

Statistics on mining and quarrying extraction activities Years 2015 and 2016

Number of extractive sites and quantities of mineral resources extracted decreased

This report focuses on the main results of the Istat¹ Survey “*Anthropic Pressure and Natural Risks. Mining and Quarrying extraction activities*”, related to *non-energy producing mineral resources* extraction (in physical units of weight), by mineral type and by extraction site at regional level (years 2015 and 2016).

The first (2015-2016) and the second wave of the survey (2017-2018) were both a response to a fragmentary supply of statistics on mining and quarrying in Italy and growing information needs at national and international level, to strengthen a knowledge framework on mining and quarrying activities at regional level (National Statistical Program PSN: IST 02559). A major aim of the survey was to produce a set of indicators to measure environmental pressures linked to the presence of mining sites and the exploitation of non-renewable natural resources.

In 2016, in Italy *active* and *non active* mining and quarrying extraction sites – with the exception of extractive sites of energy producing mineral resources and of mineral waters – amounted to 5,273 (-6.2% compared with 2015). Mining sites were 136 and quarrying sites were 5,137. Municipalities with at least one extraction site were 2,013 (almost a quarter of Italian municipalities). *Active extraction sites* –that is authorized or with a license for extraction– amounted to 4,679. Among active extraction sites, 2,295 were *into production sites*, namely sites from which quantities of mineral resources had actually been extracted in each observed year (68 mining and 2,227 quarrying sites).

In 2016, total extraction of mineral resources from mining and quarrying (with the exception of non-energy mineral resources and mineral) amounted to 167.8 million tons (-3.1% over the previous year). More in detail, 154.2 million tons of minerals from quarrying (-3.2% compared with 2015) and 13.7 million of tons of mineral resources from mining (-2.2%).

The survey collected data and information on about 100 lithotypes of minerals by mining and quarrying (according to International Mineralogical Association classification), grouped by Istat in ten aggregates, using minerals classification criteria.

In 2016, extracted quantities decreased almost for all observed aggregates compared with 2015. Only “*ceramic and industrial minerals*” and “*cement marl*” aggregates showed a slight increase (+9.2% and +6.8%, respectively).

In particular, “*limestone, travertine, gypsum and sandstone*” was the most relevant aggregate of the overall quarrying extractions, with nearly 75 million tons (accounting for 48.6% of national quarrying mineral resource extraction), nearly stable compared with 2015.

On the mining mineral resources extraction side, “*ceramic and industrial minerals*” and “*cement marl*” were the most relevant, with 5.7 and 5.5 million tons extracted (respectively +9.2% and +6.8% over 2015).

A geographical analysis showed that 44.1% of the total amount of minerals extracted from national quarrying came from the North of Italy, with almost 68 million tons. Lombardia was the first region with 22.3 million tons (-4.7% compared with 2015), followed by Puglia (16 million tons; -10.3%). With regard to minerals resources from mining, Regions with the highest quantities extracted were Sardegna (3.1 million tons), Toscana (2.8) and Umbria (1.5).

¹ Basic data were collected directly from local public institutions with competence within mining and quarrying extraction issue (Regions, Provinces, Autonomous Provinces and Sicily Mining Districts). According to minerals classification of the Royal Decree n. 1443 year 1927, data are collected on mineral resources from either quarries and mining.

Environmental pressures indicators linked to mining and quarrying activities

In environmental economics, *pressures* represent phenomena linked to anthropic activities that alter the state of environmental components. *Environmental pressures indicators* specifically linked to mining quarrying activities have been calculated at a municipality scale for year 2016, adhering to a conceptual framework named DPSIR (Driving forces, Pressures, State, Impact, Responses), that ensure methodologic harmonization, scientific requirements, reproducibility and reliability. Developed in the '80s by the EEA (European Environmental Agency) and OCSE, DPSIR conceptual model is one of the frameworks internationally used to describe interactions between economy and natural environment and it is characterized by causal relationships.

In 2016, 1,851 Italian municipalities hosted 4,680 active mining and quarrying extraction sites. The first indicator "*Active Extraction Sites Density*" (DSE) (calculated as the ratio between the number of active sites by municipality and the respective municipality areas) revealed that in 2016 almost 40% of the Italian municipalities with active sites recorded medium-high pressure in their territories, exerted by the presence of more than 5 active extraction sites per 100 square km.

