POWER PLANTS

Maximum capacity of electric power plants in Italy at 31 December 2014

By energy source

Figure 5

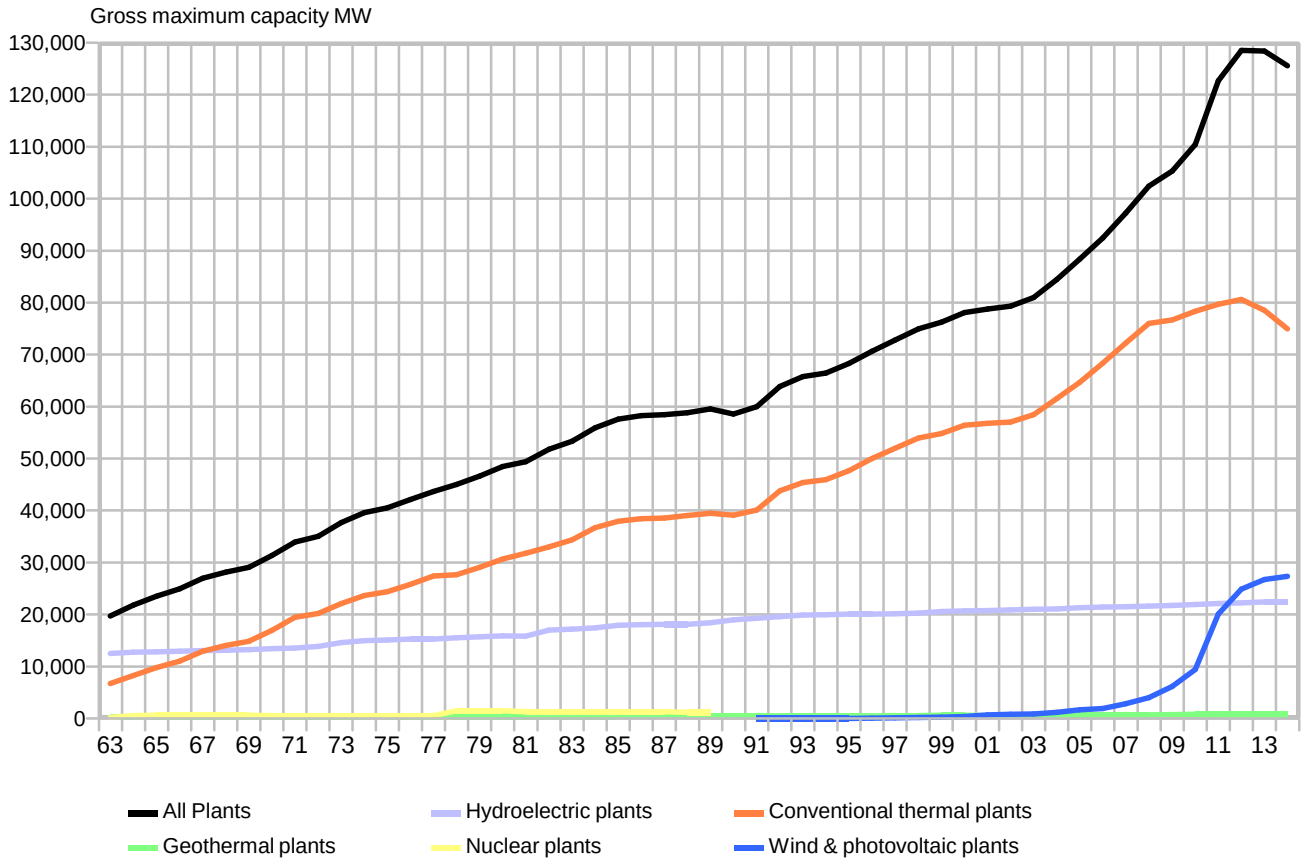


Table 5 (*)

	Gross			Net		
	Producers	Autoproducers	Total	Producers	Autoproducers	Total
MW						**2014**
hydroelectric	22,311.7	122.8	22,434.5	21,978.9	118.8	22,097.7
thermal	71,653.5	4,133.0	75,786.5	68,417.2	3,954.8	72,372.0
conventional	*70,832.5*	*4,133.0*	*74,965.5*	*67,649.2*	*3,954.8*	*71,604.0*
geothermal	*821.0*	-	*821.0*	*768.0*	-	*768.0*
wind	8,703.1	..	8,703.1	8,682.8	..	8,682.8
photovoltaic	18,609.4	-	18,609.4	18,609.4	-	18,609.4
total	**121,277.6**	**4,255.8**	**125,533.5**	**117,688.2**	**4,073.6**	**121,761.8**

The **maximum capacity** of a power plant is the maximum electrical capacity that could be produced continuously throughout a prolonged period of operation on the assumption that all parts of the plant are entirely efficient and in optimal condition (flow and heat in the case of hydroelectric plants, availability of fuel and of cooling-water in the case of thermoelectric plants).

Maximum capacity is **gross** if measured at the terminals of the plant's generators or **net**, if measured at the plant's busbars, that is, less the power absorbed by the plant auxiliary services and less the losses in the transformers that are considered integral parts of the plant.

(*) For the definition of "Autoproducer" see Introduction of the volume, page 3.

Hydro plants

Nominal and maximum capacity and average annual energy capability of hydro plants in Italy at 31 December

Table 6

	Plants		Nominal capacity			
			Prime movers		Generators	
	no.	no.	MW	MW	MVA	MVA
	2013	**2014**	**2013**	**2014**	**2013**	**2014**
Producers	3,187	3,368	24,206.8	24,254.6	27,694.4	27,758.1
variation 2014/2013		*5.7%*		*0.2%*		*0.2%*
Autoproducers	70	71	137.8	137.6	173.6	173.5
variation 2014/2013		*1.4%*		*-0.1%*		*-0.1%*
Total	**3,257**	**3,439**	**24,344.6**	**24,392.3**	**27,868.0**	**27,931.6**
variation 2014/2013		***5.6%***		***0.2%***		***0.2%***

(*) Including energy capability from pumping inflows.

