ISPRA
Istituto Superiore per la Protezione e la Ricerca Ambientale

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macc Monitoring atmospheric composition & climate

An overview of the Italian availability of air quality monitoring data

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Governance of air quality assessment and management in Italy

According to Legislative Decree no. 155 /2010, which enforces in the Italian legislation Directive 2008/50/CE on ambient air quality and cleaner air for Europe and Directive 2004/107/EC on arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air, the main bodies responsible for air quality assessment and management in Italy are the following:

1. the Ministry of Environment is responsible for general implementation of the Directives, for guidance and coordination at national level and in particular for communication of data and information on air quality to the European Commission;
2. Regions and Autonomous Provinces are the competent authorities responsible for assessment and management of air quality in their territories ;
3. Regional (and Provincial) Environment Agencies manage air quality monitoring networks on behalf of regional governments (and can also perform other functions on their behalf)
4. ISPRA is the technical body supporting the Ministry of Environment for the management of data flows from local to national level and towards the European Commission and the European Environment Agency.

Fixed measurements vs. other assessment techniques

- Legislative decree 155/2010 establishes criteria for air quality assessment, based on the use of the following techniques :
  - ✓ fixed measurements
  - ✓ indicative measurements
  - ✓ modelling techniques
  - ✓ objective-estimation techniques
- The more the situation of air pollution is severe, the greater must be the use of fixed measurements; as the severity of the situation decreases, a greater use of other assessment techniques is allowed, up to their exclusive use. Obviously, even in heavily polluted areas where the use of fixed measurement is mandatory, spatialization techniques can and should still be used to identify areas in which limit values are actually exceeded.
- Among the techniques for assessing air quality, fixed measurements play a major role because of the high reliability of data and because over the past years they have been the tool that has enabled knowledge of atmospheric pollution, the rising of individual and public environmental awareness and the development of policies to protect human health and the environment as a whole.

Criteria for the design of monitoring networks

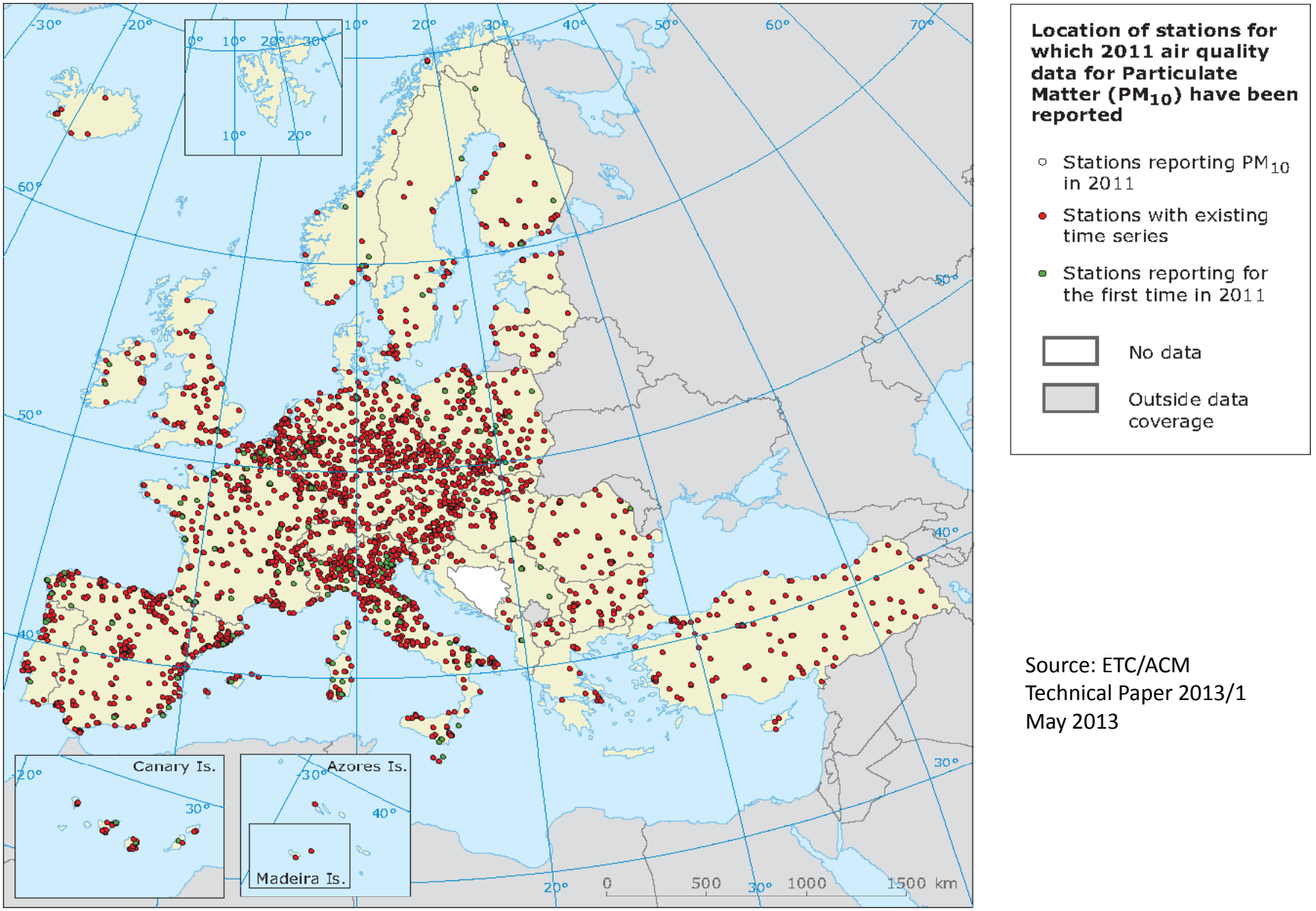
Following the prescriptions of Legislative Decree 155/2010, Regions and Autonomous Provinces have reviewed their activities concerning air quality assessment and management and defined, with reference to their area of jurisdiction, assessment programmes, including the monitoring network.

