2016

PROVISIONAL OPERATING DATA OF THE NATIONAL ELECTRICITY SYSTEM

TERNA S.P.A. AND TERNA GROUP

Terna

TERNA GROUP

Transmitting Energy

On the cover:
straight terminal for a ø41.1mm twin cable connector - 4-hole plate. Designed to guarantee the interface between the twin cable connector and the four-hole plate found on certain pieces of HV equipment.

2016

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Terna

TERNA GROUP

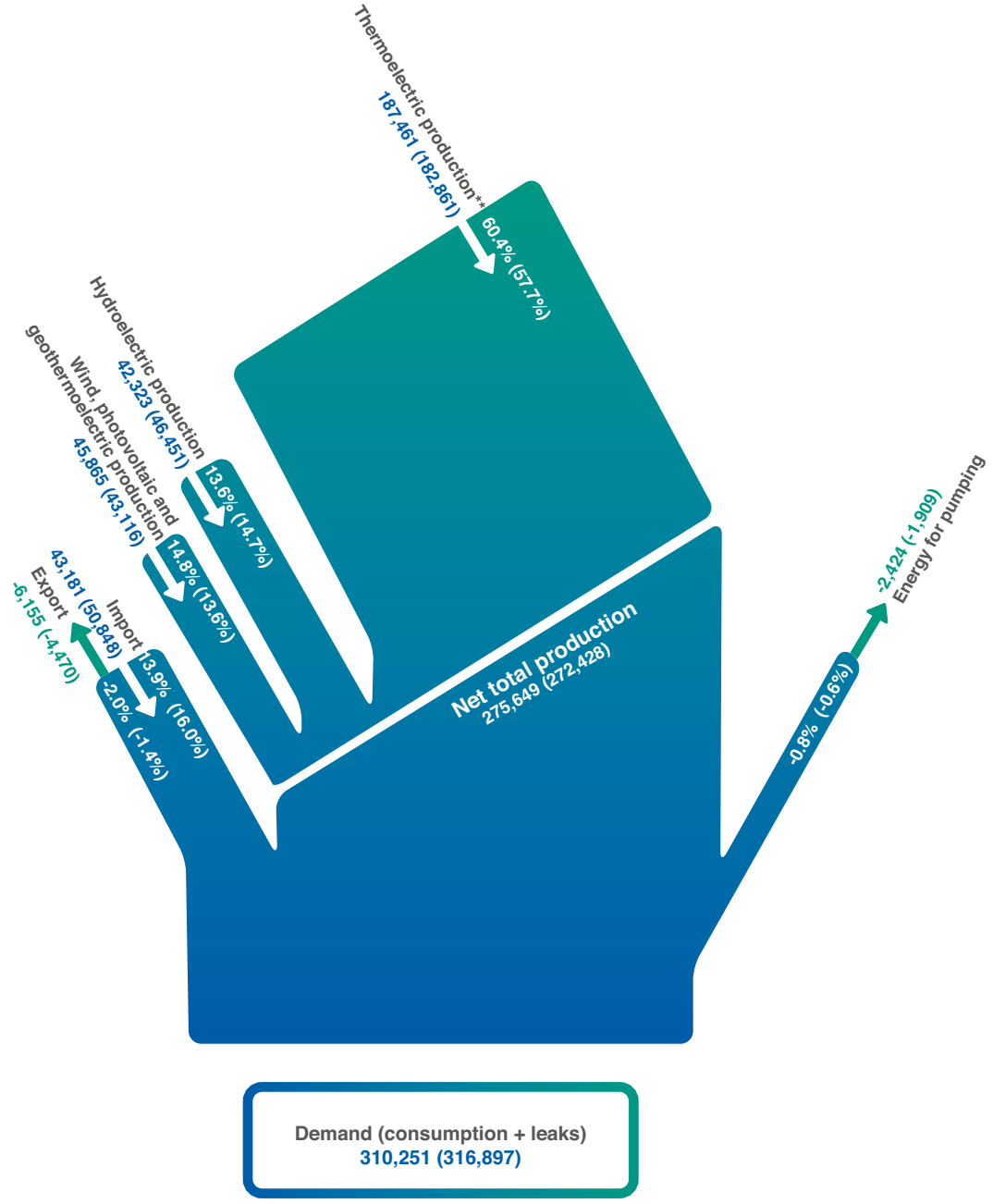
PROVISIONAL OPERATING DATA

Mission

Terna is a leading grid operator for energy transmission.
It manages electricity transmission in Italy and guarantees security, quality and cost-effectiveness over time. It ensures equal conditions of access for all grid users. It develops market activity and new business opportunities with the experience and technical skills gained in managing complex systems.
It creates value for shareholders with a strong commitment in terms of professional excellence and a responsible approach to the community, fully respecting the environment in which it operates.

Electricity balance sheet for Italy

GWh (2015 data in brackets)*



National demand for electricity was met 88.1% by internal production sources and the remainder through foreign exchange (+11.9%).

** the percentages indicate the relationship between the indicated source and demand.*
*** 18,065 GWh of which from biomass*

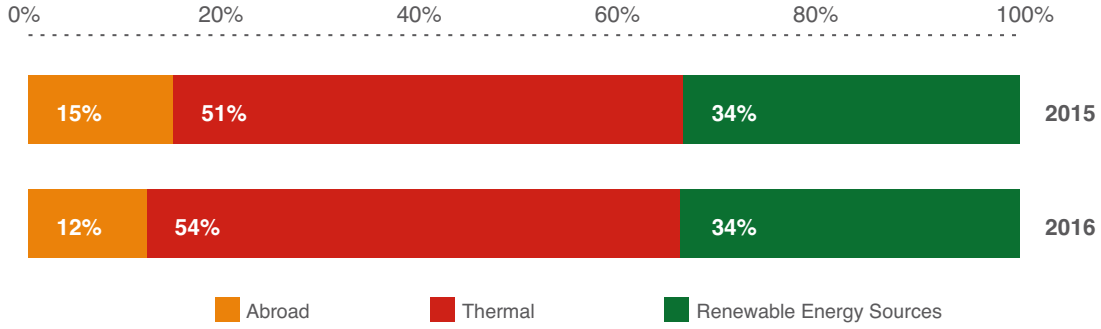
ELECTRICITY DEMAND DISTRIBUTED TO TERRITORIAL AREAS (GWh)

During the year, **electricity demand** reached 310,251 GWh, down by 2.1% compared to 2015.
In 2016, electricity demand was met 88.1% by national production for consumption (85.4% in 2015), amounting to 273,225 GWh (+1% compared to 2015), less auxiliary services and pumping consumption.
The remaining portion of demand (11.9%) was covered by net foreign imports, amounting to 37,026 GWh, down by 20.2% compared to the previous year.
Grid energy demand was met 34% by production from renewable energy sources (hydroelectric, wind, photovoltaic, geothermal and biomass), recording a figure of 106,253 GWh (-1.2% compared to the previous year).

