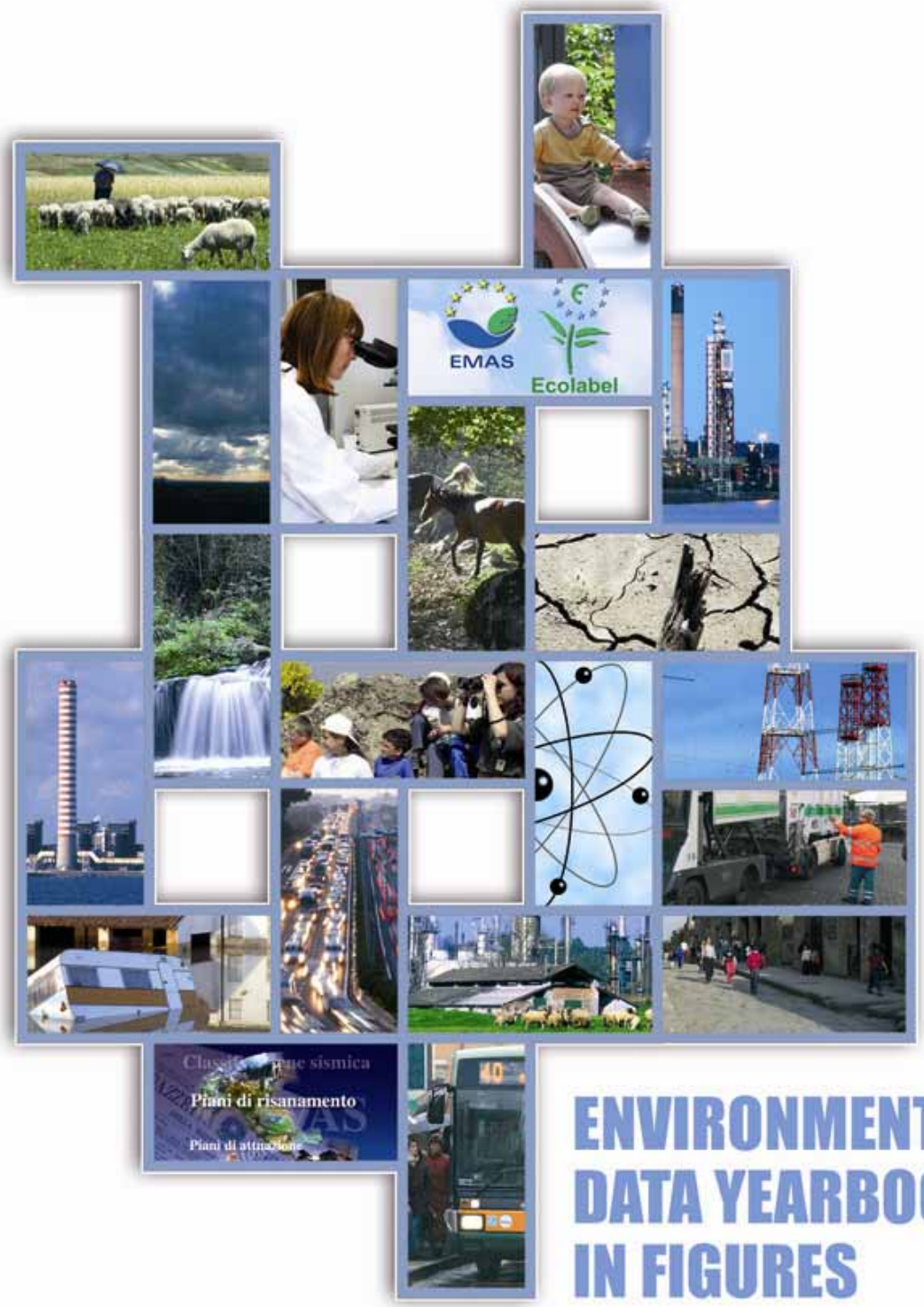
ISPRA

Italian National Institute for Environmental Protection and Research

ITALIAN ENVIRONMENTAL DATA YEARBOOK 2012

STATO DELL'AMBIENTE



ENVIRONMENTAL DATA YEARBOOK IN FIGURES

44 / 2013

SISTAN
Sistema Statistico Nazionale

ARPA APPA
Agenzie Regionali e delle Province Autonome per la Protezione dell'Ambiente

LEGAL NOTES

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For this the eleventh edition of the Environmental Data Yearbook, a number of informative products have been produced based on the same ISPRA database, in order to divulge the most up-to-date information to as many readers as possible: public decision-makers, researchers, stakeholders and individual citizens.
The 2012 edition can be split up into 7 products:

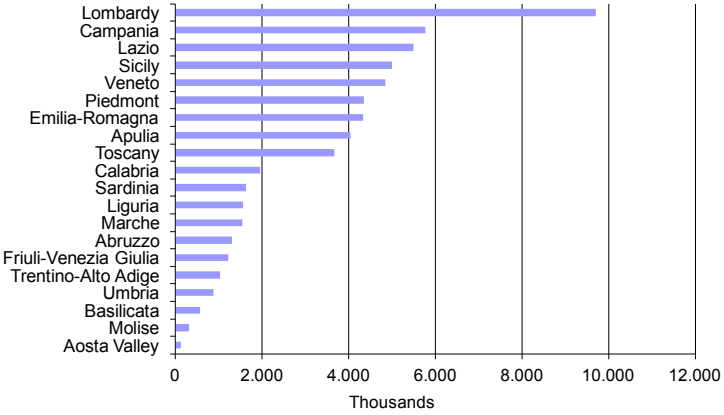
• Environmental data yearbook – Full version; gives principal indicators for 2012, broken down into areas of production, environmental conditions and responses. The text is in PDF format, and is available on CD-ROM and at the websites http://www.isprambiente.gov.it and http://annuario.isprambiente.it.
• Key topics- Version (in Italian and English) containing a possible organisation of data elements on priority environmental issues subject to specific preventive and remedial action. This is available in digital format (PDF).
Key topics "light" – A reduced version of Key topics (in Italian and English). Environmental issues analysed in Key topics are described along the lines of the DPSIR framework, using some specially chosen key indicators capable of representing issues in graphic mode. This is available in digital format (PDF).
• Yearbook in figures – a statistical Brochure (in Italian and English) containing the most representative graphs of environmental questions and statistical information or brief analysis comments. This is available in digital format (PDF).
• Database – Consultation instrument used online containing indicator factsheets and reports.
(http://annuario.isprambiente.it/).
• Multimedia – Instrument capable of communicating the data and information contained in the Yearbook in a comprehensible and immediate manner thanks to the use of film clips, animations and web applications. The 2012 Environmental Data Yearbook film version (in Italian) is available at http://www.isprambiente.gov.it/
• Comic – this year entitled "The investigation of Inspector SPRA", takes a single environmental theme each year in order to divulge the information and data contained in the Yearbook to a group of non-expert youngsters.

The Yearbook in figures is a product of the 2012 Environmental data yearbook, the most complete and exhaustive collection of scientific data and information on the environment published in Italy.
The statistical brochure provides in an extremely concise form a selection of the contents of graphs and texts of the full version.
The layout of the brochure features two columns: on the left is a selection of graphs deemed to be the most representative or which best characterise the single environmental topics, while the narrower coloured column on the right features statistical information or short notes.
The selection criteria for the diagrams are the completeness of the time series, reference to nationwide figures, intelligibility, based on the typology of the diagram (bar charts, pie charts, dot plots), and clarity (self-explanatory diagrams). The purpose of the notes is to complement – and not comment on – the diagrams, providing extra information about the various topics.
The overall aim of the layout and selection criteria is to ensure that it can be easily understood by the layman as well.
The topics addressed here are: Socio-economic background; Agriculture, Forestry and Aquaculture; Energy; Transport; Tourism; Industry; Atmosphere; Biosphere; Hydrosphere; Geosphere; Waste; Nuclear activities and Radioactivity; Non-ionising Radiation; Noise; Natural Hazards; Anthropogenic hazards; Environmental Assessment and Authorisation, Environmental certification; Promoting and spreading an environmental culture; Environmental planning tools; Environment and wellbeing.

Further information can be found in the Database of Environmental Indicators at http://annuario.
isprambiente.it/

The brochure, distributed to institutions, international organizations, media and opinion
leaders, is available at www.isprambiente.gov.it and http://annuario.isprambiente.it.

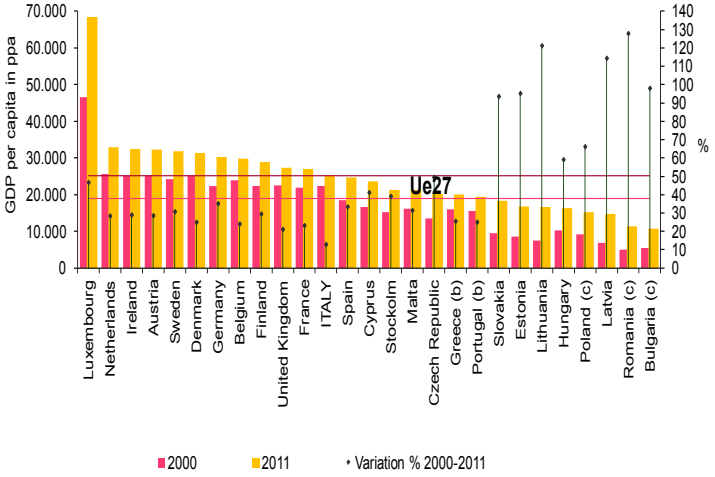
Resident population (31st December 2011)



Source: ISTAT data processed by ISPRA

The resident population in Italy at 01/01/2012 numbered 59,394,207. On the same date resident foreign nationals numbered 4,053,599.

GDP per capita EU countries *



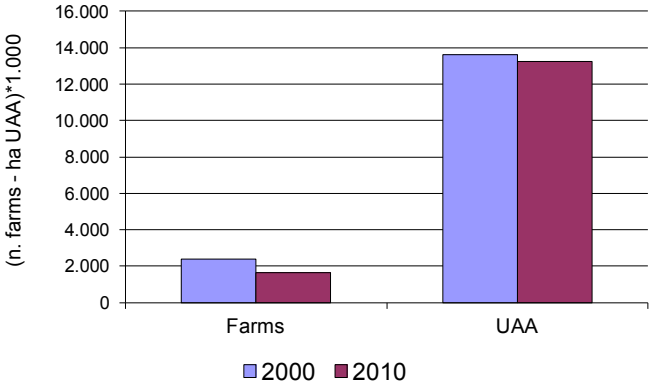
Gross Domestic Product, which represents the total output of goods and services of a country in a given period, measured at market prices, remained unchanged in real time in Italy in 2011.
In the EU GDP per capita, measured in PPA, differs considerably from country to country. In 2011 GDP ranged from 68,400 euro for Luxembourg to 14,800 euro for Latvia. The figure was 25,300 euro for Italy.

Legend:
* ppp: purchasing power parity

N.B.
[a] situation through 5th November 2012. Any differences with other national and international publications or databases may be due to roundings or the non-updating of data.
[b] data for Greece and Portugal are provisional.
[c] for Bulgaria, Poland and Romania the most recent data refer to 2010.

Source: Eurostat, National accounts data processed by ISTAT

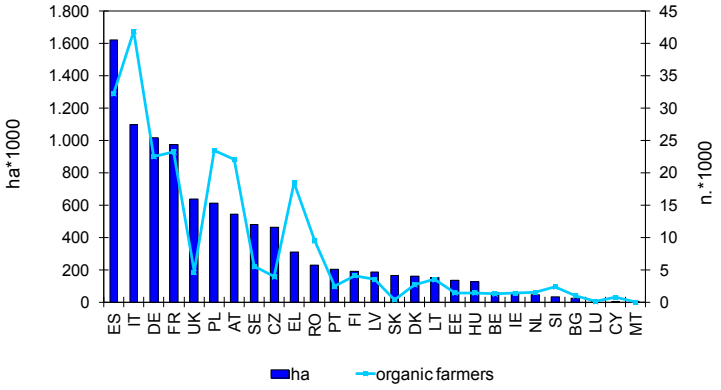
Farm enterprises and UAA



Source: ISTAT data processed by ISPRA

In 2010 there were 1,620,884 active farms and livestock holdings, occupying 12,856,048 ha of UAA.
Compared with the year 2000 there was a global fall nationwide of 775,390 farms (-32.4%). National UAA, as per the general agriculture census of 2010, was also down on the 2000 figure (-2.5%).

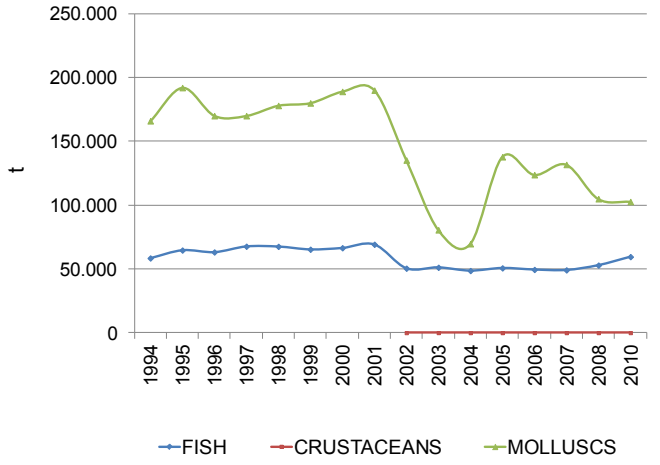
Surface area and organic farmers



Source: Eurostat *Organic Farming Statistics* and FiBL data processed by ISPRA

Italy is second only to Spain in Europe with regard to UAA set aside for organic farming, with a total of 1,096,889 ha, and is the leading country in terms of the number of organic farmers (48,269).

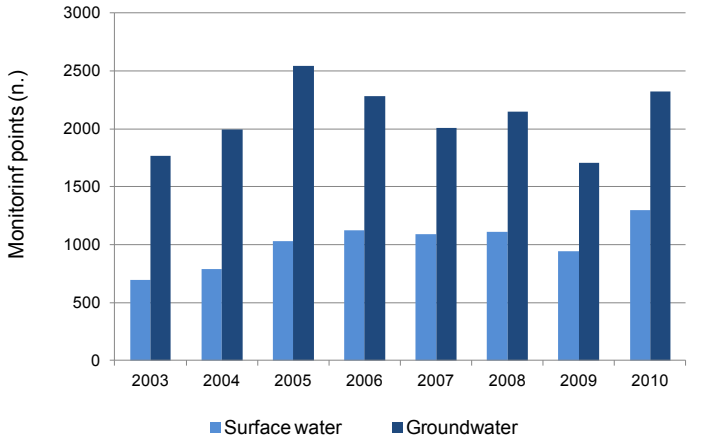
Time series of national fish, mollusc and crustacean farm production



Source: MiPAAF-UNIMAR (2007-2010), IDROCONSULT (2002-2006), ISPRA (1994-2001) data processed by ISPRA

The time series for output shows a slight decline for fish farming after the year 2000. Fluctuations for mollusc farming are due to the greater dependence of some production systems, for instance clam farming, or environmental parameters of transitional waters, which are often not optimal. A total of 851 such farms were surveyed in 2010. 48% were dedicated to fish farming, 51.9% to molluscs and 0.9% to crustaceans.

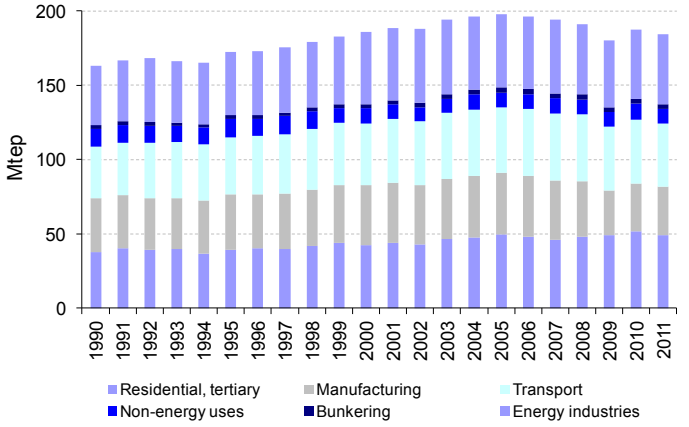
Water quality – pesticide contamination



Source: Data from regions, autonomous provinces, ARPA/APPA processed by ISPRA

The state of national controls has improved over time in the period considered both quantitatively and in terms of effectiveness. From substances found, the situation appears to be critical for contamination due to the use of triazine herbicides and their main metabolites, often greatly exceeding concentration limits.
To be noted is the high frequency of glyphosate and its metabolite AMPA in surface waters, both almost always with concentrations above set limits.

