

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, 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.

The current renewal rates are below 5% and therefore it will take over 20 years before replacing the old products with high efficiency and renewable energy ones, thus losing the possibility of achieving energy savings and reducing polluting emissions by 2030.

Bosch Thermotechnology therefore believes that it is essential to create the political and regulatory conditions to accelerate the renewal of the existing installed park, thus reducing energy consumption, increasing the use of renewable sources and improving air quality. This also represents an important opportunity for economic recovery, necessary after the crisis following the COVID-19 health emergency.

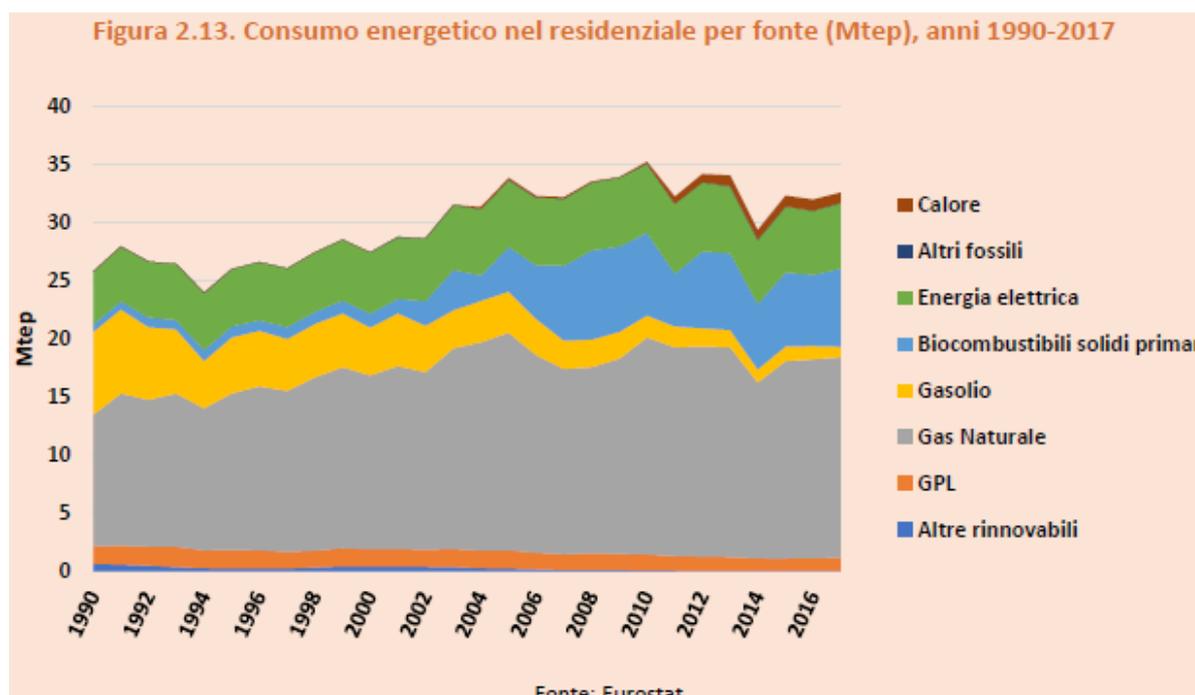
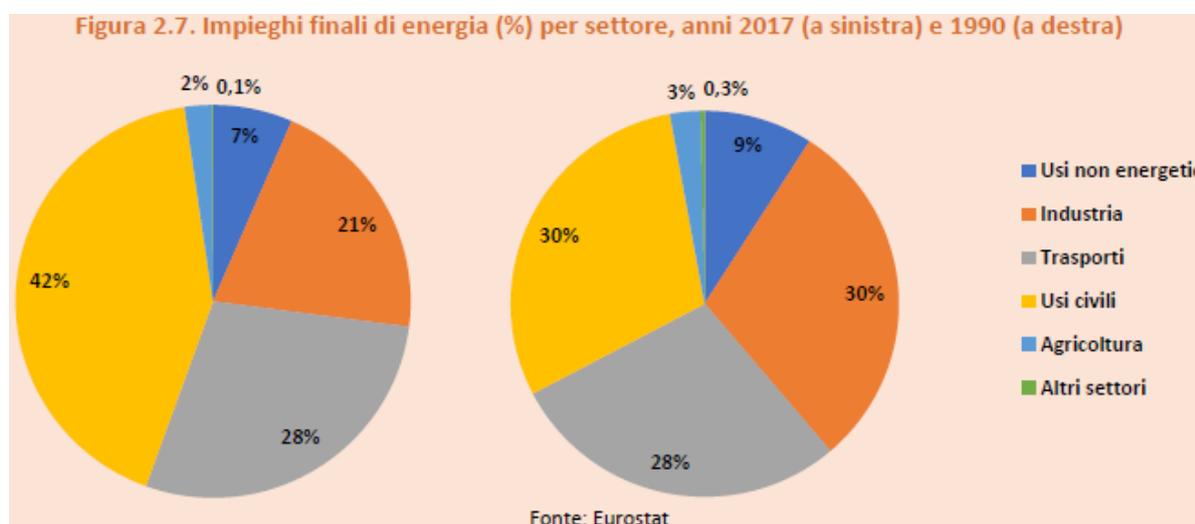
Bosch Thermotechnology in Italy is also a member of Assotermica (Association of manufacturers of equipment and components for thermal plants) and Assoclima (Association of air conditioning systems manufacturers) and it participates in the dialogue of the Associations with the authorities and shares the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