The basic principles for the review of monitoring networks, listed in art. 1 of the Decree, are the following:

- sampling points which are not included in the monitoring networks and in the assessment programme shall not be used;
- sampling points which do not comply with the provisions of the decree and with general efficiency, effectiveness and economy criteria shall not be used;
- unnecessary excess of sampling points shall be avoided;
- the entire network shall be publicly managed and supervised by Regional Environment Agencies.

Monitoring network review process

- The design of monitoring networks is being reviewed in line with the principles established by the Legislative Decree.
- In the past, the design criteria gave priority to urban areas, with lack of homogeneity at regional and national levels.
- Revised monitoring networks are more compliant and more consistent, with better integration with other air quality assessment tools and therefore more appropriate for assessing exposure of the population and the environment as a whole.
- At the moment, monitoring networks have been revised in most regions (4 regions completely lacking)



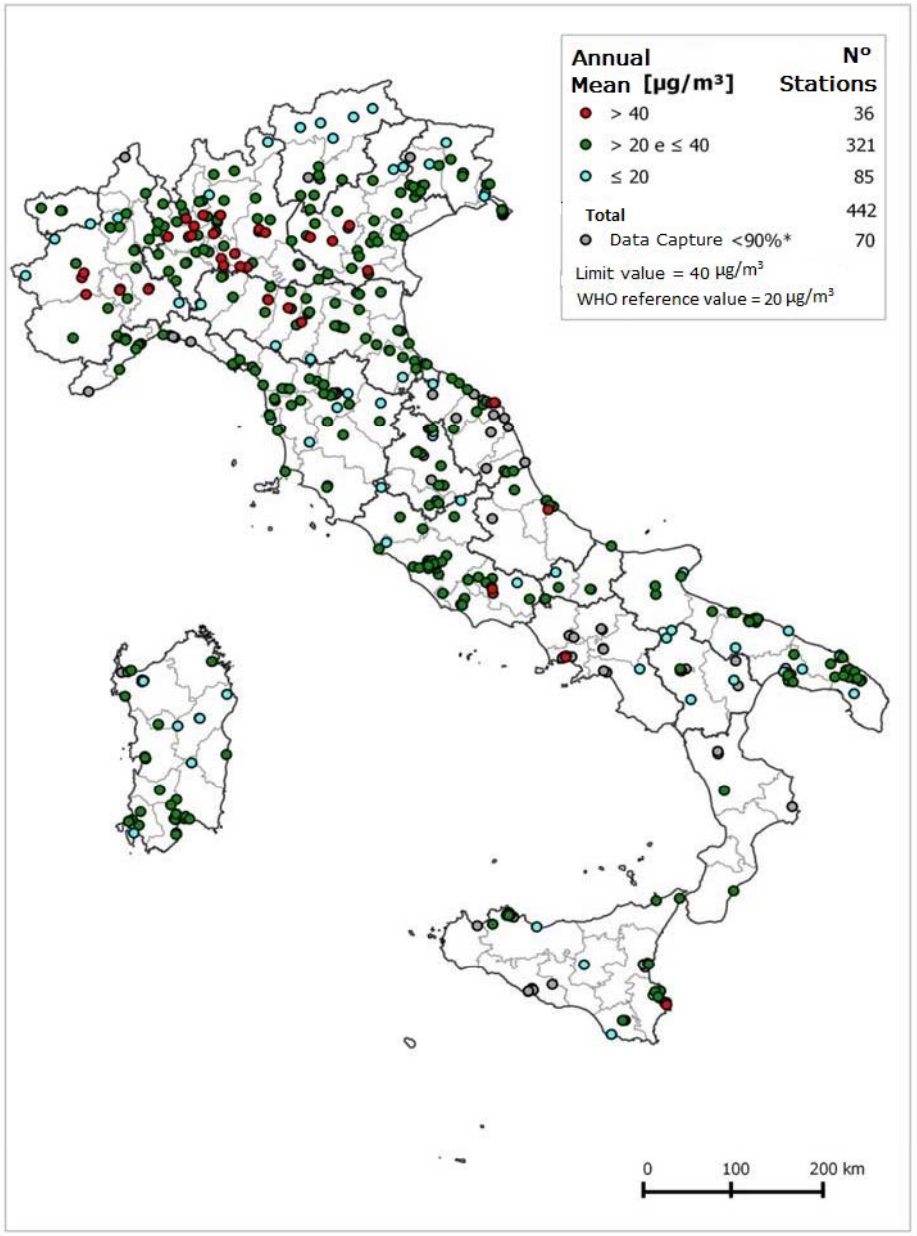
Source: ETC/ACM
Technical Paper 2013/1
May 2013

Location of stations for which 2011 air quality data for particulate matter (PM10) have been reported.

	AQD 2008/50/EC											DD 2004/50/EC	
	SO2	NO2	NOx/NO	PM10	PM2.5	Pb_aer	CO	C6H6	O3	VOC-	PM2.5_spec	HM4	PAH4
