IEA Bioenergy

Italy – 2018 update

Bioenergy policies and status of implementation

Country Reports

IEA Bioenergy: 09 2018

This report was prepared from the 2018 OECD/IEA World Energy Balances, combined with data and information provided by the IEA Bioenergy Executive Committee and Task members. Reference is also made to Eurostat. All individual country reports were reviewed by the national delegates to the IEA Bioenergy Executive Committee, who have approved the content. General background on the approach and definitions can be found in the central introductory report[1] for all country reports.

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NATIONAL POLICY FRAMEWORK IN ITALY

Italy has a national binding target for renewable energy stated in the EU Renewable Energy Directive (2009/28/EC) to account for 17 % of gross final energy consumption in 2020. The targeted shares of the three sectors heating/cooling, electricity and transport are shown in the table below.

Table 1: *Italy´s 2020 renewable energy targets.*

Sector	Share in gross final consumption per sector
Overall target	17%
Heating and cooling	17.09%
Electricity	26.39%
Transport	10.14%

Source: National Renewable Energy Action Plan of Italy (2010)[2]

Italy is on the track of fulfilling the electricity and the heating and cooling targets, even if it is still behind in reaching the EU 10% target of renewables in the transport sector.

[1] Available at https://www.ieabioenergy.com/iea-publications/country-reports/2018-country-reports/

[2] https://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans

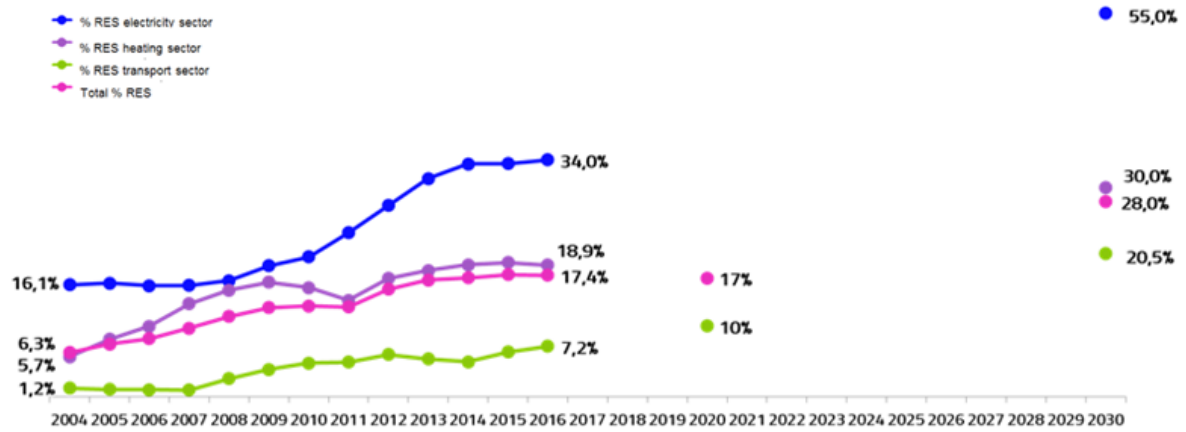

***Figure 1**: RES share in the final energy consumptions. 2020 binding targets and NES 2017 targets*

The Italian Government in November 2017 issued a new **National Energy Strategy** with a view to 2030 (NES 2017). The document results from a participative process that involved the Italian Parliament, the Regions, and over 250 stakeholders, including associations, companies, public entities, citizens, and representatives of academia. The numerous contributions given to the process testify the priority that the public opinion assigns to energy and environmental issues.

The objective of the Strategy is to make the national energy system more competitive, more sustainable, and more secure.

More competitive means aligning Italian energy prices with European ones to the benefit of both companies and consumers, opening up new markets to innovative companies, creating new employment opportunities, and fostering research and development.

More sustainable means contributing to decarbonisation, in line with the long-term targets of the Paris Agreement on Climate Change, improving energy efficiency, and encouraging energy conservation to mitigate environmental and climate impacts, promoting environmentally conscious lifestyles, from sustainable mobility to wise energy usage and confirming Italy's environmental leadership role.