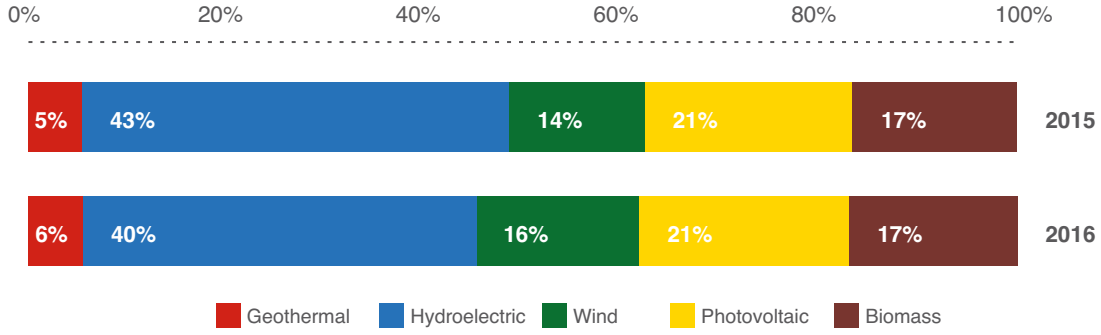
[GWh]	TURIN	MILAN	VENICE	FLORENCE	ROME	NAPLES	PALERMO	CAGLIARI	2016	2015	Change % 16/15
Thermoelectric production*	22,385	30,739	20,633	24,847	21,143	44,470	14,653	8,591	**187,461**	**182,861**	**2.5**
Hydroelectric production	9,746	9,871	13,587	1,789	4,658	2,091	322	259	**42,323**	**46,451**	**-8.9**
Photovoltaic production	1,634	2,234	2,752	3,192	4,556	5,531	1,769	877	**22,545**	**22,587**	**-0.2**
Wind production	32	0	0	277	1,167	11,133	3,002	1,844	**17,455**	**14,705**	**18.7**
Geothermoelectric production	0	0	0	5,865	0	0	0	0	**5,865**	**5,824**	**0.7**
Net total production	**33,797**	**42,844**	**36,972**	**35,970**	**31,524**	**63,225**	**19,746**	**11,571**	**275,649**	**272,428**	**1.2**
Energy for pumping	703	738	72	30	31	417	269	164	**2,424**	**1,909**	**27.0**
Net production for consumption	**33,094**	**42,106**	**36,900**	**35,940**	**31,493**	**62,808**	**19,477**	**11,407**	**273,225**	**270,519**	**1.0**
Import	*15,650*	*19,313*	*7,910*	*0*	*0*	*308*	*0*	*0*	*43,181*	*50,848*	*-15.1*
Export	*1,409*	*288*	*238*	*318*	*0*	*2,028*	*1,527*	*347*	*6,155*	*4,470*	*37.7*
Foreign exchange	**14,241**	**19,025**	**7,672**	**-318**	**0**	**-1720**	**-1,527**	**-347**	**37,026**	**46,378**	**-20.2**
Territorial areas balance	-15,311	4,195	2,339	13,593	12,110	-15,481	712	-2157			
Energy demand on the grid**	**32,024**	**65,326**	**46,911**	**49,215**	**43,603**	**45,607**	**18,662**	**8,903**	**310,251**	**316,897**	**-2.1**
2015	32,842	66,451	47,359	50,271	44,613	46,612	19,534	9,215			
% change	**-2.49**	**-1.69**	**-0.95**	**-2.10**	**-2.26**	**-2.16**	**-4.46**	**-3.39**			

N.B. Foreign exchange excludes the Republic of San Marino and Vatican City.
* *A portion of thermoelectric production came from biomass (18,065 GWh), which contributes to production from renewable sources.*
** *Including leaks*

BREAKDOWN OF DEMAND



DETAILS OF RENEWABLE ENERGY SOURCES

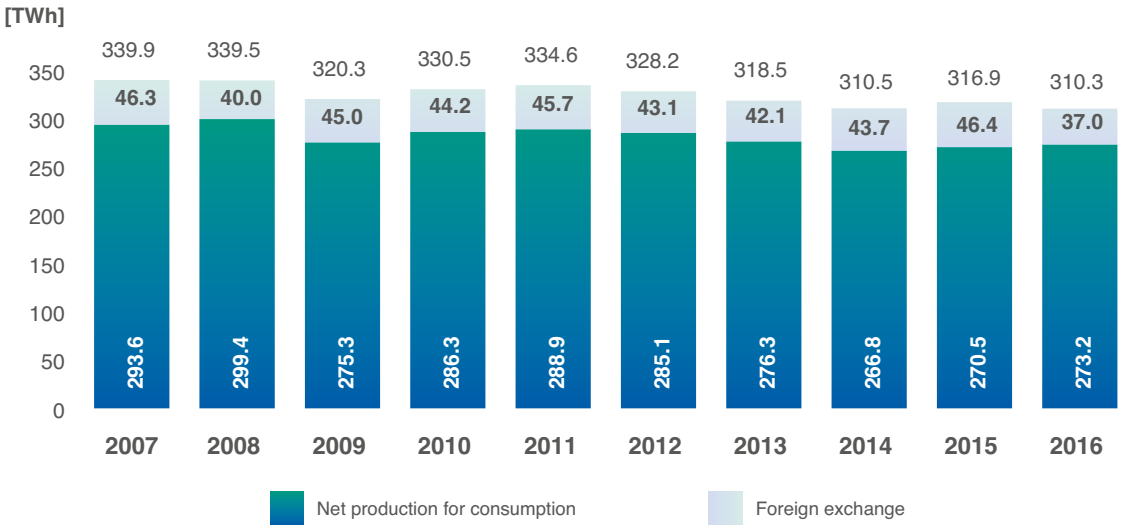


[GWh]	2016	2015	% 16/15
Thermal*	169,396	164,931	2.7%
Hydroelectric	42,323	46,451	-8.9%
Photovoltaic	22,545	22,587	-0.2%
Biomass**	18,065	17,930	0.8%
Wind	17,455	14,705	18.7%
Geothermal	5,865	5,824	0.7%
Total Production from Renewable Energy Sources	**106,253**	**107,497**	**-1.2%**
Net Total Production	**275,649**	**272,428**	**1.2%**
Import	43,181	50,848	-15.1%
Export	6,155	4,470	37.7%
Foreign Exchange	**37,026**	**46,378**	**-20.2%**
Pumping	**2,424**	**1,909**	**27.0%**
Electricity Demand [1]	**310,251**	**316,897**	**-2.1%**

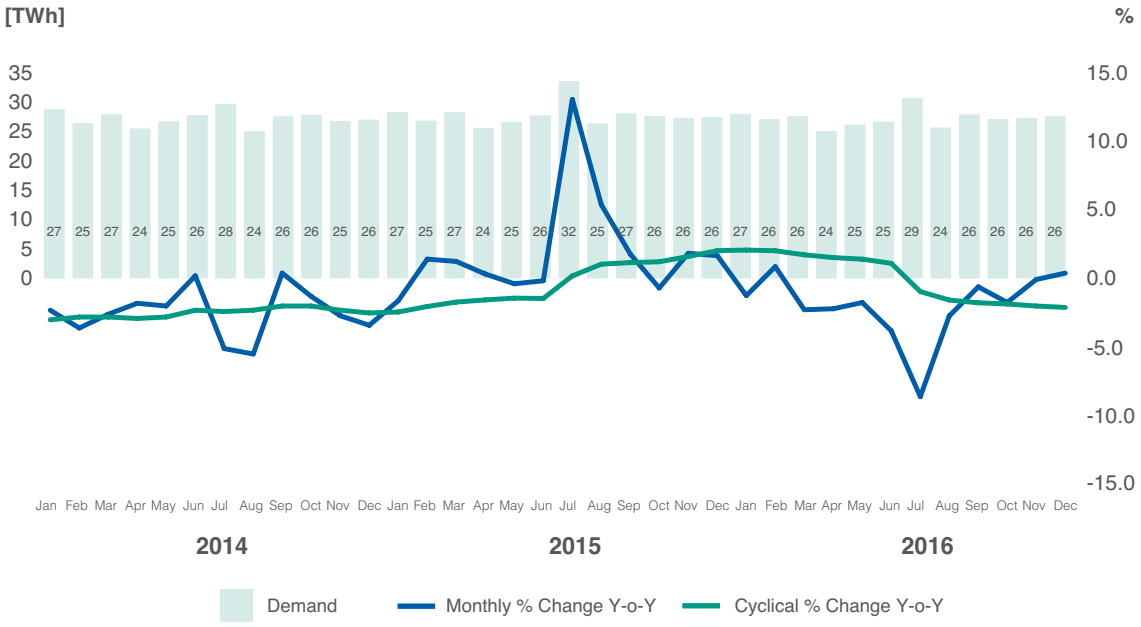
(1) Electricity Demand = Production + Net Foreign Exchange – Pumping Consumption.
** Thermal production is indicated net of biomass (18,065 GWh), which contributes to production from renewable sources.*
*** An additional contribution to renewable production is provided by a portion of thermoelectric production obtained from biomass.*

