Contents of the document

Introduction

Climate change and environmental degradation are a huge threat to the whole world. To overcome these challenges, Europe has set itself important objectives for 2030 in terms of reducing emissions of pollutants into the atmosphere, using renewable sources and energy efficiency, and an overall strategy to achieve climate neutrality in 2050. (European Green Deal).

In line with these objectives, with the vision of the Bosch Group and Bosch Thermotechnology, Bosch Thermotechnology Italy considers the achievement of the objectives of energy efficiency, reduction of atmospheric emissions and environmental protection set by the European Commission's programs and in compliance with existing Directives and Laws as its primary targets.

In this direction, the constant commitment of Bosch Thermotechnology, to develop and commercialize new and increasingly efficient technologies that can exploit renewable sources, must be understood: condensing boilers (ready to work even with a blend of Hydrogen), heat pumps and hybrid systems, solar thermal, heating recovery ventilation, VRF.

In Italy the potential for efficiency is enormous, just think that there are about 20 million heating appliances installed, largely obsolete and therefore with high consumption and emissions.

Starting from the end of 2020, thanks to extraordinary tax incentives for energy efficiency, the renovation rate of the plants has grown significantly, going from less than 5% in 2019 to about 7% in 2021.

In order to achieve energy savings and reduce pollutant emissions according to the European roadmap to 2030 and 2050, it is of fundamental importance to continue the renovation process undertaken in the last 2 years, stabilizing and rationalizing the incentive mechanisms over a period of medium-long term.

Bosch Thermotechnologies believes it is essential to create the political and regulatory conditions to continue the renewal process of the existing installed plants just undertaken, thus reducing energy consumption, increasing the use of renewable sources and improving air quality.

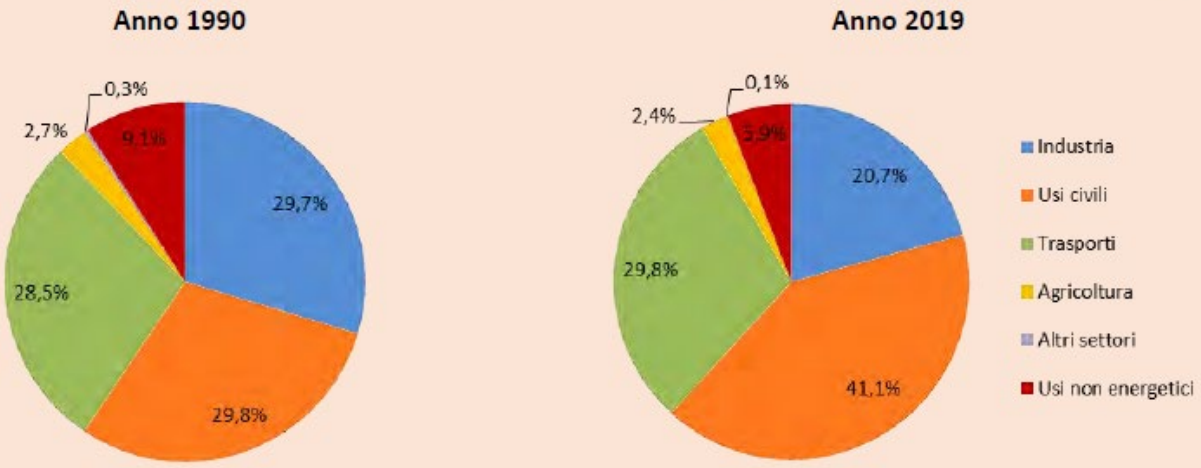
Bosch Thermotechnology in Italy is also a member of Assotermica (Association of manufacturers of equipment and components for thermal plants) and Assoclima (Association of air conditioning systems manufacturers) and it participates in the dialogue of the Associations with the authorities and shares the contents of their Position Papers.