Final energy consumption by sector

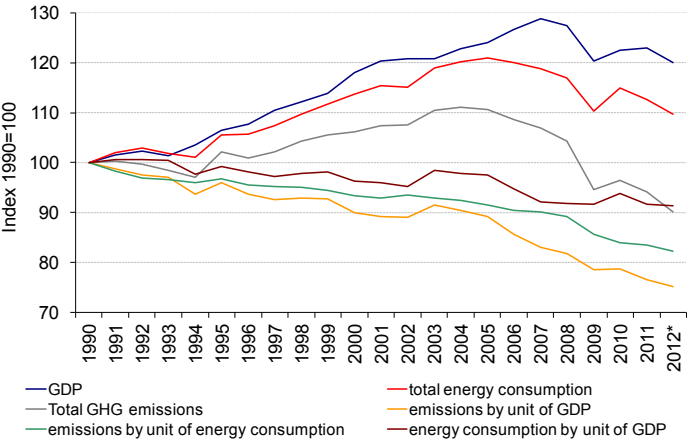


Source: MSE

The national energy system is marked by a high level of energy dependence (80.7% in 2011) and better than (EU) average performance in terms of energy intensity and the ratio final consumption to total energy consumption.

In 2011 in Italy gross domestic consumption of energy resources amounted to 184.20 Mtoe, more than 81.2% of this demand was met with fossil fuels.

Economic and energy indicators, greenhouse gas (GHG) emissions

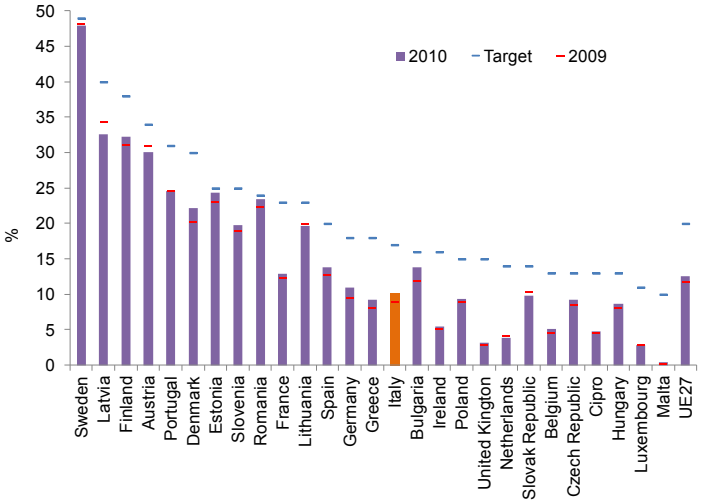


Legend: *provisional data

Source: ISPRA and MSE data processed by ISPRA

In 2011 82.7% of total GHG emissions were the result of energy consumption. The comparison of GHG emission trends with that of the main variables representing economic growth shows that, in the period 1990-2012, the growth in GHG emissions was generally slower than that of the economy in general, highlighting a relative decoupling effect.

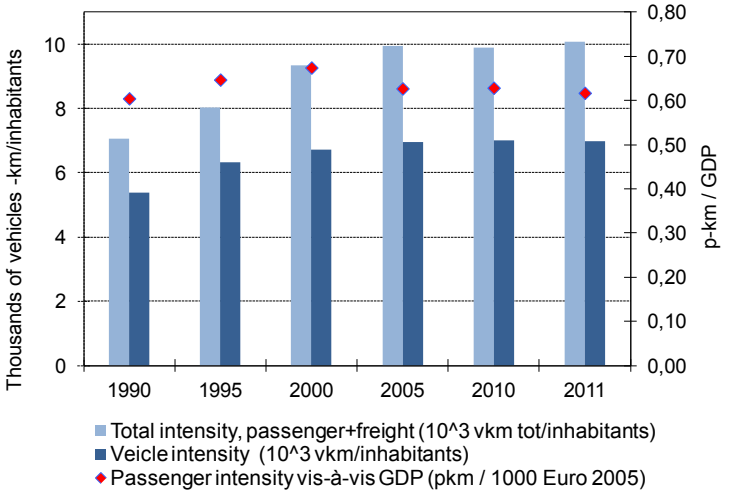
Share of energy from renewable sources vis-à-vis final consumption for European countries



Source: Eurostat

Directive 2009/28/EC establishes energy quotas from renewable sources as part of final gross consumption in 2020 for each EU country. The consumption target for renewable energy set for Italy is 17% of final gross consumption. The percentage recorded in 2010 was 10.1%.

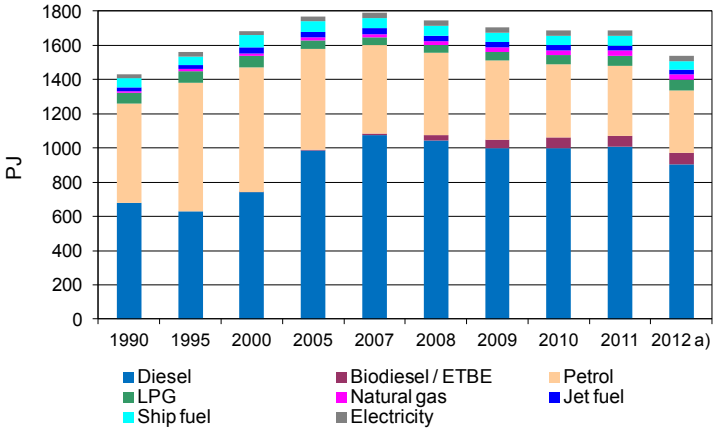
Passenger transport intensity trends



Source: ACI, ENEA, ISTAT, MSE and MIT data processed by ISPRA

Intensity of passenger transport, measured as a ratio of passengers-km to inhabitants, has been steady in recent years.

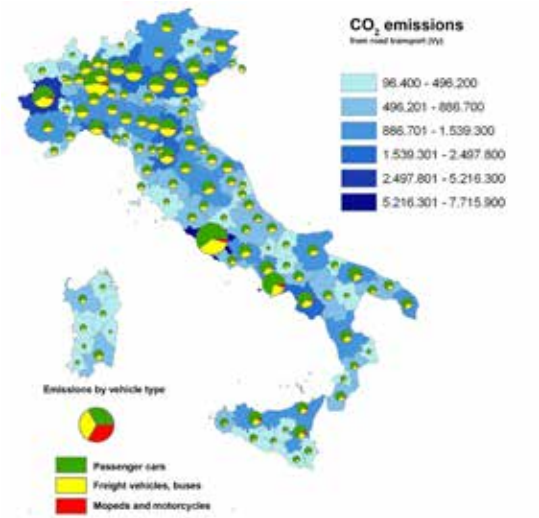
Energy consumption in transportation sector, final consumption



Source: MSE data processed by ISPRA

In 2011 the transport sector accounted for 31.5% of total consumption of final energy and for 65.5% of final consumption of oil.
Preliminary data for 2012 show a significant reduction in energy consumption of transport.

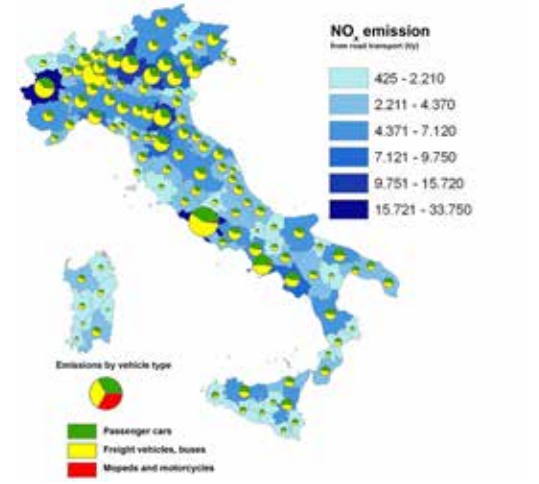
CO_2 (carbon dioxide) emissions by province and vehicle type (2010)



Source: ISPRA

In 2012 in Italy transport accounted for 23.4% of total GHG emissions. Emissions are closely related to energy consumption.

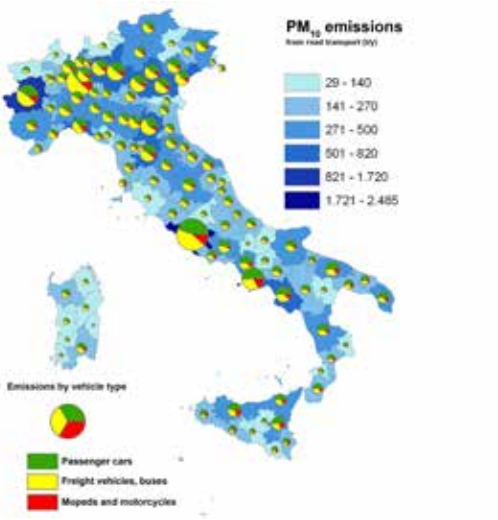
NO_x (nitrogen oxide) emissions by province and vehicle type (2010)



Source: ISPRA

In the period 1990-2010 nitrogen oxide emissions fell by 42%, but they remain significant in absolute terms; and the transport sector is the main source of this important pollutant.

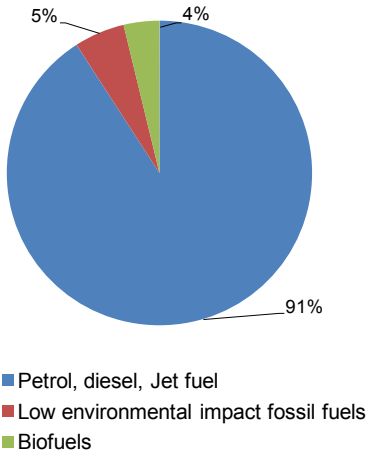
Particulate Matter (PM_{10}) emissions by province and vehicle type (2010)



Source: ISPRA

Harmful emissions caused by road transport have fallen considerably in recent years, thanks to the introduction of catalytic convertors, fine particulate filters and other motor vehicle technologies. Emissions of sulphur bi-oxide, now practically absent in road transport, are still a problem for sea transport. Emissions of sulphur oxides, particulate matter and nitrogen oxides contribute enormously to air pollution.

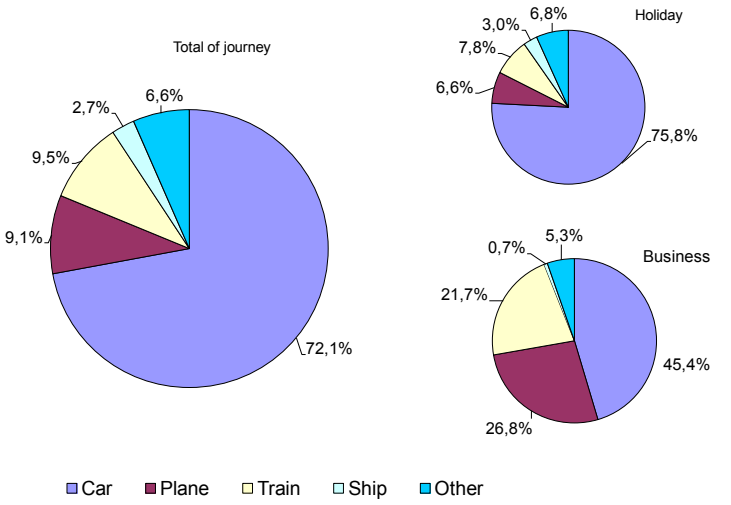
Composition of transport fuel consumption (2011)



Source: MSE data processed by ISPRA

The use of biodiesel and other biofuels has risen in recent years, but is still far from the targets set by the European Union for 2020 (10% of total).

Percentage distribution of journeys made in Italy only by residents, by mode of transport and type of journey (2011)



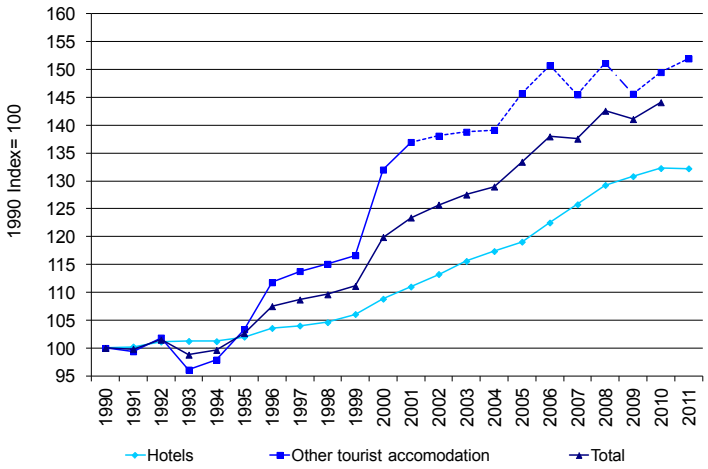
Source: ISTAT data processed by ISPRA

The economic crisis has affected the total number of trips made by Italians, which are down by 16.6%. Nevertheless, 62.9% of trips were undertaken by car.

The car is the preferred mode of transport for foreigners too (65% of border transits).

The weather is one of the principal drivers of seasonal tourist flows. In 2011 too seasonal flows were concentrated in the third quarter (with 50% of tourist stays).

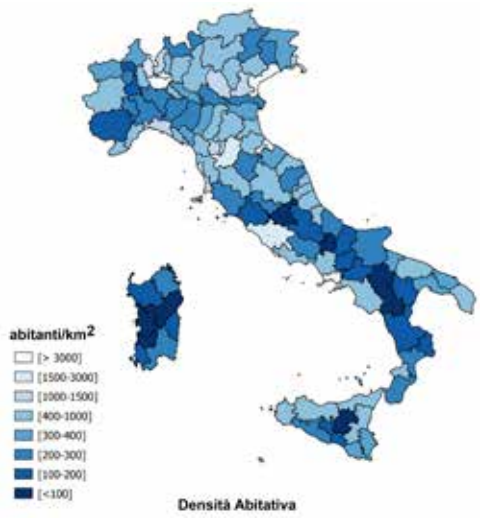
Change in the number of bed-places in hotels and other tourist accommodation establishments



Source: ISTAT data processed by ISPRA

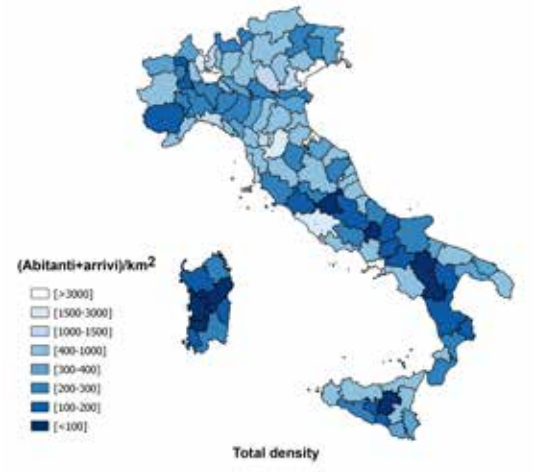
The average stay fell again in 2011 (3.7 days) compared to 2010, confirming the trend of tourists to spend shorter periods on holiday.

Change in population density in Italian regions with the contribution of tourist flows (2011)



Source: ISTAT data processed by ISPRA

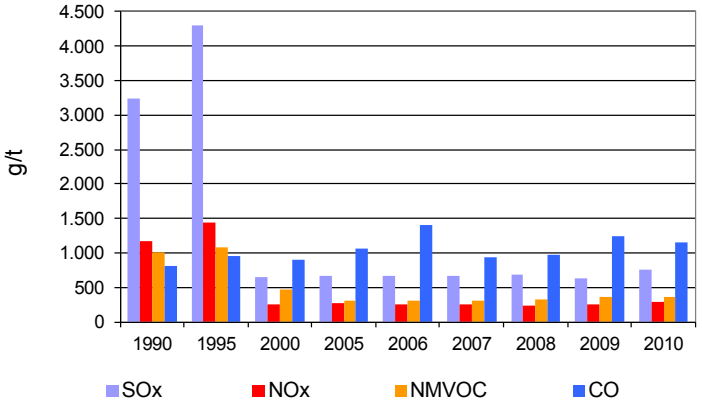
In 2011, in Italy, tourist arrivals and presences in all kinds of tourist accommodation establishments increased by 5% and 3% respectively.