Key Data

1) Energy: energy balance and uses by sector

Tabella 1 : Il Bilancio dell'energia in Italia (Mtep)								
	2017	2018(1)					Totale	Var % (2018/17)
	Totale	Solidi	Gas	Petrolio	Rinnovabili	Energia elettrica		
Produzione	39,147	0,252	4,462	4,684	34,021		43,419	10,9%
Importazione	163,461	9,479	55,588	81,494	1,572	10,378	158,511	-3,0%
Esportazione	33,936	0,252	0,320	29,526	0,272	0,719	31,089	-8,4%
Variazioni scorte	-0,997	0,241	0,216	-1,920	-0,004		-1,467	
Consumo interno lordo	169,669	9,238	59,514	58,572	35,325	9,659	172,308	1,6%

Fonte: Ministero dello Sviluppo Economico - Bilancio Energetico Nazionale (1) Dati provvisori

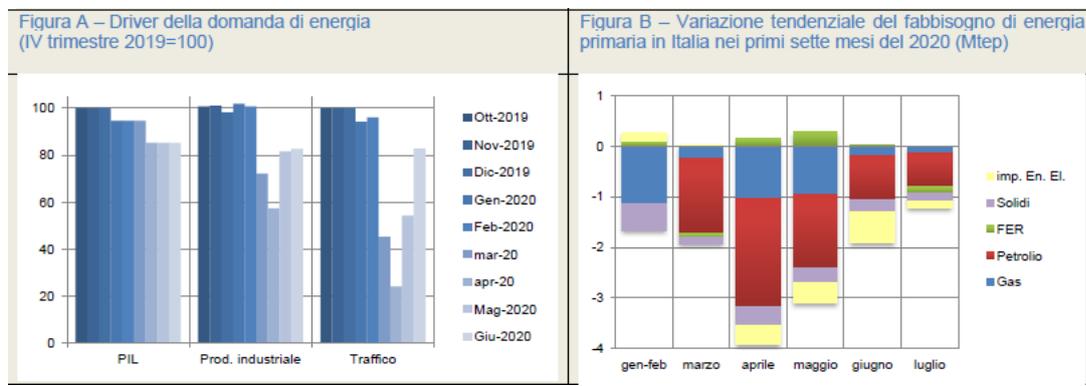


2) Impact of the COVID-19 crisis on Italian energy consumption

In Italy, the measures to shut down production activities, following the COVID-19 health crisis, led to a reduction in energy consumption of -14% in the 1st half and -22% in the 2nd quarter.