Power and energy demand

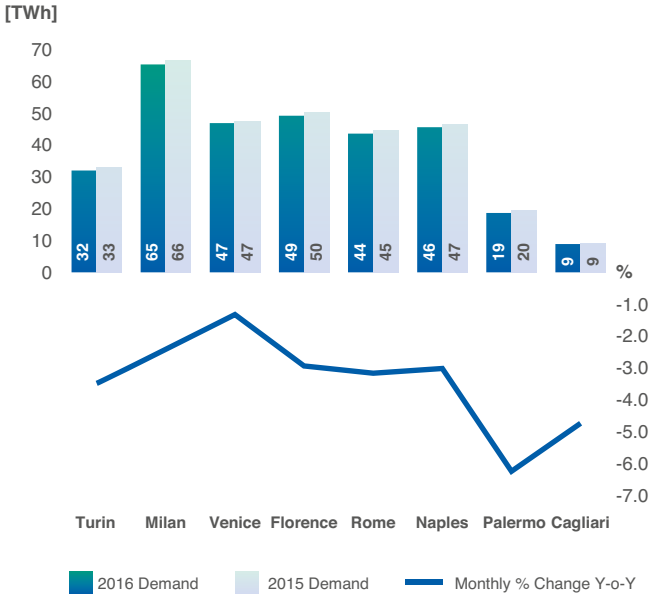
EVOLUTION AND COVERAGE OF DEMAND

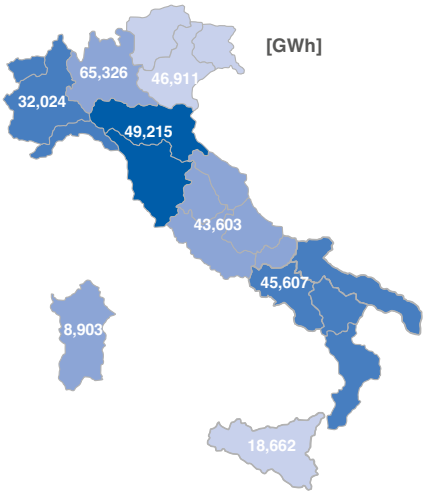


CYCLICAL AND MONTHLY PERCENTAGE CHANGES

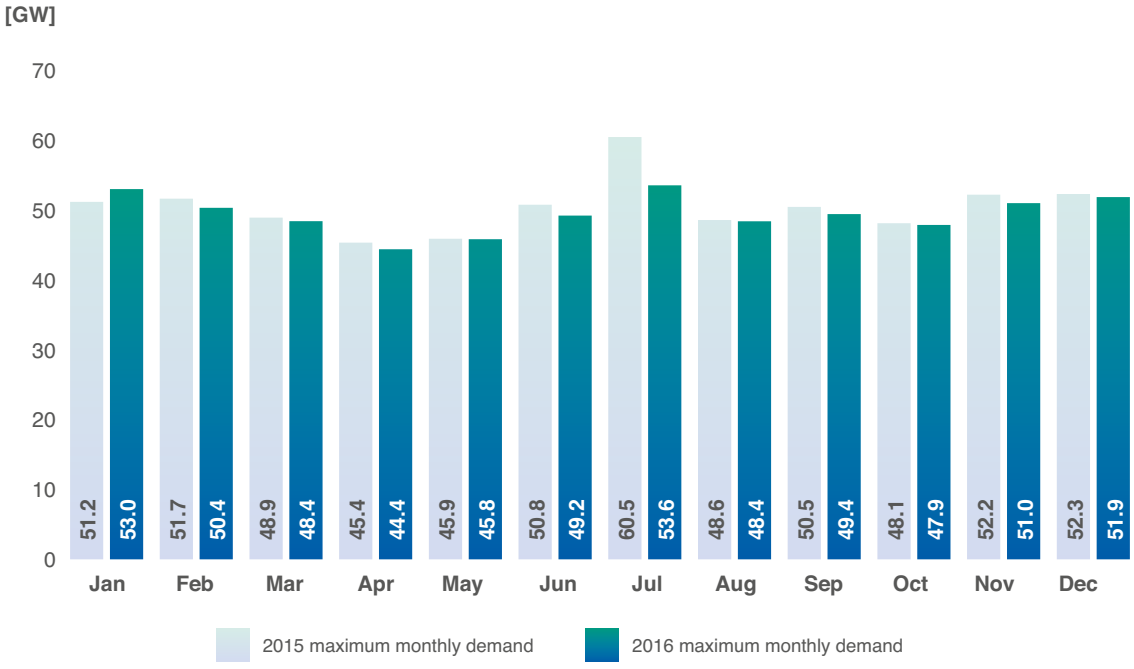


PERCENTAGE CHANGES BY TERRITORIAL AREA

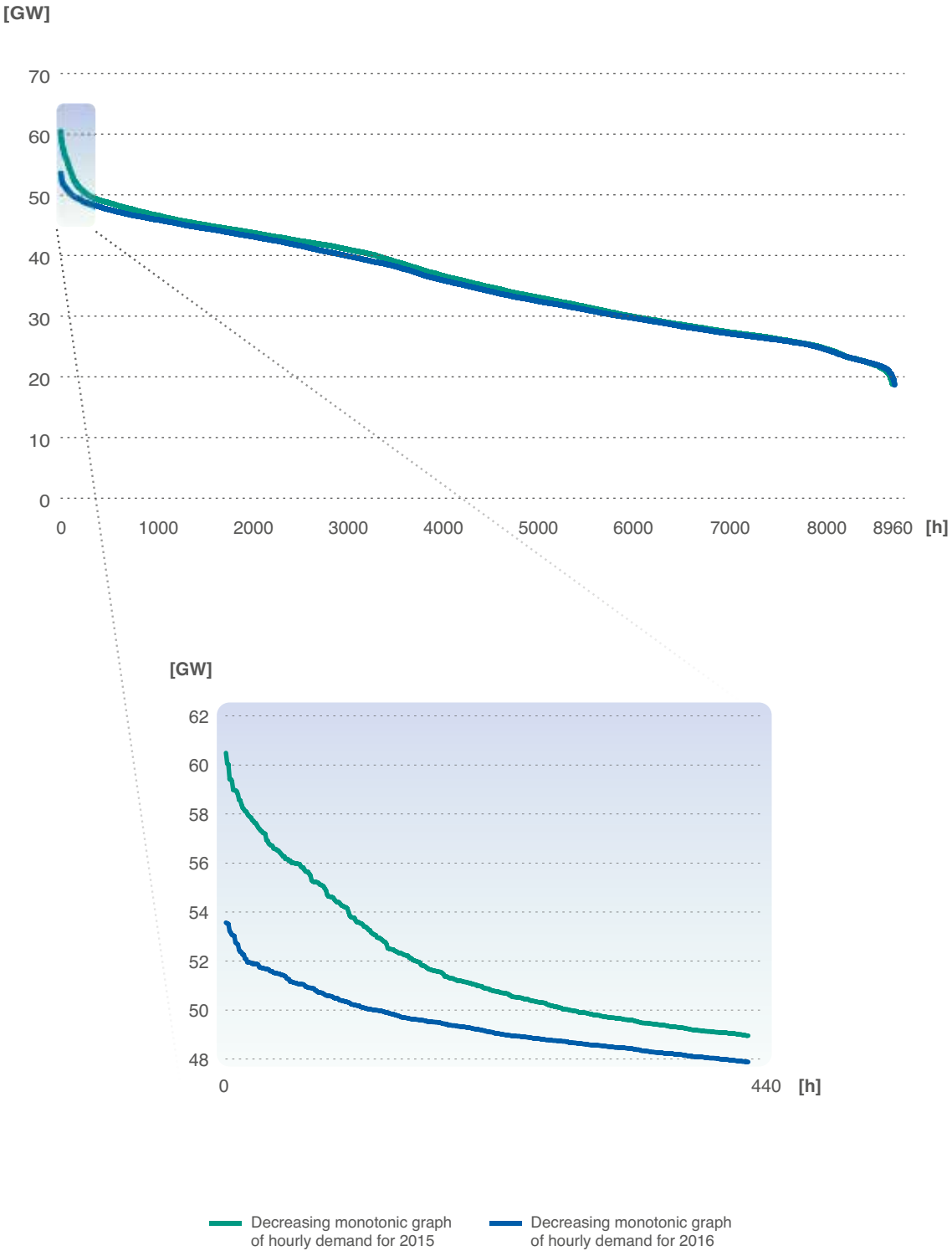




MAXIMUM HOURLY POWER DEMAND



MONOTONIC GRAPH OF HOURLY DEMAND

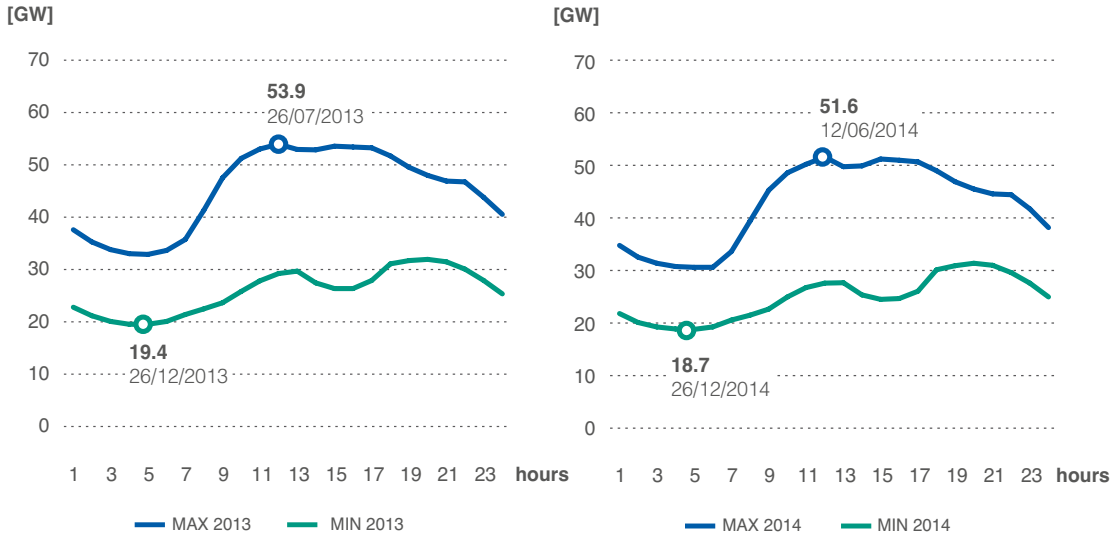


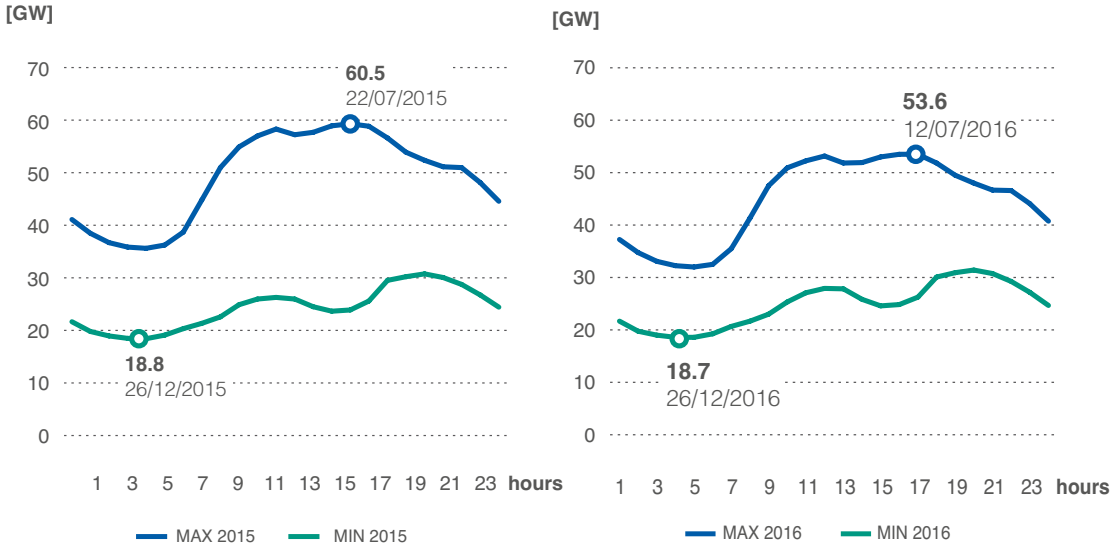
NB: Figures net of absorption for pumping and auxiliary services.