A **hydro plant** is a complex of hydraulic works, machinery, equipment, buildings and services for the conversion of hydraulic energy into electric energy. The **power station** is the plant comprising the building, the hydroelectric sets, the relative equipment and facilities such as the “station transformers”. Two hydro plants with different heads, but having in common the power-station building, the discharge installations and part of the services, are considered as separate plants, each classified in its specific category (see definition on page 31).

In **pumped-storage plants**, the pumps and the turbines are always connected to the same upper reservoir. The following two types of pumped-storage plants are distinguished according to the manner in which they are connected to the lower reservoir or reservoirs:
– **plants with contributory pumping,** in which the pumps are connected to a lower reservoir separated from that into which the turbines are discharged. In this case it is not possible to provide for pumping cycles, and the function of the pumps, which may be installed in the powerhouse building or in a different building, is solely to raise the water collected by the reservoir which supplies the pumps to the upper reservoir. Pumping with these plants is defined as “contributory pumping”;
– plants in which the pumps and turbines are connected to the same lower reservoir: in this case the pumping cycle is repeatable a larger number of times, if required. These plants are considered respectively as **pure pumped-storage plants** or **mixed pumped-storage plants** when the natural inflows which supply the upper reservoir are, on average, above or below 5% the average volume of water feeding the turbines in a year. The pumping of these plants is defined as “voluntary pumping”.

The **nominal capacity** of a hydraulic prime mover (turbine) or of an electrical generator is the maximum capacity obtainable, in continuous operation according to the accepted standards; the nominal capacity is a gross capacity. In a hydroelectric plant (or in a group of plants), nominal capacity is the sum of the nominal capacities of the machines (main and auxiliary) installed in the power plant.

Maximum capacity				Average annual energy capability (*)			
Gross		Net		Gross		Net	
MW	MW	MW	MW	GWh	GWh	GWh	GWh
2013	**2014**	**2013**	**2014**	**2013**	**2014**	**2013**	**2014**
22,260.2	22,311.7	21,890.5	21,978.9	55,454.3	55,670.5	54,622.5	54,835.4
	0.2%		*0.4%*		*0.4%*		*0.4%*
122.7	122.8	118.8	118.8	615.3	618.3	606.1	609.0
	0.1%		*0.0%*		*0.5%*		*0.5%*
22,382.9	**22,434.5**	**22,009.3**	**22,097.7**	**56,069.6**	**56,288.8**	**55,228.6**	**55,444.4**
	0.2%		***0.4%***		***0.4%***		***0.4%***

The **energy capability from natural inflows** of a hydroelectric plant in a given period is the maximum quantity of electric energy that it could possibly produce or store with said inflows in the period considered, on the assumption of complete utilisation of the inflows and that all parts of the plant are efficient. Energy capability may be gross or net and is calculated in a manner analogous to that defined for production (see page 23).

The **average energy capability from natural inflows** of a hydro plant in a given period is the arithmetic mean of the related energy capabilities during the largest possible number of consecutive years.

The **average energy capability from contributory-pumping inflows** of a hydro plant in a given period is defined in a manner analogous to energy capability from natural inflows, but with reference to a net head height equivalent to the difference between the level of the upper reservoir of the plant and that of the reservoir which supplies the pumps.

The **average energy capability from voluntary-pumping inflows** of a pure or mixed pumped-storage hydro plant in a given period is calculated conventionally on the basis of considerations that take into account the duty that this type of plant is called to perform in the generating system.

Situation of hydro plants in Italy in 2014

Table 7

	Plants		Nominal capacity	
			Prime movers	Generators
	no.	Category	kW	kVA
Situation at 31/12/2013	**3,257**		**24,344,615**	**27,867,990**
Plants commissioned in 2014	**188**		**84,893**	**102,883**
Piemonte	26	Run of river	10,624	13,495
Valle d'Aosta	11	Run of river	7,006	9,294
Lombardia	26	Run of river	7,625	8,974
Lombardia	1	Reservoir	75	88
Trentino Alto Adige	47	Run of river	34,192	41,301
Trentino Alto Adige	1	Reservoir	20	24
Veneto	2	Pondage	12	16
Veneto	14	Run of river	2,558	3,120
Friuli Venezia Giulia	8	Run of river	1,243	1,423
Liguria	3	Run of river	222	227
Emilia Romagna	1	Pondage	13	16
Emilia Romagna	9	Run of river	4,159	4,866
Toscana	14	Run of river	1,144	1,334
Umbria	2	Run of river	53	64
Marche	6	Run of river	1,549	1,893
Lazio	3	Run of river	4,620	5,775
Abruzzi	5	Run of river	7,412	8,046
Abruzzi	1	Reservoir	1,000	1,250
Campania	1	Run of river	30	38
Campania	2	Reservoir	526	655
Puglia	2	Reservoir	690	841
Basilicata	2	Run of river	102	120
Sicilia	1	Run of river	18	23
Existing modified or inoperative plants in 2014	**-14**		**-37,237**	**-39,255**
Situation at 31/12/2014	**3,439**		**24,392,271**	**27,931,619**

The **categories** in which hydro plants are classified are defined on page 31.
The electrical capacity of a set of reservoirs is the amount of electricity that their downstream hydro plants could generate through the complete emptying of the reservoirs' "water operating capacity", lacking natural flows and water losses.

