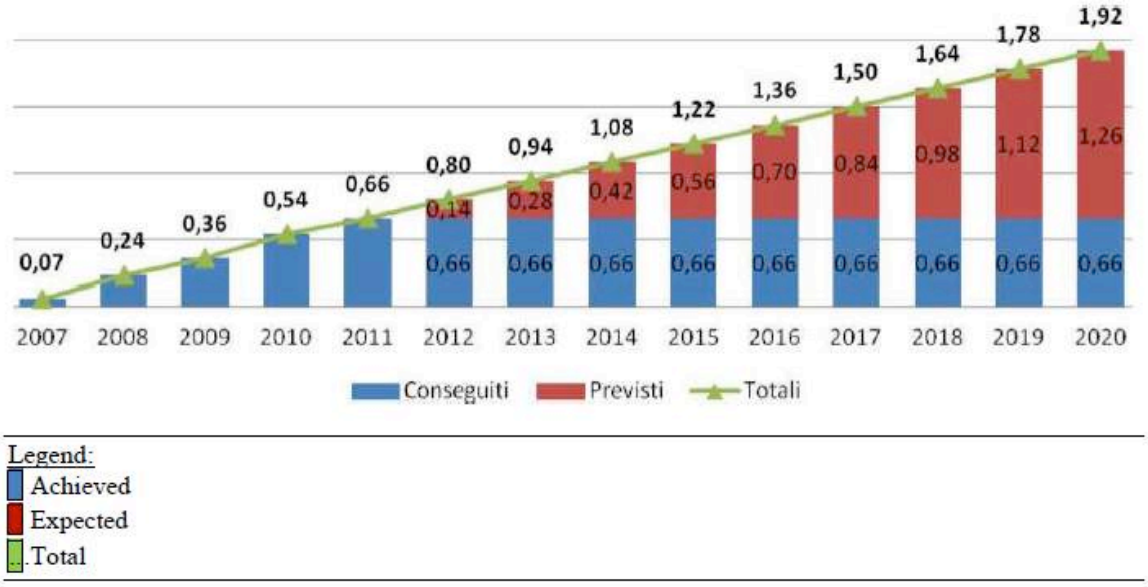
Tax deductions have been the key drivers of energy efficiency improvements in the housing sector in Italy (NEEAP, 2014). The total number of actions implemented has generated final energy savings of an average 0.86 Mtoe/year, corresponding to more than 2 million tonne/year of avoided CO_2 emissions.

Forecast of final energy savings according to the NEEAP are:

Programme	Savings 2005-2012	Savings total 2014-2020
Tax deduction	3.61 Mtoe (data available only for the 2007-2012 period)	10.4 Mtoe

[24] For further information, see: http://www.agenziaentrate.gov.it/wps/file/Nsilib/Nsi/Agenzia/Agenzia+comunica/Prodotti+editoriali/Guide+Fiscali/Agenzia+informa/pdf+guide+agenzia+informa/Guida_Le_sanzioni_tributarie_e_penali.pdf

Figure 2: Final annual energy savings achieved since the launch of the scheme and expected savings (Mtoe)



Source: Ministry of Economic Development, 2014b

1.1.3.2 Thermal Account

a) General information

The Thermal Account, introduced by D.M. 28 December 2012, is the first nationwide direct incentive scheme for the generation of renewable thermal energy. Moreover it is the first scheme encouraging public authorities to implement energy efficiency actions in their buildings (NEEAP, 2014). The Thermal Account became operational in July 2013. The decree Dlgs. 4 July 2014, n. 102, established a cap of 65% of the capital costs as a maximum subsidy.

b) Type of policy instrument

The Thermal Account belongs to the policy type "Economic policy instruments". It is a policy providing economic incentives to private and public subjects producing and using renewable thermal energy.

c) Objectives

The Thermal Account aims to provide subsidies for the installation of renewable heating and cooling systems, as well as for energy efficiency refurbishments. The Thermal Account intends to support the following energy efficiency actions:

- Thermal insulation of walls;
- Replacement of transparent vertical structures (windows);
- Installation of screening and shading systems;
- Replacement of heating systems with condensing boilers;
- Replacement of heat generators with electrical and gas heat pumps, including heat pumps for the production of sanitary hot water;

- Replacement of heat generators with biomass-fed heat generators, heating fireplaces and stoves;
- Installation of solar thermal collectors and solar cooling systems.

d) Target group

The Thermal Account target groups are public authorities and non-industrial private parties like individuals, condominiums, business and farms (NEEAP, 2014).

e) Rules and influencing mechanisms

Two categories of projects are eligible to benefit from the scheme: energy efficiency improvements in existing buildings and small-scale projects concerning systems producing thermal energy from renewable and high-efficiency systems. For the first Thermal Account Government plan, a budget of € 7 million was available for public entities and € 23 million for private ones. The maximum power limit in order to qualify for the incentive is 1,000 thermal kW or 1,000 gross m2 of surface area for thermal solar systems. In the case of energy efficiency actions, an expenditure ceiling has been set for each type of action. The incentive covers part of the costs incurred and is paid out in annual instalments for a period from 2 to 5 years according to the actions implemented. The cap of the incentive scheme was set at €200 million for public entities and at €700 million for private persons. Once the cap is reached, this funding level will be reassessed (NEEAP, 2014). Penalties (monetary fees) are imposed on the obligated parties in cases of non-compliance, as envisaged in the art. 23(3) of the Dlgs n. 28/2011. The GSE manages the monitoring regime, together to several sub-entities which act in belief of the GSE. In case of non-compliance, the GSE reports the violations to the local authorities which apply specific sanctionary measures.

f) Implementation network

Several national institutions are involved in the Thermal Account implementation network. **GSE** (Italy Energy Service Operator) is in charge of implementing and managing the scheme. It also awards, disburses and revokes incentives and it is in charge of monitoring and checks. **ENEA** (Italian Energy Agency) assists GSE in preparing the technical rules for implementing the measure and takes part in the verifications and checks. It also provides specialist assistance to GSE in monitoring activities and, in cooperation with GSE, draws up an annual report. The **Authority for Electricity and Gas** (AEEG) prepares the model contract between GSE and the beneficiaries and defines the manner whereby the funding for the incentives will be drawn from the income from natural gas tariffs (NEEAP, 2014).

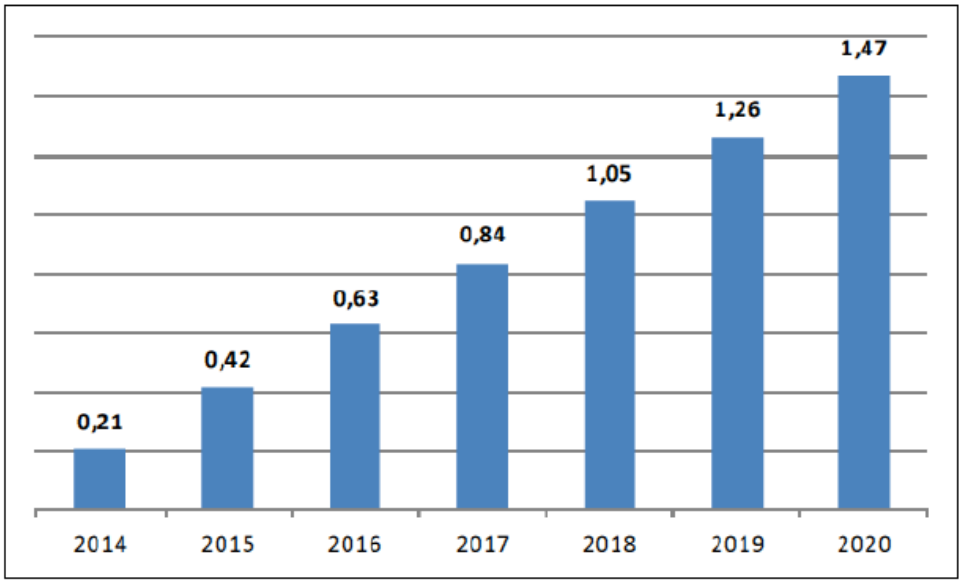
g) Outcomes

As evidenced in NEEAP 2014, "several simulations quantify the expected savings in a cumulative value of about 5.88 Mtoe of end-use energy over the period 2014-2020. In greater detail, the 1.47 Mtoe/y total savings to 2020 will come mainly from the services sector (0.93 Mtoe/y), while the remaining 0.54 Mtoe/y will come from the residential sector" (NEEAP, 2014).

Forecast of final energy savings according to the NEEAP:

Programme	Savings 2009-2013	Savings total 2014-2020
On-site energy consultation	(Thermal Account started in 2013)	5.88 Mtoe

Figure 3: Expected annual final energy savings from the Thermal Account (Mtoe)



Source: NEEAP, 2014

1.1.3.3 White Certificates (Energy Efficiency Certificates)

a) General information

The White Certificates system was introduced in the Italian legislation by ministerial decrees D.M. 20 July 2004. It foresees that distributors of electricity and natural gas annually reach specific quantitative goals of primary energy savings, expressed in tonnes of equivalent oil saved (TOE). A certificate is equivalent to saving one ton of oil equivalent.
The White Certificates scheme was amended several times during the years[25]. The characteristics of obliged actors were reviewed, the energy efficiency targets were made more stringent, the implementation times were extended and the so-called "large projects" were introduced. Large Projects are energy efficiency projects concerning relevant infrastructures, industrial processes, or linked to interventions in the transport sector, which generate, in a year, savings of no less than 35,000 toe and which have a technical life exceeding 20 years. For these projects a specific financial treatment was introduced.

b) Type of policy instrument

The White Certificates system belongs to the policy type "Economic policy instruments". It is a policy combining a regulatory/obligation policy with the generation of economic resources to be used to financially support energy efficiency projects.

c) Objectives

The White Certificates scheme aims to promote end-use energy savings both in residential and industrial sectors.