GRAPH OF LOAD FOR MAXIMUM AND MINIMUM PEAK DAYS

In 2016, the maximum power requested by the national electricity system was 53,568 MW, recorded on 12 July at 17:00, down by 11% compared to the peak of 2015.

In 2016, monthly peak figures led to a decrease compared to the corresponding months of the previous year, with the single exception of January.



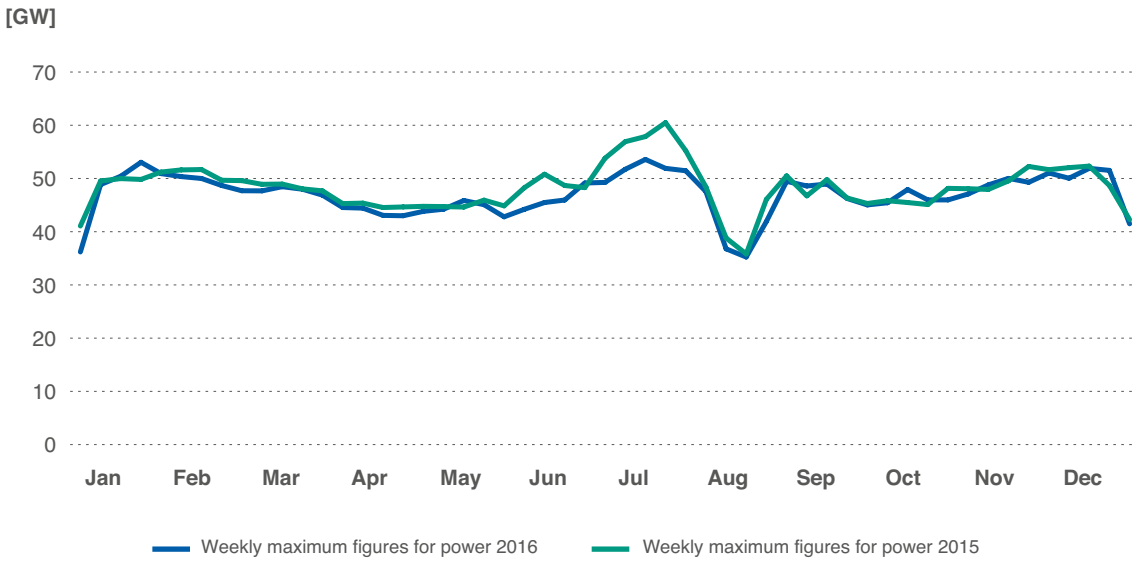


N.B.: Figures net of absorption for pumping and auxiliary services.