Gross maximum capacity	Average annual gross energy capability			
	from natural inflows	from pumping inflows		Total
		contributory	voluntary	
kW	GWh	GWh	GWh	GWh
22,382,890	**49,234.9**	**183.7**	**6,651.0**	**56,069.6**
83,533	**319.2**	**0.0**	**0.0**	**319.2**
10,388	36.7	-	-	36.7
6,989	33.6	-	-	33.6
7,427	30.6	-	-	30.6
75	0.2	-	-	0.2
33,917	108.5	-	-	108.5
20	0.1	-	-	0.1
12	..	-	-	..
2,328	11.3	-	-	11.3
1,099	4.5	-	-	4.5
222	0.9	-	-	0.9
13	..	-	-	..
4,054	9.2	-	-	9.2
1,118	6.4	-	-	6.4
47	0.3	-	-	0.3
1,500	5.7	-	-	5.7
4,620	23.0	-	-	23.0
7,355	36.4	-	-	36.4
1,000	5.0	-	-	5.0
20	..	-	-	..
526	3.2	-	-	3.2
690	3.0	-	-	3.0
95	0.5	-	-	0.5
18	0.1	-	-	0.1
-31,906	**734.6**	**..**	**-834.6**	**-100.0**
22,434,517	**50,288.7**	**183.7**	**5,816.4**	**56,288.8**

Nominal and maximum capacity and average annual gross energy capability of hydro plants in Italy at 31 December 2014

By major geographical area and category of plant

Table 8

	Plants	Nominal capacity		Maximum capacity		Average annual gross energy capability			
		Prime movers	Generators	Gross	Net	from natural inflows	from pumpings		Total
							contributory	voluntary	
	no.	MW	MVA	MW	MW	GWh	GWh	GWh	GWh
reservoir plants	126	8,976.3	10,086.1	8,540.7	8,450.1	10,372.5	109.9	3,447.9	13,930.3
of which pure and mixed pumped-storage	*15*	*5,378.4*	*6,096.9*	*5,147.1*	*5,098.2*	*2,787.5*	*34.3*	*3,447.9*	*6,269.7*
pondage plants	132	4,026.3	4,444.3	3,590.6	3,536.0	11,444.6	40.0	-	11,484.6
run-of-river plants	2,497	4,635.6	5,547.9	4,265.0	4,159.4	19,012.6	11.0	-	19,023.5
Northern Italy	**2,755**	**17,638.2**	**20,078.3**	**16,396.3**	**16,145.5**	**40,829.7**	**160.8**	**3,447.9**	**44,438.4**
reservoir plants	9	302.6	372.7	256.4	252.4	464.0	3.1	-	467.1
pondage plants	43	919.8	1,102.2	765.0	754.0	2,002.5	5.6	-	2,008.1
run-of-river plants	380	546.0	667.6	497.4	487.2	1,867.6	-	-	1,867.6
Central Italy	**432**	**1,768.4**	**2,142.5**	**1,518.8**	**1,493.5**	**4,334.1**	**8.7**	**-**	**4,342.8**
reservoir plants	46	3,702.1	4,173.9	3,361.1	3,320.3	2,015.2	14.0	2,368.4	4,397.7
of which pure and mixed pumped-storage	*7*	*2,777.1*	*3,134.3*	*2,522.0*	*2,493.6*	*429.6*	*1.0*	*2,368.4*	*2,799.0*
pondage plants	28	828.4	974.9	736.0	725.6	1,493.2	0.2	-	1,493.4
run-of-river plants	178	455.2	561.9	422.2	412.8	1,616.5	-	-	1,616.5
Southern mainland & island	**252**	**4,985.7**	**5,710.7**	**4,519.3**	**4,458.7**	**5,124.9**	**14.2**	**2,368.4**	**7,507.6**
reservoir plants	**181**	**12,981.0**	**14,632.8**	**12,158.2**	**12,022.8**	**12,851.7**	**127.0**	**5,816.4**	**18,795.1**
of which pure and mixed pumped-storage	*22*	*8,155.5*	*9,231.1*	*7,669.1*	*7,591.8*	*3,217.1*	*35.3*	*5,816.4*	*9,068.7*
pondage plants	**203**	**5,774.5**	**6,521.5**	**5,091.7**	**5,015.6**	**14,940.3**	**45.8**	**-**	**14,986.1**
run-of-river plants	**3,055**	**5,636.8**	**6,777.4**	**5,184.6**	**5,059.3**	**22,496.6**	**11.0**	**-**	**22,507.6**
ITALY	**3,439**	**24,392.3**	**27,931.6**	**22,434.5**	**22,097.7**	**50,288.7**	**183.7**	**5,816.4**	**56,288.8**

Nominal and gross maximum capacity and average annual gross energy capability of hydro plants in Italy at 31 December 2014

By gross maximum capacity class of plant

Table 9

	Plants	Nominal capacity		Gross maximum capacity		Average annual gross energy capability
		Prime movers	Generators	Of each Class	Cumulated	
	no.	MW	MVA	MW	MW	GWh
gross maximum capacity class						
over 200 MW	17	8,829.0	9,914.8	8,251.6	8,251.6	10,752.7
from over 100 to 200	25	3,846.2	4,132.6	3,441.7	11,693.2	8,010.9
" 50 " 100	29	2,200.4	2,545.5	1,964.3	13,657.6	5,979.7
" 30 " 50	63	2,696.0	3,141.4	2,475.7	16,133.3	8,173.8
" 20 " 30	54	1,512.0	1,782.9	1,370.2	17,503.5	4,884.3
" 10 " 20	122	1,899.5	2,284.3	1,758.7	19,262.1	6,147.7
" 5 " 10	141	1,089.6	1,299.8	1,006.6	20,268.8	3,610.4
" 1 " 5	684	1,596.3	1,953.9	1,487.3	21,756.0	5,803.8
up to 1	2,304	723.2	876.5	678.5	22,434.5	2,925.4
Total	**3,439**	**24,392.3**	**27,931.6**	**22,434.5**		**56,288.8**

The **hydro plants** are classified, according to the filling period of the reservoir, in three categories: reservoir plants, pondage plants and run-of-river plants.

The **filling period** of a reservoir is the time necessary for providing the reservoir with a volume of water equivalent to its useful capacity (see definition on page 28), with the average annual flow of the water course(s) which runs into it, excluding possible pumping flows.