Source: ISTAT data processed by ISPRA

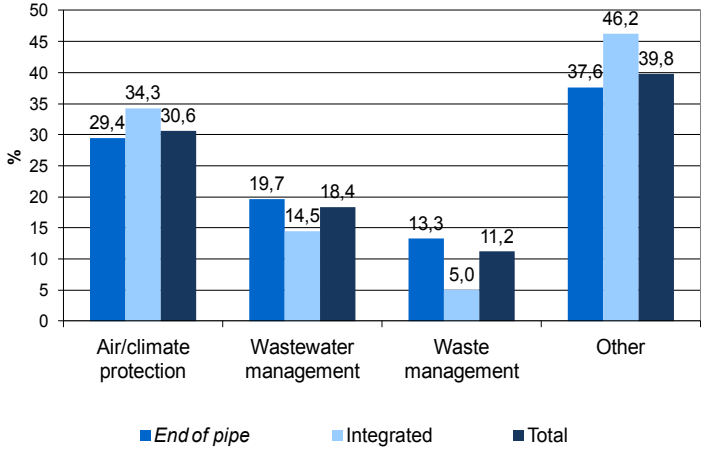
Italian tourists prefer seaside resorts (37%) and hotel stays (about 66.5% of presences).
Foreign tourists, on the other hand, prefer to visit cities of historical and artistic interest (33.8%) and stay in hotels (about 68% of stays).

Specific chemical industry emissions



Source: ISPRA, ISTAT and trade Associations data processed by ISPRA

Industrial investments for environmental protection, by environmental sector (2010)



Source: ISTAT

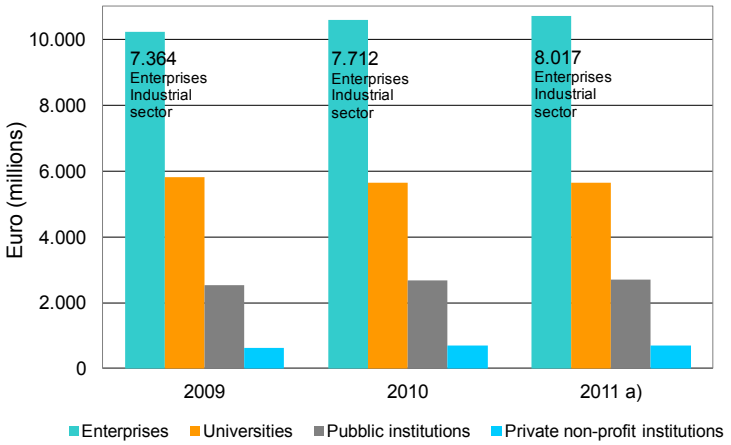
Due to the pressure they exert, the chemical industry and iron and steel industry are particularly significant sectors as regards their effect on the environment.

Investments in the sphere of environmental protection made up 4.7% of total gross fixed investments undertaken by industrial firms.

In 2010 Italian industrial firms spent 1,400 million euro investing in end of pipe plants and equipment and 485 million euro in integrated technology plants and equipment , down a total of 1,925 million euro, or 7.2% on 2009.

R&D expenditure by sector

Industrial firms contribute more than universities to total spending on research and development.

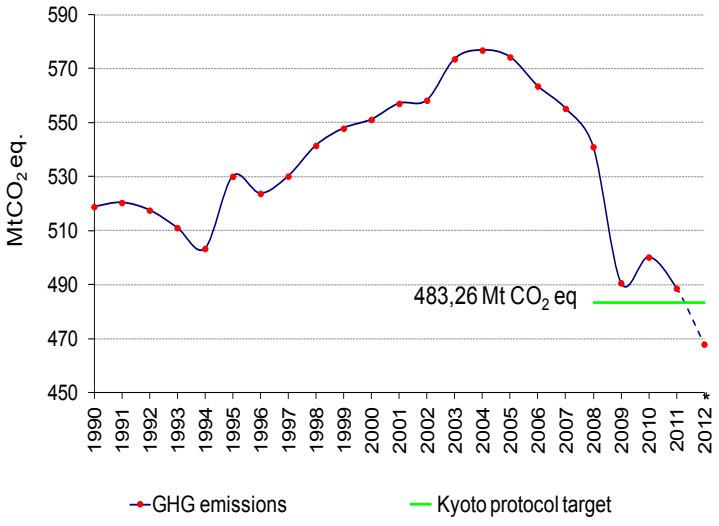


Nota

[a] estimates

Source: ISTAT data processed by ISPRA

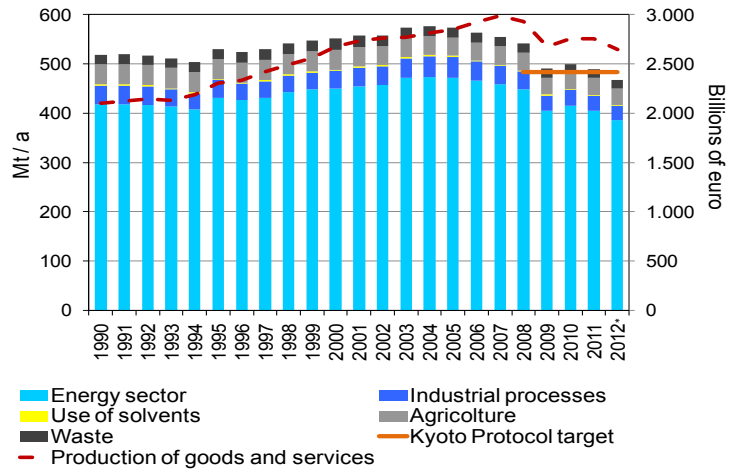
Total GHG emissions and Kyoto Protocol target levels



Legend: * Provisional data
Source: ISPRA

Total GHG emissions dropped by 5.8% in the period from 1990-2011, compared with a national commitment to reduce emissions by 6.5%, going from 518.98 to 488.79 $MtCO_2eq$.
Initial GHG estimates for 2012, of 464.55 Mt CO_2eq (as at 30 June 2013), point to a further 5% fall respect to 2011, due to the continuing economic crisis. This would entail a global reduction of 10.5% respect to 1990. The gap between actual results and the target of the Kyoto Protocol is narrowing, enabling Italy to achieve this target-thewith only a moderate effort using the credits of the Kyoto Protocol mechanism deriving from forestry activities.

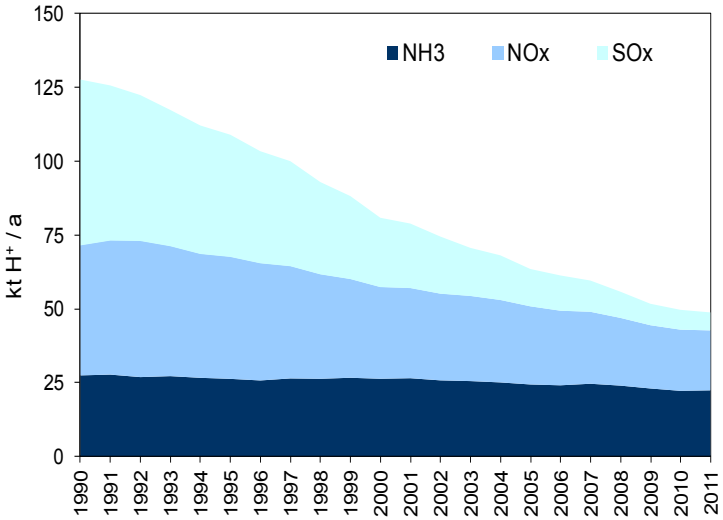
National total GHG emissions



Legend: * Provisional data
Source: ISPRA

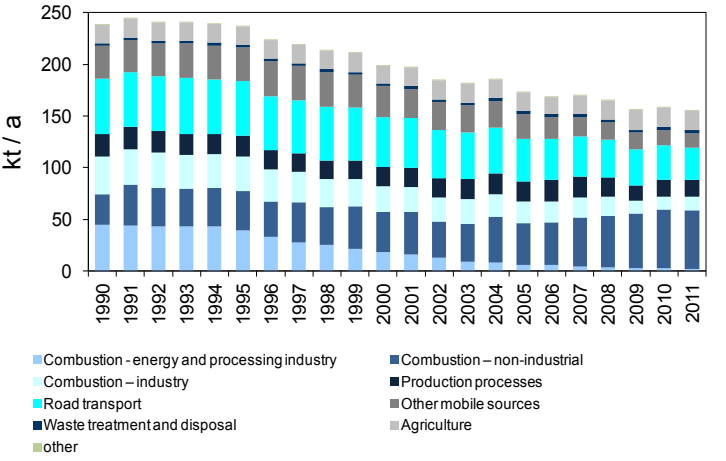
GHG emissions are primarily due to the energy sector, which accounts for 82% of total emissions for the period 1990-2012, dropping in absolute terms by 54.43 million tons.

National total emissions of sulphur oxides (SO_x), nitrogen oxides (NO_x) and ammonia (NH_3)



Source: ISPRA

National emissions of PM_{10} disaggregated by sector

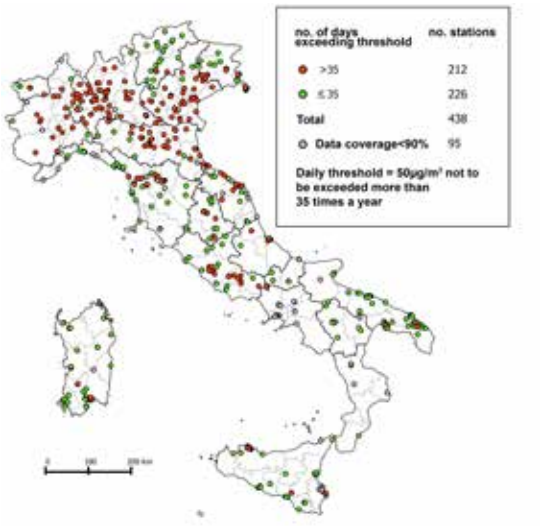


Source: ISPRA

Emissions of the acidifying substances (sulphur oxides (SO_x), nitrogen oxides (NO_x) and ammonia (NH_3)) generally fell constantly from 1990 to 2011 (-62%).
With regard to national legislation, implementing Community law, the limit set for 2010 was reached by nitrogen oxides in 2009, sulphur oxides in 2005 and ammonia in 2008.

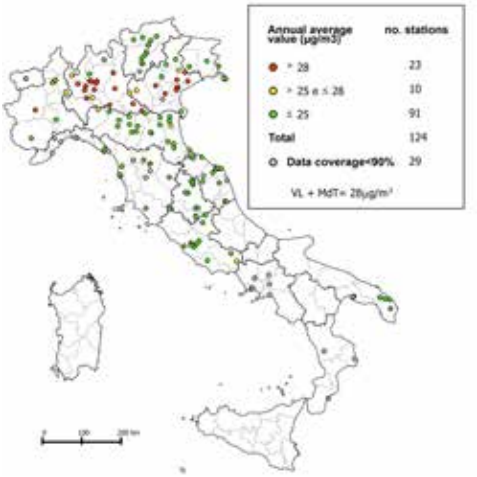
National emissions of PM10 began to fall in 1992, and from then to 2011 there was a 35% reduction. This trend is mirrored by the road transport sector, which in the period 1990-2011 contributed 23% on average to total emissions.

PM_{10} – Monitoring stations by classes of days of exceeding daily threshold (50µg/m³ not to be exceeded more than 35 times a year) (2011)



Source: ISPRA

$PM_{2.5}$ – Monitoring stations and exceeding of annual threshold (25µg/m³) (2011)



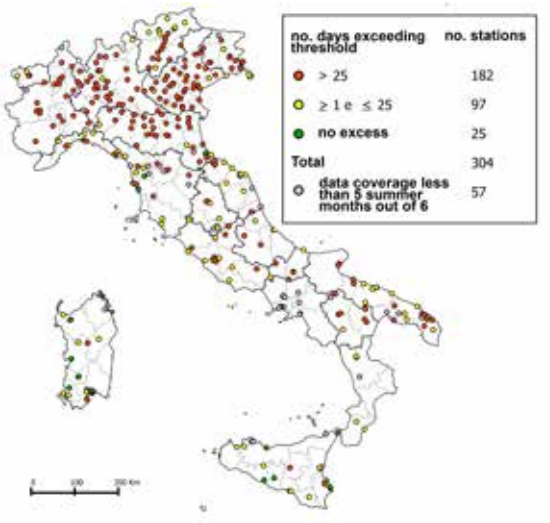
Source: ISPRA

In Italy in 2011 the most critical pollutants, due to their high concentrations in the atmosphere, are still particulate matter (PM_{10} and $PM_{2.5}$), ozone and nitrogen dioxide.
Another serious pollutant is Benzo(a)pyrene which, despite being measured at too few stations (69), is beyond the threshold value in 20% of cases.

PM_{10} – The daily limit value was exceeded at 48% of monitoring stations (50 µg/m³, not to be exceeded more than 35 times per calendar year).

PM2.5 – Information is still insufficient.
Comparing annual average values with the limit value for human health (25 µg/m³),
which will come into effect in 2015, 27% of stations exceeded the threshold.

O_3 – Monitoring stations by classes of days exceeding long-term target value (120 µg/m³) (2011)



Source: ISPRA

NO_2 - Monitoring stations and exceeding of annual threshold (2011)

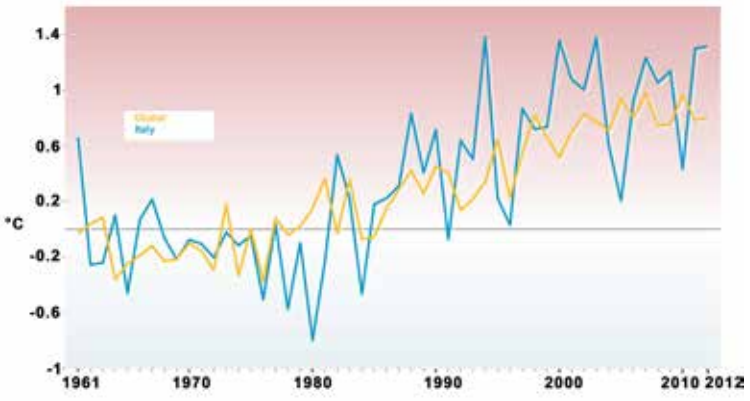
Source: ISPRA

With regard to arsenic, cadmium and nickel, information available does not offer a sufficient or uniform coverage of the territory. However, there has been only one recorded case of exceeded limits, for nickel (from 70 stations).

Ozone – the long-term target for human health protection (120 µg/m³) was exceeded in 92% of monitoring stations.

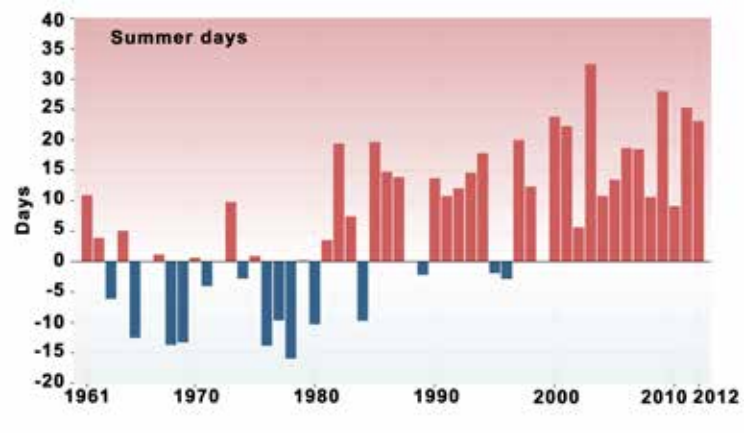
Nitrogen dioxide - the annual limit (40 µg/m³) was exceeded in 20% of monitoring stations.

Time series of global and Italian average temperature anomalies, compared with normal climatological values 1961-1990



Source: ISPRA and NCD/NOAA

Time series of annual average anomalies in Italy compared with normal values 1961-1990



Source: Rete Sinottica (Synoptic Network) and Regional Networks data processed by ISPRA

Today, there are no longer any doubts about the reality of global warming.

In Italy the increase in average daily temperatures over the last three decades has been consistently higher than the average global increase on land.

In 2012 the average temperature anomaly recorded in Italy (+1.31°C) was above the global anomaly value on land (+0.78 °C).
2012 was for Italy the twentieth consecutive positive annual value, ranking fourth in the period going from 1961 to 2012.

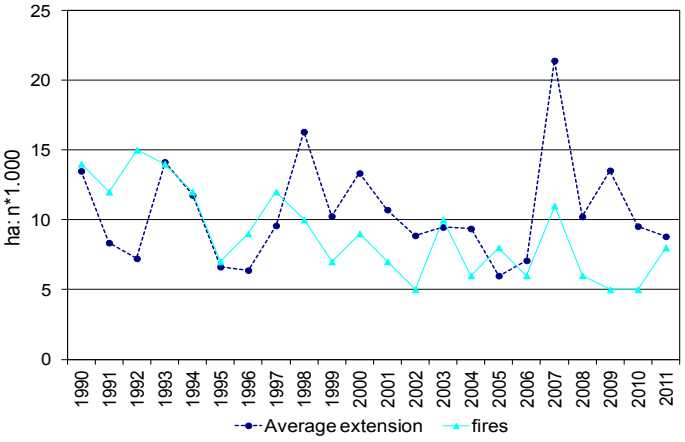
In 2012 the average number of tropical nights (i.e. nights with a minimum air temperature in excess of 20°C) was the second highest of the series since 1961, behind only 2003.