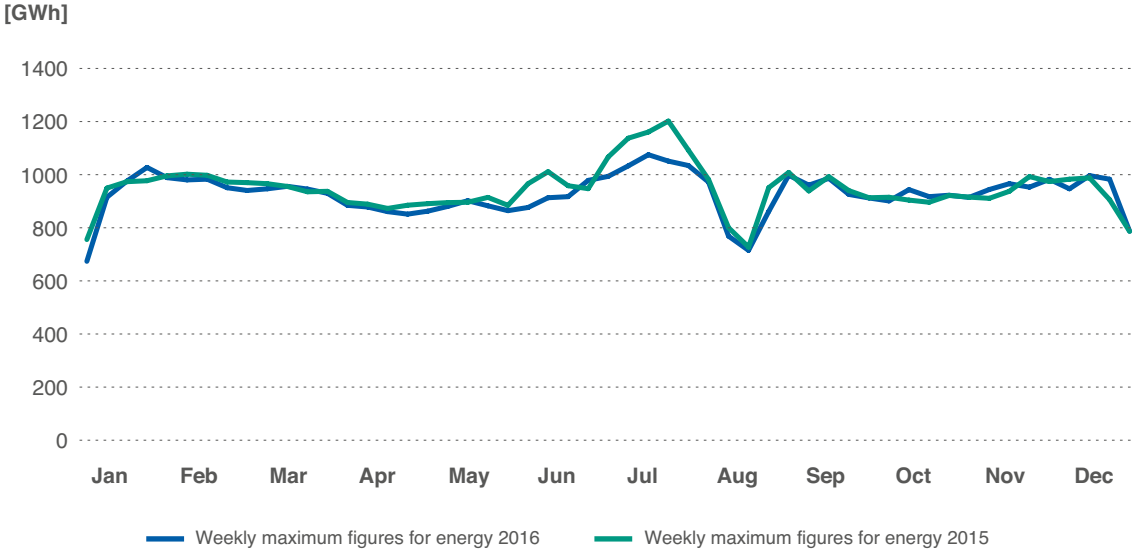
WEEKLY MAXIMUM FIGURES FOR POWER

The weekly demand graph gives the precise trend of the maximum figures for power and energy on the Italian electricity grid for each week in 2016.

Periods of lesser demand are clearly shown, corresponding with the Easter holidays, the month of August and Christmas and New Year celebrations.