In terms of primary sources, more than half of the decline in consumption in the 2nd quarter was due to oil, about 1/4 to natural gas, just under 1/5 to electricity imports, the remainder to solids. Instead, renewable sources recorded a slight increase.

The collapse of request combined with the acceleration of the decarbonisation of the Italian electricity system, reduced CO2 emissions by 26% in the second quarter of 2020 (17% considering the entire first half).



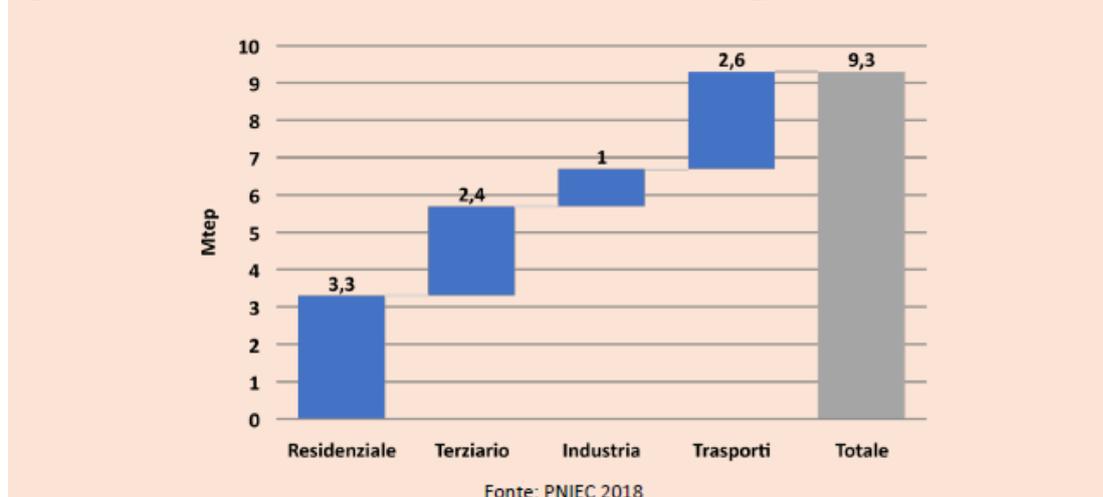
3) Energy Targets according NECP (2019): Energy and climate 2030 and reduction of consumption

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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%	

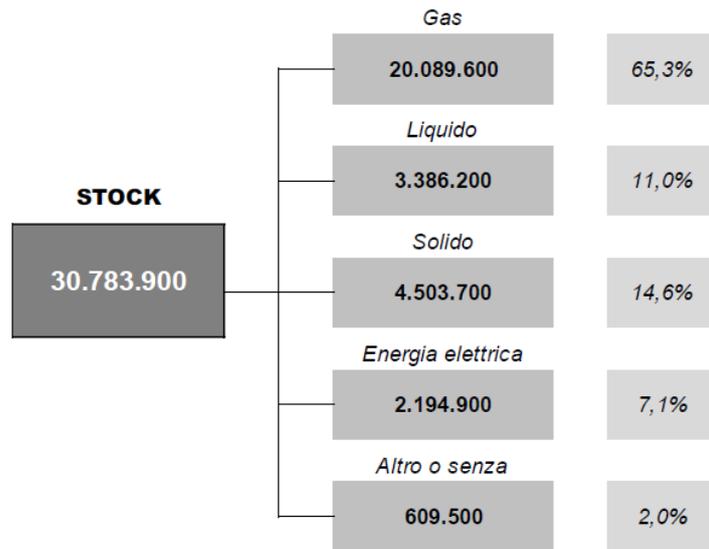
Figura 1.2. PNIEC: ripartizione per settore economico dei risparmi oggetto dell'obiettivo 2030 (Mtep)