EU-27 countries													
AUSTRIA	96	153	134	133	21	16	36	20	112	12		17	25
BELGIUM	61	87	87	65	42	40	22	39	42	39		45	22
BULGARIA	28	25	18	40	9	9	17	20	19	5		12	13
CYPRUS	2	2	2	3	5	3	1	1	2		1	3	2
CZECH REPUBLIC	74	91	91	120	44	62	27	30	61			62	33
DENMARK	2	12	7	6	8	6	6	3	9	3	2	6	2
ESTONIA	9	9	9	7	7	5	7	2	9			5	5
FINLAND	10	30	29	42	20	1	5	5	20	5	3	7	9
FRANCE	246	473	358	379	102	29	69	27	421			21	10
GERMANY	157	534	367	430	147	121	115	151	264	112	8	191	124
GREECE	10	24	16	18	4		14	2	24	1			
HUNGARY	25	25	24	25	8		22	13	17	13		7	20
IRELAND	11	14	14	17	7	3	5	3	12	3	1	6	5
ITALY	282	579	565	509	142	70	298	184	340	136		70	68
LATVIA	6	9	3	9	5	5	2	6	8	5	1	5	4
LITHUANIA	10	14	11	14	7	5	7	4	12	1		5	5
LUXEMBOURG	3	6	6	6	3	3	3	2	6	2		3	3
MALTA	4	4	4	4	3		4	3	5	3		1	
NETHERLANDS	20	59	44	48	29	7	21	6	38	6	1	8	6
POLAND	129	130	121	200	69	79	64	32	66	1	5	78	98
PORTUGAL	49	59	59	59	23	3	39	12	50	2		6	1
ROMANIA	72	56	56	44	18	38	69	35	58			37	
SLOVAKIA	12	16		31	26		10	10	15				
SLOVENIA	12	12	11	14	4	4	4	2	12	2		4	3
SPAIN	435	502	411	453	202	111	251	153	424	127		109	75
SWEDEN	9	35	14	41	18	4	4	10	16			4	2
UNITED KINGDOM	47	120	120	64	73	35	24	41	82	5	2	38	34
Total EU-27 countries	1821	3080	2581	2781	1046	659	1146	816	2144	483	24	750	569

Source:
ETC/ACM
Technical Paper
2013/1
May 2013

Number of stations for which 2011 data have been delivered for AQD 2008/50/EC & 4DD components, specified per country.