On the basis of the respective "filling periods", the reservoirs are classified as follows:
– seasonal **regulation reservoirs**: those with a filling period of or exceeding 400 hours;
– weekly or daily **modulation pondage reservoirs**: those with a filling period of less than 400 hours and more than 2 hours.

The three categories of plants are therefore defined as follows:
– reservoir plants: those with a reservoir classified as "seasonal regulation reservoir";
– pondage plants: those with a reservoir classified as "modulation pondage reservoir";
– run-of-river plants: those with no reservoir or a reservoir with a filling period of 2 hours or less.
When two or more plants, linked in series and situated at a short distance from one another and without appreciable intermediate inflows, are connected to the same reservoirs, they are classified in the category defined by the filling period of these reservoirs.

Thermal plants

Nominal and maximum capacity of thermal plants in Italy at 31 December (1)

Table 10

	Plants		Units	
	no.	no.	no.	no.
	2013	2014	2013	2014
producers	3,434	3,716	4,501	4,787
of which: geothermal	*34*	*34*	*35*	*36*
variation 2014/2013		*8.2%*		*6.4%*
autoproducers	637	745	908	1,040
variation 2014/2013		*17.0%*		*14.5%*
ITALY	**4,071**	**4,461**	**5,409**	**5,827**
variation 2014/2013		***9.6%***		***7.7%***

(1) Capacity of thermal plants stoked with renewable sources (Bioenergy) is included. For the detail on plants from renewable sources, see Table 13.

A **thermal power unit** consists of: a steam generator, a thermal prime mover, an electrical generator, thermal-cycle equipment, main and auxiliary services. In the present publication, the term “unit” has, for reasons of simplicity, been adopted to indicate also thermal power sets, consisting only of: a thermal prime mover and an electrical generator (for example, internal-combustion engines, gas turbines, geothermal power sets).

The **nominal capacity** of the prime movers or of the electrical generators of a set, of a unit, of a power plant or of a group of power plants, is the sum of the maximum capacities in continuous-operating conditions, according to the accepted standards, of each of the machines considered of the same category. The nominal capacity is a gross value.

Nominal capacity				Maximum capacity			
Prime movers		Generators		Gross		Net	
MW	MW	MVA	MVA	MW	MW	MW	MW
2013	**2014**	**2013**	**2014**	**2013**	**2014**	**2013**	**2014**
75,989.4	72,704.5	92,605.0	88,984.2	74,903.5	71,653.5	71,595.7	68,417.2
883.5	*918.1*	*1,038.1*	*1,075.1*	*773.0*	*821.0*	*729.0*	*768.0*
	-4.3%		*-3.9%*		*-4.3%*		*-4.4%*
4,509.0	4,266.5	5,656.9	5,332.5	4,370.4	4,133.0	4,182.9	3,954.8
	-5.4%		*-5.7%*		*-5.4%*		*-5.5%*
80,498.4	**76,971.0**	**98,262.0**	**94,316.7**	**79,273.8**	**75,786.5**	**75,778.6**	**72,372.0**
	-4.4%		***-4.0%***		***-4.4%***		***-4.5%***

The **maximum capacity** of a set, of a unit, of a power plant or of a group of thermal power plants is the maximum power which could be produced continuously throughout a prolonged period of operation, on the assumption that all the parts of the plant are entirely in efficient condition and that there is adequate availability of fuel and of cooling water. The value for maximum capacity is gross if measured at the terminals of the electrical generators of the plants; it is net if measured at the plant busbars.

Situation of thermal plants in Italy in 2014

Table 11

	Plants	Units	Type of unit
	no.	no.	
Situation at 31/12/2013	**4,071**	**5,409**	
Plants commissioned in 2014	**457**	**550**	
Piemonte	38	11	Power generation only
		32	Power and heat generation
Valle d'Aosta	3	2	Power generation only
		1	Power and heat generation
Lombardia	105	10	Power generation only
		106	Power and heat generation
Trentino Alto Adige	34	6	Power generation only
		37	Power and heat generation
Veneto	46	10	Power generation only
		42	Power and heat generation
Friuli Venezia Giulia	13	2	Power generation only
		14	Power and heat generation
Liguria	6	8	Power and heat generation
Emilia Romagna	111	34	Power generation only
		105	Power and heat generation
Toscana	26	17	Power generation only
		24	Power and heat generation
Umbria	11	11	Power and heat generation
Marche	14	1	Power generation only
		14	Power and heat generation
Lazio	22	3	Power generation only
		21	Power and heat generation
Abruzzi	5	4	Power generation only
		4	Power and heat generation
Molise	1	1	Power and heat generation
Campania	9	3	Power generation only
		8	Power and heat generation
Puglia	4	1	Power generation only
		4	Power and heat generation
Basilicata	1	1	Power generation only
Calabria	1	1	Power generation only
Sicilia	5	2	Power generation only
		8	Power and heat generation
Sardegna	2	1	Power generation only
		1	Power and heat generation
Existing modified or inoperative plants in 2014	**-67**	**-132**	
Situation at 31/12/2014	**4,461**	**5,827**	

Nominal capacity		Maximum capacity	
Prime movers	Generators	Gross	Net
kW	kVA	kW	kW
80,498,431	**98,261,954**	**79,273,841**	**75,778,589**
607,516	**735,899**	**585,844**	**569,291**
4,780	5,456	4,475	4,325
30,061	34,726	28,681	27,936
12	12	12	10
6	6	4	4
2,229	2,648	2,194	2,096
149,286	179,874	134,510	131,231
1,486	1,651	1,418	1,342
9,989	12,329	9,888	9,530
1,879	2,194	1,865	1,779
35,762	45,108	35,166	33,526
250	275	239	214
22,436	26,121	21,505	20,670
5,925	7,458	5,377	5,210
1,645	1,901	1,590	1,540
24,884	29,862	24,382	23,655
40,949	45,415	40,703	38,897
13,289	16,186	13,040	12,614
1,170	1,331	1,163	1,113
100	109	99	90
4,030	4,862	3,972	3,633
1,496	1,850	1,496	1,272
20,503	24,920	19,895	19,284
116,460	158,925	116,460	115,196
54	57	47	45
2,058	2,480	2,058	2,002
640	732	597	567
15,258	17,903	14,368	13,860
300	380	300	300
228	269	226	211
400	412	350	336
110	114	100	89
79,600	85,600	79,600	77,590
19,789	24,204	19,635	18,718
342	413	330	317
110	116	99	89
-4,134,933	**-4,681,153**	**-4,073,150**	**-3,975,930**
76,971,014	**94,316,700**	**75,786,535**	**72,371,951**