The average number of summer days (i.e. days with a maximum air temperature in excess of 25°C), was above the climatological average for 1961-1990 for the thirteenth consecutive year, with 2012 ranking fifth in the series starting in 1961.

Density grid (10 x 10 km resolution) of vascular flora species included in the Red Lists (2005)

Source: Data from Scoppola, Spampinato, 2005– Atlante delle specie a rischio di estinzione (CD-ROM), Environment Ministry, DPN, SBI, Univ. Tuscia, Univ. La Sapienza processed by ISPRA

Average extension and number of forest fires



Source: State Forestry Corps (www.corpoforestale.it)

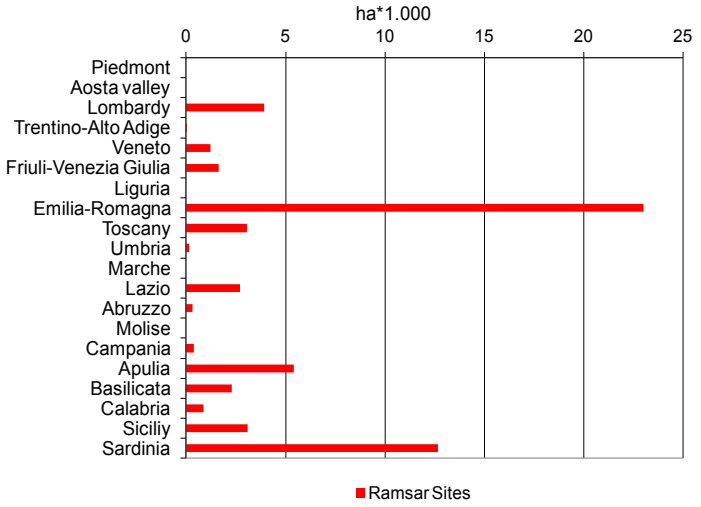
Of all the European countries, Italy has one of the largest stores of biodiversity, accounting for half the plant species and a third of the animal species occurring in Europe.

It is also the European country with the highest number of animal species (over 58,000), with a high incidence of endemic species. Vascular plant species number 6,700, 15.6% of which are endemic species.

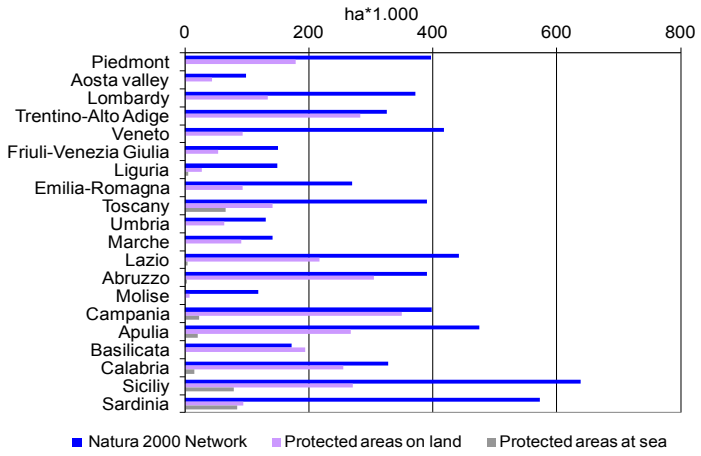
The forest area index went from 28.8% in 1985 to over 36% in 2010.

About 72% of fires are caused by deliberate acts and almost 14% by acts of negligence, while the remaining 14% are of uncertain origin.

Regional distribution of protected areas (not including Marine Mammal Sanctuary)



Source: Environment Ministry data processed by ISPRA

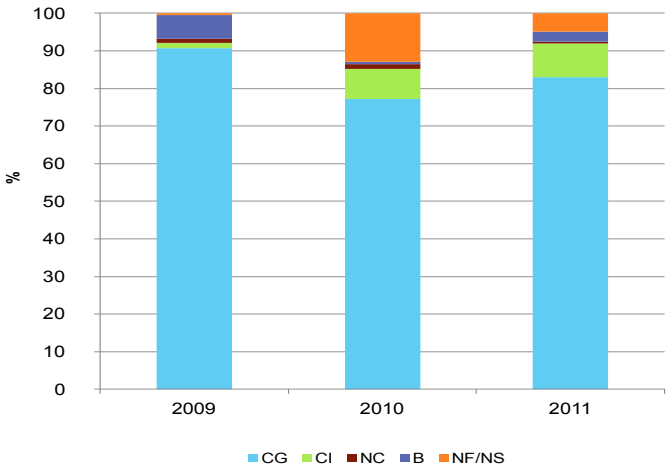


Source: Environment Ministry data processed by ISPRA

Italy has endorsed numerous conventions and international agreements designed to safeguard biodiversity, such as the Convention on Biological Diversity.

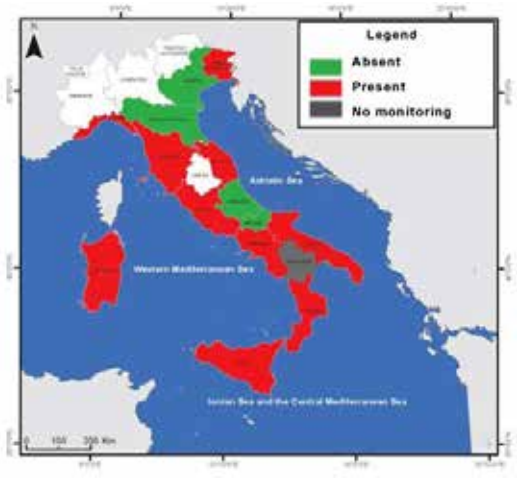
The Nature Network 2000 consists of SPAs and SCIs which, removing any overlapping, total 2,576 sites, and occupy a surface area of 6,379,090 hectares, corresponding to about 21% of the national territory.
Moreover, in Italy there are also 871 protected areas occupying a territorial surface area of over 3 million hectares (10.5% of the national territory).
The protected sea areas also include 27 Marine Protected Areas. There are also 57 Ramsar sites.

Bathing water conformity assessment



N.B. CI: compliant with imperative values; CG: compliant with guideline values; NC: not compliant with imperative values; NF: insufficiently sampled; NS: not sampled; B: banned

Ostreopsis ovata along Italian coastlines (2011)



Source: data collected by ARPA coastal areas processed by ISPRA

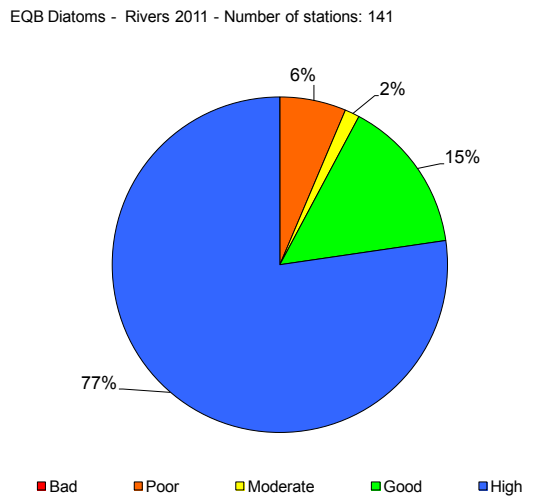
In 2011 Italy had 4,901 marine bathing waters, 91.9% of which conforming to standards established by Directive 76/160/EEC.
For 7 coastal regions the percentage of compliance with guidelines is between 90-100%, in 4 it was above 80% and in the remaining 4 between 50% and 72%.

Ostreopsis ovata Fukuyo is a potentially toxic dinoflagellate found for the first time in Italian waters in 1994 in the Lazio region.

In 2011, Ostreopsis cf. ovata was detected in coastal 10 regions, while it was not found in any of the samples taken along the coasts of Abruzzo, Emilia-Romagna, Molise and Veneto (Basilicata did not carry out the monitoring).

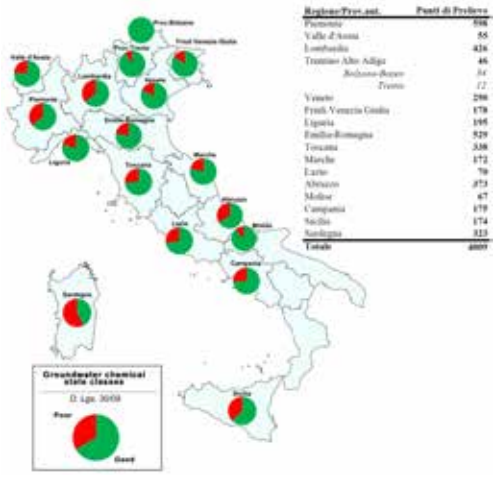
The benthic blooms of Ostrepsis cf. ovata manifest almost exclusively in the summer and autumn seasons (beginning of October). Along the Tyrrhenian and Ionian coasts peak periods are in the summer months (July/August), along the northern Adriatic coastline in September and October.

Stations in the 5 quality classes, using macroinvertebrate BQEs



Source: ARPA/APPA data processed by ISPRA

Chemical monitoring of groundwater - geographic breakdown (2011)



Source: data supplied by regions, autonomous provinces and ARPA/APPA processed by ISPRA/ ARPA Emilia-Romagna

The ecological status of a surface water body is classified based on the lowest class resulting from the monitoring data relating to the biological, physicochemical and chemical elements.

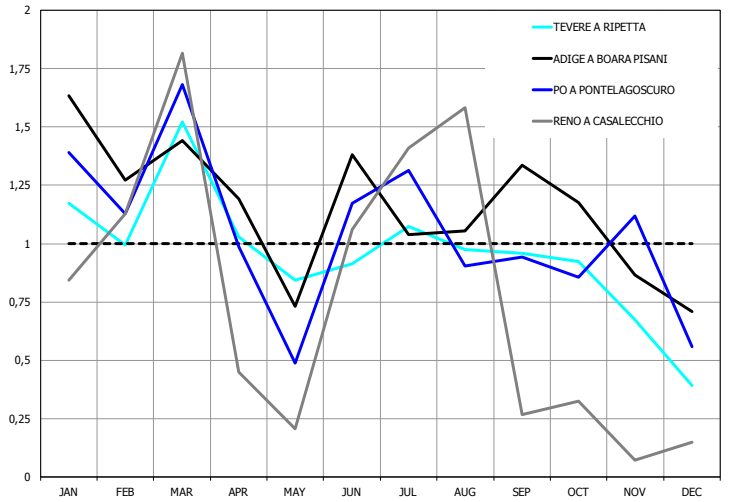
From the monitoring of rivers, the "good" class is prevalent for Macroinvertebrate BQEs, while for Diatoms and Macrophytes the "high" class reaches larger percentages.

In 2011, for river waterways the 90% of stations (233 stations in 13 regions) fell into the "good" class of Environmental Quality Standards.

In 2011, out of 4,009 stations, the 70.3% had a SCAS (chemical status of underground waters) fell into the "good" class.

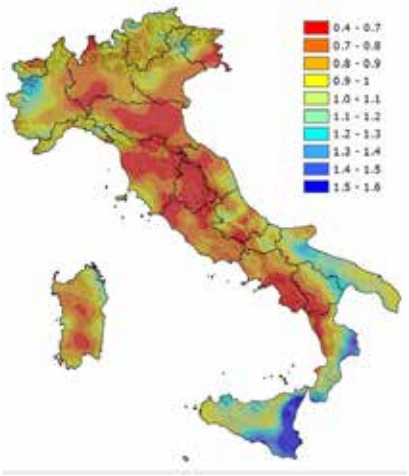
The Autonomous Province of Bolzano had all the monitoring stations in the "good" class, followed by the Autonomous Province of Trento with 91.7%, and Molise with 88.1%. The highest incidence of stations in the "poor" class was seen in Sardinia, with 57.6%, followed by Sicily and Lombardy, with 36.8% and 35.7% respectively.

Ratio of average monthly flow rates in 2011 and those calculated for the decade 2002-2011 for final sections of somewaterways



Source: ARPA/APPA, Regional Civil Defence Operational Centres

Ratio of total annual rainfall in 2011 and average total annual rainfalls in the 1961-1990 (30 year) period

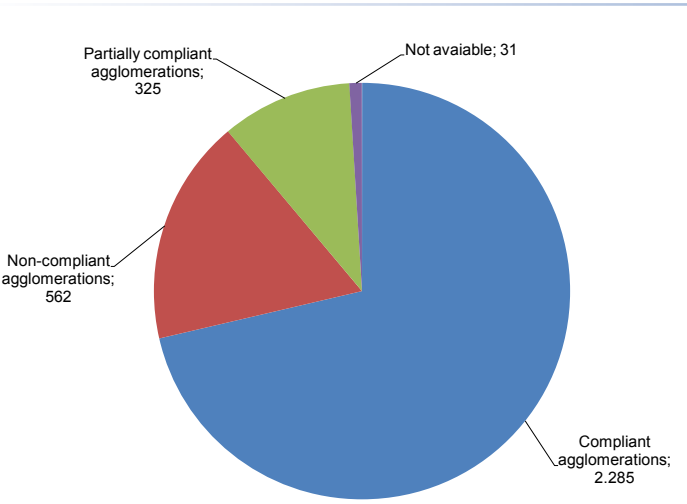


Source: ARPA/APPA, Regional Civil Defence centres

In 2011 average monthly rainfall values fluctuated considerably around mean values for the decade, with above-average values in March and for much of the summer season, while remaining well below average values in the months of April and May and in the winter season.

For the monitoring of drought the Standardized Precipitation Index (SPI) is used, quantifying rainfall deficit (SPI < 0) or surplus (SPI > 0).
In Italy no drought phenomena were seen in the first half of 2011, unlike in the second half of the year.
Overall in 2011 precipitation levels were below the 30-year average in much of Italy

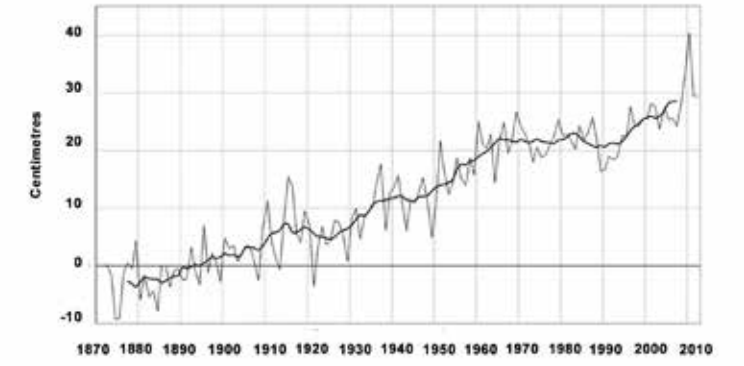
Compliance of water treatment systems for centres with over 2,000 equiv. inhab. (2009)



Source: ARPA/APPA and regional data processed by ISPRA

In Italy 12 regions (in the North, Centre and South) and the Autonomous Provinces of Trento and Bolzano show a percentage of treated waste greater than or equal to 90%, while in 5 regions it reached values of between 70 and 90%.

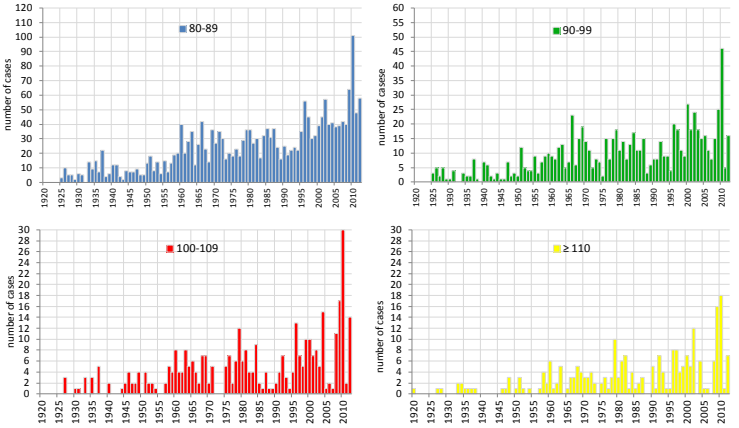
Mean annual sea level in Venice



Source: ISPRA

The mean sea level is rising in Venice. The absolute maximum value refers to 2010, with 40.5 cm above the Zero Sea Level at Punta della Salute.
To be noted that in addition to 2010 (highest level ever) and 2009 (2nd highest ever), 2011 and 2012 were respectively 3rd and 4th in the ranking of highest sea levels since records began in 1872.