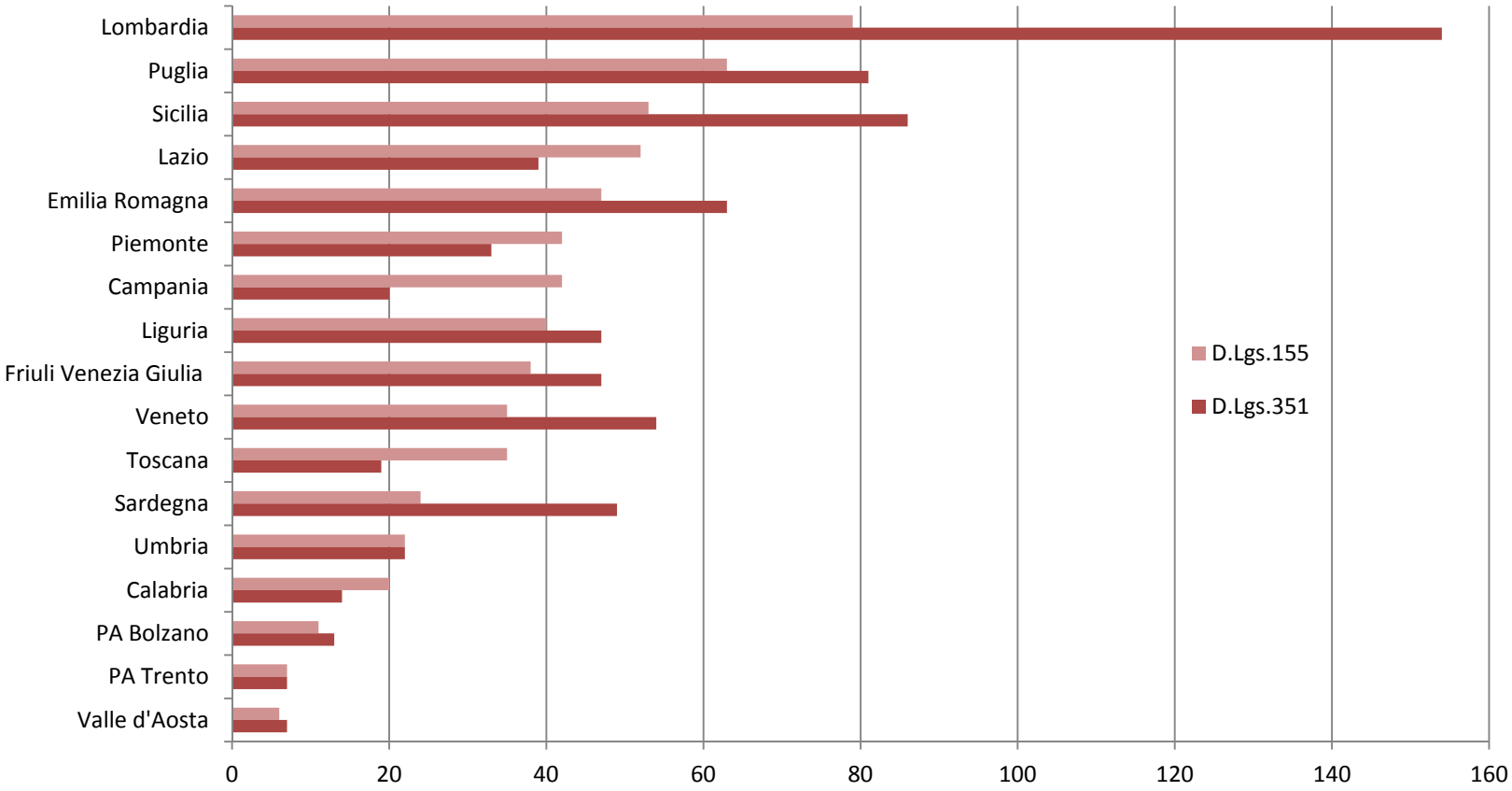


PM10 - Reference year 2012

Total number of monitoring stations

17 Regions and Autonomous Provinces

(provisional data)