In 2016, at a national level the mean value of "*Extraction intensity*" (IE: ratio between quantities of mineral resources extracted by municipalities and the respective municipality areas) was equal almost to 556 tons per square km. Among municipalities with at least one active site (1,224), 27.9% recorded withdrawals up to 300 tons per square km, representing areas with a low extraction intensity. A significant share of municipalities (39.5%), half of those located in the North of Italy, extracted between 1,000 and 10,000 tons per square km, whereas 10.9% extracted more than 10,000 tons of mineral resources per square km.

Also for its particular geomorphological characteristics, the Italian territory continued to be largely exposed to natural risks. Therefore useful environmental pressure indicators aimed at measuring quantities extracted in municipalities that are in coastal areas or that have in their territory protected areas or areas exposed to natural risk (floods and landslides).

Among these indicators, "*Extraction in coastal municipalities*" showed that 19.6% of minerals came from coastal municipalities, with a maximum registered in the Islands (40.5%) and in the South of Italy (37.7%), in particular in Puglia (62.5%) and in Calabria (55.2%).

The "*Extraction in municipalities with protected areas*" indicator reached a value more than 42% in all Italian regions (with the exception of Lombardia and Provincia Autonoma di Bolzano), indicating that a relevant share of quantities were also extracted in municipalities with protected areas.

Similarly, the indicators "*Extraction in municipalities with medium degree flood risk*" and "*Extraction in municipalities with high-very high degree risk of landslides*" reached very high values in almost all the Italian regions, exceeding 80% of the total quantities extracted in the Center geographical area.

Jointly considered, pressure indicators related to coastal areas, protected areas and hydrogeological natural risks, highlighted the significant dimension of the observed phenomenon in many areas of Italy, often simultaneously exposed to different natural risks. Liguria was in particular the region with the highest values for each indicator, followed by Molise, Umbria, Sicilia, Valle d'Aosta, Marche and Toscana.

Mineral waters statistics

For the first time Istat is disseminating official statistics on *natural mineral waters* withdrawals (volumes used for production purposes; reference year 2016). In 2018, the Ministry of Economic Affairs and Finance (MEF-DT) and Istat engaged an inter-institutional collaboration mainly aimed at integrating information, to develop a coherent and complete knowledge data framework at territorial level, accessing to information on mining licenses on the assets of the State, yearly collected by the Ministry. In 2016 mineral waters withdrawals amounted to 16.2 million cubic meters (+1.2% compared with 2015). Lombardia (3.3 million cubic meters), Piemonte (2.5) and Veneto (2.4) were the most involved regions and in general 57% of the total amount came from the Northern of Italy. In the North-east and in the Islands withdrawals decreased (-6.2% and -4.6%, respectively), whereas in the other geographical increased (+3.9% in the Nord-west, +4.2% in the Centre, +2.7% in the South).

The “*Extraction Intensity*” (IE) indicator measured a mean value of 54 cubic meters of mineral water per square km at national level. Higher values of the indicator were observed in the North-west (106 cubic meters per square km).

Energy producing mineral resources extraction (hydrocarbons)

Statistics on energy producing mineral resources extraction are regularly provided in Italy by the Ministry of Economic Development (MISE, DGS-UNMIG). Data refers to the amount of extractions of energy producing minerals in Italy in 2016, both onshore and offshore. On December 2016, 202 hydrocarbons extraction licenses were active (113 onshore and 69 offshore) and 818 extraction sites were into production.

The total amount accounted for 3.7 million tons of *crude oil*, 13.7 thousand tons of *gasoline* and 6.0 million standard cubic meters of *natural gas*. Southern Italy contributed the most both for crude oil (61.6%) and natural gas extraction (76.8%).

In 2016, all energy producing minerals extractions decreased with respect to 2015, and both crude oil and natural gas reached their lowest quantity of extractions since 1996 (crude oil -31.3%; natural gas -12.5%; gasoline -8.4%).