Frequency of 'high water' events in Venice, by height class

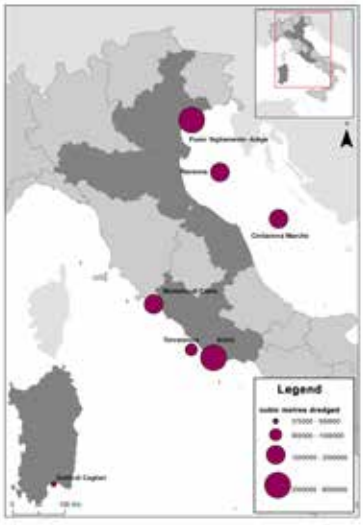


Source: ISPRA

2010 was a record year for all height classes, and exceptional for the frequency of cases of medium-high to high (90-109 cm) and high (110 cm and more) water.
The frequency of high water cases has grown considerably since the mid-1990s, and appears to have gathered pace over the past four years.

Surface water temperatures of Italian seas from October 2011 to September 2012 were in the norm.
Worthy of note is the increase in Tyrrhenian water temperatures in the summer months.

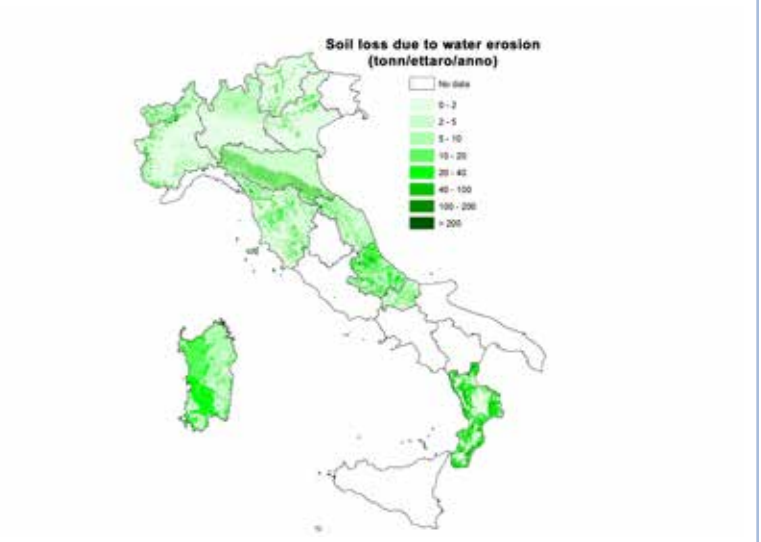
Relict sand volumes dredged along the Italian continental shelf



Source: data collected by Magistrato delle Acque (Water Authority), Abruzzo, Marche, Emilia-Romagna, Lazio regions, processed by ISPRA

Between 1994 and 2007 more than 14,000,000 m^3 of cubic metres of relict sand was dredged for beach nourishment purposes, in the province of Venice and along the Lazio coast.
From 2008 to 2010 no dredging operations were recorded.

Assessment of soil loss due to water erosion (SIAS Project - 2011)



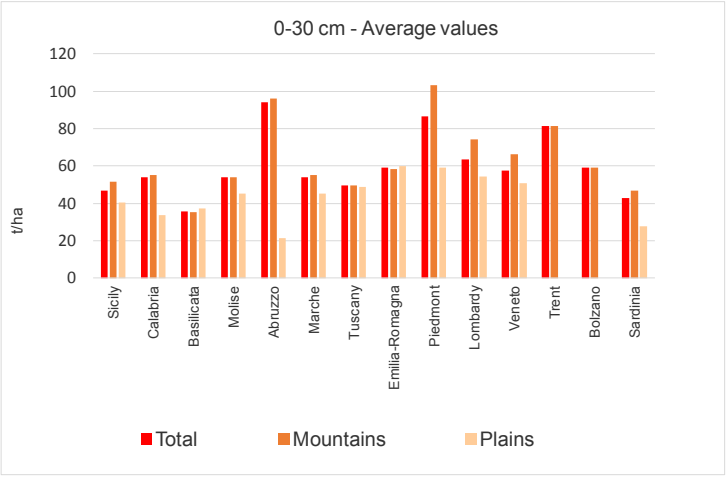
Source: ISPRA

Extensive areas of Italy feature erosion rates well above tolerance limits.

Water erosion brings about a loss of soil, fertility and biodiversity.

Surface area (based on the RUSLE model) affected by the phenomenon in EU27 is estimated at 1.3 million km^2, of which about 20% suffering a soil loss in excess of 10 t/ha/year.
The percentage for Italy is about 30%.

Organic Carbon (OC) content in topsoil layers (2012)

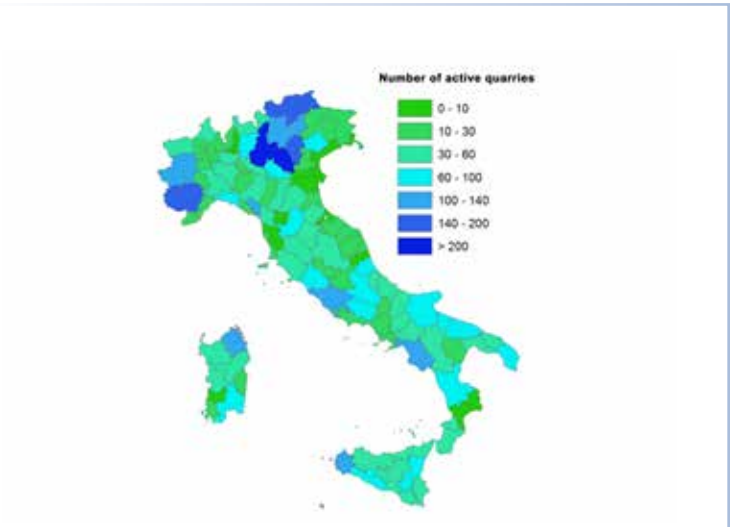


Source: ISPRA, SIAS project

Organic carbon makes up 60% of organic substance.
In Italy a 1.2% OC content for farmland is considered adequate to guarantee sufficient nutritional elements for crops.

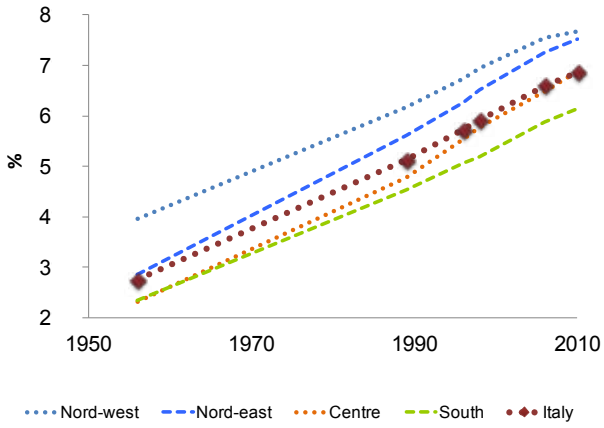
The majority of soils on Italian farmed plains and hills has an OC concentration of between 1% and 2%, while for unfarmed hilly and mountainous zones the concentration is between 2% and 5%.

Active quarries by province (2012)



Source: ISPRA

Soil consumption in Italy (1956-2010)



Source: ISPRA

Quarrying is an important economic sector, but also a cause of environmental degradation.

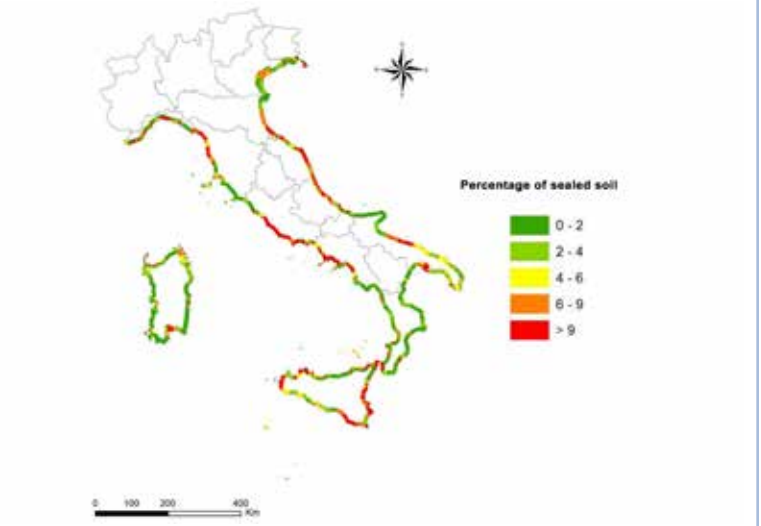
There are about 5,500 active quarries in Italy.

Regions having the most active quarries are: Veneto, Lombardy, Piedmont in the North; Sicily and Apulia in the south.

In Italy 7 m^2 per second of soil have been consumed on average for over 50 years. In absolute terms 20,500 km^2 of soil has been irretrievably lost.
The period in which soil consumption has been most rapid was the 1990s, with the taking of about 10 m^2 a second. The current rate is 8 m^2 per second.
By 2010 the surface area consumed per capita had doubled compared with the 1950s, going from 170 m^2 per inhabitant to more than 340 m^2.
This phenomenon is most common in northern Italy. Lombardy is the region having the most surface area consumed, more than 10% of the regional territory, followed by Veneto, Emilia-Romagna, Apulia and Lazio.
The biggest increases of the past 60 years have been recorded in the south.

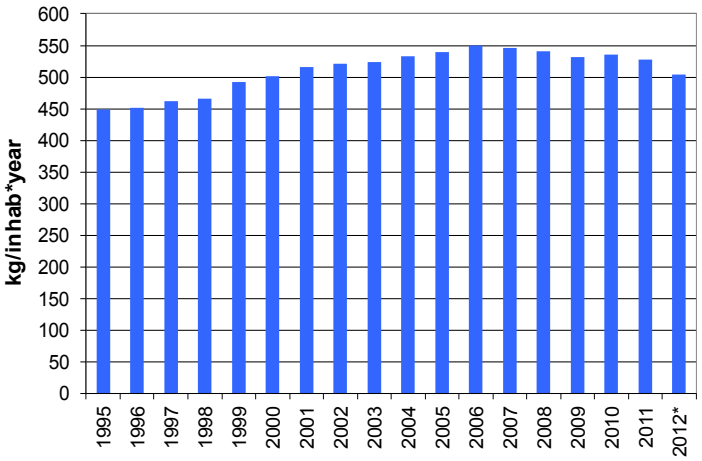
Soil sealing along the 10 km coastal band

Soil sealing is a fundamental component of soil consumption.
In the 10km coastal band higher than average values for sealing were recorded compared with the rest of the country.



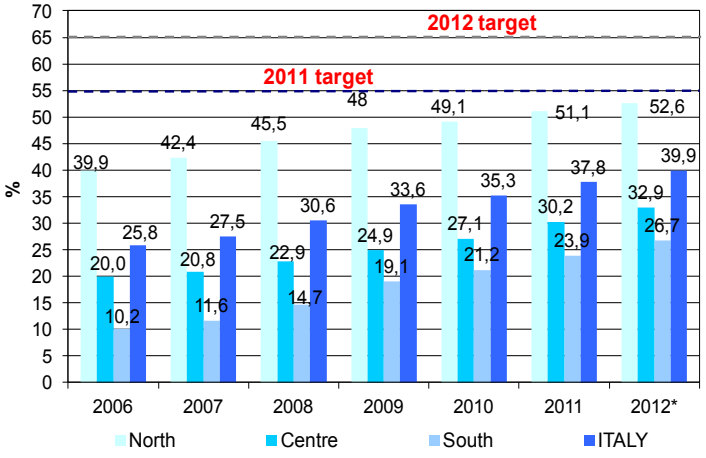
Source: COPERNICUS 2009 data (project GEOLAND 2) processed by ISPRA

Municipal waste production *per capita*



N.B.: * Preliminary figures
Source: ISPRA and ISTAT processed by ISPRA

Percentage of separate collection of municipal waste

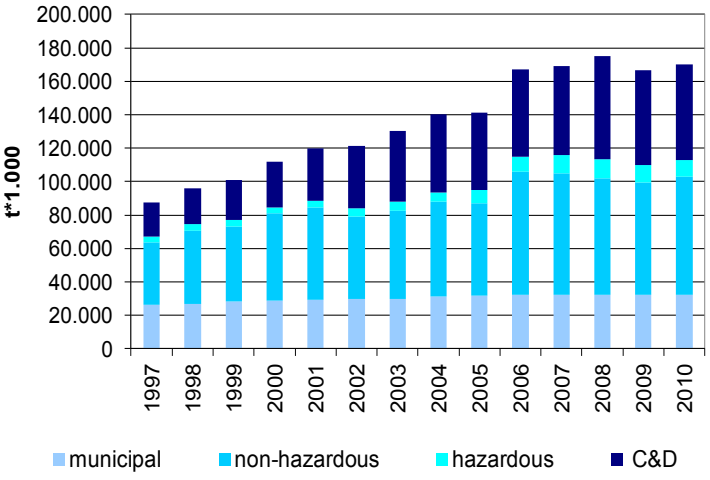


N.B.:* Preliminary data
Source: ISPRA

Total municipal waste in 2012 was just under 30 million tons, 4.5% down on 2011. Per capita waste generation confirms this trend, falling from 528 kg/inhab. in 2011 to 504 kg/inhab. in 2012.
Per capita generation by macroarea remains non-uniform:
North 503 kg/inhab.;
Centre 582 kg/inhab.;
South 463 kg/inhab..

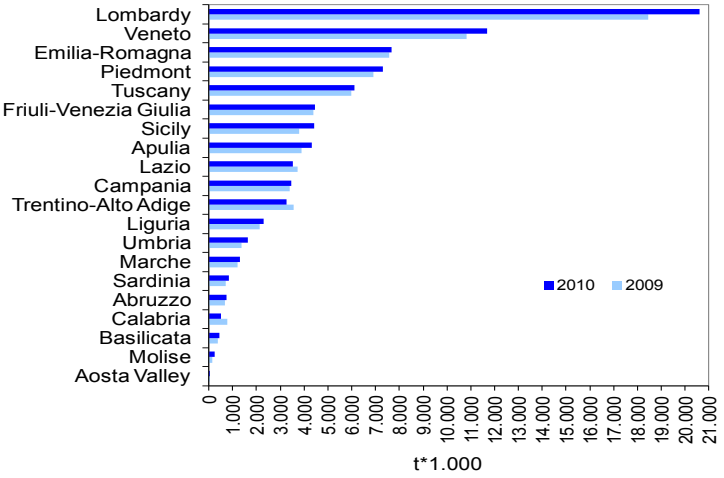
In 2012, at a national level, separate waste collection reached a percentage equal to about 39.9% of the national generation of municipal waste,.
This marks a further rise compared with 2011 (37.8%), but not yet sufficient to achieve the target for 2011 (60%) nor that for 2012 (65%).

Waste production



Source: ISPRA

Total hazardous and waste recovered

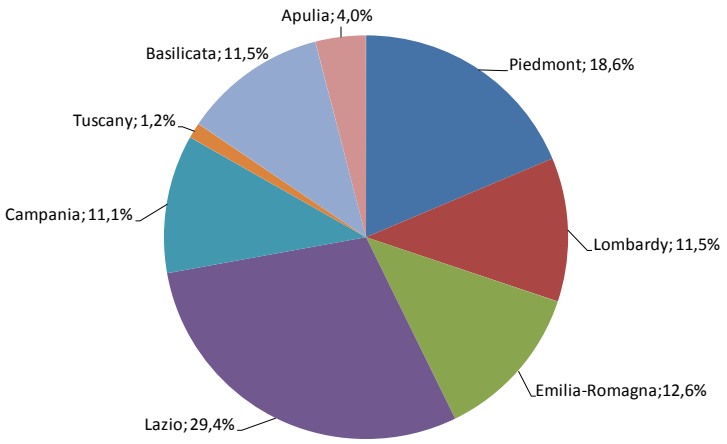


Source: ISPRA

Total waste generation was around 170 million tons in 2010.
The 2.2% increase from 2009 to 2010 was however less than that recorded in 2008 (-2.8%).

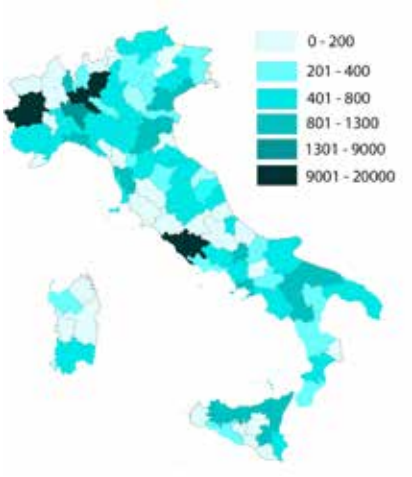
Amounts of special waste for recycling increased considerably, and the trend appears to be growing, also in relation to waste generation levels. In the period 2000-2010 there was a 156% rise in quantities collected. Regions recovering most special waste were Lombardy (24%), Veneto (14%) and Emilia-Romagna (9%).