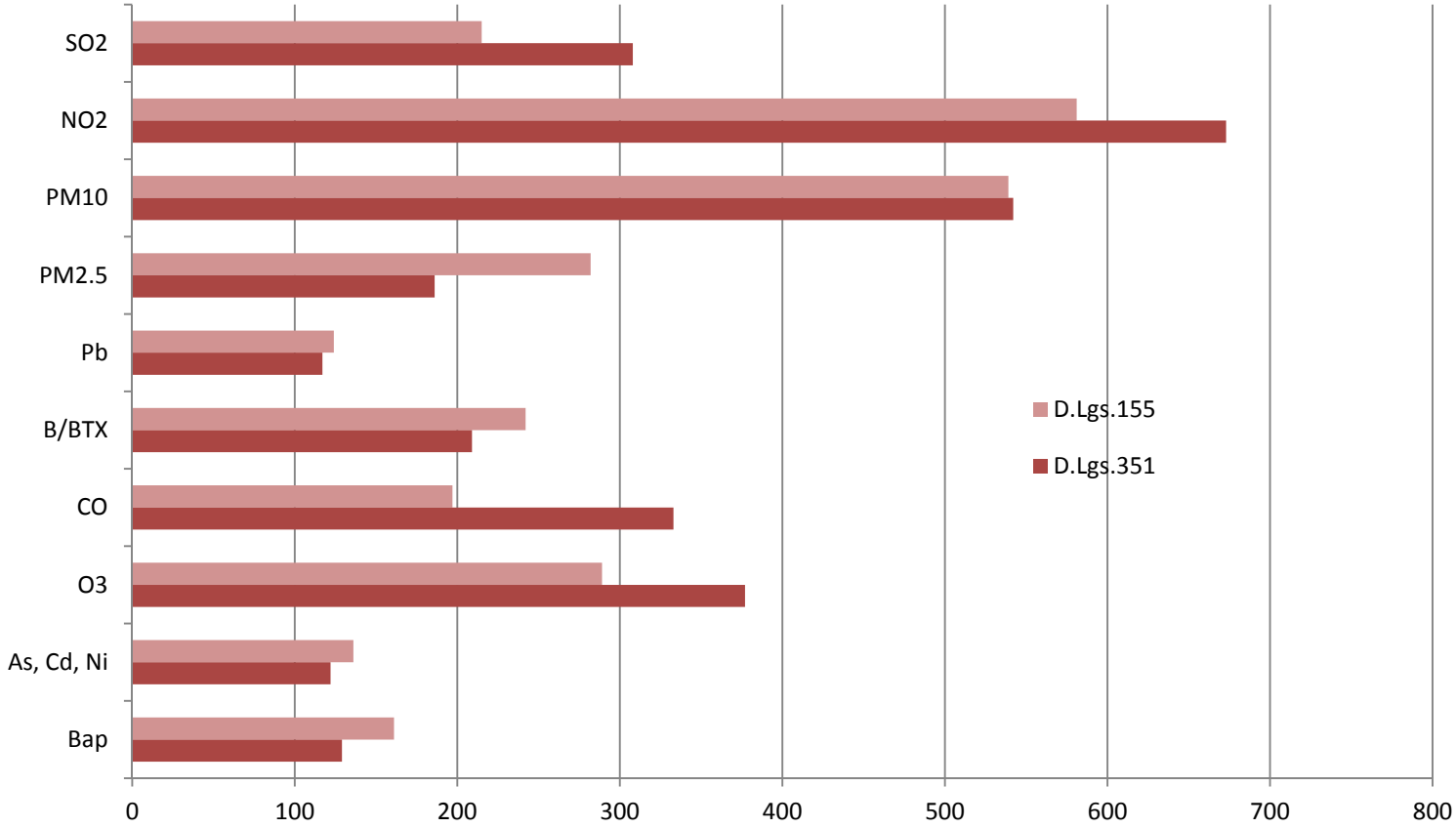


Following the review of monitoring networks, the number of monitoring stations has decreased from 755 to 616 (this figure does not include data from 4 regions)