For more details please refer to the Italian version on the Istat web site www.istat.it

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Survey *Anthropic Pressure and Natural Risk. Extraction activities from mining and quarrying*

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FIGURE 1. Mining and quarrying minerals resources extraction by type, Italy
Years 2015 and 2016, million tons.

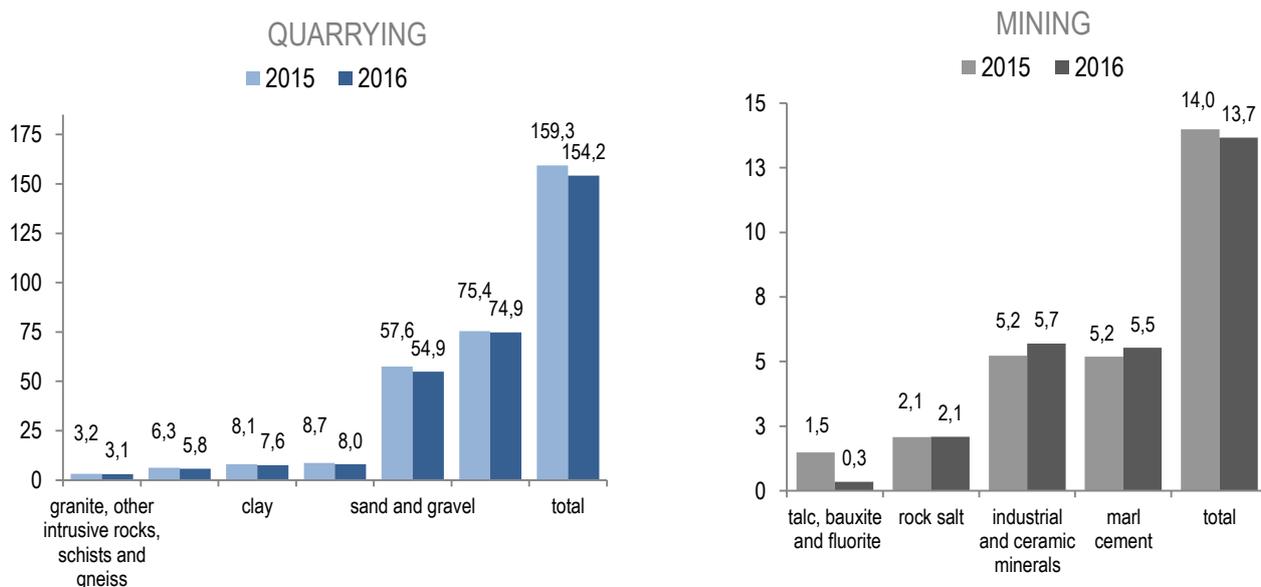


TABLE 1. Extraction of mineral resources from quarrying by geographical area, . Year 2016, thousand of tons.

| GEOGRAPHICAL AREAS | mineral resources extracted | | | | | | total |
|--------------------|-----------------------------|--|-----------------|--|--------------|---|----------------|
| | clay | limestone, travertine, gypsum, sandstone | sand and gravel | granite, other intrusive rocks, schists and gneiss | marble | porphyry, basalt, tufa and other volcanic rocks | |
| Nord-ovest | 776 | 10,978 | 26,014 | 1,663 | 1,006 | 17 | 40,454 |
| Nord-est | 1,759 | 6,129 | 17,715 | 95 | 531 | 1,365 | 27,595 |
| Centro | 2,351 | 22,020 | 5,771 | 175 | 3,570 | 3,384 | 37,272 |
| Sud ^(a) | 1,797 | 26,822 | 3,566 | - | - | 300 | 32,485 |
| Isole | 872 | 8,907 | 1,844 | 1,128 | 676 | 2,925 | 16,352 |
| ITALIA | 7,556 | 74,856 | 54,911 | 3,061 | 5,783 | 7,991 | 154,159 |

a) Provisional data

TABLE 2. Extraction of mineral resources from mining by geographical area, . Year 2016, thousands of tons.