Distribution of radioactive waste in terms of volumes (2011)



Source: data collected by Operators processed by ISPRA

Radioactive material transport indexes (mSV/h*100) (2011)



Source: ISPRA

In Italy nuclear activities, implying for the population and the environment a potential risk from exposure to ionizing radiation, mainly comprise: refurbishment and construction of facilities for temporary storage of radioactive waste on the sites of the NPPs currently undergoing decommissioning, and operation of some research reactors in research centres and at universities; employment of ionizing radiation sources in medical, industrial and scientific research applications, and transport of radioactive materials.

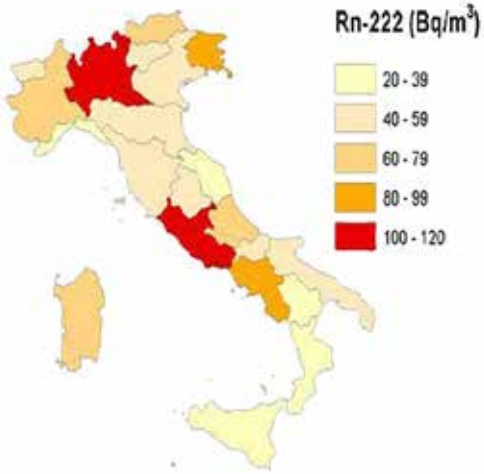
In the last years a total of 190 tons of spent fuel were moved from the Caorso Plant to the reprocessing facility in France, with a remaining of 45 tons in the Avogadro Deposit and the Trino NPP – still to be transferred and reprocessed.

Waste generated by medical, industrial and research applications amount to 4,000 m^3. This material is stored at authorised facilities.

The transportation of radioactive materials in Italy relates to sources used in medical applications for 82%, to radioactive waste for 12%, and to sources employed by the industry for 6%.

Transportation of radioactive materials is mainly performed by road, and for the minor part by air.

Average concentration of indoor radon activity (1989-1997)

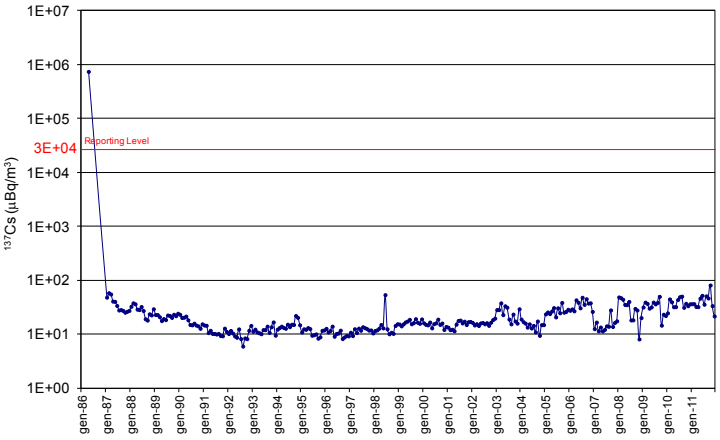


Source: Bochicchio F., Campos Venuti G., Piermattei S., Torri G., Nuccetelli C., Risica S., Tommasino L., Results of the National Survey on Radon Indoors in the all 21 Italian Regions, Proceedings of Radon in the Living Environment Workshop, Athens, April 1999

With no significant nuclear accidents occurring, Radon is the main source of exposure to radioactivity. In Italy, the average concentration is 70 Bq/m^3, higher than the global world average, which is estimated at 40 Bq/m^3, and higher than the European average, which is 59 Bq/m^3. There is great local variability depending in particular on rock composition.

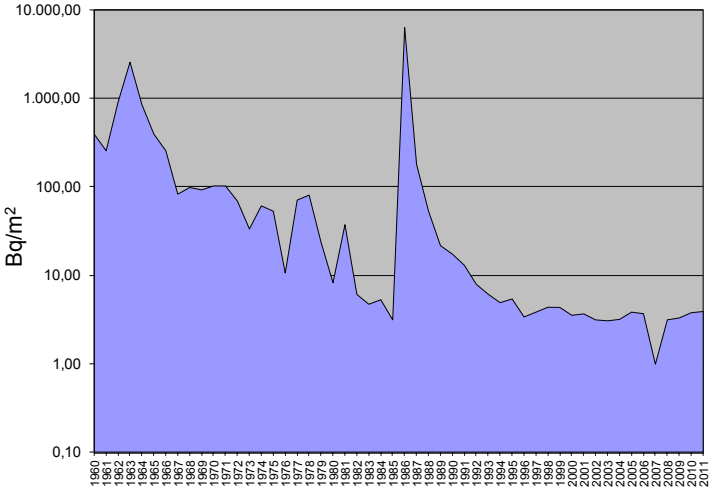
The GAMMA network, set up by ISPRA for the real-time monitoring of the gamma dose rate absorbed in the air, comprises 58 monitoring stations distributed throughout the country.

Trend of Cs-137 concentration in airborne particulate in Italy



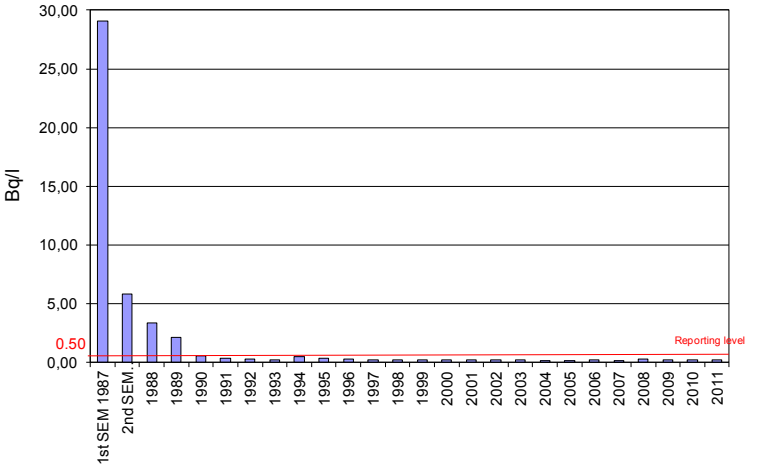
Source: Data collected by ENEA-DISP, Annual Report on environmental radioactivity in Italy. National networks,1986-87, 1998, 1990; ANPA, Annual Report on environmental radioactivity in Italy, 1991; 1992; 1994-97; 1998; APAT, National surveillance networks of environmental radiation in Italy, 2002; and ISPRA, processed by ISPRA

Trend for dry and wet depositions of Cs-137 in Italy



Source: ISPRA/ARPA/APPA data collected and processed by ISPRA; OECD-ENEA, 1987, The radiological impact of the Chernobyl accident in OECD countries, Paris

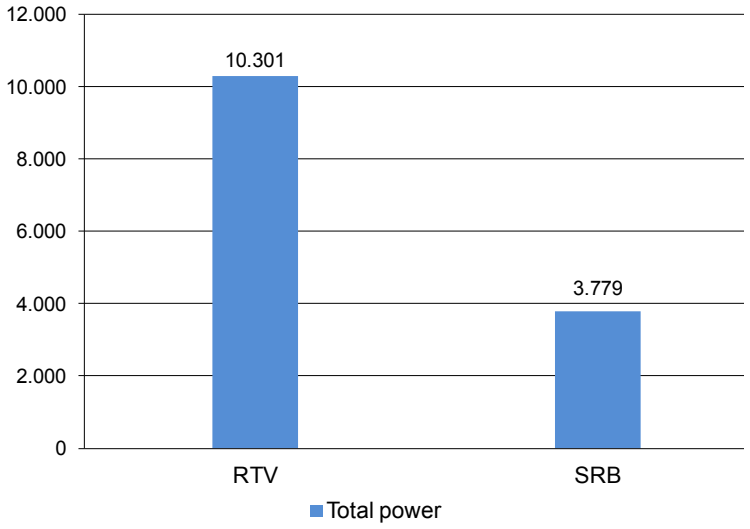
Trend for the deposition concentration of Cs-137 in cow milk in Italy



Source: ISPRA/ARPA/APPA data collected and processed by ISPRA; OECD-ENEA, 1987, The radiological impact of the Chernobyl accident in OECD countries, Paris

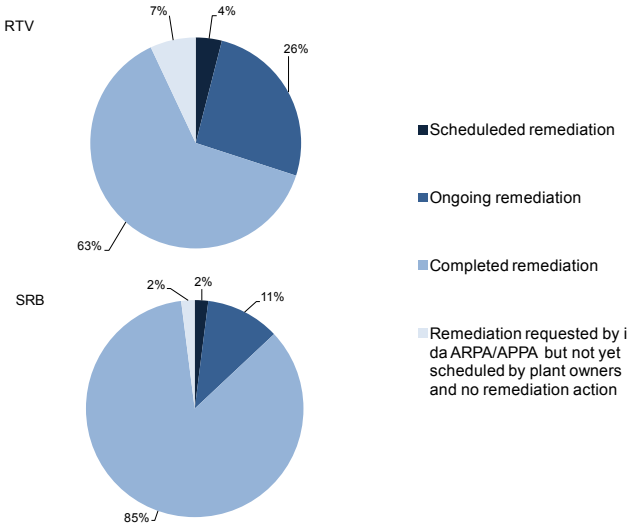
Environmental radioactivity surveillance is based on a number of networks, at local, regional and national levels. Its main purpose is the preventive protection of the population.
Local networks control the areas surrounding nuclear facilities; regional networks are responsible for monitoring environmental radioactivity at a regional level; national networks collect data to assess the nationwide situation, also in connection with the occurrence of anomalous events.

Total power, comparison between RTV and RBS, for regions where complete datasets are available (2011)



Source: ARPA/APPA (CEM Observatory) processed by ISPRA

State of remediation actions at sites detecting at least one exceeded limit because of RTV and RBS plants, only in regions for which full data are available (1998-2012)



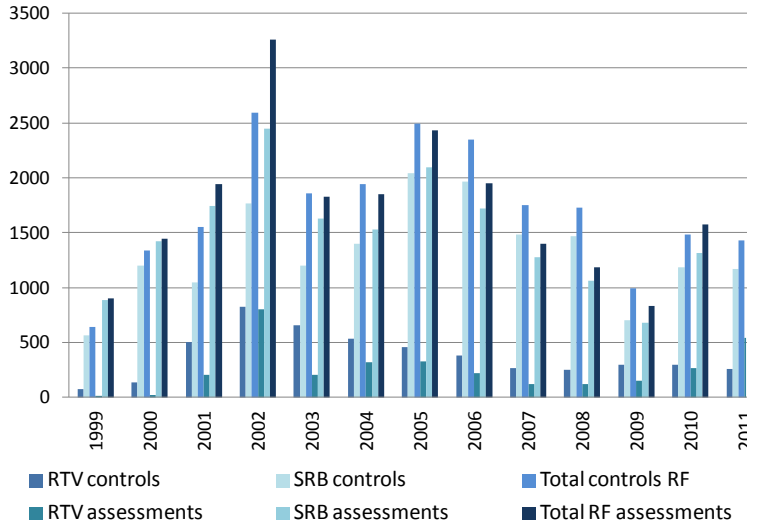
N.B.: figures refer to only those regions/autonomous provinces for which the full data series is available

Source: Terna S.p.A. , Enel Distribuzione S.p.A., Deval. S.p.A. data processed by ISPRA

Between 2010 and, 2011 there was 6% growth of BTS systems, while RTV systems and their total power fell by 8% and 13% respectively.

In 2011 there were, respectively, 4% and 8% rises in cases of RTV and BTS legal limits being exceeded (from 579 to 603 for RTV and from 79 to 85 for RBS).

Assessments and controls carried out on RF plants in Italy, broken down by source type

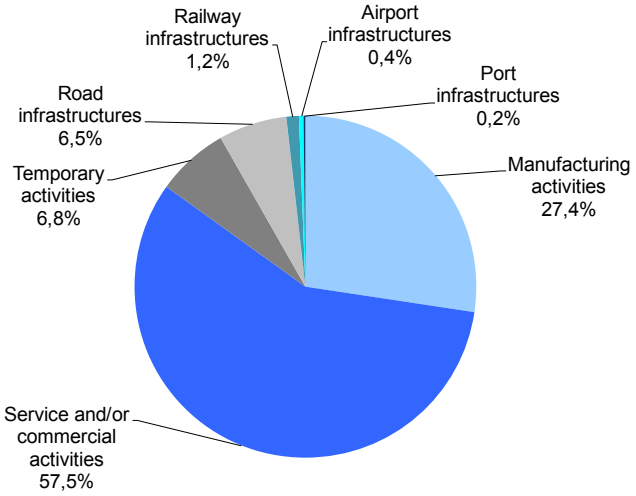


Source: ISPRA/ARPA/APPA (CEM Observatory) processed by ISPRA

The cases of exceeding the legal limits regarding the RTV systems are about 7 times greater than those regarding the BTS systems.

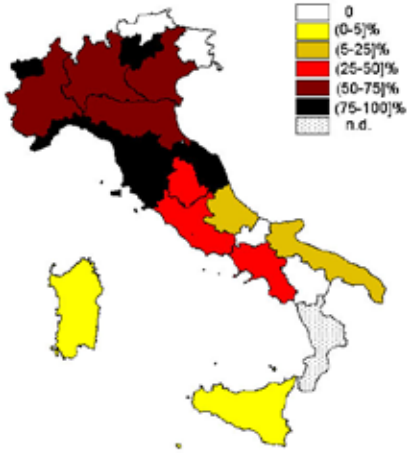
The number of controls carried out on BTS systems is however higher than those for RTV systems, facilities, due to the fact that the former cause greater social concern because the network is more widespread.

Distribution of controlled sources (2,598) among different types of activities/infrastructures (2011)



Source: ARPA/APPA data processed by ISPRA

Percentage of municipalities that have approved acoustic classification plans out of total number of municipalities for each region/autonomous province (2011)

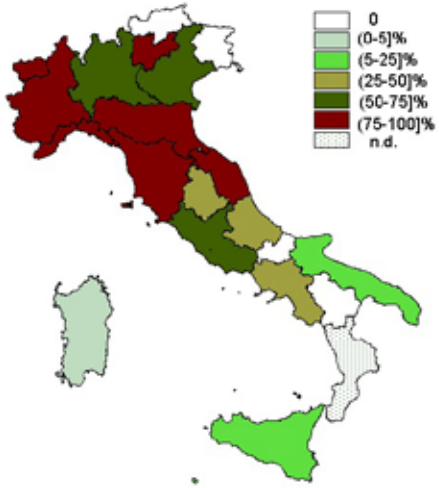


Source: ARPA/APPA data processed by ISPRA

In 2011, 42.2% of noise sources controlled by ARPA/APPA exceeded legal limits at least on one occasion, highlighting the problem of noise pollution.
The sources subject to most controls were, in 2011 too, service and/or commercial activities (57.5%), followed by production activities (27.4%)

The percentage of municipalities that have approved acoustic classification plans is 49.1%. Regions having the highest percentage of municipalities with zoning plans are: Marche and Tuscany (97%), Aosta Valley (93%), Liguria (84%), Province of Trento (76%), Piedmont and Lombardy (73%), Emilia-Romagna and Veneto (64%), on the other end of the scale (less than 10%) are Abruzzo (7%), Sardinia (3%) and Sicily (1%). Local administrations have generally provided an inadequate response to Framework Law 447/95.

Percentage of population residing in municipalities with an approved acoustic classification plan out of the total population of each region/autonomous province (2011)



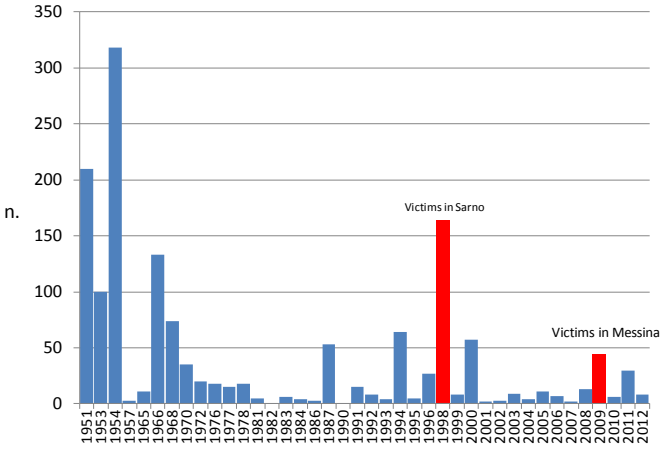
Source: ARPA/APPA data processed by ISPRA

The percentage of population residing in areas where the municipalities have approved acoustic zoning plans is 55.8% in 2011, with considerable variations nation wide, the highest values being recorded in Marche (97.9%), Tuscany (96,7%), Aosta Valley (84.5%) and Liguria (84.4%).