[25] See for a complete framework of all the changes IEA Energy Efficiency. Policies and Measures databases. Italy. http://www.iea.org/policiesandmeasures/energyefficiency/?country=Italy

d) Target group

Target groups are Italian electricity and gas distributors. Italian electricity and gas distributors with at least 50,000 end-user customers are the obligated parties. Voluntary participants are distributors with less than 50 000 customers, energy services companies, entities required to appoint an energy manager, entities which have voluntarily appointed an energy manager, entities that have implemented an energy management system conforming with ISO 50001 (NEEAP, 2014).

e) Rules and influencing mechanisms

Electricity and gas distributors may fulfil their energy efficiency national obligation by implementing energy efficiency projects entitled to White Certificates or by buying White Certificates from other parties in the Energy Efficiency Certificates Market that is organised by GME. Energy service providers, subsidiaries of electricity and gas distributors and distributors themselves will all sell energy efficiency certificates each representing primary energy savings. Distribution companies must meet specified energy savings targets, either by implementing energy conservation projects that benefit their customers, which will earn them White Certificates, or through the purchase of White Certificates produced by energy conservation projects undertaken by others.

The White Certificates represent marketable documents issued by the Energy Market Administrator (GME) testifying the energy saved by the energy distribution companies - as well as by their controlled partnerships - and by the ESCOs. A simplified methodology, by "technical cards"[26], is used to determine the quantification of primary energy savings. Savings achieved under the scheme must be additional to measures that would be normally implemented, including those implemented to meet new legal requirements. Reference conditions are thus continuously updated to account for regulatory and market changes. The White Certificates can be exchanged by means of bilateral contracts, or in the frame of a specific market ruled by GME.

Three types of white certificates can be produced and traded. Type I certificates are for savings achieved in the electricity sector, Type II certificates for those achieved in the gas sector, and Type III for those in neither sector (from other fuels). Penalties are imposed on the obligated parties in cases of non-compliance (NEEAP, 2014).

In particular, the monitoring system of the White Certificates scheme in Italy is not executed on the entire applicants population, but relies on randomly-distributed checks. The checks are performed by the GSE through several sub-entities which are responsible for verifying the accuracy and reliability of the requested documents as specified in the Dlgs. 3 March 2011, n. 28. Once the check is concluded, such entities report to GSE the final response which allows for receiving the incentives. When control subjects, which include also local authorities such as the Municipal Police, report non-compliant actions (such as falsification of documents, information or infringement of local building regulations), a sanctionary system also applies. The GSE, through the local authorities, is allowed to impose monetary sanctions to non-compliant applicants and, in case of repeated violations, it can also suspend the incentive scheme up to six months.

f) Implementation network

Several national institutions are involved in the White Certificates implementation network. **GSE** (Energy Service Operator) is in charge of implementing, assessing and certifying the savings. On May of each year GSE verifies whether the obligated parties have achieved their target. The **Ministry for Economic Development**, in agreement with **the Ministry for the Environment**, sets periodically the

[26] http://www.gse.it/it/CertificatiBianchi/Modalit%C3%A0%20di%20realizzazione%20dei%20progetti/Schede%20tecniche/Pagine/default.aspx

national energy efficiency targets to be achieved by the obligated parties. The applications for the White Certificates undergo technical and administrative assessment by **ENEA** (National Energy Agency) or **RSE** (a GSE technical office). **GME** (the energy markets' operator) issues the certificates after completing the assessment and manages the certificates trading mechanisms.

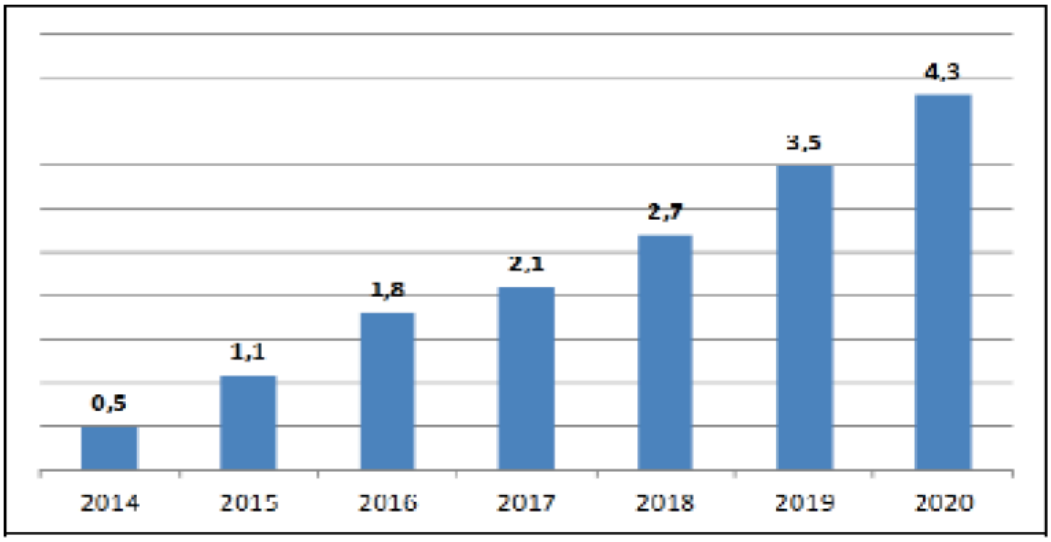
g) Outcomes

The NEEAP 2014 shows the predicted annual savings, yielding a cumulative value of about 16.03 Mtoe of final energy. The 4.3 Mtoe/y achievable by 2020 through projects implemented in the period 2014-2020 are increased by the sum of 1.2 Mtoe/y savings from the projects implemented over the period 2011-2013. Thus, the total expected savings by 2020 from actions over the period 2011-2020 comes to 5.45 Mtoe/y.

Forecast of final energy savings according to the NEEAP:

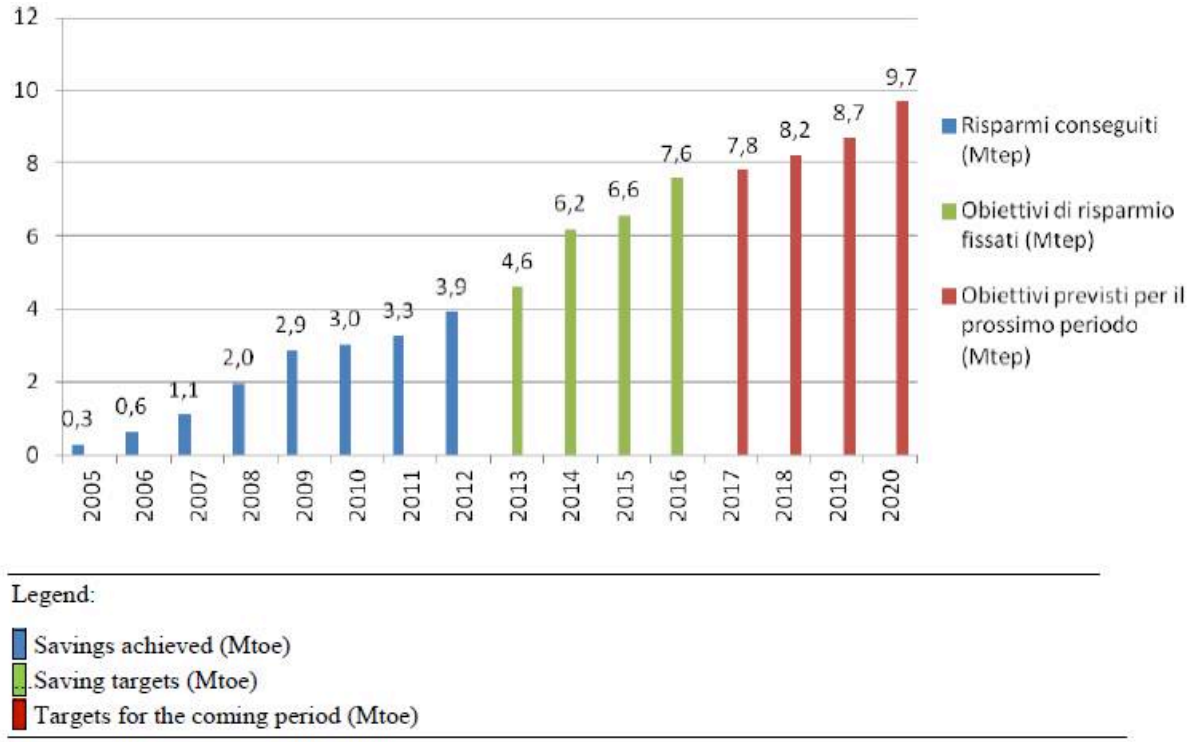
Programme	Savings 2005-2012	Savings total 2014-2020
On-site energy consultation	22.4 Mtoe	16.03 Mtoe

Figure 4: Expected annual final energy savings under the White Certificates mechanism (Mtoe)



Source, NEEAP, 2014

Figure 5: Past and forecast annual primary energy savings under the White Certificates scheme