More secure means improving the security of energy supply, while ensuring its flexibility and strengthening Italy's energy independence

The main targets of the Strategy are:

1) reducing final energy consumption by a total of 10 million tons of oil equivalent (Mtoe) by 2030
2) phasing out coal in electricity generation by 2025
3) reducing greenhouse gases emissions by 39% in 2030 and 63% in 2050 compared to 1990 levels
4) raising the share of renewables in energy supply to 28% by 2030, with a share of 55 % for renewables in electricity generation, 30% in the heating and cooling sector and 21% in transport.
5) reducing energy dependency from 76% in 2015 to 64% in 2030
6) promoting advanced biofuels, biomethane and sustainable mobility
7) doubling investments in research and development of clean-energy technologies: from € 222 million in 2013 to € 444 million in 2021.

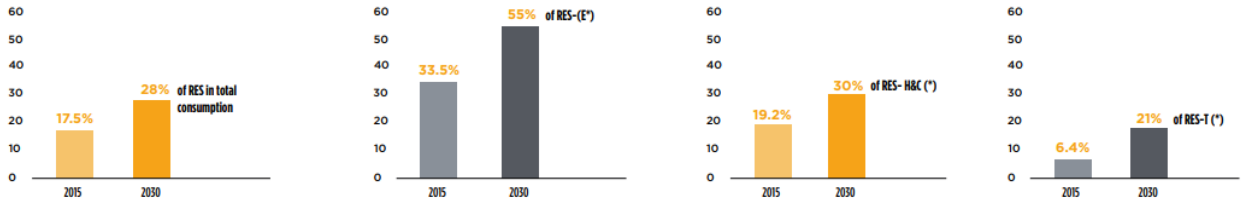

***Figure 2**: NES 2017 RES targets*

The National Energy Strategy will lead to the realization of important investments, increasing the trend scenario with additional total investments of 175 billion euro to 2030, divided as follows:

- 30 billion euro for networks and infrastructure for gas and electricity;
- 35 billion euro for renewable sources;
- 110 billion euro for energy efficiency.

Concerning bioenergy, the new National Energy Strategy plans to maintain existing power generation plants in the electricity sector, without distortions to the agricultural sector chain. In the heating sector biomass facilities (traditionally very widespread in Italy) will have to mitigate their emissions, and guarantee high environmental quality. Furthermore, the potential of district heating in urban and non-urban areas will be harnessed in efficient ways. In the transport sector Italy will have to promote the transition towards fuels having low lifecycle GHG emissions and low land use (advanced biofuels and biomethane).

Support schemes for renewable energy sources (including bioenergy)

In Italy, the growth of RES has been supported by different mechanisms and significant revisions occurred over time, in particular in the electricity sector.

In 2013, the "PV Conto Energia" reached the limit for the yearly cumulative cost of incentives equal to 6.7 billion euro; in the meanwhile, Green Certificates were substituted by a sliding Feed-in Premium scheme with access procedures which, depending on the plant power class, include direct access, registries and auctions. For renewable technologies different from PV, a limit cost of 5.8 billion euros per year was defined.

Additionally, during recent years, other schemes were introduced such as a fiscal incentives for the private sector and a White Certificate scheme for energy utilities and ESCO companies. In 2013 (updated in 2016) a further mechanism, named Thermal Account ("Conto Termico"), for the H&C sector was introduced, in addition to those systems already in force. For the transport sector a biofuels quota obligation was defined.

Electricity sector

Italy has managed different schemes to support the growth of renewable energy sources in electricity (including bioenergy):

- Feed-in Premium scheme (changed in the last phase in a feed-in tariff scheme/sliding FIP scheme) named "Conto energia" for PV installations (over 20 years) and CSP (over 25 years);
- Green Certificate scheme for all RES different from PV (over 15 years);
- Feed in Tariff scheme for all RES different from PV with a capacity up to 1 MW (over 15 years);

- New feed-in Tariff and sliding feed-in Premiums systems through registries and auction (over the plant lifetime);
- Fiscal incentive (tax credit).

The following table summarizes the main features of the support scheme for electricity production from renewable energy sources into force in Italy.