The Italian Contest

Tabella 2: Il bilancio dell'energia in Italia – La disponibiltà energetica lorda (Ktep)										
	2019	**2020***								
	Totale	Combustibili solidi	Petrolio e prodotti petroliferi	Gas naturale	Rinnovabili e bioliquidi	Rifiuti non rinnovabili	Calore derivato	Energia elettrica	Totale	Var % (2020/ 2019
+ Produzione	36.910	-	5.811	3.287	26.985	1.175	-	-	37.258	0,9%
+Saldo Importazioni	151.903	4.636	65.562	54.376	2.694	-	-	3.421	130.689	-14,0%
- Saldo Esportazioni	29.411	216	23.645	258	492	-	-	652	25.264	-14,1%
+ Variazioni scorte	-1.315	327	180	881	159	-	-	-	869	-166,1%
=Disponibilità energetica lorda	**158.086**	**4.747**	**47.549**	**58.286**	**29.027**	**1.175**	**-**	**2.769**	**143.552**	**-9,2%**

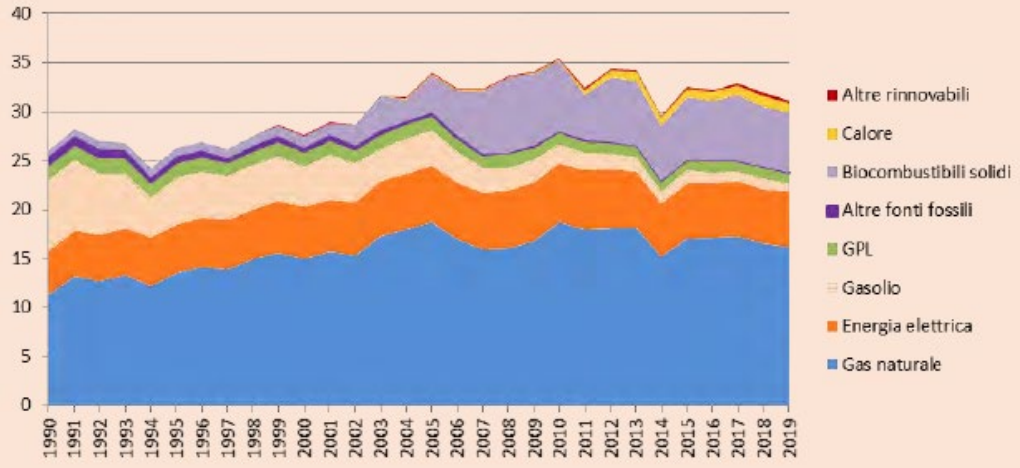
Fonte: Ministero della Transizione Ecologica - Bilancio Energetico Nazionale - Metodologia Eurostat . (*) Dati provvisori

Figura 2-7. Consumi finali di energia in Italia. Dettaglio per settore, anni 1990 e 2019 (%)



Fonte: EUROSTAT

Figura 2-13. Consumo energetico nel residenziale in Italia. Dettaglio per fonte (Mtep), anni 1990 -2019