Source: Ministry of Economic Development, 2014b

1.1.3.4 Kyoto Fund

a) General information

The Kyoto Fund is a revolving fund supporting GHG emission reduction projects, managed by "Cassa Depositi e Prestiti" (Deposit and Loan Fund). The Kyoto Fund was activated in 2012. In 2014 the Kyoto Fund was ended and the residual economic resources were directed to a "National Fund for youth employment in the Green Economy Sector"[27].

b) Type of policy instrument

The Kyoto Fund belongs to the policy type "Economic policy instruments". It provides discounted loans to public and private subjects interested in financing GHG emission reduction projects.

c) Objectives

The Kyoto Fund aimed to provide discounted loans to public and private subjects interested in financing GHG emission reduction projects in accordance to the Kyoto Protocol. In particular the Kyoto Fund intended to support investments in the following energy efficiency technologies:

- Micro-cogeneration;
- Renewables;

[27] http://www.nextville.it/Archivio_Incentivi_e_agevolazioni/960/Archivio_Fondo_rotativo_per_Kyoto

- Electric motors;
- Energy reduction in end-use;
- "Nitrous oxide measures".

d) Target group

Kyoto Fund target groups are Small and Medium Enterprises (SMEs), ESCOs, national and local public authorities, condominiums and individuals with a legal entity (Cassa Depositi e Prestiti, 2012).

e) Rules and influencing mechanisms

The Kyoto Fund had a total budget of € 600 million, to be paid out in three one-year cycles of € 200 million each. The subsidised projects obtained loans with a duration of 3 to 6 years (3 to 15 for public authorities) with six-monthly instalments at a fixed annual interest rate of 0.5%.

f) Implementation network

The Kyoto Fund was managed by "Cassa Depositi e Prestiti" (Deposit and Loan Fund), the joint-stock company under public control (Italian government holding 80.1% and a broad group of bank foundations holding 18.4%, the remaining 1.5% in treasury shares). The economic resources to be allocated were decided by the Central Government. The Kyoto Fund economic resources were allocated through the national bank system.

g) Outcomes

No final energy savings related to Kyoto Fund are documented in Italian NEEAPs.[28]

1.1.4 CAPACITY BUILDING AND NETWORKING

General description of the different policies that are described in this chapter

Italy has several capacity building and networking instruments related to the buildings sector. The main national capacity building and networking instruments policy in the building sector are:

- Integrated plan for the uptake of energy efficiency ("Piano integrato di diffusione dell'efficienza energetica", PIDEE)(Dlgs. 4 July 2014, n. 102[29]);
- General conference on Energy Efficiency ("Stati Generali Efficienza Energetica"[30])(ENEA);
- ENEA training platform and e-learning courses for experts on energy efficiency in buildings[31].

[28] The demand for these funds has been very limited (ENEA, 2014), especially for local micro-cogeneration and electric motors. For this reason the fund was interrupted in 2013.

[29] http://www.gazzettaufficiale.it/eli/id/2014/07/18/14G00113/sg

[30] http://www.statigeneraliefficienzaenergetica.it/

[31] http://www.formazione.enea.it/

1.1.4.1 ENEA training platform and e-learning courses for experts on energy efficiency in buildings.

a) General information

"ENEA e-learn" platform[32] is an online repository of thematic courses on energy efficiency and renewable energy. These courses were thought both for energy efficiency experts (technician, installers, etc.) and for national and local public authorities working on these themes.

Figure 6: Homepage of ENEA energy efficiency training platform

b) Type of policy instrument

[32] http://www.formazione.enea.it/

"ENEA e-learn" platform belongs to capacity building policies. In fact "ENEA e-learn" platform provides training materials and thematic courses aimed to increase the technical skills of private and public subjects operating in buildings energy efficiency sector.

c) Objectives

The "ENEA e-learn" platform objective is to improve the energy efficiency skills of professionals and regional and local public authorities, both in Italy and abroad.

d) Target group

The "ENEA e-learn" platform target groups are both energy efficiency experts (technician, installers, etc.) and national and local public authorities working on energy efficiency themes.

e) Rules and influencing mechanisms

The "ENEA e-learn" platform provides energy efficiency and renewable energy thematic courses. These courses are both:

- E-learning courses;
- Traditional lessons.

The platform was so successful that ENEA was committed to provide specific training courses to Italian regions and provinces using the materials contained in this e-learning platform. All the experts attending these courses were rewarded with a specific certification.

f) Implementation network

"ENEA e-learn" platform is fully managed and financed by ENEA trough their "Training and technology knowledge transfer service" (Servizio Formazione e Informazione dell'Unità Trasferimento Tecnologico).

g) Outcomes

Over 200 online courses and 300 video lectures are available for free on the "ENEA e-learn" platform[33]. No data on final energy savings related to this measure are available.

1.1.5 POLICY INSTRUMENTS FOR THE PROMOTION OF ENERGY SERVICES

General description of the different policies that are described in this chapter

Italy has only few policies related to the promotion of energy services. The most important policy in energy services promotion is:

- Definition of ESCOs and set-up of a voluntary national certification scheme for ESCOs (Dlgs. 30 May 2008, n. 115[34]).

[33] http://www.formazione.enea.it/index.php?option=com_content&view=article&id=3&Itemid=105

[34] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto.legislativo:2008-05-30;115~art11!vig=

1.1.5.1 Voluntary national certification scheme for ESCOs

a) General information

The first Italian definition of Energy Service Companies (ESCOs) was detailed in the legislative decree Dlgs. 30 May 2008, n. 115. This definition represents the first fundamental step for the full development of the ESCOs market in Italy. Later, in 2011, AEEG launched a voluntary accreditation scheme for ESCOs. Today this voluntary accreditation scheme is based on the ESCOs technical quality requirements defined in UNI CEI 11352:2014 (Energy management - Energy services companies (ESCO) - General requirements, checklist for verification of organization requirements and service offer contents)[35].

b) Type of policy instrument

The "Voluntary national ESCOs certification scheme" belongs to policy instruments for the promotion of energy services. It defines an accreditation system certifying the managerial and economic quality of an ESCO operating in Italy.

c) Objectives

The "Voluntary national certification scheme for ESCOs" objective is to check and assess the quality of an ESCO operating in Italy, both from the managerial and economic point of view.

d) Target group

The "Voluntary national ESCOs certification scheme" target groups are all the Energy Service Companies operating in Italy.

e) Rules and influencing mechanisms

The voluntary ESCOs accreditation is based on the technical norms defined by UNI CEI 11352:2014. This standard "defines general requirements and a checklist for their verification in an energy service company (ESCO) providing to its customers energy efficiency services compliant to UNI CEI EN 15900, with guarantee of results. Especially, it defines general requirements and capacities (organizational, diagnostic, designing, managing, economic and financial) that an ESCO shall demonstrate to have in order to offer energy efficiency services and other specific activities, here described too, to its own final customer. Moreover it gives a check list to be used for the verification of ESCO's capacities and the minimum content of the contractual offer of an energy efficiency improvement service supplied by an ESCO, and guidance for the management of a second and third party audit for certification scope" (UNI CEI, 2014)[36].

Under national legislation, the ESCO's organisational chart must include a manager with appropriate skills in the management of energy and the energy markets and a technician with appropriate design competence in the project areas (NEEAP, 2014). Consequently, it is advisable for ESCOs to have one or more managers fulfilling the profile of the Energy Manager and at least one certified EME (Energy Management Expert).

f) Implementation network

The Italian ESCOs accreditation system is managed by GSE (earlier these activities were in charge to AEEG) through an online accreditation platform[37]. The Technical requirements were defined by UNI -

[35] http://store.uni.com/magento-1.4.0.1/index.php/uni-cei-11352-2014.html

[36] http://store.uni.com/magento-1.4.0.1/index.php/uni-cei-11352-2014.html?___store=en&___from_store=it

[37] http://www.gse.it/it/CertificatiBianchi/Accreditamento%20Operatori/Pagine/default.aspx#2

Italian Organization for Standardization (Ente Italiano di Normazione)[38], a private association responsible for the definition of technical voluntary norms in Italy.

g) Outcomes

As evidenced in NEEAP 2014, "the ESCO sector in Italy is quite diverse, with 1,900 units registered with AEEG in 2011. But the companies operating routinely in the sector (in particular within the White Certificates scheme) are just 15% of the total, about 390 operators". There aren't available data on final energy savings related to this policy.

1.1.6 POLICY INSTRUMENTS FOR RESEARCH AND DEVELOPMENT AND BEST AVAILABLE TECHNOLOGY (BAT) PROMOTION

General description of the different policies that are described in this chapter

Italy has several research and development and best available technology promotion instruments related to the buildings sector. The main national research and development and best available technology promotion instruments in the building sector are:

- National Electric System Research (ENEA[39], CNR[40] and RSE[41] carry out R&D activities on urgent and strategic issues which have results for the benefit of the national electric system users as a whole);
- National "Smart Cities and Communities and Social Innovation" funds (2012 and 2013) (Director Decree 5 July 2012, N.391/Ric)[42];
- National prize for energy efficiency measures (GSE's "Premio Efficienza Energetica");
- ENEA reports on energy efficiency best available technologies.