***Table 2**: Summary of the support schemes for RES in the electricity sector*

SUPPORT SCHEME	VALIDITY PERIOD (1)	DURATION OF THE INCENTIVE (1)	SOURCES/ TECHNOLOGIES	PLANT CAPACITY(2)	SUPPORT TYPOLOGY(3)	DESCRIPTION OF THE INCENTIVE	TYPE OF ENERGY ELIGIBLE TO THE INCENTIVE	ENERGY REMUNERATION(4)
MD 23rd June 2016	2016 - 2017	15-30 years	RES-E including CSP but not PV	<=500kW	FIT	Constant tariff	Injected	Included in the tariff
				>500kW	SFIP	The tariff is obtained by the difference between the incentive and the energy price	Injected	Market
MD 6th July 2012	2013-2016	15-30 years	RES-E - not PV	<=1MW	FIT	Constant tariff	Injected	Included in the tariff
				>1MW	SFIP	The tariff is obtained by the difference between the incentive and the energy price	Injected	Market
5th PV Energy Account	2012-2013	20 years	PV	<=1MW	FIT + PT	Constant tariff	Produced	Included in the tariff
				>1MW	SFIP + PT	The tariff is obtained by the difference between the incentive and the energy price	Produced	Market
CSP Energy Account	2008-2016	25 years	CSP	All	FIP	Constant tariff	Produced	Market or NM or SP
All-inclusive FIT	2008-2012	15 years	RES-E not PV	<=1MW(5)	FIT	Constant tariff	Injected	Included in the tariff
1st – 4th PV Energy Account	2006-2012	20 years	PV	All	FIP(6)	Constant Tariff	Produced	Market or NM or SP
Green Certificates/ Support Tariff	2002-2012	8-15 years	FER-E(7)	All	Green Certificates / SFIP	Green Certificates Market or withdrawal by the GSE at a price linked to the energy market price / The tariff is obtained by the difference between the incentive and the energy price	Produced	Market or NM or SP
CIP6/92	1992-2001	8-15 years	RES - E	ALL	FIT	Tariff partly linked to fuel prices	Injected	Included in the tariff

Footnotes to the table

(1) Indicative period of eligibility to the support scheme without prejudice of specific or transitional provisions.
(2) Not less than 1 kW
(3) FIT: Feed in Tariff
FIP: Feed in Premium
SFIP: Sliding Feed in Premium
PT: Premium tariff
(4) Access to Simplified Purchase (SP) or Net Metering (NM) is regulated on the basis of the plant typology and capacity
(5) 200 kW for wind power plants
(6) The 4th Energy Account provided a FIT + PT for the power plants entered into operation from 2013
(7) Including specific CHP power plants connected to district heating systems

In addition to the previous mechanisms, there have been other facilitating measures available for RES in the electricity sector:

- Simplified purchase, accessible by all renewable non-programmable power plants and for other power plants up to 10 MVA. It allows the operator to have the energy injected into the grid retired by GSE, who is responsible for bidding the energy into the market;

- Net Metering, accessible by renewable power plant and CHP power plants up 200 kW (extended up to 500 kW in 2015). It provides to the producers an economic contribute in order to pay back a part of the cost of purchased energy. The value of the contribute is determined on the basis of an economic valorisation of the energy injected into the grid.

Heating sector

In Italy renewable energy sources for heating and cooling (including bioenergy) are supported by:

- Grants for the generation of thermal energy from renewable energy sources and for small-scale energy efficiency projects (Conto Termico)
- Tax deductions
- White certificates

According to the "Conto Termico" small-scale renewable thermal energy production (including biomass fireplaces, boilers and stoves) and energy efficiency projects will receive an incentive (a grant) proportionate to the investment. The incentive takes into account the amount of renewable thermal energy production or energy saving achieved. The scheme was introduced in 2013 and updated in 2016 (MD 16th February 2016).

Tax deduction for energy saving in buildings (provided by the Budget Law 2007) allows deducting 65% of the costs incurred to improve the energy efficiency of buildings from IRPEF (personal income tax) or from IRES (corporate income tax). The deduction is staggered over 10 years. Eligible interventions include replacement of heating systems with heat pumps and biomass appliances.

Tax deduction for building renovations (art. 16-bis DPR n. 917/86) allows the deduction from IRPEF (personal income tax) of the 50% of the costs incurred for restructuring the dwellings and common areas of residential buildings located in Italian territory. The deduction is staggered over 10 years. The various types of works eligible for tax deduction include the installation of renewable energy appliances for heating and cooling including bioenergy installations.

White certificates (Ministerial Decree 11 January 2017) are tradable securities which certify energy savings in final energy uses. The White Certificate scheme rests on the obligation for gas and/or electricity distributors with more than 50 000 final customers to achieve pre-set annual energy savings targets. Electricity and gas distributors may meet their obligations by implementing energy efficiency projects or by purchasing securities on the white certificates' market or via bilateral contracts, from 'voluntary parties' which implement energy saving actions with final users and sell the White Certificates so obtained. Eligible interventions include the use of renewable energy sources for heating and cooling purposes.