| GEOGRAPHICAL AREAS | mineral resources extracted ^(a) | | | | total |
|--------------------|--|---------------------------------|--------------|----------------------------|---------------|
| | cement marl | industrial and ceramic minerals | rock salt | talc, bauxite and fluorite | |
| Nord-ovest | 1,355 | 637 | - | 148 | 2,141 |
| Nord-est | 1,348 | 746 | - | - | 2,093 |
| Centro | 2,414 | 878 | 1,504 | 197 | 4,993 |
| Sud ^(b) | 420 | 70 | - | - | 490 |
| Isole | - | 3,371 | 581 | - | 3,952 |
| ITALIA | 5,537 | 5,703 | 2,085 | 345 | 13,671 |

a) Gold minerals are not included.

b) Provisional data

TABLE 3. Extraction of non-energy producing and energy mineral resources. Year 2016, tons, standard cubic meters for natural gas

| REGIONS | non-energy producing mineral resources | | energy producing mineral resources (hydrocarbons) ^(b) | | |
|--|--|------------------------|--|---------------|----------------------|
| | solid minerals from mining and quarrying | natural mineral waters | crude oil | gasoline | natural gas (Smc) |
| Piemonte | 16,323,606 | 2,553,120 | 16,004 | - | 4,179,443 |
| Valle d'Aosta | 188,481 | 193,328 | - | - | - |
| Liguria | 2,336,785 | 86,891 | - | - | - |
| Lombardia | 23,746,564 | 3,292,852 | - | 17 | 16,473,802 |
| <i>Provincia Autonoma di Bolzano/Bozen</i> | <i>1,903,141</i> | <i>62,454</i> | - | - | - |
| <i>Provincia Autonoma di Trento</i> | <i>1,440,193</i> | <i>103,622</i> | - | - | - |
| Veneto | 12,012,427 | 2,361,766 | - | - | 2,822,914 |
| Friuli-Venezia Giulia | 3,512,679 | 224,740 | - | - | - |
| Emilia-Romagna | 10,819,810 | 358,956 | 22,442 | 575 | 148,355,638 |
| Toscana ^(a) | 16,686,767 | 982,417 | - | - | 2,683,486 |
| Umbria | 8,936,029 | 1,132,317 | - | - | - |
| Marche | 3,269,765 | 448,902 | - | 2 | 18,934,031 |
| Lazio | 13,372,978 | 454,007 | - | - | - |
| Abruzzo | 3,299,742 | 585,449 | - | - | 26,406,913 |
| Molise | 3,016,661 | 0 | 9,546 | 282 | 79,749,044 |
| Campania | 4,979,411 | 1,412,355 | - | - | - |
| Puglia | 15,962,947 | 62,112 | - | 2,181 | 206,729,241 |
| Basilicata | 3,497,402 | 875,905 | 2,297,416 | - | 1,027,327,555 |
| Calabria | 2,219,334 | 339,324 | - | - | 7,221,817 |
| Sicilia | 11,010,349 | 424,719 | 678,952 | 10,240 | 213,021,225 |
| Sardegna | 9,294,169 | 233,491 | - | - | - |
| Nord-ovest | 42,595,436 | 6,126,191 | 16,004 | 17 | 20,653,245 |
| Nord-est | 29,688,250 | 3,111,538 | 22,442 | 575 | 151,178,552 |
| Centro | 42,265,539 | 3,017,642 | 0 | 2 | 21,617,517 |
| Sud | 32,975,497 | 3,275,145 | 2,306,962 | 2,463 | 1,347,434,570 |
| Isole | 20,304,518 | 658,210 | 678,952 | 10,240 | 213,021,225 |
| Onshore extractions ^(c) | - | - | 3,024,360 | 13,297 | 1,753,905,109 |
| Offshore extractions ^(c) | - | - | 721,468 | 392 | 4,267,104,292 |
| ITALIA | 167,829,240 | 16,188,726 | 3,745,828 | 13,689 | 6,021,009,401 |

a) Source of mineral water data: Istat calculation on data provided by the Ministry of Economic Affairs and Finance (MEF-DT)

b) Source for energy producing minerals (onshore and offshore): Istat calculation on data provided by the Ministry of Economic Development (MISE-DGS-UNMIG).

c) About hydrocarbons, onshore data can be referred to the corresponding regional level while offshore data only to national level.