Nominal and maximum capacity of thermal plants in Italy at 31 December 2014

By type of plant and gross maximum capacity class of units

Table 12

	Producers				
	Units	Nominal capacity		Maximum capacity	
		Prime movers	Generators	Gross	Net
	no.	MW	MVA	MW	MW
A) Plants for power generation only					
internal combustion	**1,549**	**1,234.3**	**1,523.8**	**1,203.4**	**1,156.4**
-up to 25	*1,548*	*1,199.3*	*1,481.2*	*1,169.2*	*1,122.6*
-over 25 up to 50	*1*	*35.0*	*42.7*	*34.2*	*33.8*
gas turbine	**54**	**1,453.5**	**1,725.5**	**1,445.4**	**1,433.2**
-up to 25	*41*	*137.1*	*155.1*	*129.0*	*127.7*
-over 25 up to 50	-	-	-	-	-
-over 50 up to 100	*7*	*607.2*	*730.4*	*607.2*	*602.0*
-over 100 up to 200	*6*	*709.2*	*840.0*	*709.2*	*703.4*
steam condensing	**125**	**17,938.9**	**20,803.6**	**17,856.2**	**16,100.8**
-up to 25	*65*	*505.9*	*609.7*	*478.7*	*428.9*
-over 25 up to 50	*6*	*226.0*	*325.8*	*226.0*	*201.8*
-over 50 up to 100	*6*	*430.0*	*540.7*	*430.0*	*394.0*
-over 100 up to 200	*16*	*2,537.0*	*2,977.5*	*2,524.5*	*2,320.8*
-over 200 up to 500	*20*	*6,380.0*	*7,360.0*	*6,337.0*	*5,735.5*
-over 500	*12*	*7,860.0*	*8,990.0*	*7,860.0*	*7,019.8*
combined cycle	**70**	**25,686.3**	**33,378.3**	**25,131.4**	**24,584.6**
-up to 25	*11*	*62.7*	*77.4*	*58.2*	*54.8*
-over 25 up to 50	*6*	*242.1*	*312.5*	*241.5*	*235.5*
-over 50 up to 100	*3*	*178.0*	*231.2*	*178.0*	*172.3*
-over 100 up to 200	*1*	*115.5*	*144.6*	*115.5*	*113.0*
-over 200 up to 500	*35*	*13,730.7*	*18,988.8*	*13,376.5*	*13,074.8*
-over 500	*14*	*11,357.3*	*13,623.8*	*11,161.6*	*10,934.2*
turbo expander sets	**57**	**72.9**	**89.4**	**72.3**	**70.2**
-up to 25	*57*	*72.9*	*89.4*	*72.3*	*70.2*
repowered plants	**8**	**5,317.6**	**6,160.0**	**5,317.6**	**5,068.4**
-over 200 up to 500	*4*	*1,737.6*	*2,040.0*	*1,737.6*	*1,594.4*
-over 500	*4*	*3,580.0*	*4,120.0*	*3,580.0*	*3,474.0*
plants not classified elsewhere	**9**	**168.9**	**206.4**	**166.8**	**159.7**
-up to 25	*7*	*54.9*	*66.4*	*52.8*	*51.4*
-over 25 up to 50	*1*	*42.0*	*50.0*	*42.0*	*39.9*
-over 50 up to 100	*1*	*72.0*	*90.0*	*72.0*	*68.4*
Total A	**1,872**	**51,872.3**	**63,887.0**	**51,193.1**	**48,573.3**