4) Domestic heating and air conditioning park

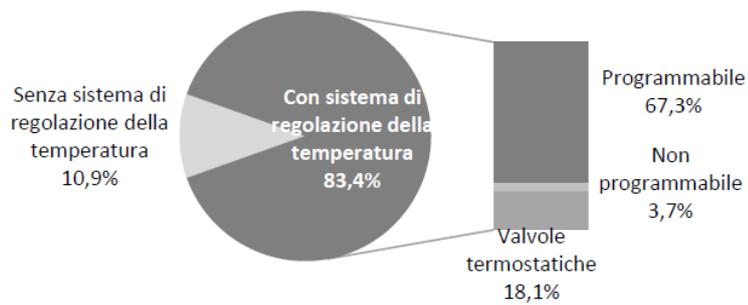
In Italy there are about 30 million homes (of which 23 primary owned or rented and 7 second homes / holiday homes or empty apartments). HVAC systems inside the homes are distributed as follows:

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



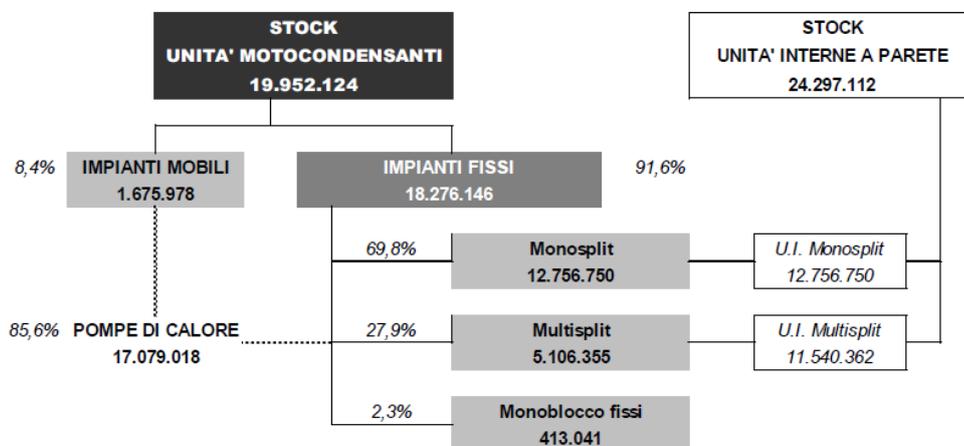
Fonte: elaborazioni e stime CRESME/SI

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 Assoclimate

5) Boilers and Heat pumps market

The market for heating products was first affected (March and April) by the "lockdown" due to the health emergency, which led to a prolonged shutdown for most of the construction sites and postponing the replacement of many old systems. The following months showed stagnation in sales of both boilers and heat pumps.

To restart the energy efficiency chain, the Italian government has considerably enhanced the Ecobonus (bringing it to 110% for some types of interventions) and re-introducing the mechanism of credit transfer and, above all, the fiscal discount directly on invoice, which allows the end user to have a lower price for efficiency improvement reduced by the tax deduction.

Proposals and comments

- **Promote energy labelling of existing appliances to survey their efficiency and increase awareness of the need to replace old heat generators**

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, in May 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.

- **Improve air quality by replacing old heating appliances with new, low environmental impact ones (greater efficiency = fewer emissions)**

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.

• **Stabilization and rationalization of the incentive mechanisms**

The incentive mechanisms (*Ecobonus* and *Bonus ristrutturazioni* and *Conto Termico*) for high efficiency appliances and / or with renewable sources have been one of the main drivers towards improving the efficiency of residential heating systems. However, the installed renewal rate remained low and insufficient for a rapid improvement in consumption and emissions into the atmosphere.

The *Decreto Rilancio*, of May 2020, introduced the so-called *Super Ecobonus*, which significantly enhanced the incentives (for large renovations, a tax deduction of up to 110% can be obtained, for all those interventions that will improve the energy performance of the building by 2 classes) and introduced discount mechanisms on invoices and credit transfer to third parties (including banks and financial institutions).

The implementing decrees of the *Super Ecobonus*, which entered into force on 1 July 2020 and valid until the end of 2021, were completed in the summer and therefore the first effects can start by the end of 2020.

The opportunities that this new mechanism opens up 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 months.