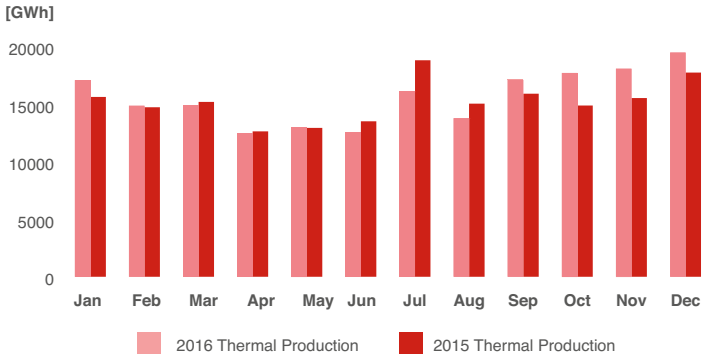


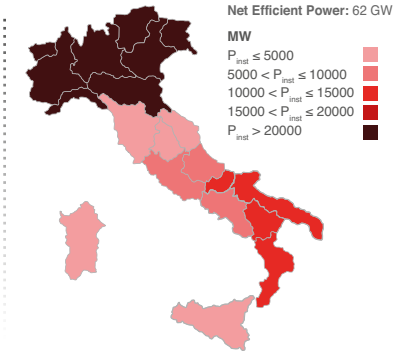
WEEKLY MAXIMUM FIGURES FOR ENERGY



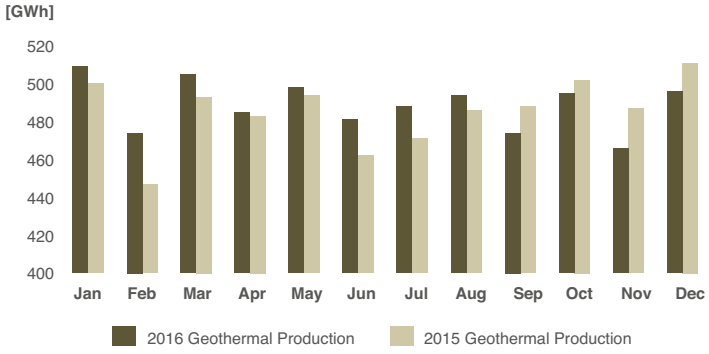
Production and capacity

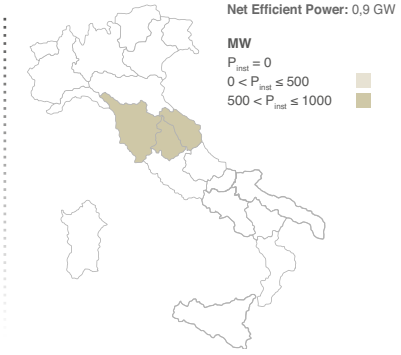
THERMAL PRODUCTION AND CAPACITY



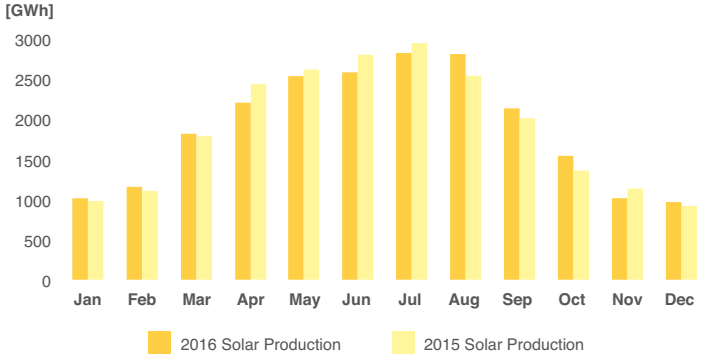


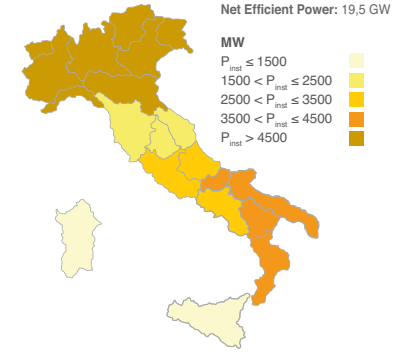
GEOTHERMAL PRODUCTION AND CAPACITY



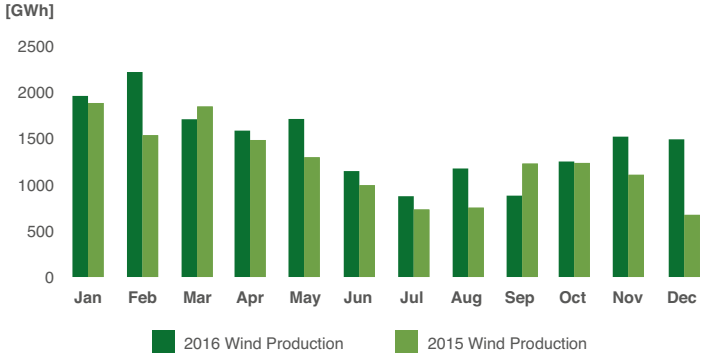


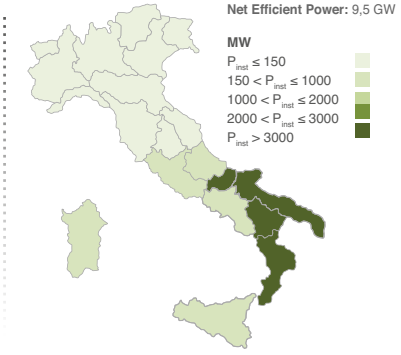
PHOTOVOLTAIC PRODUCTION AND CAPACITY



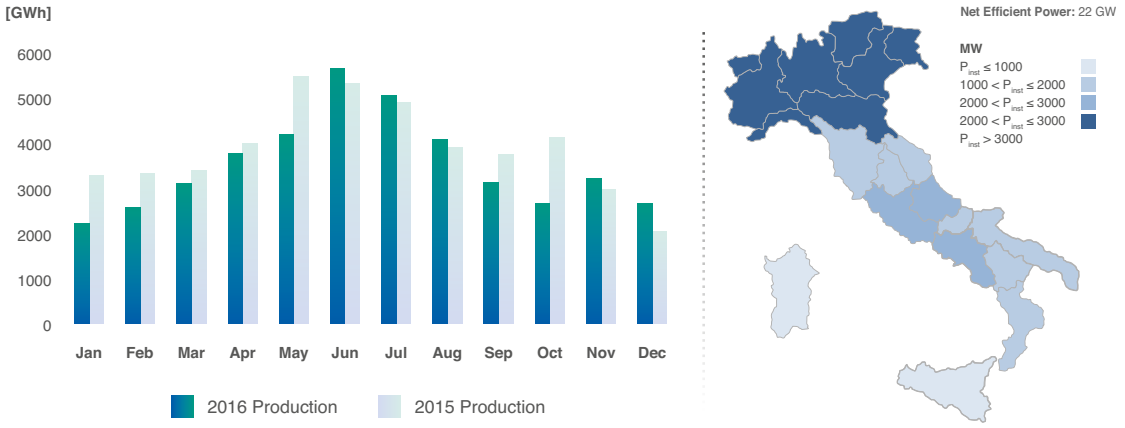


WIND PRODUCTION AND CAPACITY

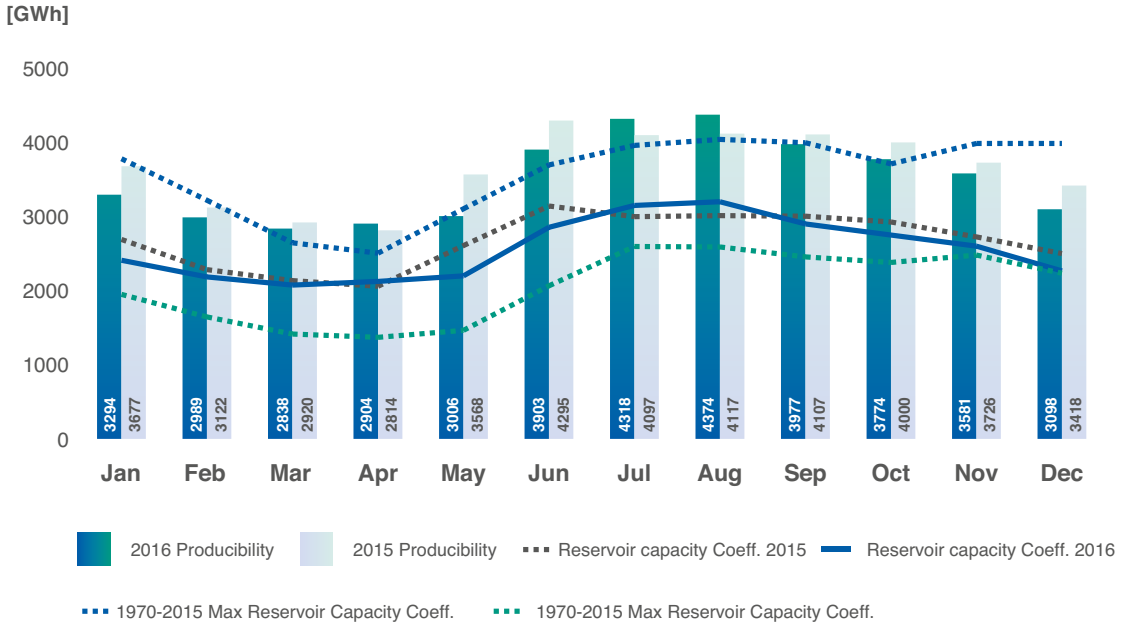




HYDROELECTRIC PRODUCTION AND CAPACITY



HYDROELECTRIC PRODUCIBILITY



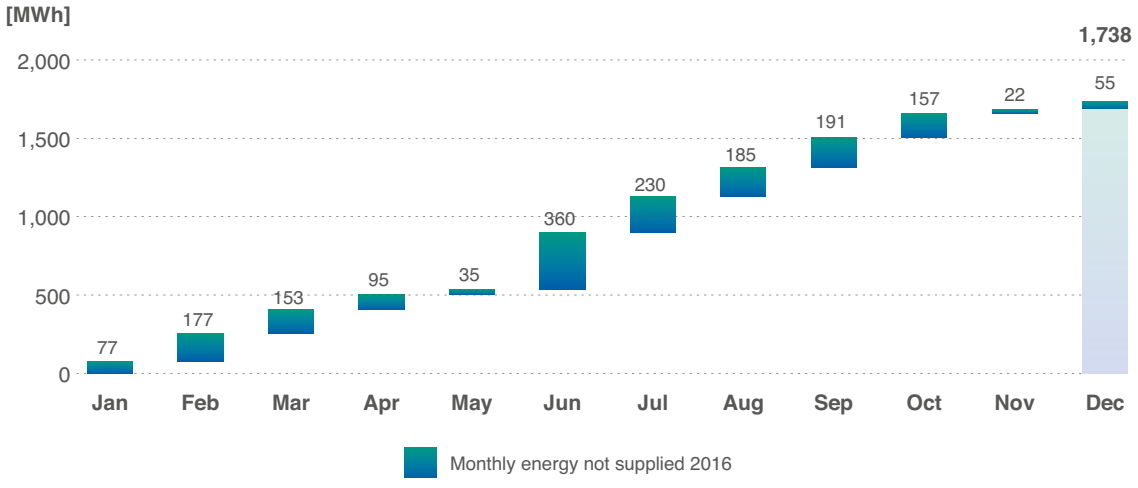
	Reservoir capacities of tanks	NORTH	CENTRE AND SOUTH	ISLANDS	Total
2016	*[GWh]*	2,117	793	188	**3,098**
	% (*Reservoir Capacity/ Maximum Reservoir Capacity*)	45.6%	43.7%	49.4%	**45.3%**
2015	*[GWh]*	2,442	784	192	**3,418**
	% (*Reservoir Capacity/ Maximum Reservoir Capacity*)	52.6%	43.2%	50.3%	**50.0%**

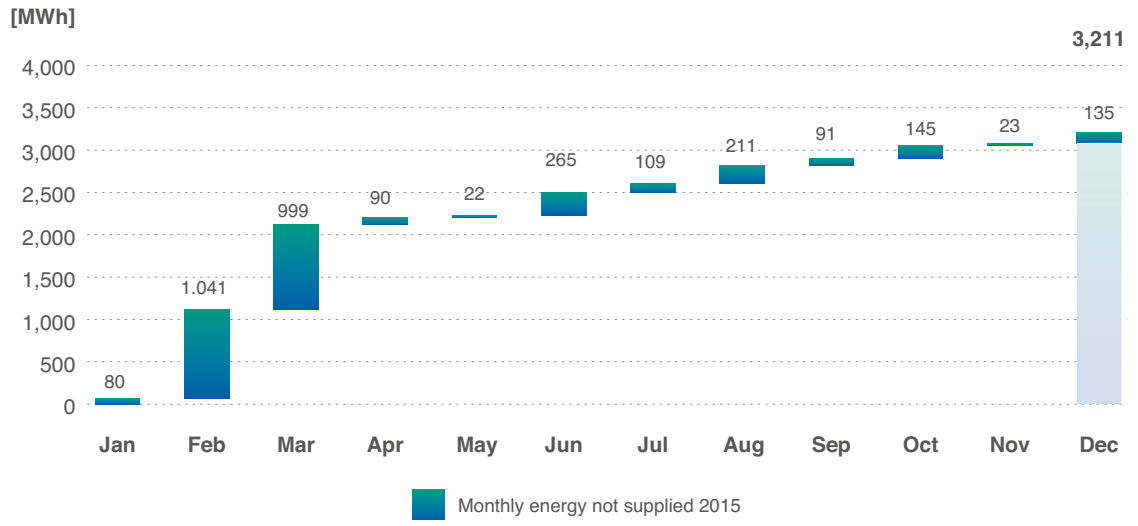
Energy not supplied

Energy not supplied is energy that is not withdrawn by users connected on the VHV-HV-MV grid following an interruption with outage. The table and graphs below provide the figures divided by territorial area, relative to the events that occurred on the relevant grid, which are not distinguished by cause and origin.