Autoproducers					ITALY				
Units	Nominal capacity		Maximum capacity		Units	Nominal capacity		Maximum capacity	
	Prime movers	Generators	Gross	Net		Prime movers	Generators	Gross	Net
no.	MW	MVA	MW	MW	no.	MW	MVA	MW	MW
83	**117.8**	**144.1**	**114.6**	**110.5**	**1,632**	**1,352.1**	**1,668.0**	**1,318.0**	**1,266.8**
83	*117.8*	*144.1*	*114.6*	*110.5*	*1,631*	*1,317.1*	*1,625.3*	*1,283.8*	*1,233.1*
-	-	-	-	-	*1*	*35.0*	*42.7*	*34.2*	*33.8*
9	**70.7**	**92.6**	**70.7**	**69.1**	**63**	**1,524.2**	**1,818.1**	**1,516.1**	**1,502.3**
8	*38.7*	*45.1*	*38.7*	*37.9*	*49*	*175.8*	*200.2*	*167.7*	*165.6*
1	*32.0*	*47.5*	*32.0*	*31.2*	*1*	*32.0*	*47.5*	*32.0*	*31.2*
-	-	-	-	-	*7*	*607.2*	*730.4*	*607.2*	*602.0*
-	-	-	-	-	*6*	*709.2*	*840.0*	*709.2*	*703.4*
7	**19.0**	**23.4**	**17.6**	**15.4**	**132**	**17,957.9**	**20,827.0**	**17,873.8**	**16,116.2**
7	*19.0*	*23.4*	*17.6*	*15.4*	*72*	*524.9*	*633.1*	*496.3*	*444.3*
-	-	-	-	-	*6*	*226.0*	*325.8*	*226.0*	*201.8*
-	-	-	-	-	*6*	*430.0*	*540.7*	*430.0*	*394.0*
-	-	-	-	-	*16*	*2,537.0*	*2,977.5*	*2,524.5*	*2,320.8*
-	-	-	-	-	*20*	*6,380.0*	*7,360.0*	*6,337.0*	*5,735.5*
-	-	-	-	-	*12*	*7,860.0*	*8,990.0*	*7,860.0*	*7,019.8*
-	-	-	-	-	**70**	**25,686.3**	**33,378.3**	**25,131.4**	**24,584.6**
-	-	-	-	-	*11*	*62.7*	*77.4*	*58.2*	*54.8*
-	-	-	-	-	*6*	*242.1*	*312.5*	*241.5*	*235.5*
-	-	-	-	-	*3*	*178.0*	*231.2*	*178.0*	*172.3*
-	-	-	-	-	*1*	*115.5*	*144.6*	*115.5*	*113.0*
-	-	-	-	-	*35*	*13,730.7*	*18,988.8*	*13,376.5*	*13,074.8*
-	-	-	-	-	*14*	*11,357.3*	*13,623.8*	*11,161.6*	*10,934.2*
11	**102.6**	**134.3**	**94.0**	**91.0**	**68**	**175.4**	**223.7**	**166.3**	**161.2**
11	*102.6*	*134.3*	*94.0*	*91.0*	*68*	*175.4*	*223.7*	*166.3*	*161.2*
-	-	-	-	-	**8**	**5,317.6**	**6,160.0**	**5,317.6**	**5,068.4**
-	-	-	-	-	*4*	*1,737.6*	*2,040.0*	*1,737.6*	*1,594.4*
-	-	-	-	-	*4*	*3,580.0*	*4,120.0*	*3,580.0*	*3,474.0*
2	**12.3**	**16.1**	**11.6**	**11.1**	**11**	**181.2**	**222.4**	**178.4**	**170.8**
2	*12.3*	*16.1*	*11.6*	*11.1*	*9*	*67.2*	*82.4*	*64.4*	*62.5*
-	-	-	-	-	*1*	*42.0*	*50.0*	*42.0*	*39.9*
-	-	-	-	-	*1*	*72.0*	*90.0*	*72.0*	*68.4*
112	**322.3**	**410.5**	**308.5**	**297.0**	**1,984**	**52,194.7**	**64,297.4**	**51,501.6**	**48,870.4**

Nominal and maximum capacity of thermal plants in Italy at 31 December 2014

By type of plant and gross maximum capacity class of units

Cont. Table 12

	Producers				
	Units	Nominal capacity		Maximum capacity	
		Prime movers	Generators	Gross	Net
	no.	MW	MVA	MW	MW
B) Power and heat generating plants					
internal combustion	**2,601**	**1,990.4**	**2,443.3**	**1,933.7**	**1,851.6**
-up to 25	*2,599*	*1,919.6*	*2,357.1*	*1,864.0*	*1,784.8*
-over 25 up to 50	*2*	*70.8*	*86.1*	*69.8*	*66.8*
gas turbine	**63**	**403.9**	**498.4**	**386.7**	**379.5**
-up to 25	*59*	*158.2*	*201.7*	*154.8*	*152.3*
-over 25 up to 50	*3*	*118.7*	*144.3*	*104.9*	*102.3*
-over 100 up to 200	*1*	*127.0*	*152.5*	*127.0*	*125.0*
combined cycle	**110**	**15,925.9**	**19,129.6**	**15,758.7**	**15,394.1**
-up to 25	*43*	*222.9*	*267.1*	*215.1*	*205.9*
-over 25 up to 50	*8*	*372.7*	*468.6*	*355.7*	*344.3*
-over 50 up to 100	*12*	*851.8*	*1,089.0*	*821.3*	*795.7*
-over 100 up to 200	*21*	*3,485.8*	*4,037.2*	*3,401.6*	*3,320.3*
-over 200 up to 500	*22*	*7,997.0*	*9,618.7*	*7,972.5*	*7,789.9*
-over 500	*4*	*2,995.8*	*3,649.0*	*2,992.5*	*2,938.0*
back-pressure steam	**35**	**645.8**	**796.3**	**638.1**	**604.0**
-up to 25	*27*	*180.3*	*223.1*	*179.1*	*170.7*
-over 25 up to 50	*3*	*128.9*	*156.3*	*125.8*	*118.7*
-over 50 up to 100	*5*	*336.7*	*417.0*	*333.3*	*314.6*
steam condensing with bleeding	**70**	**948.1**	**1,154.5**	**922.2**	**846.6**
-up to 25	*63*	*593.8*	*733.4*	*572.2*	*523.0*
-over 25 up to 50	*3*	*104.8*	*129.1*	*100.5*	*95.5*
-over 50 up to 100	*4*	*249.5*	*292.0*	*249.5*	*228.1*
Total B	**2,879**	**19,914.2**	**24,022.2**	**19,639.4**	**19,075.9**
Total plants (A + B)	**4,751**	**71,786.5**	**87,909.1**	**70,832.5**	**67,649.2**
geothermal plants	**36**	**918.1**	**1,075.1**	**821.0**	**768.0**
Overall plants	**4,787**	**72,704.5**	**88,984.2**	**71,653.5**	**68,417.2**