Fonte: EUROSTAT

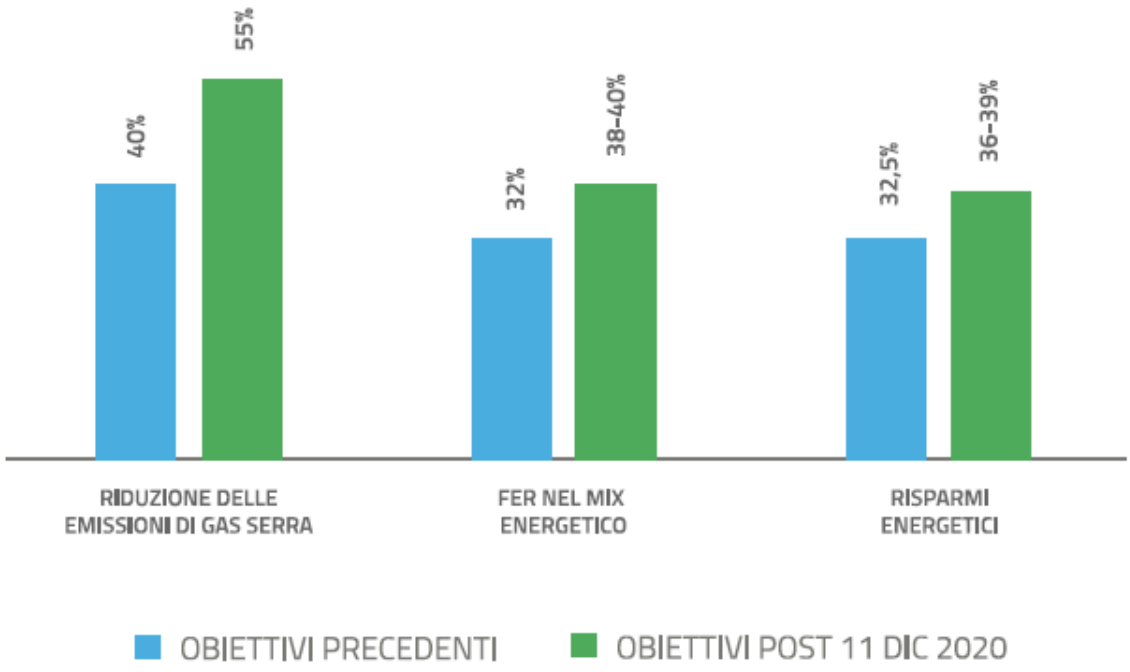
The technologies for heating and for domestic hot water production are responsible for over 30% of the total final energy consumption of our country as, for example, the whole transport sector or the whole industry.

2) Energy Targets according NECP: Energy and climate 2030 and reduction of consumption

Tabella 1 - Principali obiettivi su energia e clima dell'UE e dell'Italia al 2020 e al 2030

	Obiettivi 2020		Obiettivi 2030	
	UE	ITALIA	UE	ITALIA (PNEC)
Energie rinnovabili (FER)				
Quota di energia da FER nei Consumi Finali Lordi di energia	20%	17%	32%	30%
Quota di energia da FER nei Consumi Finali Lordi di energia nei trasporti	10%	10%	14%	21,6%
Quota di energia da FER nei Consumi Finali Lordi per riscaldamento e raffrescamento			+1,3% annuo (indicativo)	+1,3% annuo (indicativo)
Efficienza Energetica				
Riduzione dei consumi di energia primaria rispetto allo scenario PRIMES 2007	-20%	-24%	-32,5% (indicativo)	-43% (indicativo)
Risparmi consumi finali tramite regimi obbligatori efficienza energetica	-1,5% annuo (senza trasp.)	-1,5% annuo (senza trasp.)	-0,8% annuo (con trasporti)	-0,8% annuo (con trasporti)
Emissioni Gas Serra				
Riduzione dei GHG vs 2005 per tutti gli impianti vincolati dalla normativa ETS	-21%		-43%	
Riduzione dei GHG vs 2005 per tutti i settori non ETS	-10%	-13%	-30%	-33%
Riduzione complessiva dei gas a effetto serra rispetto ai livelli del 1990	-20%		-40%	

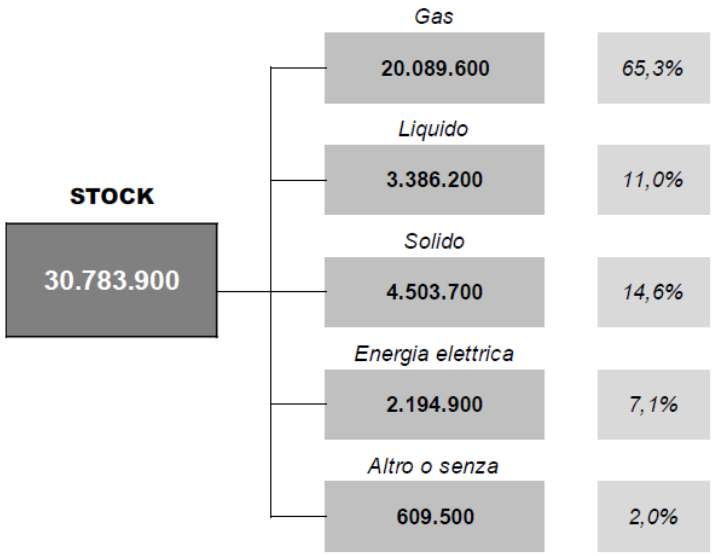
Figura 5 - Nuova declinazione degli obiettivi in materia di energia e clima.
Fonte: Commissione europea DG Energy