Support schemes for transport biofuels

Biofuel blending obligation quota

In order to comply with the 10% EU RES target in the transport sector, Italy introduced, through the regulations implementing Directive 2009/28 (Legislative Decree 3rd March 2011 n. 28 and MD 10th October 2014 and following amendments), a quota obligation of biofuels for suppliers of petrol and diesel from fossil sources.

The obligation can be met by acquiring, in whole or in part, the equivalent quota or corresponding rights from others, buying the so called Biofuel Certificates (CICs).

It is relevant to say that a mandatory quota for "advanced biofuels" has been introduced. Advanced biofuels are produced from materials listed in Annex 3 of the Decree and include agricultural and industrial wastes (apart from UCOs and animal fats), residues, ligno-cellulosic materials, cellulosic materials and algae. The measure specifies that the mandatory quota for advanced biofuels must be fulfilled for 75% by biomethane and for 25% by other advanced biofuels. The respective shares will be reviewed every two years.

***Table 3**: Mandatory quota for biofuels and "advanced biofuels"*

Year	Q%	Q% Advanced biomethane	% Other advanced biofuels
2015	5%		
2016	5.5%		
2017	6.5%		
2018	7.0%	0.45%	0.15%
2019	8%	0.60%	0.20%
2020	9%	0.68%	0.23%
2021	9%	1.13%	0.38%
From 2022	9%	1.39%	0.46%

Furthermore, all the biofuels released for consumption in Italy must comply with the sustainability criteria stated by Renewable Energy Directive (2009/28/EC) and Fuel Quality Directive (2009/29/EC) and they must be certified by specific certification bodies according to the National Certification Scheme (MD 23 January 2012) or according to voluntary schemes approved by the European Commission or according to bilateral or multilateral agreements with third countries.

The scheme provides extra incentives for advanced biofuels and UCO and animal fats (double counting mechanism – 5 Gcal[3] of biofuels released gives rights to a certificate instead of 10 Gcal for conventional biofuels).

Not complying with the obligation leads to a fee of euro 750 for every missing Biofuel Certificate in a certain year without prejudice of the maximum quota of Biofuel Certificates that can be postponed to the next year (20% in 2018, 5% from 2019 onwards).

[3] 1 Gcal (gigacalorie) = 4.1868 GJ (gigajoules) = 0.099933 toe (tons of oil equivalent)

Biomethane and advanced biofuels

The Decree of 3rd March 2018 provides incentives for biomethane injected into the natural gas grid and for advanced biofuels to be used in the transport sector. The Decree provides measures for:

- biomethane injected into the natural gas grid without a specific intended use - Guarantees of Origin (art. 4).
- Biomethane injected into the natural gas grid to be used in the transport sector (art. 5)
- Advanced biomethane injected into the natural gas grid with the obligation to connect third parties to be used in the transport sector (art. 6)
- Advanced biofuels, different from biomethane (art.7).

Biomethane injected into the natural gas grid to be used in the transport sector is supported by the above described biofuels' blending obligation. Double counting is recognised.

Producers of advanced biomethane injected into the natural gas grid to be used in the transport sector (art. 6) can decide to sell the biomethane produced to the GSE, the company in charge of the management of the scheme, obtaining the gas market price (equal to the monthly weighted average price for natural gas on the market), minus 5%. The producer will also obtain a premium corresponding to the value of the CICs, reflecting the calorific value of the biomethane purchased. Under this mechanism, the value of one CIC is set at 375 €. One CIC will be issued for 5 GCal of advanced biomethane. The advanced biomethane producers can alternatively decide to trade directly their biomethane without the intervention of the GSE, obtaining only the premium of 375 euro/CIC.

The producers of advanced biofuels, different from advanced biomethane, can obtain from the GSE a premium of EUR 375/CIC for every 5 GCal of biofuels sold to obliged fuel retailers who participate in the scheme and upon proof submitted by those retailers that the said quantity has been placed in the market for use in transport. Obliged fuel retailers purchase the biofuel at a maximum price linked to fuel prices (based on the average Platt's published levels, minus 5%).

The Decree applies to production plants starting operations between 2018 and 2022. The scheme is also open to existing plants for the production of biogas which are converted partially or totally in plants for the production of advanced biomethane between 2018 and 2022.