Major landslides in 2012

Source: ISPRA

Victims of main floods in Italy

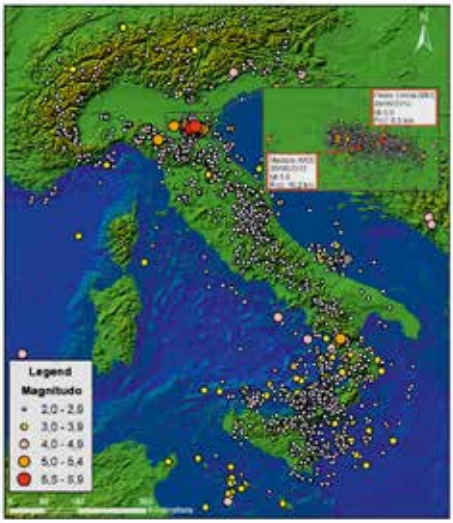


Source: ISPRA estimates based on data from ISTAT; CNR-GNDCI Project AVI; Coldiretti; CIA; MiPAAF; National Civil Defence; Coldiretti, CIA; MiPAAF; Press Agencies; www.ilgiornaledellaprotezionecivile.it; Acts and Decrees of Italian Government

Due to its particular climatic and geomorphological conditions, Italy is one of the countries subject to the highest hydrogeological risk.
In 2012 85 major landslide events were recorded.
About 487,000 landslides have occurred in Italy, involving an area of 20,800 km², 6.9% of the national territory.
5,708 municipalities were affected by landslides: 2,940 having a very high level of attention; 1,732 with a high level; 1,036 with a medium level; 2,393 with a very low level.

In the period 2008-2012 there was an increase in the number of flood victims, halting the previous falling trend (2001-2007). From 1951 to 2012 floods have caused the deaths of 1,519 people.
It is estimated that 6,153,860 inhabitants are exposed to the risk of floods.

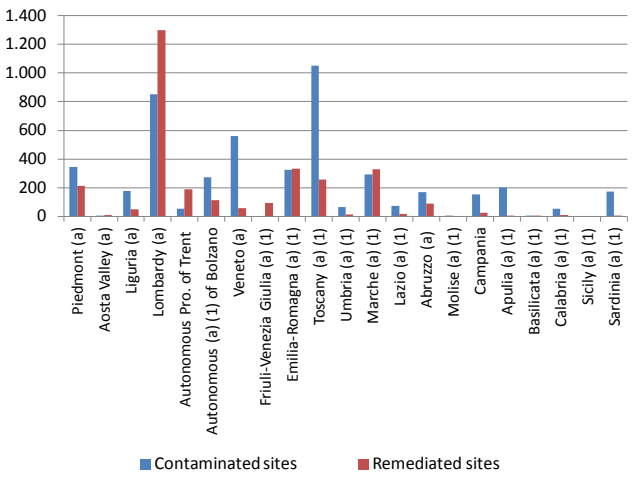
Seismic events of magnitude equal to or higher than 2 recorded by the INGV National Seismic Network, from 1st November 2011 to 31st December 2012



Source: INGV data © ISIDe Working Group (INGV, 2010), Italian Seismological Instrumental and parametric database: http://iside.rm.ingv.it; © Bollettino Sismico Italiano, Istituto Nazionale di Geofisica e Vulcanologia. http://bollettinosismico.rm.ingv.it/ processed by ISPRA

Due to its particular position in the geodynamic context of the Mediterranean region, Italy
is one of the countries with the highest seismic risk in Europe.
From 1 November 2011 to 31 December 2012 4,129 earthquakes were recorded in Italy having a magnitude of 2 or more. The number of earthquakes having a magnitude of 5 or more has risen significantly.
The sudden events in Emilia-Romagna occurring on 20 and 29 May 2012 caused the loss of 27 human lives and enormous damage to dwellings, industrial buildings and the local architectural heritage, and had important environmental effects over an area of about 700 km^2.

Contaminated and remediated sites by region



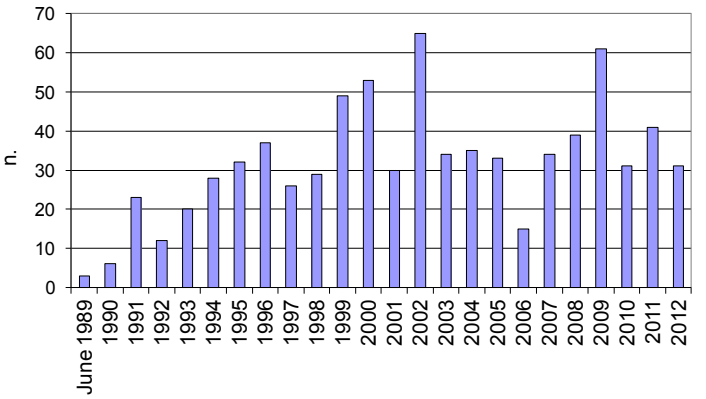
N.B.:
[a] Does not include SIN
[1] Updated through 2012

Source: ISPRA

Soil contamination caused by industrial activity, waste management, mining activity, leaks from tanks and lines transporting hydrocarbons is one of the main factors of environmental pressure. The presence of potentially hazardous substances in the soil, subsoil, sediments and ground water may have negative effects on human health and on ecosystems.

Contaminated sites include those areas where, following the performance of human activities, there has been an ascertained alteration, pursuant to existing legislation, of the quality of soil due to any polluting agent. With the Environment Ministry decree of January 2013, 18 of the 57 sites classified as SINs (sites of national interest) were given over to regional authorities, so now the overall number of SINs is 39.

Total number of EIAs (Environmental Impact Assessments) under State jurisdiction



Source: Environment Ministry data processed by ISPRA

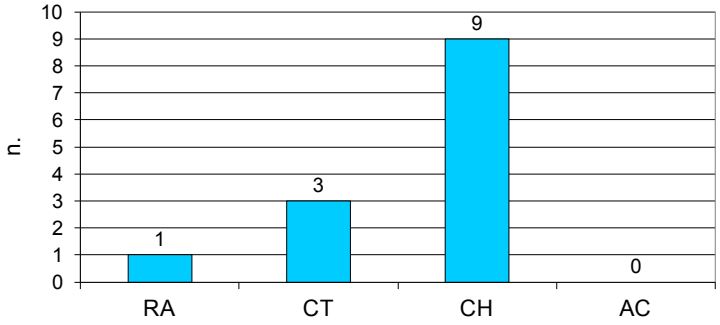
ESA (Environmental Strategic Assessment) procedures completed in 2011

Source: ISPRA

The type of works subject to EIAs (environmental impact assessments) has undergone changes over the years to come into line with European directives and relative amendments (Presidential Decree of 12 April 1996 and L.D. 112 of 31 March 1998). The EIA procedure concludes positively in about 82% of cases.
19% of positive decisions were for "roadways", 16% for "waste", 15% for "thermoelectric power plants", 8% for "offshore hydrocarbon/ oil prospecting, exploration and production" and the remaining 42% for "other".

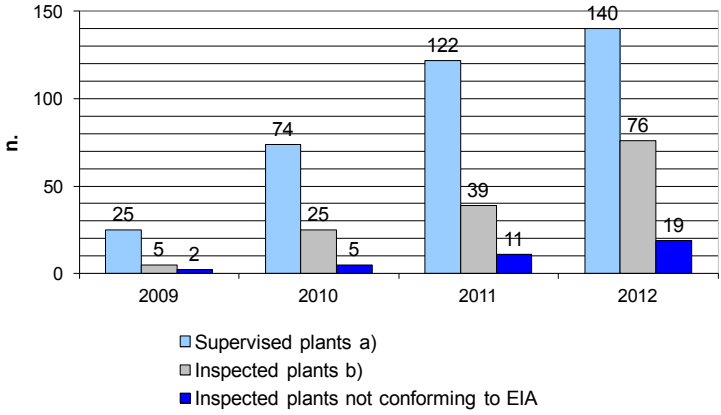
Figures clearly show that the larger number of SEAs (strategic environmental assessments) conducted in different regions refer to inter-municipal/ municipal plans. In 2009 VASs for municipal plans accounted for about 85% of total SEAs, in 2010 the figure was 88% and in 2011 89%.
For the years 2009, 2010 and 2011 95%, 92% and 91% respectively of the plans for which the screening was conducted were excluded from the SEA procedure.
82% of all screenings were carried out in two regions, Emilia-Romagna (65%) and Lombardy (17%).

Number of first-issue State IEAs (Integrated Environmental Authorisations) broken down by plant category (2012)



Legend: RA: Refineries, CT: Thermoelectric plants, CH: Chemical plants, AC: Steelworks
Source: Environment Ministry data (www.aia.minambiente.it) processed by ISPRA

Plant controls under State jurisdiction

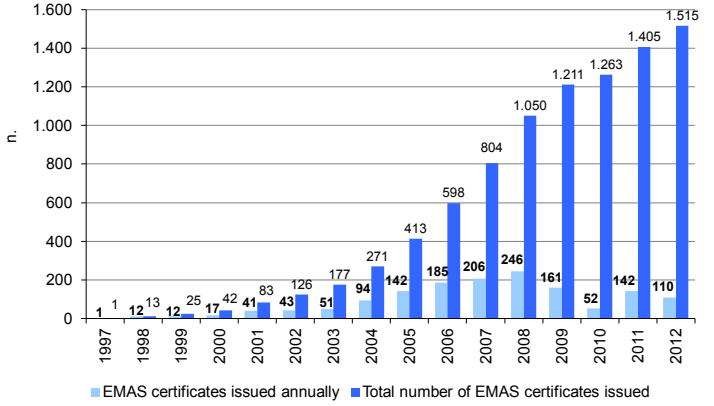


N.B.:
a) documentary controls
b controls including site inspection
Source: ISPRA

A total of 78 first-issue State EIAs were released by the Environment Ministry in the period 2010-2012, broken down as follows: 31 in 2010, 34 in 2011 and 13 in 2012.
With reference to 2012, the 13 EIA decrees were all issued to existing facilities: an EIA can be issued for existing (i.e. old and already operational) facilities or to new structures (yet to be built).
In greater detail, EIAs were granted to 1 refinery, 3 thermoelectric plants and 9 chemical plants.

The time series shows a large variation in both overseen and inspected facilities.
The former went from 25 in 2009 to 140 in 2012, the latter went from 5 in 2009 to 76 in 2012.
Inspected facilities proving to have EIA non-conformities went from 2 in 2009 to 19 in 2012.
Although they were positive in terms of environmental control, these variations make it impossible to gauge inspection trends, since the number of facilities varies considerably.

EMAS certification trends in Italy



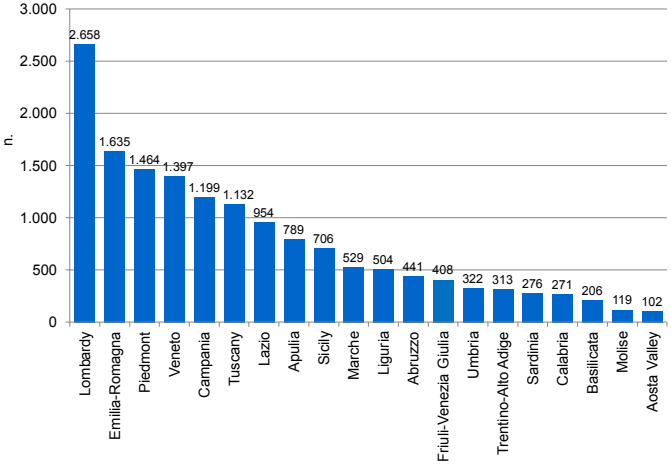
N.B.: data through 31 December of every year

Source: ISPRA

Emilia-Romagna (184) and Lombardy (159) are the two regions having the largest number of EMAS certificates, with Trentino-Alto Adige just behind them (135).
Small enterprises were again the type of enterprise having the largest number of certificates, but their relative share fell from 36% to 33%.

The global number of EMAS certificates awarded in Italy (1,515 in 2012) grew steadily, in line with the average for recent years.

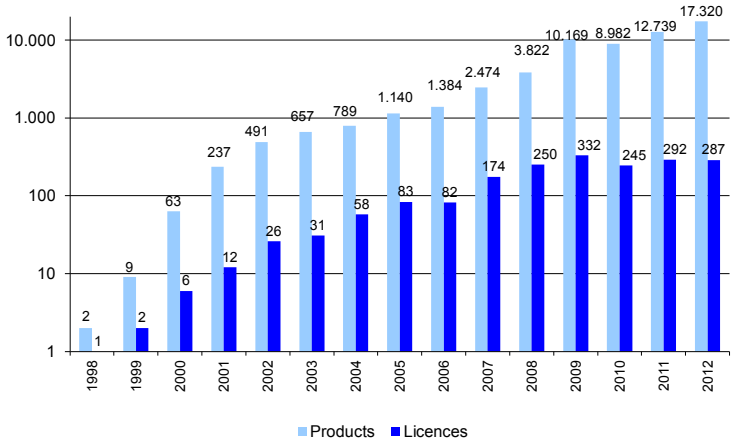
Regional distribution of UNI-EN-ISO 14001 certification (at 31 December 2012)



Source: ACCREDIA

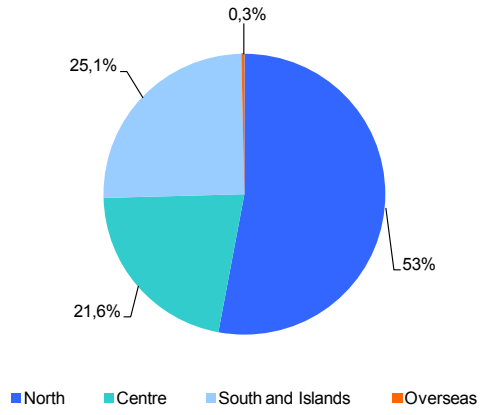
The number of organisations having UNI-EN-ISO 14001 certified sites is on the rise, reaching 15,425 in December 2012.

Number of EU Ecolabel licences and products in Italy



Source: ISPRA

Geographic breakdown of EU Ecolabel licences issued by competent Italian body (at 31 December 2012)



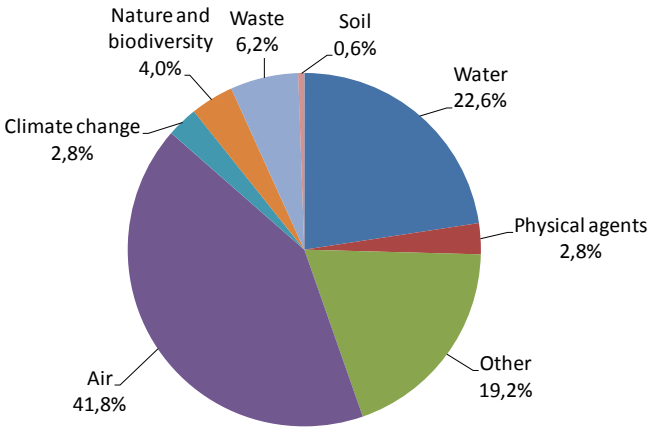
Source: ISPRA

In Italy there were a total of 287 valid EU Ecolabel licences in December 2012, covering a total of 17,320 certified products/services.

The group of products having the largest number of EU Ecolabel licences is "tourist accommodation services" (166), while "hard coverings" is the group having the largest number of certified products (13,863).

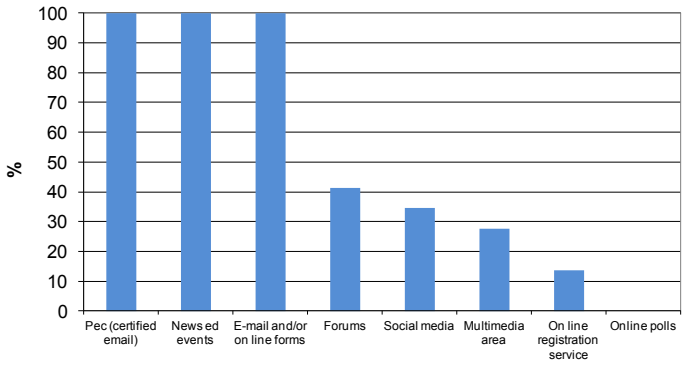
The rise in the number of EU Ecolabel licences is connected with the greater visibility of the standardisation label among consumers and with the growing "environmental awareness" of businesses, owing to factors such as the growth in the "green market", competition and incentives.