1.1.6.1 National Electric System Research

a) General information

Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), National Research Council (CNR) and Research centre on energy system (RSE) carry out R&D activities on urgent and strategic issues, which have results for the benefit of the national electric

[38] http://www.uni.com/

[39] Italian National Agency for New Technologies, Energy and Sustainable Economic Development. URL: http://www.enea.it/en/home?set_language=en&cl=en

[40] National Research Council. URL: http://www.cnr.it/sitocnr/Englishversion/Englishversion.html

[41] Ricerca sul Sistema Energetico S.p.a. URL: http://www.rse-web.it/Missione.page?country=eng

[42] http://attiministeriali.miur.it/anno-2012/luglio/dd-05072012.aspx

system users as a whole (IEA, 2015). In order to support these R&D activities, the Italian central government allocates specific economic resources. Moreover, it defines a three year plan in order to coordinate the different research activities carried out by these national research offices.

b) Type of policy instrument

The National Electric System Research belongs to the policy type "Policy instruments for research and development and best available technology promotion". It set up economic resources to finance energy R&D activities at national level.

c) Objectives

The National Electric System Research objective is to finance research activities aimed to supporting national and regional local authorities in taking/defining the most effective energy efficiency policies based on real data and research activities.

d) Target group

The National Electric System Research target groups are national authorities (in particular Ministries with specific competencies on energy efficiency and government authorities which often consult these national technical authorities before launching a new legislative proposal) and regional public authorities.

e) Rules and influencing mechanisms

At national level, there are three main technical organizations with a key role in Italian buildings energy efficiency policies and measures definition. These key national technical organizations are:

- **Organization for New Technologies, Energy and the Environment (ENEA)** is the national energy agency. ENEA performs research activities and provides agency services in support to public administrations, public and private enterprises, and citizens. Specifically, ENEA is concerned with energy efficiency, renewable energy sources, nuclear energy;
- **National Research Council (CNR)**. CNR is the largest public research institution in Italy, the only one under the Research Ministry performing multidisciplinary activities . Its role is to promote innovation and competitiveness of the national industrial system, to promote the internationalization of the national research system, to provide technologies and solutions to emerging public and private needs.
- **Electric Systems Research (RSE)**. RSE is a joint stock company, whose unique shareholder is GSE SpA, which develops research in electro-energy, with a particular focus on the strategic national projects of general public interest, financed by the Italian Electricity System Research Fund (Fondo per la Ricerca di Sistema) of the Italian Economic Development Ministry. RSE's activity topics concern electricity system innovation, its technological development and topics of general interest such as efficiency, economics and material, process and device experimentation.

The Decree of the Ministry of Economic Development D.M. 19 March 2009 set a floor of € 210 million on available funds for the 2009-2011 triennium, subdivided into: a) management and development of the national electric system (€ 79mill); b) electricity production and environmental protection (€ 56mill); c) rationalization and saving of electricity use (€ 75 mill). The Ministry of Economic

Development issued a new decree approving a three-year plan to finance research activities in the field of electricity system (D.M. 9 November 2012)[43](IEA, 2015).

f) Implementation network

The Central government, in accordance with the Ministry of Economic Development, set up funds to be allocated to national R&D activities. ENEA, CNR and RSE have their own elected administrative bodies managing these funds and define the specific implementation activities to be launched.

g) Outcomes

No data on final energy savings related to this measure are available in national NEEAPs.

[43] http://www.gazzettaufficiale.it/eli/id/2013/01/30/13A00674/sg

1.1.7 SUMMARY TABLE FOR THE BUILDINGS SECTOR IN ITALY

Summary table: Buildings					
Policy instruments	**Short list of implemented policies and measures**	**Objective**	**Target group and targeted objects**	**Rules and influencing mechanism** (motivation or punish non-compliance)	**Implementation network**
Regulatory policy instruments	Energy Performance in buildings	Improve energy performance of new and existing buildings	Private house owners and public authorities	Compulsory buildings energy efficiency targets.	National government; Regional Authorities
Dissemination and awareness instruments/Informative policy instruments	Electric Smart Meters	Improve awareness of households behaviours	Final energy users and Distribution Service Operators (DSOs)	Voluntary action of Italian DSOs	DSOs and AEEG
	ENEA Website "Obiettivo Efficienza Energetica"	Widespread energy efficiency culture	Citizens, business operators and public authorities	ENEA initiative	ENEA
Economic policy instruments	Tax deductions	Provide financial and economic support for energy efficiency projects	Citizens and companies	65% tax deduction + Tax bonus for energy efficient furniture and appliances	National Government, ENEA, Revenue Agency (Agenzie delle Entrate)
	Thermal Account	Subsidies for installation of renewable heating and cooling systems	Public authorities and non-industrial private parties	Economic incentive covering a part of the total costs (spread from 2 o 5 years according to project type)	GSE, ENEA, AEEG.
	White Certificate	Promote end-use energy savings in residential and industrial sectors	Italian electricity and gas distributors; ESCOs; entities requiring an energy manger; voluntary participants.	Tradable energy savings certificates (1 certificate =1 TOE)	GSE; GME; ENEA; RSE; Minister for Economic Development
	Kyoto Fund	Provide discounted	Small and medium	Revolving fund with a total	Cassa Depositi e Prestiti; Central

		loans to GHG emissionis reduction projects	enterprises; public authorities; individuals with legal entities	budget of € 600 billion	Government.
Capacity building and networking	ENEA training platform and e-learning courses	Improve energy efficiency skills and disseminate energy efficiency information	Energy Efficiency experts; national and regional public authorities	Thematic training courses for experts	ENEA
Policy instruments for the promotion of energy services	Voluntary national certification scheme for ESCOs	Certificate the quality of ESCOs operating in Italy	ESCOs operating in Italy	Certification of ESCOs quality based on UNI CEI 11352:2014	GSE; AEEG
Policy instruments for Research and Development and BAT promotion	National Electric System Research	Promote energy efficiency R&D activities	National and regional public authorities	Research and consultancy activities	Ministry of Economic Development; National Government

1.2 POLICY INSTRUMENTS IN THE TRANSPORT SECTOR

Based on the relevance given in the national NEEAPs and on the expert assessment of Bocconi University-IEFE research team, 5 key policy instruments among those in force for the energy efficiency in the transport sector have been selected for a deeper description and analysis.

They are presented in the following paragraphs divided according to policy type (planning instruments, regulatory instruments, economic instruments, information and awareness instruments, Policy instruments for Research and Development).

1.2.1 PLANNING INSTRUMENTS

General description of the different policies that are described in this chapter

Italy has several planning instruments related to the transport sector. The main national transport planning instruments are:

- Italy's National Plan for Logistics 2011/2020 (Piano Nazionale della Logistica 2011-2020) (Ministry of Transport note prot. 567/CGA 30 may 2012[44]);
- National Strategic Plan for Ports and Logistic (Piano Strategico Nazionale della Portualità e della Logistica[45]) (Ministry of Transport 2015);
- National infrastructure plan to set up electric vehicle charging points (Piano Nazionale Infrastrutturale per la ricarica dei veicoli alimentati ad energia elettrica, PNIRE) (L. 7 August 2012, n.134[46]);
- National Action Plan for Intelligent Transport System (Piano di Azione Nazionale sui Sistemi Intelligenti di Trasporto) (D.M. 12 February 2014, n.44[47]);
- Promotion of use of biomethane in transports. (Dlgs. 3 March 2011, N.28, Article 8[48]);
- Five years bus fleet renewal plan (Piano quinquennale per il rinnovo del parco mezzi del trasporto passeggeri su gomma) (L. 27 December 2014, N.147[49]);
- Contract for the development of the national rail infrastructures (Contratto di Programma 2012-2016. Parte Investimenti) (Report to Italian Senate 3 February 2015 n.21[50]);

[44] http://www.mit.gov.it/mit/mop_all.php?p_id=12968

[45] http://www.mit.gov.it/mit/mop_all.php?p_id=23291

[46] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:2012;134

[47] http://www.mit.gov.it/mit/mop_all.php?p_id=17744

[48] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto.legislativo:2011-03-03;28

[49] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:2013-12-27;147

[50] http://serviziparlamentari.com/index.php?option=com_mtree&task=att_download&link_id=1166&cf_id=72

- Sustainable Urban Mobility Plans, SUMP (Piani Urbani per la Mobilità Sostenibile);
- National Green Procurement Plan (Piano d'Azione Nazionale per il GPP) (D.M. 11 April 2008, updated with D.M. 10 April 2013[51]);
- Sustainable Energy Action Plan, SEAPs (Piani d'Azione per l'Energia Sostenibile).

Among all these planning instruments, the "National infrastructure plan to set up electric vehicle charging points" (PNIRE) has been chosen for a deeper analysis as it is expected to have a big impact on the spread of electric vehicles in Italy.

1.2.1.1 National infrastructural plan to set up electric vehicle charging points

a) General information

In 2013 the Italian Ministry of Infrastructure and Transport, with Law 134/2012 (L. 7 August 2012, n.134)[52], set up a "National infrastructure plan for installing electric vehicles charging points" (PNIRE)[53] to ensure an uniform spreading of electric charging points across the national territory to 2020.

b) Type of policy instrument

The "National infrastructural plan to set up electric vehicle charging points" belongs to the policy type "Planning instruments". It set up a national strategy to 2020 for the construction of a widespread national electric charging points network.

c) Objectives

PNIRE main objective is to develop a national wide electric charging points network with common technical and operational standards. More specifically, in the short term (1-2 years), an infrastructure network will be set up with charging points in urban and metropolitan areas. In the medium and long term (3-5 years) charging points will also be set up in non-urban areas and along the motorways (PNIRE, 2013).

d) Target group

"National infrastructure plan for installing electric vehicles charging points" main target groups are Regions and local authorities. Moreover it involves the main national energy distributors interested in the construction and operation of the charging points (for example the Italian energy distributors ENEL, A2A, etc.).

e) Rules and influencing mechanisms

The PNIRE foresees two main phases for a full development of an Italian wide electric charging points network:

[51] http://www.sviluppoeconomico.gov.it/images/stories/normativa/decreto_ministeriale_10aprile2013.pdf

[52] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:2012-08-07;134

[53] For further information, see http://www.mit.gov.it/mit/site.php?p=cm&o=vd&id=2983

- Phase 1 (2013-2016) dedicated to the definition and development of electric charging points common operational and construction standards. Moreover PNIRE phase 1 is dedicated to the definition, development and implementation of the required national policies able to contribute to the development of an electric mobility in Italy;
- Phase 2 (2017-2020) dedicated to the consolidation of the Phase 1 results and to the construction of the national charging infrastructures.