The total amount of biomethane that can access to the provisions of the Decree is **1.1 billion Standard Cubic Metre/year**.

The incentives are funded by transport fuel suppliers.

A description of fiscal and non-fiscal supports for bioenergy development is available at: http://www.iea.org/policiesandmeasures/renewableenergy/?country=Italy

TOTAL PRIMARY ENERGY SUPPLY (TPES) AND THE CONTRIBUTION OF BIOENERGY

The total primary energy supply of Italy in 2016 amounted to 6,321 petajoule (PJ) with an import of electricity of 133 PJ (2.1% of TPES). The energy system is still dominated by fossil fuels (around 80%), with 2,432 PJ natural gas, 2,158 PJ oil products, 460 PJ coal and a small share of non-renewable waste (50 PJ). Renewable energy sources have a share of 17.2% or 1,089 PJ - 8.7% bioenergy and 8.5% other renewable energy sources.

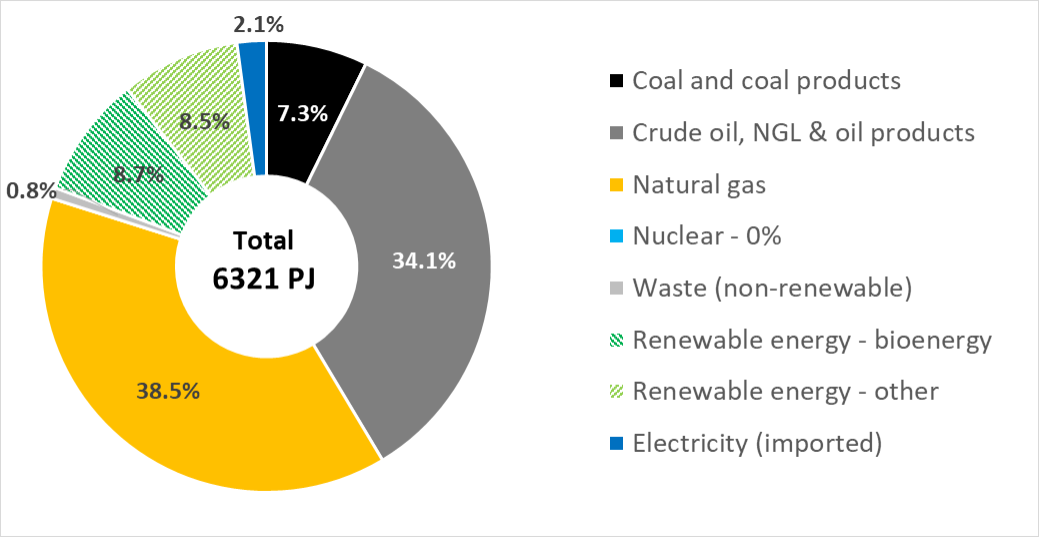

Figure 3: Total primary energy supply in Italy in 2016 (Source: World Energy Balances © OECD/IEA 2018)

Compared to 5 years earlier (2011) the share of coal has gone down from 9.1% to 7.3%, and the share of oil products has dropped from 37.4% to 34.1%. In the same period and the share of renewable energy increased from 12.5% to 17.3%. The share of natural gas remained relatively stable.

Half of total primary energy supply of renewable energy sources is covered by bioenergy (552 PJ). Geothermal energy amounts for 233 PJ, hydropower for 153 PJ, solar energy for 88 PJ and wind energy for 64 PJ.