Autoproducers					ITALY				
Units	Nominal capacity		Maximum capacity		Units	Nominal capacity		Maximum capacity	
	Prime movers	Generators	Gross	Net		Prime movers	Generators	Gross	Net
no.	MW	MVA	MW	MW	no.	MW	MVA	MW	MW
657	**918.2**	**1,130.4**	**893.4**	**863.2**	**3,258**	**2,908.6**	**3,573.7**	**2,827.1**	**2,714.8**
657	*918.2*	*1,130.4*	*893.4*	*863.2*	*3,256*	*2,837.8*	*3,487.6*	*2,757.3*	*2,648.0*
-	-	-	-	-	*2*	*70.8*	*86.1*	*69.8*	*66.8*
120	**670.9**	**836.2**	**657.2**	**641.4**	**183**	**1,074.8**	**1,334.6**	**1,043.9**	**1,021.0**
117	*549.9*	*677.0*	*537.2*	*523.9*	*176*	*708.1*	*878.7*	*692.0*	*676.2*
3	*121.0*	*159.2*	*120.0*	*117.5*	*6*	*239.7*	*303.4*	*224.9*	*219.7*
-	-	-	-	-	*1*	*127.0*	*152.5*	*127.0*	*125.0*
50	**1,135.8**	**1,437.5**	**1,099.6**	**1,061.4**	**160**	**17,061.8**	**20,567.2**	**16,858.3**	**16,455.5**
36	*354.2*	*450.2*	*340.9*	*331.8*	*79*	*577.0*	*717.3*	*556.0*	*537.7*
10	*397.7*	*504.4*	*378.9*	*372.0*	*18*	*770.4*	*973.0*	*734.6*	*716.2*
2	*118.3*	*156.8*	*114.2*	*111.2*	*14*	*970.1*	*1,245.8*	*935.4*	*906.9*
2	*265.7*	*326.2*	*265.7*	*246.4*	*23*	*3,751.5*	*4,363.4*	*3,667.3*	*3,566.7*
-	-	-	-	-	*22*	*7,997.0*	*9,618.7*	*7,972.5*	*7,789.9*
-	-	-	-	-	*4*	*2,995.8*	*3,649.0*	*2,992.5*	*2,938.0*
69	**396.2**	**500.4**	**385.4**	**363.4**	**104**	**1,042.1**	**1,296.8**	**1,023.5**	**967.4**
68	*321.2*	*402.9*	*310.4*	*294.4*	*95*	*501.5*	*626.0*	*489.5*	*465.1*
-	-	-	-	-	*3*	*128.9*	*156.3*	*125.8*	*118.7*
1	*75.0*	*97.5*	*75.0*	*69.0*	*6*	*411.7*	*514.5*	*408.3*	*383.6*
32	**822.9**	**1,017.4**	**788.9**	**728.3**	**102**	**1,771.0**	**2,171.9**	**1,711.2**	**1,574.9**
19	*132.2*	*165.3*	*125.0*	*117.7*	*82*	*726.0*	*898.7*	*697.3*	*640.7*
7	*288.7*	*329.9*	*261.9*	*237.1*	*10*	*393.5*	*459.0*	*362.4*	*332.6*
6	*402.0*	*522.2*	*402.0*	*373.5*	*10*	*651.5*	*814.2*	*651.5*	*601.6*
928	**3,944.1**	**4,922.0**	**3,824.5**	**3,657.7**	**3,807**	**23,858.3**	**28,944.2**	**23,463.9**	**22,733.6**
1,040	**4,266.5**	**5,332.5**	**4,133.0**	**3,954.8**	**5,791**	**76,052.9**	**93,241.6**	**74,965.5**	**71,604.0**
-	**-**	**-**	**-**	**-**	**36**	**918.1**	**1,075.1**	**821.0**	**768.0**
1,040	**4,266.5**	**5,332.5**	**4,133.0**	**3,954.8**	**5,827**	**76,971.0**	**94,316.7**	**75,786.5**	**72,372.0**

Renewable energy sources

Gross maximum capacity of plants from renewable sources in Italy at 31 December

By source

Table 13

	Plants	Gross maximum capacity	Plants	Gross maximum capacity	Gross maximum capacity
	no.	kW	no.	kW	%
	2013		2014		2014/2013
Hydro	**3,250**	**18,365,890**	**3,432**	**18,417,517**	**0.3%**
0 - 1 MW	*2,130*	*645,167*	*2,304*	*678,485*	*5.2%*
1 - 10 MW	*817*	*2,476,096*	*825*	*2,493,905*	*0.7%*
> 10 MW	*303*	*15,244,627*	*303*	*15,245,127*	*0.0%*
Wind	**1,386**	**8,560,808**	**1,847**	**8,703,077**	**1.7%**
Photovoltaic (2)	**596,355**	**18,185,465**	**648,418**	**18,609,360**	**2.3%**
Geothermal	**34**	**772,990**	**34**	**820,990**	**6.2%**
Bioenergy (1)	**2,409**	**4,033,422**	**2,482**	**4,043,636**	**0.3%**
Electricity production only	1,133	2,097,251	1,087	2,037,614	-2.8%
Solid	132	831,056	131	806,996	-2.9%
- municipal solid waste	*46*	*491,585*	*42*	*465,991*	*-5.2%*
- solid biomass	*89*	*339,471*	*92*	*341,005*	*0.5%*
Biogas	780	634,638	762	610,157	-3.9%
- from landfills	*248*	*299,694*	*246*	*292,561*	*-2.4%*
- from sludge	*21*	*5,901*	*20*	*6,731*	*14.1%*
- from manure	*178*	*66,639*	*186*	*66,203*	*-0.7%*
- from crops and agricoltural waste	*353*	*262,405*	*331*	*244,663*	*-6.8%*
Bioliquids	225	631,556	200	620,460	-1.8%
- raw vegetable oils	*175*	*528,755*	*170*	*525,168*	*-0.7%*
- other bioliquids	*50*	*102,801*	*31*	*95,292*	*-7.3%*
Cogeneration	1,284	1,936,171	1,406	2,006,022	3.6%
Solid	157	772,816	184	803,151	3.9%
- municipal solid waste	*27*	*462,123*	*28*	*480,216*	*3.9%*
- solid biomass	*133*	*310,693*	*159*	*322,935*	*3.9%*
Biogas	831	753,727	919	795,927	5.6%
- from landfills	*98*	*102,144*	*114*	*108,847*	*6.6%*
- from sludge	*47*	*34,929*	*54*	*37,176*	*6.4%*
- from manure	*201*	*125,835*	*235*	*137,110*	*9.0%*
- from crops and agricoltural waste	*567*	*490,819*	*610*	*512,794*	*4.5%*
Bioliquids	311	409,628	320	406,944	-0.7%
- raw vegetable oils	*264*	*364,737*	*272*	*361,130*	*-1.0%*
- other bioliquids	*51*	*44,891*	*53*	*45,814*	*2.1%*
Total	**603,434**	**49,918,575**	**656,213**	**50,594,580**	**1.4%**

Further thermal plants mostly using conventional fuels, stoked with bioenergy too (see Table 19)

	2013		2014		2014/2013
Bioenergy (1)	**6**	**2,480,500**	**5**	**2,144,500**	**-13.5%**

(1) Capacity of bioenergy plants is given for fuels which can be used.