[MWh]

Territorial Area	2016	2015
Turin	244	59
Milan	568	540
Venice	65	332
Florence	113	670
Rome	310	1,026
Naples	361	358
Palermo	72	139
Cagliari	3	87
Total	**1,738**	**3,211**



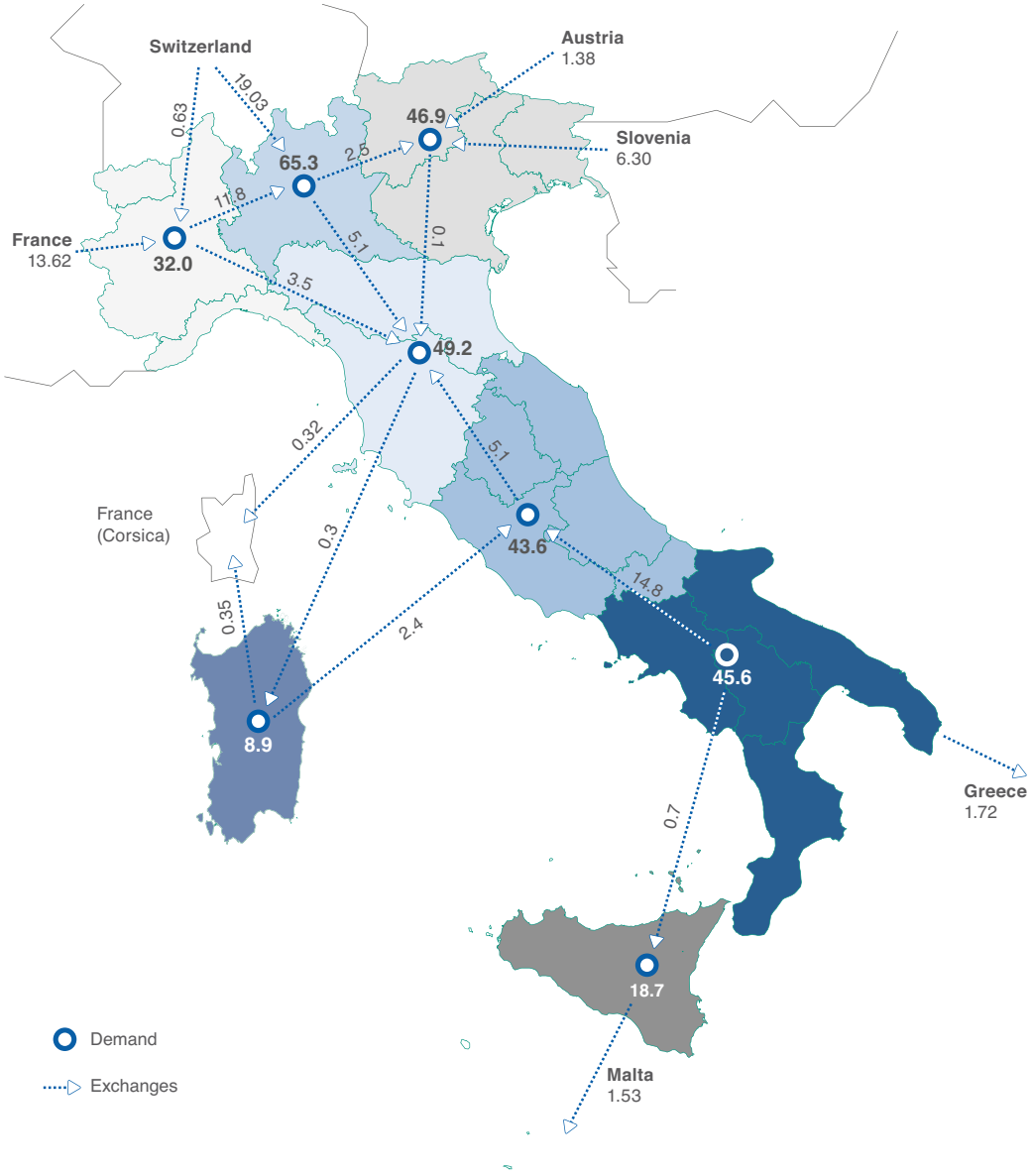


Physical exchanges of electricity between Italy and foreign countries

The balance of physical exchanges of electricity mainly shows the energy flows among the various areas identified in the Italian electricity system.

The entry into service of the new 380 kV connection between Sicily and Calabria ensures increased secure management of the national electricity system.

[TWh]