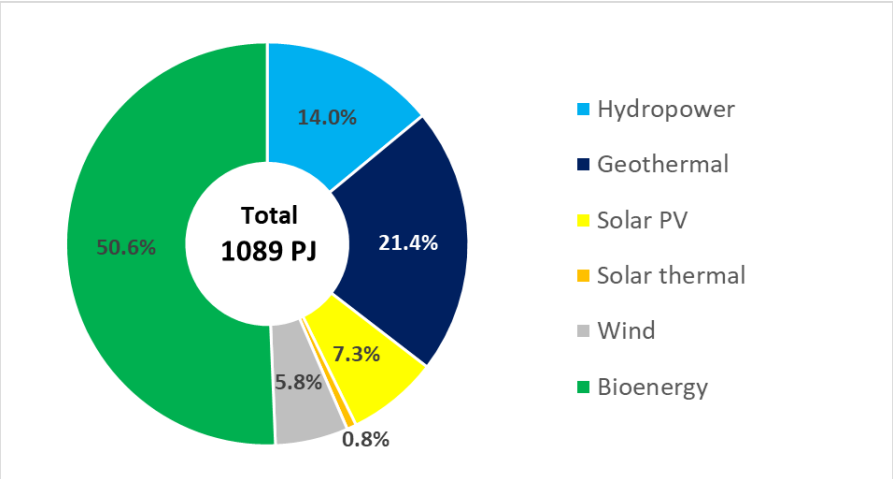

Figure 4: Total primary energy supply of Renewable Energy Sources in Italy in 2016 (Source: World Energy Balances © OECD/IEA 2018)

Two thirds of the bioenergy consumed in Italy comes from solid biomass (353 PJ), of which most (around 257 PJ) is used in residential applications. The second largest item is biogas (79 PJ), followed by biodiesel (42 PJ), other liquid biofuels (38 PJ) and renewable municipal waste (36 PJ). Biogasoline only reached 1.4 PJ. Charcoal was reported at 1.8 PJ.

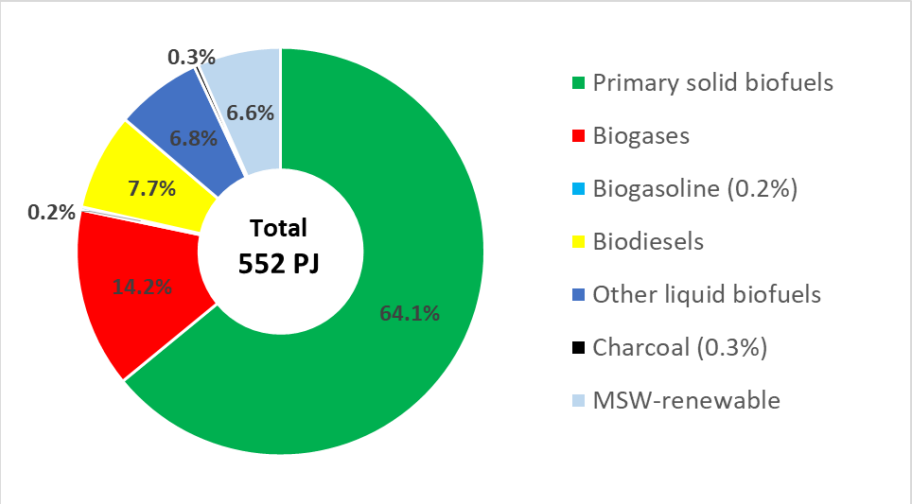

Figure 5: Total primary energy supply from bioenergy in Italy in 2016 (Source: World Energy Balances © OECD/IEA 2018)

Bioenergy consumption in Italy increased more than fivefold from 2000 to 2010, increasing its share in TPES from 1.2% to 6.7% in only ten years. There was high growth in all different energy carriers – solid biomass, liquid biofuels, biogas and renewable MSW. After 2011 (when there was a substantial drop in solid biomass consumption) growth continued up to an overall level of 8.7% in 2013; however this level has stabilized since 2013.