3) Domestic heating and air conditioning park

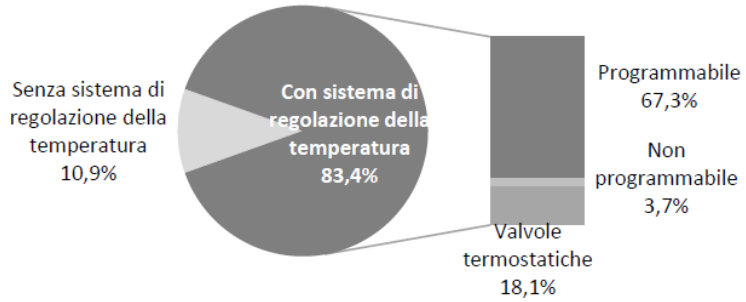
In Italy there are about 30 million homes (of which 23 primary owned or rented and 7 second homes / holiday homes or empty apartments). Overall, approximately 20 million of residential heating systems can be estimated, of which approximately 95% are autonomous systems. HVAC systems inside the homes are distributed as follows:

Schema 3.2. – Fonte di alimentazione degli impianti termici nelle abitazioni - 2017



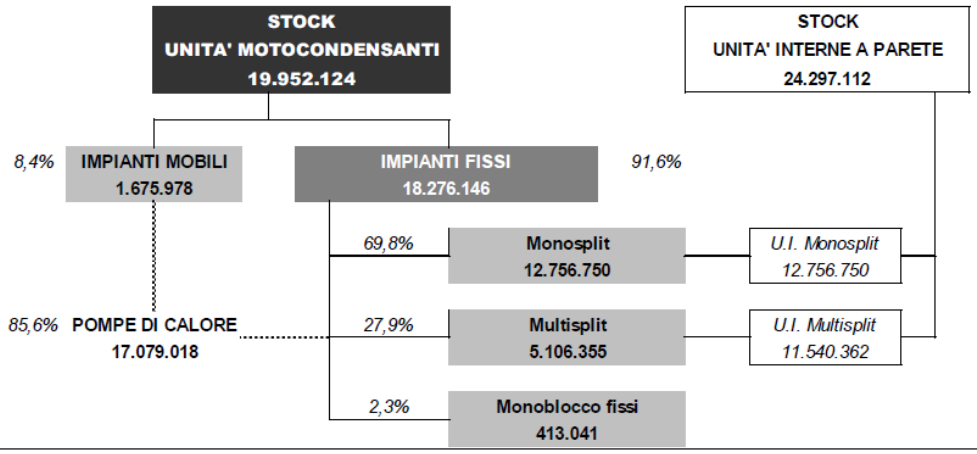
Fonte: elaborazioni e stime CRESME/SI

Grafico 3.5. - Sistemi di regolazione della temperatura – 2017



Fonte: Indagine diretta CRESME

Schema 3.3. – La dotazione residenziale di impianti di raffrescamento - 2017



Fonte: elaborazioni e stime CRESME/SI su dati Istat e Assoclima

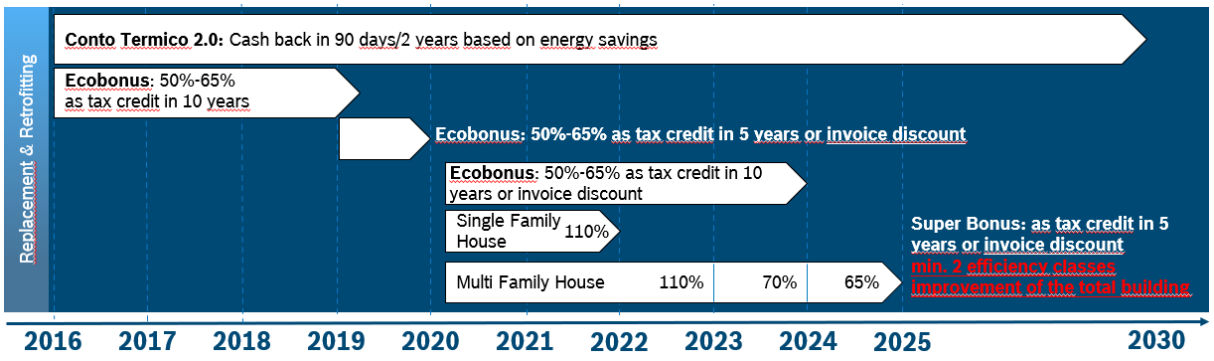
4) Boilers and Heat pumps market

The market for heating products in 2021, following the strengthening of tax incentives, showed extraordinary growth compared to 2020 (and 2019). Gas condensing boilers have shown an increase of close to 50% of the units installed and heat pumps have more than doubled. The Italian government, in fact, starting from July 2020, as a measure to relieve the country's economy from the crisis following the COVID-2019 pandemic and to achieve the objectives of the European Green Deal, has decided to focus on energy efficiency, significantly enhancing the Ecobonus (bringing it to 110% for some types of interventions) and re-introducing the mechanism of credit transfer and, above all, of invoice discount, which allows the end user to have a price for an efficiency intervention already reduced by the fiscal detraction. The Legge di Bilancio 2022, approved on 30 December 2021, extended the tax incentives for energy efficiency, as they are today, for the whole of 2022. Starting from 2023, a progressive reduction will begin:

• starting from January 2023 Ecobonus 110% (also called SuperBonus) will no longer be applicable to Single Family Houses, but only to Multy Family Houses (condominiums). The percentage of incentivized interventions in condominiums will gradually decrease from 110% in 2023, to 70% in 2024, up to 65% in 2025;