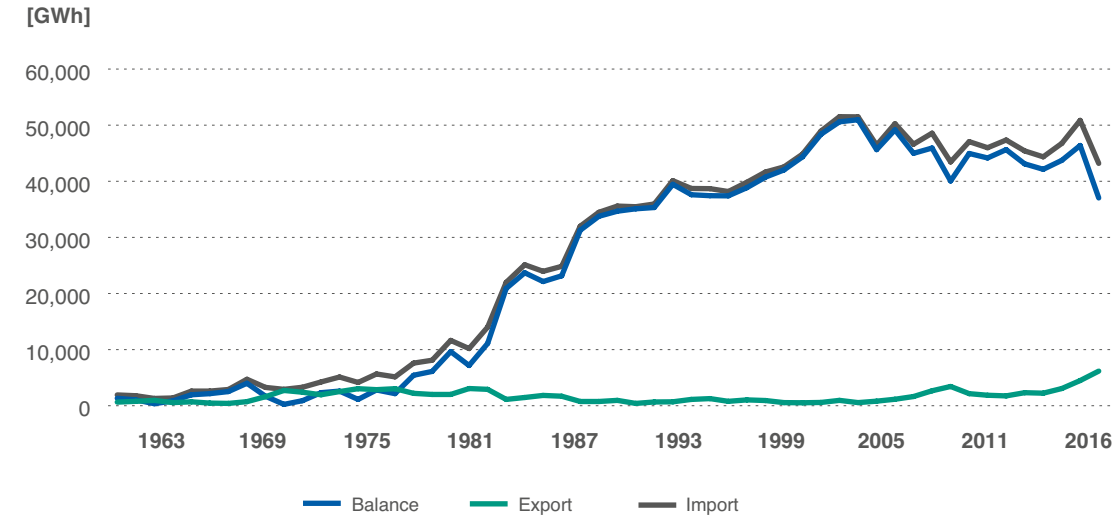


TABLES OF PHYSICAL EXCHANGES OF ELECTRICITY BETWEEN ITALY AND NEIGHBOURING COUNTRIES

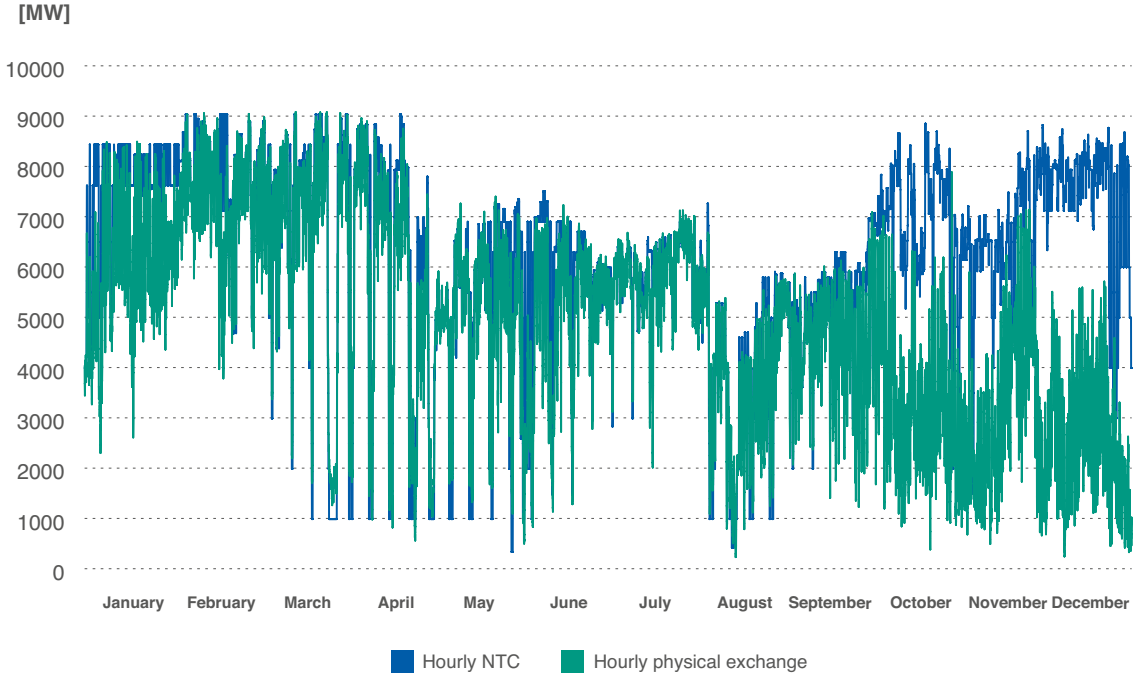
[GWh]	Electricity imported to Italy from							Electricity exported from Italy to							
2015	France	Switzer-land	Austria	Slovenia	Greece	Malta	TOTAL	France	Switzer-land	Austria	Slovenia	Greece	Malta	TOTAL	2015 ex-change balance
January	1,505	2,901	163	604	5	0	5,179	93	8	1	6	312	0	419	4,759
February	1,530	2,506	147	546	8	0	4,737	80	10	0	3	206	0	299	4,437
March	1,556	2,433	152	575	5	0	4,721	71	36	3	8	294	6	417	4,304
April	1,170	2,003	119	579	25	0	3,897	64	117	5	7	192	58	443	3,454
May	1,127	1,370	108	529	9	0	3,143	69	180	8	9	134	78	478	2,665
June	1,293	1,917	100	376	29	0	3,715	65	141	2	9	65	111	392	3,323
July	1,226	2,295	126	516	281	0	4,444	55	59	3	3	16	140	277	4,167
August	919	1,389	88	297	177	0	2,871	55	142	8	13	94	146	457	2,414
September	1,464	1,798	121	461	31	0	3,873	46	65	2	5	236	139	493	3,380
October	1,475	2,398	148	584	4	0	4,608	54	49	1	5	61	123	294	4,314
November	1,631	2,695	151	572	0	0	5,048	65	7	1	7	0	130	210	4,838
December	1,423	2,475	115	583	17	0	4,613	92	12	6	5	61	114	290	4,323
YEAR	16,316	26,180	1,538	6,223	592	0	50,849	810	824	40	81	1,672	1,044	4,471	46,378

[GWh]	Electricity imported to Italy from							Electricity exported from Italy to							
2016	France	Switzer-land	Austria	Slovenia	Greece	Malta	TOTAL	France	Switzer-land	Austria	Slovenia	Greece	Malta	TOTAL	2016 ex-change balance
January	1,548	2,313	85	511	17	0	4,474	79	6	12	21	279	118	515	3,959
February	1,688	2,631	167	583	7	0	5,078	57	4	0	5	281	116	464	4,614
March	1,589	2,527	162	626	8	0	4,912	95	41	4	5	286	124	555	4,357
April	1,454	1,932	141	567	12	0	4,105	74	131	7	20	269	117	619	3,487
May	1,402	1,514	121	608	17	0	3,662	71	130	8	11	186	129	535	3,127
June	1,222	1,567	143	530	12	0	3,473	50	179	3	14	81	135	461	3,012
July	1,153	2,361	182	640	77	0	4,413	54	103	0	8	189	144	497	3,916
August	774	1,513	127	379	25	0	2,818	126	162	4	22	204	138	655	2,163
September	1,072	1,612	30	538	53	0	3,305	62	31	2	10	169	130	404	2,901
October	911	1,137	96	523	78	0	2,746	86	121	8	22	86	130	453	2,293
November	650	1,063	101	507	0	0	2,322	133	167	6	15	0	121	442	1,880
December	522	806	88	456	0	0	1,872	152	248	13	19	0	122	554	1,318
YEAR	13,987	20,978	1,443	6,468	306	0	43,181	1,039	1,322	68	171	2,030	1,525	6,154	37,026

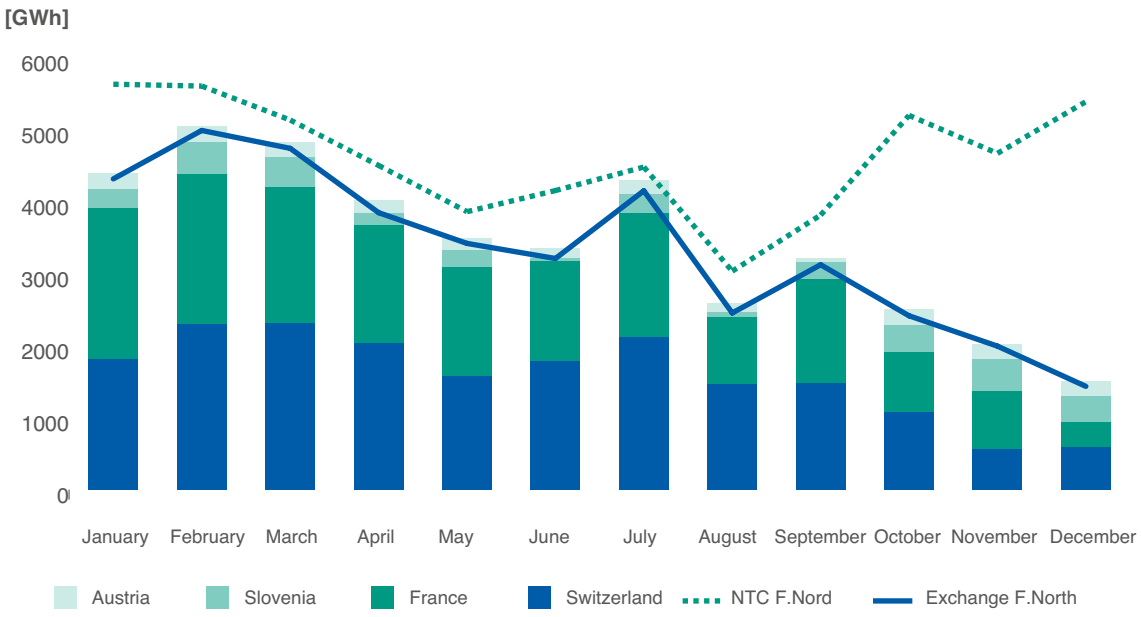
NET PHYSICAL EXCHANGES WITH NEIGHBOURING COUNTRIES



TIME GRAPH OF EXCHANGES AND NTC - NORTHERN BORDER



NET FOREIGN EXCHANGE BALANCE ON THE NORTHERN BORDER - MGP PROGRAMME



Italian 380 kV grid

ITALIAN 380KV GRID AT 31 DECEMBER 2016

Key

- **Energy supplied on the grid** is the energy that must be injected into the grid to cover net internal consumption. In the case of a national grid, it is equal to the sum of net electricity production and of electricity imported from foreign countries, after deducting the electricity consumed for pumping and exports to neighbouring countries.

- **Net electricity** production of a group of generation plants, in a given period of time, is the sum of the amounts of electricity injected into the grid.

- **Electricity consumed for pumping** is the electricity used for lifting water by pumps, for the sole purpose of being used subsequently for electricity production.

- **Territorial Areas**: these consist of one or more adjacent regions and are aggregated as indicated:
  TURIN: Piedmont - Liguria - Valle d'Aosta;
  MILAN: Lombardy
  VENICE: Friuli Venezia Giulia - Veneto - Trentino Alto Adige;
  FLORENCE: Emilia Romagna - Tuscany
  ROME: Lazio - Umbria - Abruzzo - Molise - Marche
  NAPLES: Campania - Apulia - Basilicata - Calabria;
  PALERMO: Sicily;
  CAGLIARI: Sardinia;

- **Energy not supplied** is energy that is not withdrawn by users connected to the VHV-HV-MV grid following an interruption with outage.

Disclaimer

1. The monthly electricity reports of the year 2015 are definitive.
2. The monthly electricity reports of the year 2016 are provisional.
3. The data presented in the document are provisional and subject to recalculation.
4. In particular, the monthly electricity reports of the year 2016 – prepared at the end of each month using the operating archives – are subject to further and precise verification or recalculation in the following months on the basis of additional information. This refining process on the monthly figure guarantees a greater degree of data reliability.

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