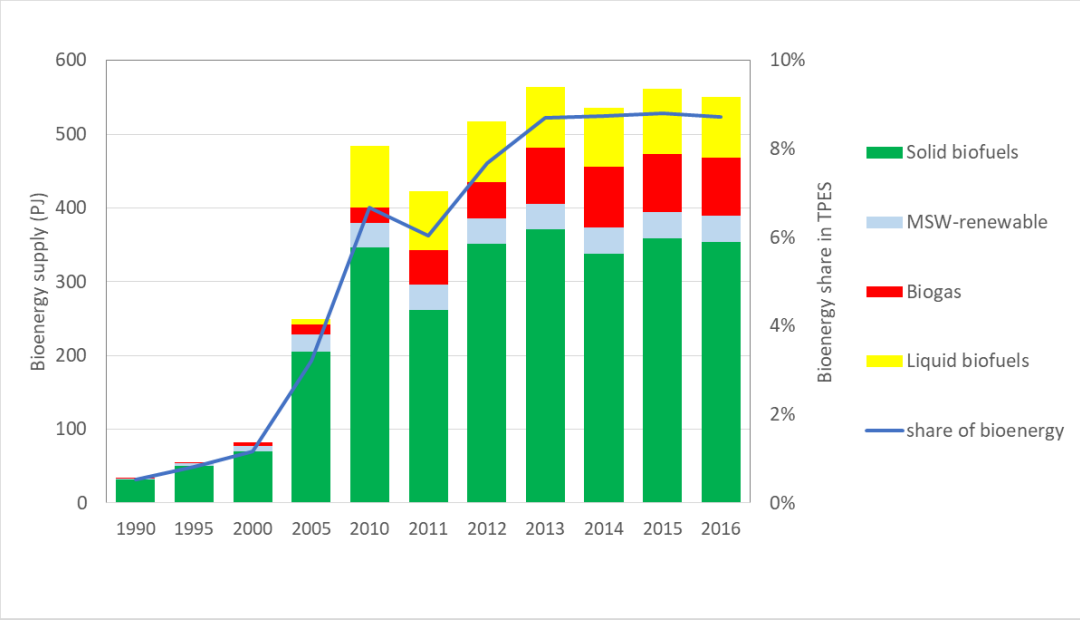

Figure 6: Development of total primary energy supply from bioenergy in Italy 1990 – 2016 (Source: World Energy Balances © OECD/IEA 2018)

Table 2 expresses the 2016 TPES figures per capita, considering Italy's population of 60.6 million people. Compared to the other 22 member countries of IEA Bioenergy (expressed per capita), Italy ranks in the top 5 for biogas, halfway for liquid biofuels and renewable MSW, and in the lower end for solid biofuels.

***Table 4**: Total primary energy supply per capita in 2016*

	GJ/capita
Total energy	104.3
Bioenergy	9.1
Solid biofuels	5.8
Renewable MSW	0.6
Biogas	1.3
Liquid biofuels	1.3

Source: World Energy Balances © OECD/IEA 2018

Role of bioenergy in different sectors

Italy has a rather important share of renewable electricity. 40% of it is from hydropower, and the rest is distributed over solar, biomass and wind.

The share of biofuels for transport is around 2.9%. Mind that the share of biofuels was already 3.7% in 2010, and this figure slightly reduced over the past years.

Overall, the direct share of biomass for heating in the different sectors is around 13%. Heat output generated and sold by CHP plants and heat plants represents around 8% of fuel/heat provided, of which on average 17% is produced from biomass. In the residential sector biomass represents about a quarter of fuel/heat consumption.

***Table 5:** Role of bioenergy and renewable energy in electricity production, transport energy consumption and fuel/heat consumption in 2016*

Sector	Share of bioenergy	Share of renewable energy	Overall production/ consumption
Electricity production	6.8%	37.5% *(14.7% hydro)*	288 TWh (1,037 PJ)
Transport energy (final consumption)	2.9%	3.9%	1,499 PJ
Overall fuel and heat consumption[4]	Direct biomass: 12.9% Biobased heat: 1.3%	14.8%	2,168 PJ

Source: World Energy Balances © OECD/IEA 2018

[4] This includes final consumption of fuels and heat in industry, the residential sector, commercial and public services and agriculture/forestry. Transport fuels are excluded. Energy used for transformation and for own use of energy producing industries is also excluded.

According to Eurostat[5], the following renewable energy shares in gross final energy consumption were reached in Italy in 2016:

- Overall share: 17.4%
- In heating and cooling: 18.9%
- In electricity: 34.0%
- In transport: 7.2%

The overall target for 2020 has already been reached, as well as the separate targets for the electricity and heating/cooling sectors (see Table 1). Some additional efforts are still to be made in the transport sector. It is important to note that in 2013 Italian National Institute of Statistics (ISTAT) made a survey on biomass used in the residential sector. After this survey GSE reviewed and updated time series of energy consumption from biomass in the residential sector from 2002. Mind that some of these figures can differ from the IEA derived data because of different accounting rules, particularly for renewable energy in transport.

LINKS TO SOURCES OF INFORMATION

GSE (Gestore Servizi Energtici): https://www.gse.it/

National Energy Strategy: http://www.sviluppoeconomico.gov.it/index.php/en/news/2037432-national-energy-strategy

IEA overview policies and measures:
http://www.iea.org/policiesandmeasures/renewableenergy/?country=Italy

RES LEGAL renewable energy policy overview Italy: http://www.res-legal.eu/search-by-country/italy/

[5] http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nrg_ind_335a&lang=en