• Ecobonus 50% -65% will remain valid until 2024;

• The credit transfer and invoice discount mechanisms will remain valid until the end of the incentives.



Proposal:

Push towards renewable sources and reduction of greenhouse gas emissions in the thermal sector: electrification and green gas

In addition to the reduction of consumption, or the improvement of energy efficiency, the other two "pillars" of decarbonisation are the growth of renewable sources and the reduction of greenhouse gas emissions.

In the thermal sector, the transition from heating with a gas-powered system to one with an electric heat pump will have to take place simultaneously with the growth of renewable sources within the production of electricity.

Italy is one of the European nations with the largest methane distribution network where about 85% of homes are heated with a gas system (about 17 million boilers) and where 80% of new heating systems installed is a gas condensing appliance.

Despite the significant growth of electric heating technologies, whose penetration increased from 7% of total installations in 2019 to around 15% in 2021, the main technology will still be the gas condensing boiler for many years.

In this context, a very efficient solution is represented by hybrid systems, i.e. the combination of a condensing boiler with an electric heat pump, managed by an intelligent control that optimizes their operation in order to always obtain maximum energy efficiency.

Hybrid systems have the great advantage, compared to just electric heat pumps, that they can be installed to replace the old gas generators without the need to modify the heat distribution system and terminals (radiators), thus containing the costs of Technological "upgrade".

A further significant support for decarbonization can derive from green gases and in particular green hydrogen, whose combustion does not emit greenhouse gases into the atmosphere.

These fuels can be fed directly into the natural gas network in mixtures with the latter (within a certain%) and also used by most of the existing boilers. A possible future scenario sees a gas

distribution network with some 100% hydrogen parts destined to power new boilers or hybrid systems with zero emissions.