Total number of sampling points

17 Regions and Autonomous Provinces

(provisional data)



Total number of monitoring stations

17 Regions and Autonomous Provinces

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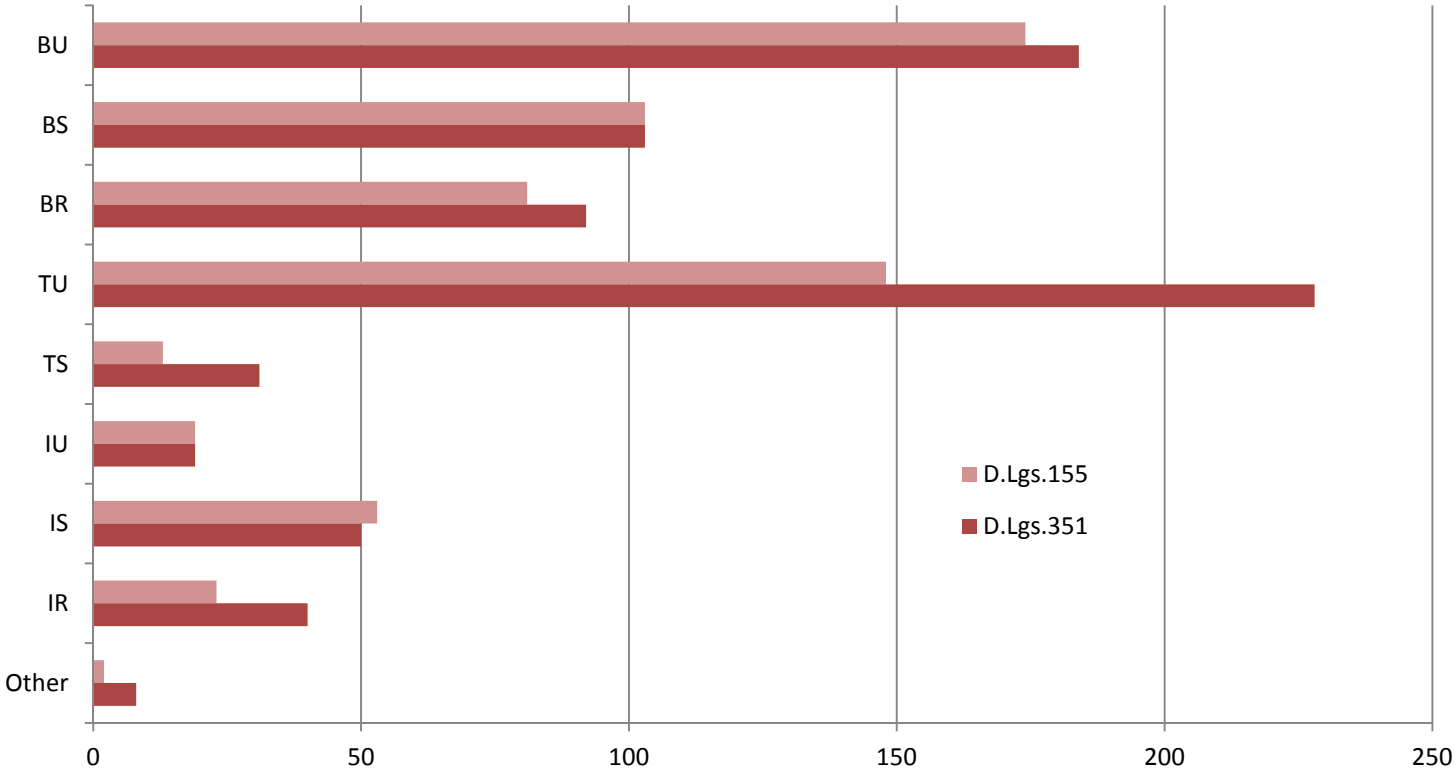
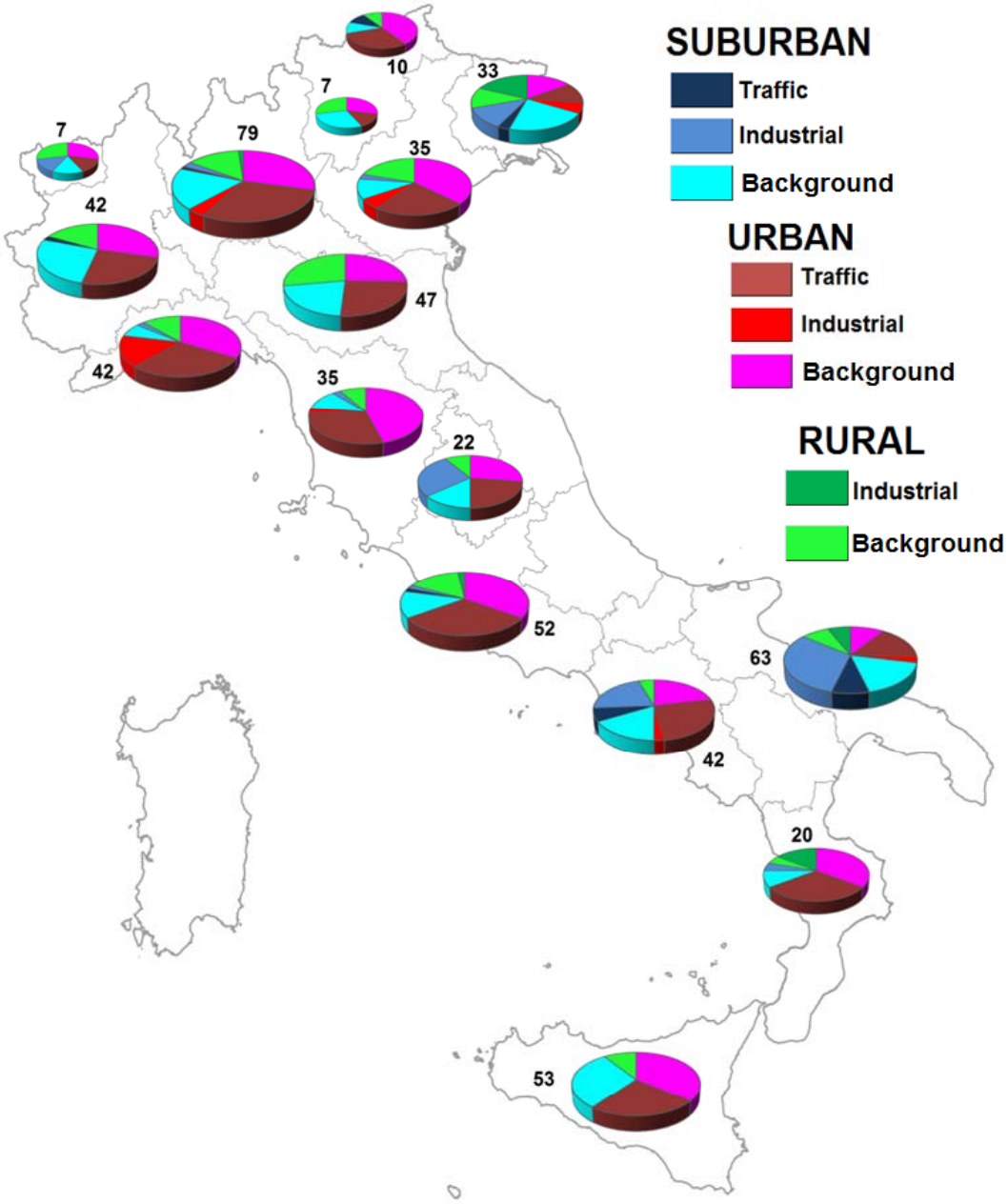