One of the key aspects of PNIRE is related to the definition of national standard electric charging protocols in line with the main international and European standards. In particular 4 main typologies of charging points protocols were developed (PNIRE, 2013):

- Mode 1. Slow charging from a household-type socket-outlet;
- Mode 2. Slow charging from a household-type socket-outlet with an in-cable protection device;
- Mode 3. Slow or fast charging using a specific EV socket-outlet with control and protection function installed;
- Mode 4. Fast charging using an external charger.

In order to implement the plan, the Ministry of Infrastructure and Transport has provided for the establishment of an ad-hoc fund with a budget of EUR 20 million for 2013 and EUR 15 million for each of the years 2014 and 2015. In July 2013 the Ministry issued a "Call in favour of the Regions to fund a network of electric vehicle charging points" (NEEAP, 2014).

f) Implementation network

There are several public and private subjects participating in the PNIRE implementation network. In fact the charging points will be both public and private, in a ratio of 1 to 8. The main PNIRE coordination actions are in the hand of Ministry of Infrastructure and Transport, which defined the general framework. For the regulatory and standardization aspects, both national technical offices (AEEG and ENEA) and national and international standardization associations like ISO and CEI were involved. Moreover the construction and realization of the charging infrastructures are entrusted to Regions and to interested energy distributors (Enel S.p.A, A2A S.p.A, etc.).

g) Outcomes

As PNIRE has a 2020 prospective, no data on outcomes are yet available.

1.2.2 REGULATORY POLICY INSTRUMENTS

General description of the different policies that are described in this chapter

Italy has several regulatory policy instruments related to the transport sector. The main national transport regulatory policy instruments are:

- Vehicle Certification. Vehicle CO_2 emissions standards (several national laws compliant with European policies on theme);

- Renewable energy in transport sector. (Dlgs. 3 March 2011, N.28[54]);
- Urban Traffic Plans (Piano Urbano del Traffico) (Dlgs. 30 April 1992, N.285[55]);
- Obligation for national fuel producers to input into consumption 1% of biofuels of total traditional fuel. (L.11 March 2006, n. 81[56]);
- National quality standards for biofuels (AEEG Resolution 160/2012/R/GAS[57]);
- Minimum Environmental Criteria for the acquisition of vehicles for road transport (Criteri Minimi Ambientali per l'acquisizione dei veicoli adibiti al trasporto su strada) (D.M. 8 May 2012[58]);
- Limits to polluting vehicles (Regional legislations).

Among these regulatory policy instruments, "Obligation to input into consumption biofuels" was chosen for a deeper analysis as it had a relevant impact on innovation of transport fuel markets in Italy.

1.2.2.1 Obligation to input into consumption biofuels

a) General information

With Legislative Decree 128/2005 (Dlgs. 30 May 2005, n. 128[59]), Italy adopted the EU Directive 2003/30/EC (Biofuels Directive) on the promotion of biofuels in the transport sector. The decree, in accordance with the EU Directive objectives, defines annually obligatory biofuels targets (in percentage) to be inputted into traditional fuels national markets. The obligatory biofuels percentages to be inputted each year on the national market are calculated on the basis of energy content of the fuel and apply to petrol and diesel fuel for transport purposes placed on the national market. Italy set as mandatory for national suppliers of petrol and diesel (obligated parties) to annually input in the national territory ("release for consumption") a minimum quantity of biofuel. These obligatory biofuels input quotas are defined year by year (GSE, 2013).

b) Type of policy instrument

The "obligation to input into consumption biofuels" belongs to the policy type "Regulatory Policy Instruments". In fact this policy sets annually compulsory objectives to be reached with sanctions for the national fuels suppliers not attending their obligations.

c) Objectives

[54] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto-legislativo:2011-03-03;28

[55] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto.legislativo:1992-04-30;285

[56] https://www.politicheagricole.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/3457

[57] http://www.autorita.energia.it/allegati/docs/12/160-12.pdf

[58] http://www.minambiente.it/sites/default/files/archivio/allegati/GPP/gu_128_dm.pdf

[59] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto.legislativo:2005-05-30;128

The "Obligation to input into consumption biofuels" objectives are to support the growing of national biofuels production and supply chains[60] and to increase the use of biofuels among final consumers.

Figure 7: Annual Italian biofuels objectives 2006-2012

Anno di riferimento	Quota minima	Riferimento legislativo
2006	1%	Art. 2-quater, comma 2 Legge 11 marzo 2006, n. 81
2007	1%	Art. 1, comma 368 Legge 27 dicembre 2006, n. 296
2008	2%	
2009	3%	Art. 139 Legge 24 dicembre 2007, n. 244
2010	3,50%	Decreto MiSE 25 gennaio 2010
2011	4%	
2012	4,50%	

Source: GSE, 2013

d) Target group

The "Obligation to input into consumption biofuels" target groups are both the producers of biofuels and the traditional fuel sellers.

e) Rules and influencing mechanisms

The Italian government has defined annually obligatory biofuels targets (in percentage) to be inputted into traditional fuels national markets. The share of biofuels to be inputted into consumption is calculated based on the total calorific value of gasoline and diesel fuel supplied in the previous year (GSE, 2013). As a tool for monitoring the compliance of obliged subjects with the national targets, a "Certificate of Release for consumption" (Certificati di Immissione in Consumo) was created. This certificate issued by the Ministry of Economy with the technical assistance of GSE, proves the input into the market of 10 Gcal of biofuels. In order to carry out its obligation, the obliged parties can purchase the Certificates by those who have them in excess. The Government (with D.M. 23 April 2008, n. 100[61]) defined fines for the subjects not attending the minimum biofuels input.

f) Implementation network

Since 2013[62], all the management and technical competencies on biofuels were entrusted to GSE (earlier these competencies were in charge to the Ministry of Economic Development). An important role, from the regulatory point of view, in the implementation national network is fulfilled by AEEG. AEEG, in 2012, defined the biofuels sustainable minimum criteria, in accordance with EU Directive

[60] http://www.gse.it/it/EnergiaFacile/guide/Trasporti/Biocarburanti/Pages/default.aspx

[61] http://www.gazzettaufficiale.it/atto/serie_generale/caricaDettaglioAtto/originario?atto.dataPubblicazioneGazzetta=2008-06-06&atto.codiceRedazionale=008G0120&elenco30giorni=false

[62] http://www.gse.it/it/Qualifiche%20e%20certificati/Biocarburanti/Pagine/default.aspx

2009/28/EC[63] and 2009/30/EC[64] ("Fuel Quality Directive"). Only biofuels compliant with AEEG sustainable requirements could access the national biofuels incentives.

g) Outcomes

This measure is not analysed in the Italian NEEAPs. No data on final energy savings are available.

1.2.3 FINANCIAL POLICY INSTRUMENTS

General description of the different policies that are described in this chapter

Italy has several financial policy instruments related to the transport sector. The main national transport financial policy instruments are:

- Government subsidies for the purchase of low-emission vehicles (D.L. 10 February 2009, n. 5, converted into law by L. 9 April 2009, n.33[65]; L. 7 August 2012, n.134[66]);
- Incentives for the promotion of biofuels in transport sector (Dlgs. 3 March 2011, n.28[67]);
- Ad-hoc fund of Ministry of Infrastructure and Transport on PNIRE implementation 2013-2015 (L. 7 August 2012, n.134);
- Ministry call in favour of the Regions to fund a network of electric vehicle charging points (L. 7 August 2012, n. 134);
- National electric car sharing project in cities (co-financed by the Ministry of Environment);
- National funds for the development of underground railways (Defined in annual Italian Budget Laws);
- Funds related to the "Five years bus fleet renewal plan" (L. 27 December 2013, N.147[68]);
- Structural fund on thematic area "sustainable movement of people and goods" (EU 2014-2020 Structural Funds);
- Road tax (tax exemption for electric vehicles and discount on car assurance) and regional schemes for tax exemption for LPG and methane vehicles. (Regional legislations);
- National funds for local public transports (indirect effects for example in fleets renewal, etc.). (Defined in annual Italian Budget Laws);
- Funding for energy efficiency, renewable energy and bike-sharing (L. 24 December 2007, n.244[69]).