It is important to highlight that the period of validity of the mechanism is still too limited and that, if it conceived only as a one-off intervention and there will be no follow-up, it will only lead to a partial recovery in 2021, but followed by a foreseeable stagnation in the following years.

The proposal is 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 to 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 widely incentivized with the *Conto Termico* mechanism.

To tackle the crisis, the European Union has made available a "Recovery Fund" of 750 billion euros. These are subsidies and funding, available from the first quarter of 2021 and to be used by 2023, which member states will be able to draw on to develop projects in line with the objectives of the European Union (cohesion, digitization and sustainability) and which allow restart their economies. For Italy, €209 billion is expected. The Italian Government is engaged

in the elaboration of a *Piano Nazionale di Ripresa e Resilienza* (PNRR), which will have to define the projects to be submitted to the European Union by 31 December 2020. One of the objectives of the plan is to have a greener and more sustainable country, in line with the European Green Deal.

This is a great opportunity which, if taken, will lead to a strong acceleration of decarbonisation. However, it is essential that the government uses these funds to accelerate the energy efficiency of buildings, for example by stabilizing incentives and eliminating distortions and defining a clear decarbonisation strategy that takes into account electrification and "green gas", going through the technologies already available today and not very invasive such as condensing boilers which, although still powered by fossil energy (natural gas), are immediately within the reach of a large number of potential users who, with low economic impact, can contribute to significantly reducing harmful emissions in environment.

• 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 electrification of consumption has a fundamental importance, i.e. the transition from heating with a gas-powered system to one with an electric heat pump. The penetration of renewables within the production of electricity is constantly growing.

However, we must consider that Italy is one of the European nations with the largest natural gas distribution network and that about 85% of homes are heated by a gas system (about 17 million boilers). Converting gas to electric heating is not always easy and costs are high. This explains the fact that in 2020 only 5% of the new generators installed are an air / water heat pump and that in the next few years the prevailing technology will still be the gas boiler.

In parallel with electrification, a great deal of support for decarbonization could come from green gases and in particular green hydrogen, whose combustion does not emit greenhouse gases into the atmosphere. These fuels can be, within certain %, placed directly into the natural gas network and used by most of the existing boilers. In the future, there could be the possibility of having 100% hydrogen network parts that power new zero-emission boilers.

Bosch Thermotechnology considers the role of hydrogen in the energy transition to be fundamental and without its contribution, it is unlikely that the NECP targets can be reached.

It is therefore important that Italy also prepare, as has already been done by the European Commission and some member states, a strategy of decarbonisation of buildings that also takes into account hydrogen as an energy source.

Sources:

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- CRESME - 6° Rapporto congiunturale sul mercato dell'installazione di impianti [6nd Trends Report on the System Installation Market by CRESME]
- Assotermica - Rapporto Attività 2019 [Activity Report 2019]
- Assoclima – Rapporto Attività 2019 [Activity Report 2019]
- Assotermica – Proposte Assotermica per un Piano d'Azione per la riduzione delle emissioni inquinanti, 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]
- Assotermica –La qualità dell'aria nei centri urbani [Air quality in urban centres]. Il settore residenziale: le principali sostanze inquinanti, le fonti e le possibili soluzioni (09.2016) [The residential sector: main pollutants, their sources and potential solutions]

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- ENEA – RAEE 2019
- Ministero per lo Sviluppo Economico – Piano Nazionale Integrato Energia e Clima (PNIEC) 2019 [National Energy and Climate Plan (NECPs)]
- CIG - Statistica incidenti da gas combustibile in Italia 2018 [Statistics for combustible gas incidents in Italy 2018]
- Protocollo di intesa “Piano d'azione per il miglioramento della qualità dell'aria” 2019 [Memorandum of understanding "Action plan for improving air quality" 2019]
- Decreto Rilancio (D.L. 34/2020) [Law decree No 34/2020]
- TT - Position paper Bosch Thermotechnology: Energy Systems of the Future - The Path to Carbon Neutrality (Marzo 2020).
- European Commission – Hydrogen Strategy (July 2020)