In addition to the undoubted environmental benefits, hybrid systems and, in the future, green gas-fired boilers, will be able to help support employment within the sector of manufacturers of heating appliances, a sector that is currently undergoing a process of profound transformation.

Bosch Thermotechnology considers it essential to tackle the ecological transition with a technologically neutral and multi-technological approach to better adapt to the individual needs of the final consumer.

It is therefore important that Italy also prepares, as has already been done by the European Commission and some member states, a strategy of decarbonization of buildings that also considers hydrogen as an energy source.

Stabilization and rationalization of the incentive mechanisms

The incentive mechanisms (Ecobonus, Bonus Ristrutturazioni and Conto Termico) for high efficiency appliances and / or with renewable sources have always been one of the main drivers towards improving the efficiency of residential heating systems. The renovation rate of heating plants, however, remained low (and insufficient for a rapid improvement in consumption and emissions into the atmosphere) until July 2020, when the Government, with the Decreto Rilancio, introduced the SuperBonus and invoice discount and credit transfer to third parties mechanisms for all tax bonuses (Ecobonus and Bonus Ristrutturazioni).

The renovation rate of the residential heating systems went from 5% in 2019 to 7% in 2021 and the big renovation rate of buildings (and therefore of the heating systems) from 0.8% to 1.2%, arriving at what is proposed in the STREPIN (Strategy for the energy requalification of the national real estate stock) for 2030/50. The opportunities that these new mechanisms have shown are many and can truly be a driving force for the improvement of the heating systems park and help the entire Hydro-Thermo-Sanitary sector to recover what has been lost in recent years. For the first time, since the tax bonuses for energy efficiency were introduced, the Italian government has clearly indicated a "multi-year" time frame for the validity of the incentives (see “The Italian Contest” part).

Bosch Thermotechnology welcomes this "multi-year" vision of incentives towards energy efficiency, accompanied by clarity of the rules. It is important to highlight that the period of validity of the mechanism is still too limited and there is still not much clarity on how to continue the path towards energy efficiency after 2025. The proposal is to create a strategic vision that reaches at least 2030 and to make structural the deductions for energy efficiency and the

mechanism for assigning credit to third parties (including banks and financial institutions). Furthermore, some critical issues remain to be overcome, such as the need to reward interventions with increasing incentives according to increasing efficiency and ensure that inefficient and more polluting products are no longer encouraged, such as conventional boilers, which today can still take advantage of the incentive. for building renovation (Bonus Ristrutturazioni), or some models of efficient but polluting biomass boilers, which are only widely incentivized with the Conto Termico. It should also be remembered that, in addition to residential buildings, towards which the majority of incentives are addressed, and the Public Administration, for which there are dedicated plans relating to energy efficiency, there are about 600.000 buildings used as private offices, hotels, hospitals, industrial sites, shopping centers and supermarkets, (without considering industrial sites and warehouses) which also need to be considered in the national energy efficiency process.

The tools (mainly Conto Termico) to support the energy efficiency of these latter buildings are far below the savings potential they can show.

Bosch Thermotechnology therefore believes it is of fundamental importance to define a strategy, supported by incentives, for the refurbishment of these types of buildings as well.

Promote energy labelling of existing appliances

The experience of other industries has shown that energy labels are widely known by customers and they used them as purchase criteria. This is why we believe that launching an energy labelling programme for existing heating systems, alongside the programme that already applies to new products introduced into the market, could provide a very useful stimulus to accelerate the replacement of old heat generators, which holds the greatest potential for containing climate-altering agents and making efficiency gains.

Germany launched a similar initiative (“Nationaler Aktionsplan Energieeffizienz”) in early 2016, initially as a voluntary scheme for users whose generators were more than 15 years old. The scheme involved no additional costs for households and carried out by staff performing regular energy performance checks (maintenance technicians) in fulfilment of existing legal provisions. The United Kingdom subsequently followed suit with a similar programme.