[63] http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0028&from=EN

[64] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0088:0113:EN:PDF

[65] www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto.legge:2009-02-10;5!vig=2015-09-21

[66] www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:2012-08-07;134!vig=2015-09-21

[67] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto.legislativo:2011-03-03;28

[68] www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:2013-12-27;147!vig=

1.2.3.1 Government subsidies for the purchase of low emission vehicles

a) General information

In February 2009, as part of measures aimed to support industrial sectors in crisis (IEA, 2015), the Italian Council of Ministers launched a temporary incentive scheme for consumers to replace their old vehicles with new ones meeting certain environmental criteria (D.L. 10 February 2009, n. 5). The temporary incentive ended at the end of 2009. A second incentive scheme aimed to replace old vehicles was launched with Law No 134/2012 (L. 7 August 2012, n.134) (Article 17-decies). It introduced incentives for the purchase of low CO_2 emission vehicles in the period from the January ,1st 2012 and December, 31st 2015.

b) Type of policy instrument

"Government subsidies for the purchase of low emission vehicles" belongs to the policy type of "Financial Policy Instruments". It provides incentive to privates substituting their old car with a more environmentally friendly one.

c) Objectives

The "Government subsidies for the purchase of low emission vehicles" objective is to provide an economic support to the renewal of Italian private cars, motorcycles and light commercial vehicles fleets.

d) Target group

The "Government subsidies for the purchase of low emission vehicles" target groups are people intending to substitute their car with a more environmentally friendly one.

e) Rules and influencing mechanisms

The 2009 incentives scheme applies to cars, light commercial vehicles, as well as motorcycles and scooters. The incentives are provided in the form of a discount obtained by consumers directly from the dealers, who in turn receive this as a tax credit. There were several typologies of incentives (ODYSEE-MURE, 2014):

- A bonus of € 1500 was provided when a car older than 9 years meeting Euro 0, 1 or 2 standards was exchanged for a new vehicle meeting Euro 4 or 5 standards and emitting a maximum of 130gCO2/km for diesel cars or 140gCO2/km for others;
- Additional incentives for green and high performance vehicles (purchase incentive of € 1500 for new vehicles running on electricity, hydrogen or methane. This purchase incentive increased to € 3000 if the vehicle emitted 120gCO2/km, and to € 3500 if it emitted less than that);
- Purchase incentive for liquefied petroleum gas (LPG) vehicles. This incentive amounted to €1500 (€ 2000 if the vehicle emitted less than 120gCO2/km);
- Lightweight commercial vehicles (a bonus of € 2500 was provided for scrapping a vehicle meeting Euro 0, 1 or 2 standards and registered before 31 December 1999, and purchasing a

[69] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:2007-12-24;244!vig=

new one. In addition, € 4000 were provided for the purchase of a new "innovative vehicle", running on gas, LPG, hydrogen);

- For motorcycles, scooters and other two-wheel vehicles, a € 500 bonus was provided when purchasing a new 400cc Euro 3 vehicle when combined with the scrapping of a Euro 0 or 1 category vehicle;
- Incentives were also provided for converting existing cars to run on LPG (€ 500) and methane (€ 600).

The 2012 national incentives scheme, instead, was paid out through an ad-hoc fund with a budget of € 50 million for 2013 and € 45 million respectively for 2014 and 2015, mainly targeting the purchase of company and public-use vehicles. Subsequently, the "Stability Law 2013" of 24 December 2012 reduced the overall budget for the three-year period to € 120 million. In compliance with this Decree, the Ministry of Economic Development issued an "Implementing Decree concerning the incentives for the purchase of low emission vehicles" (February 2013), which detailed the procedure for requesting the incentives and the allocation of resources for 2013 (NEEAP, 2014).

f) Implementation network

Both incentives schemes were defined by the National Government. The technical aspects were defined by the Ministry of Economic Development. Finally, also car sellers were involved as they applied the discount on cars sales.

g) Outcomes

Based on NEEAP 2014 data, at January 2014, 2,584 vehicles had been registered, of which 535 electric and 541 hybrid. Most of the vehicles that benefited from the incentives (about 1,820) have CO2 emissions between 50 and 95 gCO2/km. No data about final energy savings are provided in Italian NEEAP.

1.2.3.2 Funds related to the “Five-year bus fleet renewal plan”

a) General information

The Stability Law 2014 (L. 27 December 2013, n. 147[70]) has earmarked € 500 million for the purchase of new public transport vehicles, including € 200 million for renewing the railway cars and € 300 million for renewing the bus fleets. These funds are related to a long-standing and multi-year national investments strategy on improvements of local public transport services.

b) Type of policy instrument

The funds related to the “Five-year bus fleet renewal plan” belong to the policy type “Financial Policy Instruments” as they provided economic resources to regional authorities involved in the renewal of their local public transport fleets.

c) Objectives

The funds related to the “Five-year bus fleet renewal plan” objective is to provide funds for a complete renewal over the next five years of the national bus fleet both public and private (NEEAP, 2014) which has an average age of 12 years.

[70] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:2013-12-27;147

d) Target group

The funds related to the "Five-year bus fleet renewal plan" target groups are Regional authorities. In fact the Italian normative framework entrusted to regional authorities the management of the local public transport services.

e) Rules and influencing mechanisms

The feasibility of launching a 5-year financing plan to renew the bus fleets (around 50 000 vehicles) is currently being assessed and alternative incentive schemes for the private sector are being considered (NEEAP, 2014).

f) Implementation network

The funds are set up by the national Government in its annual Stability Law. These funds will be managed by regional authorities which are in charge of local transport services provision.

g) Outcomes

Based on ASSTRA analysis (ASSTRA, 2014), 7,500 old buses will be substituted by 2019 (the Italian total public bus fleet is about 40,000 buses). According to the NEEAP 2014, this should generate an energy saving of 0.04 Mtoe/year. Total savings in the period 2014-2020 are not available.

Forecast of final energy savings according to the NEEAP:

Programme	Savings 2009-2013	Savings total 2014-2020
On-site energy consultation	/	/

1.2.4 DISSEMINATION AND AWARENESS INSTRUMENTS

General description of the different policies that are described in this chapter

Italy has several dissemination and awareness instruments related to the transport sector. The main national transport regulatory policy instruments are:

- Guide to fuel saving and decreasing CO_2 emission by cars (Guida sul risparmio di carburanti e sulle emissioni di anidride carbonica delle autovetture[71]) (Published by MATTM, MIT and MISE);
- National Logistics Platform UIRNET[72] (Sistema Nazionale della Logistica Integrata e Intermodalità) (D.M. 20 June 2005, n.18T)[73];
- Events and initiatives within the European Sustainable Mobility Week;
- National observatory on local public transports policies Osservatorio nazionale sulle politiche per il trasporto pubblico locale (L. 24 December 2007, n.244[74]).

[71] http://www.sviluppoeconomico.gov.it/images/stories/documenti/Guida_Co2_2013_rev_small.pdf

[72] https://www.uirnet.it/uirnet/

[73] https://www.uirnet.it/uirnet/resources/cms/documents/Decreto_Ministeriale_18T_del_20.06.2005.pdf

1.2.4.1 National Logistic Platform UIRNET

a) General information

The National Logistic Platform UIRNET, driven by the Ministry of Transport, is a complex web-based system that intends to manage all the movements of freights on road, railroad and on Italian sea. The Platform intends to coordinate at a national level all the logistic activities carried out by the different logistic operators, in order to guarantee a more efficient delivery of Italian freights. Moreover, the UIRNET platform intends to promote inter-mobility and to optimize the interactions among trucks, trains and cargo ships. The National Logistics Platform falls under the broader context of the National Action Plan for Intelligent Transport Systems (ITS), launched in February 2014 by the Ministry of Transport in accordance with Directive 2010/40/EU[75] (NEEAP, 2014).

b) Type of policy instrument

The National Logistic Platform UIRNET belongs to the policy type "Dissemination and awareness instruments". It creates a national online platform where logistic operators and public authorities can share data on their freights delivery services and increase their awareness on inefficiency in the freights delivery services.

c) Objectives

The National Logistic Platform UIRNET main objective is to improve the overall efficiency level of national freights delivery services.

d) Target group

The National Logistic Platform UIRNET main target groups are logistic operators. Moreover also national and local public authorities are involved.

e) Rules and influencing mechanisms

The National Logistic Platform UIRNET focuses "on the realization of a localized hardware and software platform which is open and modular and capable of integrating service providers and freights suppliers directed towards logistics process management and freight transport, with the aim of providing various services through the interaction of the various players involved" (UIRNET)[76]. On 28th of December 2006, UIRNet SpA signed an agreement with the Ministry of Transport in order to identify a subject responsible to manage the platform during the years. The UIRNET platform started its operations with a commissioning cost of € 14 million and an annual operating budget of € 2 million for the first three years (NEEAP, 2014). After the start-up phase, the UIRNET platform should not require any further public funding (NEEAP, 2014).

f) Implementation network

The National Logistic Platform UIRNET was launched by the Italian Ministry of Transport. In January 2014 UIRnet S.p.A. launched an European call in project-financing mode to select a private operator able to manage the platform.

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[74] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:legge:2007-12-24;244!vig=2015-09-18

[75] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:207:0001:0013:EN:PDF

[76] https://www.uirnet.it/uirnet/

g) Outcomes

The UIRNET platform, based on NEEAP 2014 data, should have 25,000 users and 8 logistics nodes in the starting phase and in a few years the number of actual users will rise to 250 000 actual users. Thanks to the UIRNET platform, a € 40 billion saving in the entire transport system will be possible (Milano Finanza, 2013). The pilot phase, implemented in 2013, involved more than 800 transport companies and around 10,000 trucks (UIRNET Data). If plan estimates are confirmed, the energy savings achievable in the national road transport would be in the range of 0.5 Mtoe/year. Total savings in the period 2014-2020 are not available.

Forecast of final energy savings according to the NEEAP:

Programme	Savings 2009-2013	Savings total 2014-2020
On-site energy consultation	/	/

1.2.5 POLICY INSTRUMENTS FOR RESEARCH AND DEVELOPMENT

General description of the different policies that are described in this chapter

Italy has several instruments for research and development in the transport sector. The main national policy instruments for research and development are:

- Design and implementation of a Green Wheel bicycle (Initiative of Ministry of Environment);
- National "Smart Cities and Communities and Social Innovation" funds 2012 and 2013 (Director Decree 5 July 2012, N.391/Ric[77]);
- National technological maritime platform (Piattaforma Tecnologica Nazionale Marittima) (Dlgs. 21 November 2005, N.284[78]).