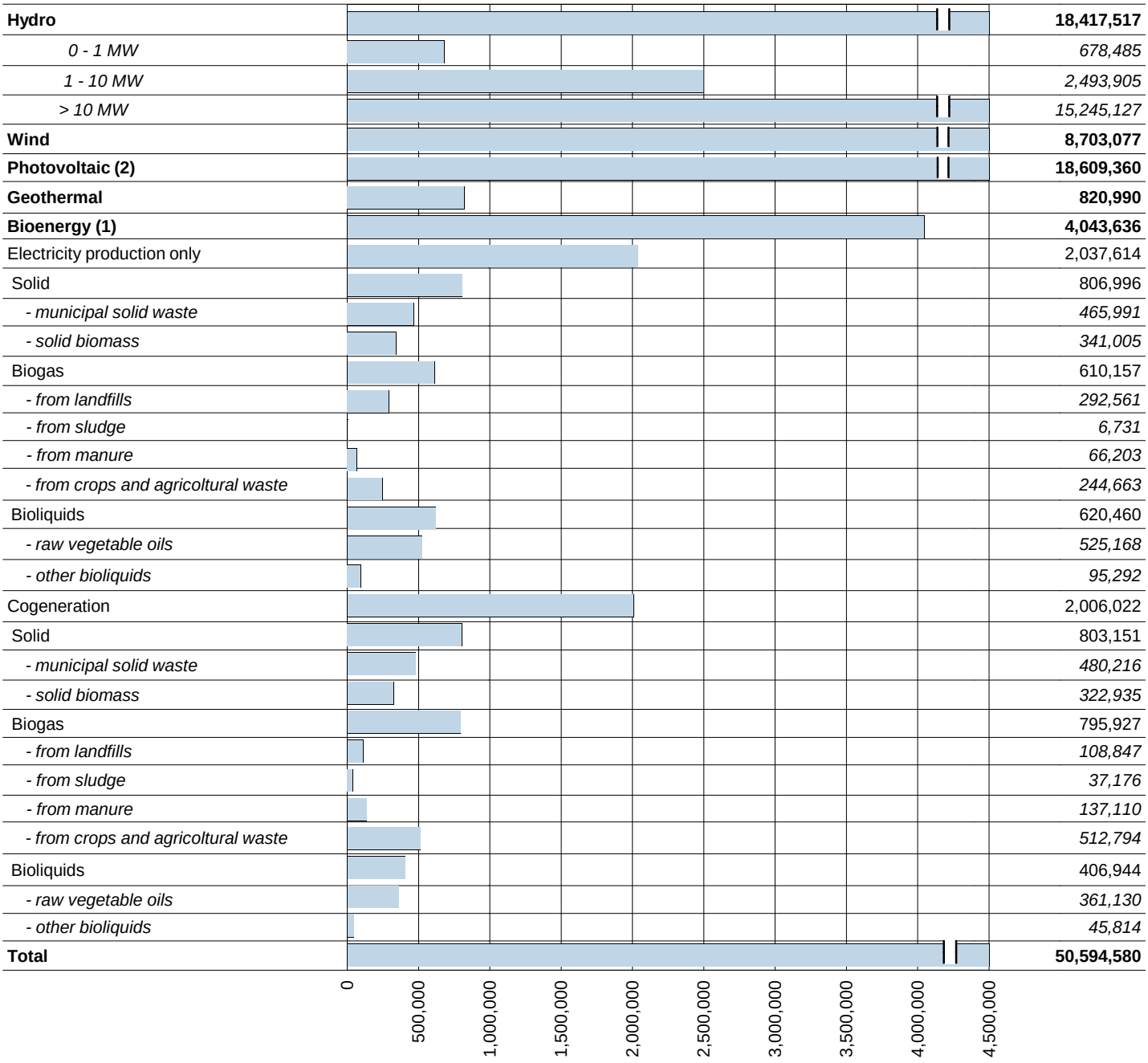
(2) 2013 figure corrected following integration and alignment of the data relative to the photovoltaic sector present in TERNA's GAUDI system and in the GSE archives.

Gross maximum capacity of plants from renewable sources in Italy at 31 December 2014

By source

Figure 6

kW



Hydro	**18,417,517**
0 - 1 MW	*678,485*
1 - 10 MW	*2,493,905*
> 10 MW	*15,245,127*
Wind	**8,703,077**
Photovoltaic (2)	**18,609,360**
Geothermal	**820,990**
Bioenergy (1)	**4,043,636**
Electricity production only	2,037,614
Solid	806,996
- municipal solid waste	*465,991*
- solid biomass	*341,005*
Biogas	610,157
- from landfills	*292,561*
- from sludge	*6,731*
- from manure	*66,203*
- from crops and agricoltural waste	*244,663*
Bioliquids	620,460
- raw vegetable oils	*525,168*
- other bioliquids	*95,292*
Cogeneration	2,006,022
Solid	803,151
- municipal solid waste	*480,216*
- solid biomass	*322,935*
Biogas	795,927
- from landfills	*108,847*
- from sludge	*37,176*
- from manure	*137,110*
- from crops and agricoltural waste	*512,794*
Bioliquids	406,944
- raw vegetable oils	*361,130*
- other bioliquids	*45,814*
Total	**50,594,580**