Percentage of topic areas for which topic reports have been published by Agency System



Source: ISPRA

Communication tools on official sites of 29 public bodies operating in the environmental sector



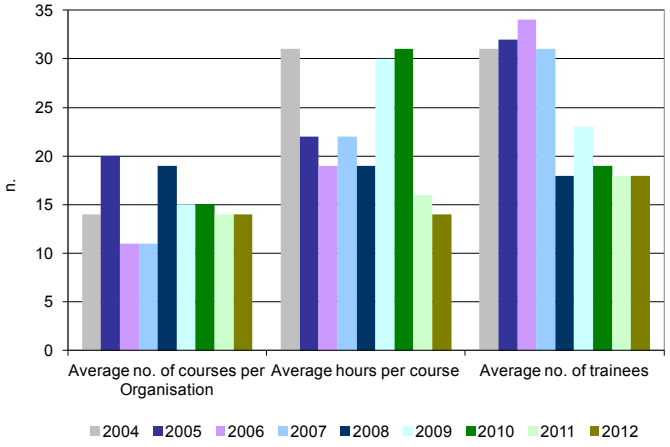
Source: ISPRA

The following dissemination tools and information services have chiefly been used to enhance and foster a knowledge about environmental issues: reporting; dissemination through the web portal; library services; environmental education and training activities.

In 2012, the network of environmental agencies produced over a hundred special topic reports, 42% of which dedicated to the topic of air and 23% to water.

Official websites have taken up the challenge and the opportunities afforded by new web technologies, and have opened up to new social media.

Environmental training courses



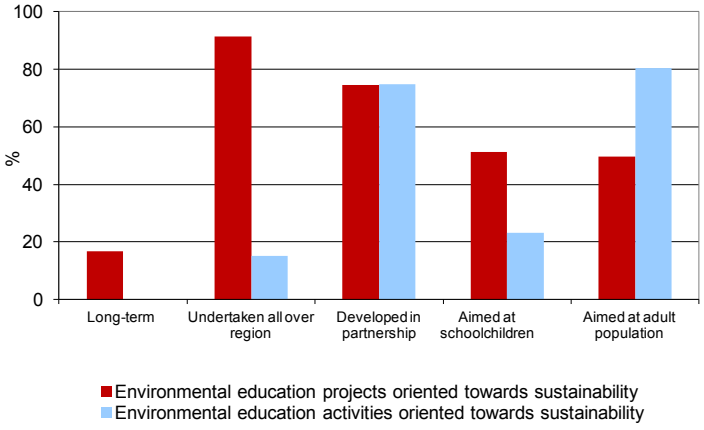
Source: ISPRA

The number of training courses, traineeships and guidance actions performed through the Agency network has remained constant.
Compared with previous years however there was a drop in the average number of courses staged, with a significant reduction in the average number of training hours, going from 31 training hours in 2010 to 16 in 2011 and 14 in 2012.

From 2007 to 2012, the average annual number of environmental education initiatives per Agency remained steady: 18 for projects and 16 for specific activities.

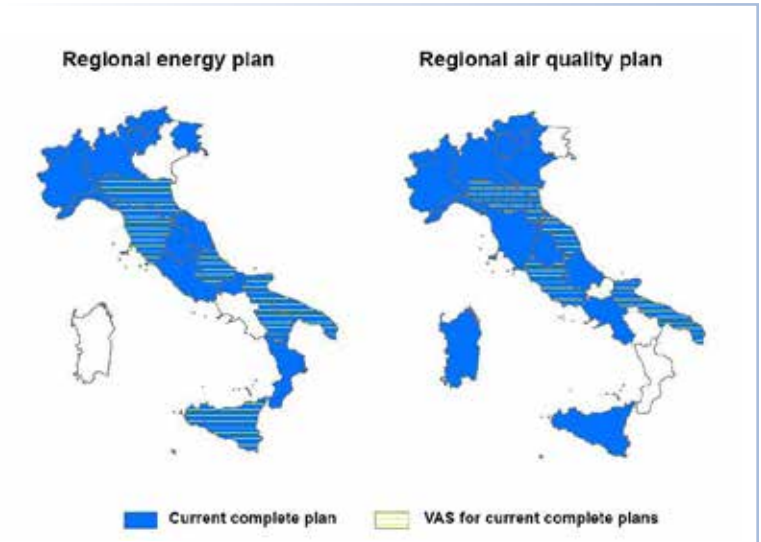
Projects are aimed mainly at the school population, while specific activities (informative meetings, guided tours, exhibitions, awareness building events, etc.) are aimed more at adults.

Traits of environmental education initiatives oriented towards sustainability (specific projects and activities



Source: ISPRA

State of complete and current plans for VAS processes (2012)



Source: ISPRA

Source: ISPRA

With regard to complete, valid plans, there is a large number of Waste Management plans (20/21) and a medium-large number of Energy plans (18/21) and Air Quality plans (17/21).

The response level is lower for other plan types (13-14/21), in particular for Landscape plans (only 3 in place). Only in Aosta Valley and in the Province of Trento all the plans examined are in place.

State of complete and current plans for VAS processes (2012)

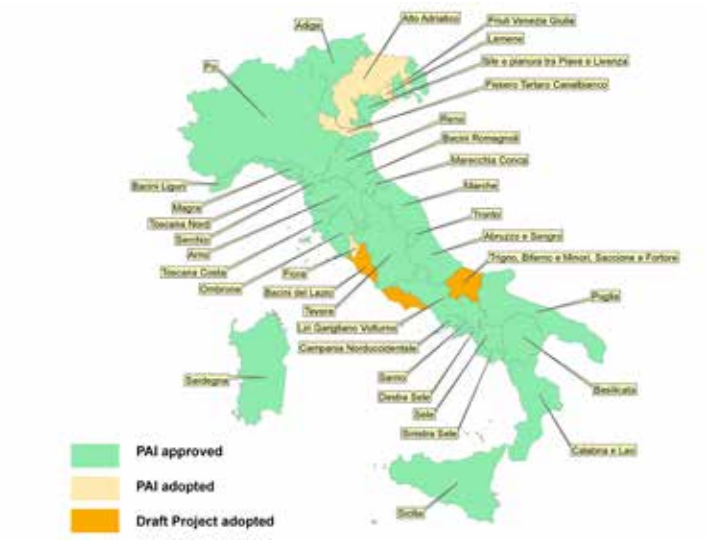
Source: ISPRA

Source: ISPRA

With regard to complete, valid plans with SEA (strategic environmental assessment), water protection plans number 9/21, while there are no plans for the transport ; 4 or 6 SEA processes have been applied to other plan types.

As regards the plans examined, Emilia-Romagna is the region having the largest number of complete plans with SEA (5/7), while the Province of Bolzano and the Molise and Calabria regions do not have any plans applying the SEA.

Map showing state of implementation of Hydrogeological hazard mitigation plans (PAIs)



Source: ISPRA

State of implementation of National Parks Plans (updated through 31/12/2012)

Source: ISPRA

In December 2012 the PAI (hydrogeological management plan) process was unchanged in terms of the number of approved Plans. 86.3% of PAI wass were approved and 12.5%was adopted. Actions were also ongoing to draw up plans to modify or partially update PAIs.

Compared with 2010 the percentage of National Parks reaching the most advanced planning stages (2 and 3) has risen slightly (46%), even though there have been no significant changes. The situation may be considered stationary.

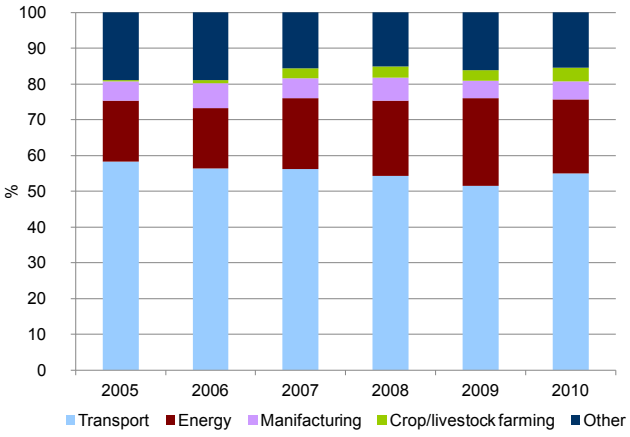
Transmission of information on air quality plans (2010)

Source: ISPRA

In 2010 the autonomous provinces of Trento and Bolzano and 15 regions exceeded at least one of the air limit value fixed by L.D. 155/2010. Until now, only 3 of these regions have not complied with the obligation of transmitting information for 2010 (18%).

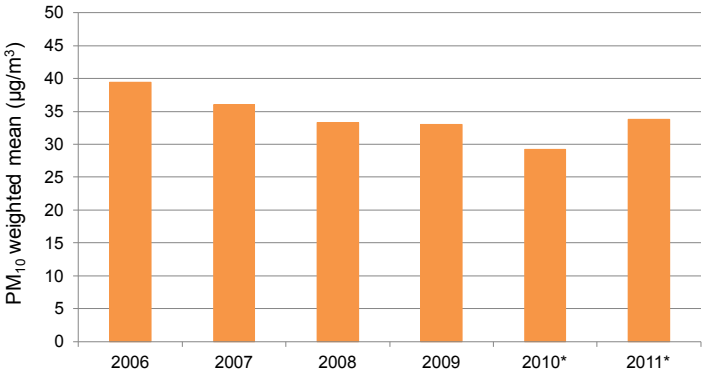
Between 2005 and 2010, even though most measures adopted refer to the "transport" sector, over time there has been an increase in measures in the sectors "agriculture/livestock breeding" and "energy".

Sectoral breakdown of remediation measures adopted



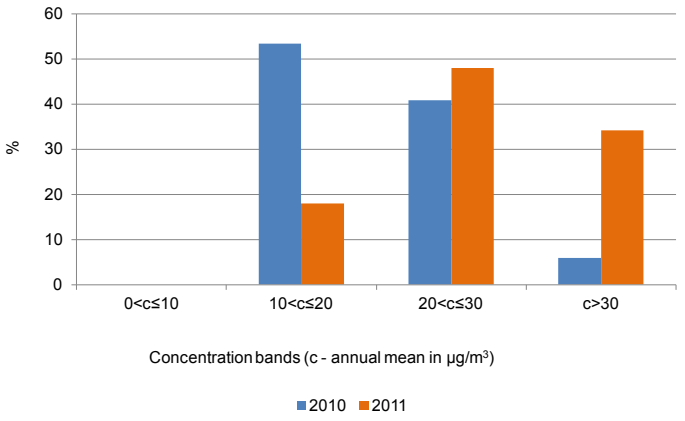
Source: ISPRA

PM_{10} weighted annual mean trends



N.B.: * The years 2010-2011 were calculated using a larger core set of stations/municipalities than in previous years
Source: ISPRA and ISTAT data processed by ISPRA

Percentage of population exposed to PM2.5 by annual mean concentration bands

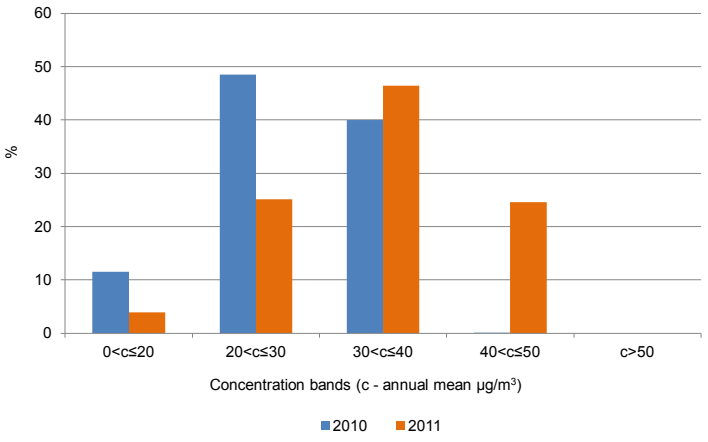


Source: ISPRA and ISTAT data processed by ISPRA

Numerous studies have highlighted the link between air quality and the health of the urban population, and environmental policies are oriented to improving this quality and protecting human health.

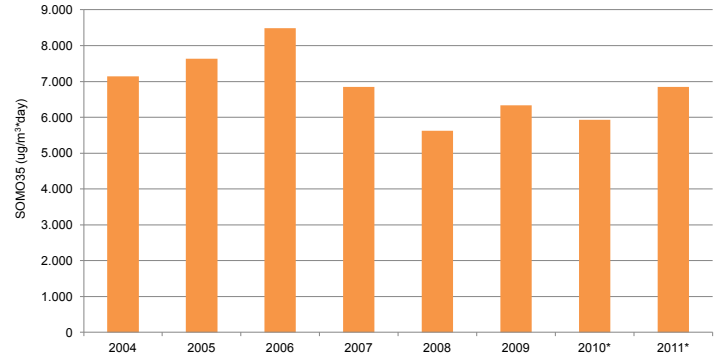
The concentration of particulate matter (especially the smaller particles, PM_{10} and $PM_{2.5}$) is the air quality indicator most consistently associated with harmful effects on health.

Percentage of population below age of 20 exposed to PM_{10} by annual mean concentration bands



Source: ISPRA and ISTAT data processed by ISPRA

Weighted annual mean trends for ozone (SOMO35)

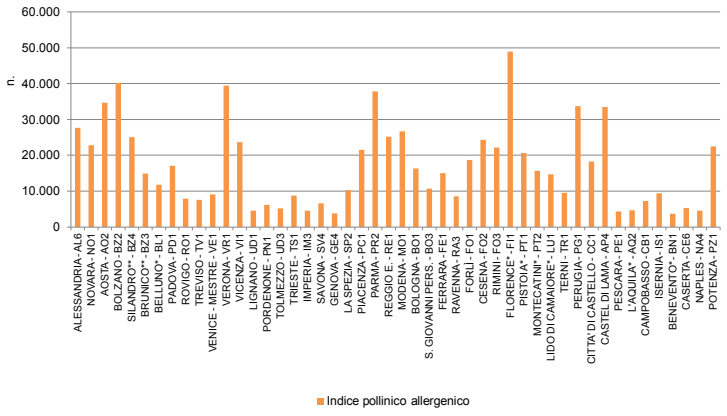


N.B.: * The years 2010-2011 were calculated using a larger core set of stations/municipalities than in previous years
Source: ISPRA and ISTAT data processed by

Children and teenagers belong to a social group that is particularly sensitive to the effects of pollution. Their greater sensitivity is due to the biological traits of the different stages of human development, from conception to adolescence, as well as to social variables.

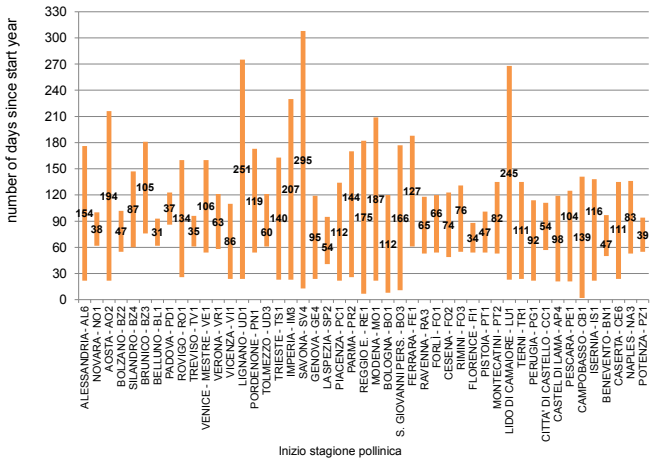
Ozone is one of the air pollutants that can aggravate the conditions of people suffering from chronic respiratory diseases. Exposure may lead to increased frequency of hospitalization, increased hospital visits for asthma and COPD (chronic obstructive pulmonary disease), and reduction in respiratory disturbance indices.

Pollen and allergenic index (2012)



N.B.: * The Pollen Index value for these stations was underestimated as it was calculated for a period not covering all the pollen season
** Seasonal mountain stations for which there is a shorter monitoring period
Source: ARPA/APPA

Cupressaceae-taxaceae pollen season (2012)



N.B.: * ARPA Piedmont, ARPA Aosta Valley, APPA Bolzano, ARPA Veneto, ARPA Friuli-Venezia Giulia, ARPA Liguria, ARPA Emilia-Romagna, ARPA Tuscany, ARPA Umbria, ARPA Marche, ARTA Abruzzo, ARPA Molise, ARPA Campania, ARPA Basilicata
Source: ARPA/APPA*

The analysis of aerobiological components is vital for correctly evaluating air quality. This is especially true in metropolitan areas where existing chemical and physical pollution combines to favour and intensify the adverse effect on human health due to the action of aeroallergens.

The pollen/allergenic count in central Italy is generally above the national average, due in part to the presence of cupressaceous pollen, leading to peak values for Florence (48,930), Perugia (33,679) and Castel di Lama (AP) (33,440).

The biggest problems for human health are felt in the spring time, when there is a concurrent presence in the atmosphere of pollens of all monitored allergising families.