1.2.5.1 Design and implementation of a Green Wheel bicycle

a) General information

The Copenhagen Wheel is an international project unveiled on December 2009 at the COP15 United Nations Climate Conference. The project was conceived and developed by the SENSEable City Lab. The prototype bikes were realized with the help of technical partner "Ducati Energia" and funding from the Italian Ministry for the Environment.

[77] http://attiministeriali.miur.it/anno-2012/luglio/dd-05072012.aspx

[78] http://www.normattiva.it/uri-res/N2Ls?urn:nir:stato:decreto.legislativo:2005-11-21;284

b) Type of policy instrument

The Green Wheel bicycle project belongs to the policy type supporting research and development activities.

c) Objectives

The Green Wheel bicycle project objective is developing an electric bike for municipalities able to elaborate traffic data for urban planning activities.

d) Target group

Green Wheel bicycle project's target group are municipalities. These bikes in fact could map pollution levels, traffic congestion and road conditions in real-time in order to provide data for the municipalities transport planning activities.

e) Rules and influencing mechanisms

The prototype bikes were realized with the help of technical partner Ducati Energia and funding from the Ministry for the Environment.

f) Implementation network

The project was conceived and developed by the SENSEable City Lab for the Kobenhavns Kommune. The prototype bikes were realized with the help of technical partner Ducati Energia and funding from the Italian Ministry for the Environment.

g) Outcomes

No data available.

1.2.6 SUMMARY TABLE FOR THE TRANSPORT SECTOR IN ITALY

Summary table: Transport					
	Short list of implemented policies and measures	**Objective**[79] (improve system, travel or vehicle efficiency)	**Target group and targeted objects**	**Rules and influencing mechanism** (motivation or punish non-compliance)	**Implementation network**
Planning instruments	National infrastructural plan to set up electric vehicles charging points	Develop a national wide electric charging points network	Regions; Italian energy distributors	Dedicated funds and definition of policy and technical standards	Ministry of Infrastructure; Regions; Electric distributors
Regulatory policy instruments	Obligation to input into consumptions biofuels	Supporting national biofuels production and supply chains	Biofuels producers and traditional fuels seller	Obligation to input a quota of biofuels into market	GSE; AEEG
Financial policy instruments	Government subsidies for the purchase of low emissions vehicles	Provide economic support to the renewal of vehicles fleets	Private car owners	Economic support to purchase a new car	National Government; Car sellers
	Funds related to "Five Years bus fleets renewal plan	Complete the renewal of national bus fleets	Regional public authorities	Economic incentives for the purchasing of green buses	National Government; Regional public authorities

[79] Energy efficiency in the transport sector can be divided into system efficiency (reduce or avoid travel or the need to travel), travel efficiency (shift to more energy efficient modes) and vehicle efficiency (improve the efficiency through vehicle technology).

Dissemination and awareness instruments	National Logistic Platform UIRNET	Sharing data and information among Italian logistic operators	Logistic operators operating in Italy	Share of data and information	Ministry of Transport
Policy instruments for Research and Development	Design and implementation of a Green Wheel bicycle	Developing an electric bike for municipalities able to elaborate traffic data for urban planning activities.	Municipalities	Support from a technical partner and funding from the Ministry for the Environment.	SENSEable City Lab; Ducati Energy; Ministry for the Environment

2. POLICY INSTRUMENTS ON THE REGIONAL / LOCAL LEVEL

The interaction between the different levels (national, regional, local) in energy efficiency policy making has already been covered in D.1.1. Next to national energy efficiency policies, many regions and cities have implemented own climate action plans, energy efficiency action plans, or are part of the Covenant of Mayors. Describing all existing policy instruments or energy efficiency measures, would be too much and is not possible in the framework of this project. Therefore, in this deliverable, specific policy instruments on the regional / local level are exemplarily covered by a case study.

2.1 PRESENTATION OF THE CASE STUDY: METROPOLITAN CITY OF MILAN

- **City / Region:**

Metropolitan City of Milan (until 2014 named: Province of Milan).

The Metropolitan City of Milan is an autonomous territorial entity located in Lombardy (Northern Italy) comprising 134 municipalities, covering 1.575 km² and totalling 3,2 million inhabitants. It has been established through L. 7 April 2014, n. 56[80], substituting the entity of the Province of Milan.

- **Energy Efficiency Policy / Action:**

In 2006, the Province of Milan adopted the **Provincial Energy Efficiency Programme** ("Programma Provinciale di Efficienza Energetica", deliberation 739/2006[81] of 23/10/2006), updating the 1996 provincial energy plan. The Programme established a 35.000 toe/year energy saving target (130 kton/CO_2/year) to be accomplished by 2010 targeting the civil and industrial sector. The programme included an **Action Plan** that defined the operative instruments to concretely implement these targets, reducing energy use from fossil fuels and promoting renewable energy, with the aim also to tackle air quality problems.

The Action Plan identified five strategic sectors (Information, Buildings, SMEs, Public Administration, Mobility and Transport) focusing on three pillars:

1. Adoption of a set of rules for the civil sector;

2. Provision of financial incentives to renovate buildings and heating systems;

3. Diffusion of information, communication and education.

The main activities of the Metropolitan City of Milan regarding energy efficiency regard the building sector and are the following:

[80] http://www.gazzettaufficiale.it/eli/id/2014/04/07/14G00069/sg

[81] http://www.cittametropolitana.mi.it/export/export_14032014/n_energia_dgp_739_2006_allegato_1_programma_efficienza_energetica.pdf

Elaboration and dissemination of Guidelines for energy-efficiency oriented Building Regulations[82]

This activity aims at providing municipalities with common orientations for updating their municipal building regulations taking into account high energy efficiency and environmental quality criteria. The guidelines have been updated in 2014 and they set requirements which go beyond national and regional regulations in force, looking at sustainability criteria and environmental certification protocols.

Management of info-desks (Infoenergia)

Founded in 2006 by the Province of Milan, Infoenergia is an in-house company (public limited liability consortium) currently joined also by the Province of Monza Brianza and 65 municipalities. The company acts through a network of info-desks located in the municipalities (60 municipal info-desks for citizens, 4 info-desks for technicians), carrying out the following functions:

- providing support to technical departments of municipal and provincial authorities regarding energy and environmental issues;
- promoting information and awareness raising towards citizens regarding renewable energy, energy saving and energy efficiency (i.a. the "CalorEfficienza" communication campaign, aimed at diffusing compliance with normative rules regarding heating plants);
- controlling thermal plants in small municipalities (< 40.000 inhabitants).

Infoenergia also provides technical assistance to municipalities in the elaboration of their Sustainable Energy Action plans within the Covenant of Mayors initiative. To date 23 SEAPs regarding 447.564 citizens have been elaborated, also with the financial support of the banking foundation Fondazione Cariplo. The estimated emission reductions from these plans are 327 kton CO_2 (source: Infoenergia website[83]).

- **Energy Efficiency instruments / measures per sector:**

An interesting measure launched by the Province of Milan to promote energy efficiency in the building sector is the "**Programme for the energy refurbishment of public buildings owned by Municipalities of the Province of Milan"**. This measure concerns the energy refurbishment of public buildings, mainly schools, owned by Municipalities that adhered to the Covenant of Mayors with the support of the Province of Milan. The measure aimed to overcome the problem of the limited capacity of municipalities to finance investments in energy renovation in their properties. A pilot project based on the involvement of third-party financers (Energy Service Companies - ESCOs) was designed and submitted to the European Investment Bank (EIB). The project was based on a wide database of data obtained through a previous energy auditing activity (700 audited buildings), financed by the banking foundation Fondazione Cariplo.

After the assessment of the application, the EIB approved in 2009 the province investment programme (90 million €) and authorized the use of up to 65 million € as loan to ESCOs, to be selected through public tenders, for the realization of refurbishment activities on public buildings

[82] Available at: http://www.cittametropolitana.mi.it/export/sites/default/ambiente/doc/doc_energia_infoenergia_linee_guida_regolamento_edilizio_2014.pdf

[83] http://www.infoenergia.net/bkjoomla/joomlaa/index.php/notizie/paes

through the activation of Energy Performance Contracts (EPC) with Guarantee of Result in favour of the Municipalities (each tender corresponds to a grouping of municipalities); the remaining part should be covered by the ESCOs through equity (Zabot, Di Santo, 2013). Energy Performance Contracting is a contract form explicitly aimed to improve the energy performances of building-heating systems through energy renovation[84]. In EPC, the future energy savings deriving from the energy renovation interventions are guaranteed by the contract and they are used to finance the interventions; the remuneration of the ESCO is based on the results effectively achieved (Zabot, Di Santo, 2013). In the investment programme of the Province of Milan, the EPC form enables to repay the EIB's loan through the obtained energy savings. The municipalities will pay a fee to the ESCO calculated each year based on actual performance. Municipalities will benefit since the beginning from a percentage of the savings; in case of underperformance, the fee paid by the municipalities to the ESCO will be lowered, in case of overperformance, the additional savings will be shared by the municipality and the ESCO (Micale et al., 2014). The supply of fuel and electricity is excluded from the Concession. This is the first case of "pure" EPC applied to energy retrofits in the public sector in Italy, since - in the country - energy-saving services are usually bundled with fuel supply in the energy service contracts (Micale et al., 2014).