We believe that Italy should work on the millions of installed systems, in order to survey their efficiency and hence their consumption and emissions. This would undoubtedly result in users upgrading their systems, or at least managing them more wisely. For example, replacing a 1998 gas boiler with an A class condensing boiler generates energy savings of around 22%; replacing a 1988 boiler (with the same new appliance) brings 28% savings on average (the savings are even greater if the thermoregulation and the hydronic circuit are also upgraded).

Also taking into account the drastic reduction in polluting emissions (including a reduction of almost 80% in nitrogen oxides alone), the advantages for the whole country become immediately clear.

Starting from October 2018, Bosch Thermotechnology together with Assotermica undertook to promote the labelling of existing devices by spreading to the entire service network an online tool, developed by Assotermica, which allows the creation of labels.

Furthermore, starting from 2019, Italy, represented by Assotermica, participates in the EU-funded HARP (Heating Appliances Retrofit Planning) project. The project involving 18 countries aims to define a common basis for adopting the energy labelling of the installed on a legislative basis and has created an online free tool, which can be used by both installers and end users, which aims to raise awareness of the energy class of existing heating appliances and plan their replacement.

Improve air quality by replacing old heating appliances with new, low environmental impact ones

In addition to being responsible for an important share of consumption, domestic heating is also one of the main causes of pollution, particularly in urban centers, where there are particularly high concentrations of NOx and fine particulate.

In this direction, it is very important to accelerate, first the replacement of the old boilers that use liquid or solid fuel and then of the old conventional boilers, with new gas condensing technologies or electric heat pumps (with the advantage of reducing, in addition to 'NOx, even fine particulate emissions).

A step forward in this sense was done in June 2019 with the signing of the Memorandum of Understanding “Piano d’azione per il miglioramento della qualità dell’aria” (Action Plan for the improvement of air quality). Among the various initiatives, it also provides for the establishment of a fund "Fund for the financing of the National Air Pollution Control Program" of 400 million euros active from 2020, limitations on the use of oil heating plants and the revision of biomass incentive mechanisms (incentives only for the most efficient).

Bosch Thermotechnology, together with the other boiler manufacturers members of Assotermica, in 2018 carried out a campaign to measure emissions in the field on gas food plants. This in order to try to anticipate the times and give tangible proof of how much the heating sector contributes to pollution highlighting the reduction potential with the renewal of the installed park (condensing boilers vs conventional),

The results, which clearly confirm the reduction of emissions of a condensing boiler compared to a conventional one, will be used to incentivize the redevelopment of the existing one, while

the methodology has already been used as a basis for guiding the measurement standards in the field.

Sources:

- BRG - The European Heating Product Markets (2021 update): Italy
- CRESME - 8° Rapporto congiunturale sul mercato dell'installazione di impianti [8nd Trends Report on the System Installation Market by CRESME]
- Assotermica – Manifesto 2021 [Manifest 2021]
- Assotermica – Proposte Assotermica per un Piano d'Azione per la riduzione delle emissioni inquinati, per l'incremento delle rinnovabili e la riduzione dei consumi (2019) [Assotermica Proposals for an Action Plan to reduce polluted emissions, increase renewables and reduce consumption]
- Assoclima – Rapporto attività 2021 [Activity Report 2021]
- ENEA – RAEE 2021
- MiSE – Piano Nazionale Integrato Energia e Clima (PNIEC) 2019 [National Energy and Climate Plan (NECPs]
- CIG – Statistica incidenti da Gas combustibile 2018 [Statistics for combustible gas incidents in Italy 2018]
- Protocollo di intesa "Piano d'azione per il miglioramento della qualità dell'aria" 2019
- Decreto Rilancio (D.L. 34/2020)
- Legge di Bilancio 2022 [Balance Law 2022] (December 2021)
- TT - Position paper Bosch Thermotechnology: Energy Systems of the Future - The Path to Carbon Neutrality (March 2020)
- European Commission – Hydrogen Strategy (July 2020)