The programme benefitted also from a technical assistance support through ELENA (European Local ENergy Assistance)[85]. The ELENA grant was used to set up the investment programme support unit; assess existing audits; draw the Terms of Reference; prepare the tender documents, the contracts, negotiate with suppliers and banks; handle any litigation; monitor the results, disseminate and transfer the know-how.

The programme is currently being implemented involving 48 Municipalities with less than 30.000 inhabitants and the Municipality of Milan. The first tender (13 Mln.€) has been awarded, regarding 98 buildings in 16 Municipalities, with interventions such as envelope insulations, Micro-Cogeneration, Heat Pumps, condensation boilers, Solar Thermal, Lighting sensors, BEMS, etc.... Guaranteed Savings are 35%, with a shared saving for Municipalities of 5% and a concession duration of 15 years.

The second tender (two lots, 187 buildings in 31 Municipalities) and the third tender (dedicated to the Municipality of Milan and regarding 38 schools) are in progress.

The implementation of the investment programme has seen delays due to the tendering processes for the selection of the consultants (technical, financial and legal) and for the identification of the financial intermediary, which in the end was identified through a direct negotiation (Micale et al., 2014).

Within an interview with representatives of the Metropolitan City of Milan (energy department), the following lessons learnt have been highlighted:

- This investment programme has engendered a positive relation between the Province of Milan and the single Municipalities and has offered the opportunity of putting Energy Efficiency to the core of their interests;

[84] EPC is defined as a "contractual arrangement between the beneficiary and the provider (normally an ESCO) of an energy efficiency improvement measure, where investments in that measure are paid for in relation to a contractually agreed level of energy efficiency improvement" (art. 3, comma j, Directive 2006/32/EC).

[85] ELENA is a grant facility managed by EIB funded by EU budget (CIP/IEE programme) (http://www.eib.org/products/advising/elena/index.htm). For the Province of Milan the ELENA support had a 2.16 Mln.€ total budget, of which 1.94 Mln.€ from EIB and 10% of Province of Milan contribution.

- ELENA Technical Assistance has proven to be essential for the development of an innovative tender documentation, the Energy Supply Contracting being yet largely predominant over Energy Performance Contracting in Italy;
- Scarce financial autonomy of Municipalities due to the "Stability Pact" together with a lack of legal and technical knowledge of EPC have represented major barriers to the implementation of this EIB Investment Programme, hence without the ELENA fund and the Province of Milan acting as Support Structure this initiative would have not taken place;
- EIB should directly release the line of credit to the winning ESCOs, because banks are reluctant to assume the risk and thus apply high interest rates. Finding the Intermediary Financial Institution has proven to be very challenging and time consuming.
- Time and costs needed to train the personnel of the Municipalities involved is often underestimated as well as the time required to run the administrative procedures.

- **Interaction between national and local policies:**

Energy efficiency of buildings is a cross-cutting topic among national, regional and local policies. The policy framework at **national level** has been described in the previous chapters, and reflects the transposition of European directives on the topic.

The policy framework at **regional level** is complex, since in Italy energy issues are governed under a system of "concurrent legislative powers", with the regions having legislative powers in the framework of key principles determined by the central government. Each region has therefore its set of laws and schemes for energy efficiency in the building sector.

The **Lombardy Region**, in which the Metropolitan City of Milan is localized, is considered among the best performers in Italy on energy efficiency[86]. The Region has implemented several policy instruments to address energy efficiency in buildings:

- a set of **regional laws** regarding regional energy and air quality policy and specific regulations regarding energy efficiency and energy certification of buildings[87];
- an **Energy Action Plan**, in place since 2007 (PAE) and an **Energy and Environmental Regional Programme** (PEAR), which is currently being elaborated, both targeting the buildings sector;
- a series of **energy cadastres**, in place since 2007, which represent relevant sources of information for energy efficiency policies and that display data also in Opendata format; these include the Regional Energy Cadastre of Buildings (CEER - Catasto Energetico Edifici Regionale[88]); and the Unique Regional Cadastre of Heating Plants (CURIT - Catasto Unico Regionale Impianti Termici[89]);
- an **information system on Sustainable Energy Policies** (SIRENA20[90]), developed with the support of the EU-funded project LIFE+ "Factor 20", which enables the planning and monitoring of GHG reduction, energy saving and renewable energy policies in the region; the system includes a set of operational tools for municipalities and provinces participating in the Covenant of Mayors.

[86] http://www.efficienzaenergetica.enea.it/l-efficienza-energetica-nelle-regioni/lombardia/politiche-regionali-in-materia-di-efficienza-energetica.aspx

[87] A complete list can be found at: http://www.cened.it/normativa_regionale.

[88] http://www.cened.it/ceer

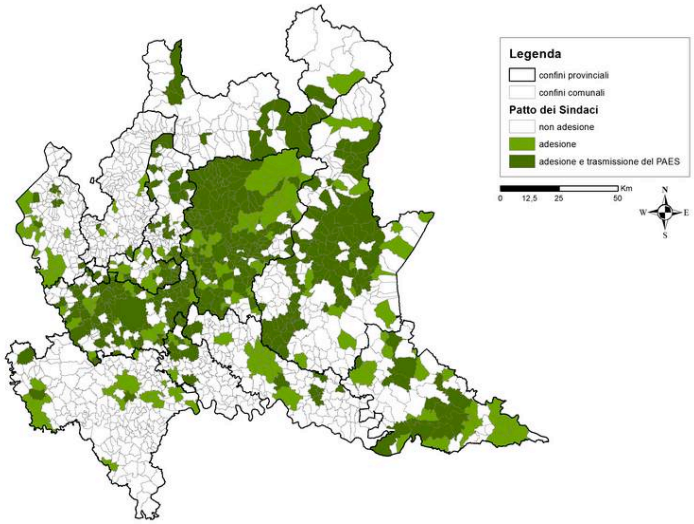
[89] http://www.curit.it/

[90] http://www.energialombardia.eu/sirena20

Looking at the **local level**, in January 2013 622 municipalities on 1546 of the Lombardy Region had adhered to the Covenant of Mayors, of which 415 with a SEAP submitted to the European Commission (elaboration by Factor 20 project on CoM data[91]).

Figure 8: Covenant of Mayors – Signatories in Lombardy Region (2013) (table and figure)

	N. of municipalities	Inhabitants	Municipalities with signed adhesion	Municipalities with signed adhesion and submitted SEAP	Total Municipalities	Municipalities coordinated by the province
Bergamo	244	1.075.582	71	143	214	182
Brescia	206	1.230.159	14	85	99	
Como	162	584.762	5	2	7	
Cremona	115	360.223	12	8	20	
Lecco	90	335.420	4	27	31	4
Lodi	61	223.639	3	9	12	
Mantova	70	409.775	19	14	33	8
Milano	134	3.096.997	20	75	95	94
Monza e Brianza	55	833.348	11	19	30	10
Pavia	190	539.238	21	3	24	
Sondrio	78	182.084	1	19	20	
Varese	141	871.448	26	11	37	
Lombardy Region	**1546**	**9.742.675**	**207**	**415**	**622**	**298**



Source: Factor 20 project, elaboration of CoM data 2013

As shown in the graph, the province of Bergamo, Brescia and Milan are those with the highest number of signatories.

The capital city of Milan, in particular, joined the CoM in 2008 and is currently completing a participative process in which the SEAP proposal has been presented. Public and private buildings are

[91] http://www.factor20.it/PattoDeiSindaci_ComuniLombardi

key strategic sectors of Milan's SEAP, accounting, respectively, for 5% and 55% of total expected emission reductions by 2020 (Comune di Milano, AMAT, 2015).

Among the several policy instruments foreseen in Milan's SEAP, in October 2014 Milan adopted its new Municipal Buildings Regulations, which foresee high energy efficiency mandatory targets for new buildings (A class) and renovations, as well as an incentive system (volumetric incentive) based on increasing levels of sustainability in buildings.

- **Discussion / Recommendations:**

The case study of the Metropolitan City of Milan shows how in Italy energy efficiency in the building sector is a cross-cutting issue being targeted by policies at the national, regional and local level. In the Lombardy region, several supporting instruments are in place to guide municipalities in their sustainable energy planning efforts, both from the Regional Authority, the provincial authority (now Metropolitan City) and from other subjects of the territory, such as the banking foundation Fondazione Cariplo. The availability of data and monitoring (such as the cadastre of energy performance certificates and heating plants) represents a key excellence of the region and a valid source of information to plan, implement and monitor effective policies on the topic.

Looking in particular at the refurbishment programme on public buildings promoted by the Metropolitan City of Milan, the case is particularly interesting since it has seen the collaboration of a wider metropolitan authority with single municipalities of its territory, bundling projects that otherwise would not have had enough size to be brought forward. Furthermore, the experience is innovative in Italy since it promotes Energy Performance Contracting instead of Energy Supply Contracting which is currently more diffused. The experience is currently in progress and it is not possible to measure its actual energy impacts. Nonetheless, the lessons learnt show that some barriers exist in the implementation of Energy Performance Contracting in Italy (such as long times of procedures and bureaucracy; lack of legal and technical knowledge on EPC; scarce will of financial institutions to assume risks when energy efficiency projects are considered), as well as opportunities (energy efficiency potential of the building sector; supporting role of technical assistance in preparing tenders and related documentation).

After Milan, also other Italian provinces have launched EPC schemes, including the Provinces of Modena, Chieti and Padova.

- **Further information:**

http://www.cittametropolitana.mi.it/ambiente/energia/index.html

ANNEXES

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