Monitoring stations: distribution by type and by region/province

(provisional data: update October 2014)

Current availability of air quality monitoring data

The following national air quality databases are available by ISPRA:

- BRACE database (http://www.brace.sinanet.apat.it/web/struttura.html)
  Data and information from the so-called EoI (Exchange of Information) data flow, 2002-2012. In particular, metadata, hourly data, daily data and statistics for the main atmospheric pollutant (NOx,/NO2, SO2, PM10, PM2.5, O3, CO, C6H6, B(a)P and others). DB Brace will no longer powered.

- Environmental Data Yearbook database (http://annuario.isprambiente.it/ada/versioni)
  Statistics, annual averages and exceedances of limit values for the following pollutants: PM10, PM2.5, NO2, SO2, C6H6, O3, metalli e B(a)P. Now data available from 2002 to 2012.

e-Reporting at national level

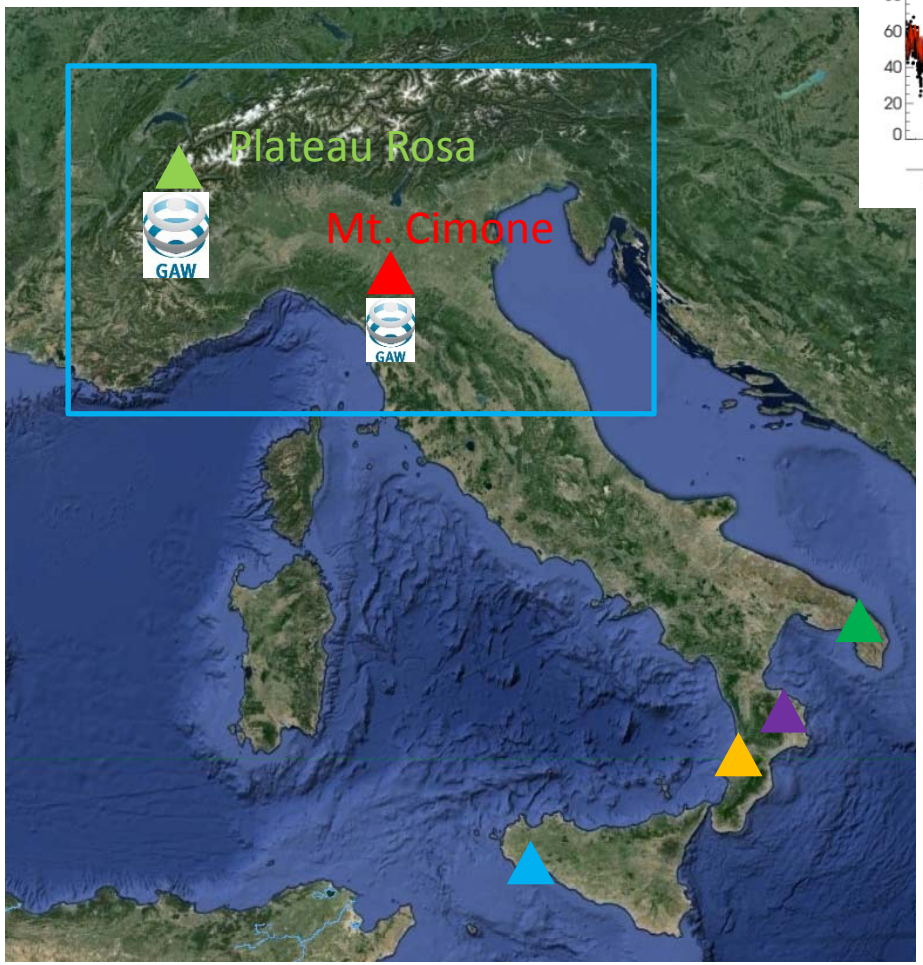
- Based on the provisions of legislation (Directive 2008/50/EC, Directive 2004/107/EC and Decision 2011/850/EU) the previous air quality reporting system, characterized by different, non-coordinated information flows is being replaced by a new system based on the exclusive use of information technology and in line with the principles of the INSPIRE Directive.

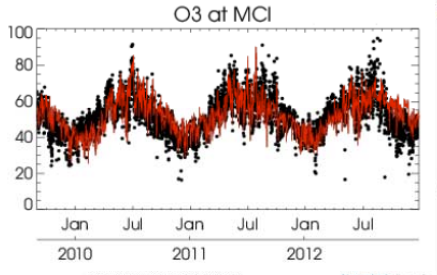
- The new e-Reporting system, InfoARIA, is in preparation by ISPRA and is expected to be fully operating by 2016. We are now in a transition phase. Italian 2013 air quality data delivery to EC and EEA will be completed by June 2015; data will then be available through the EEA website.

- Near Real Time (up-to-date) data. Up-to-date data, now available at local level in most regions, will also be available at national level through InfoARIA.

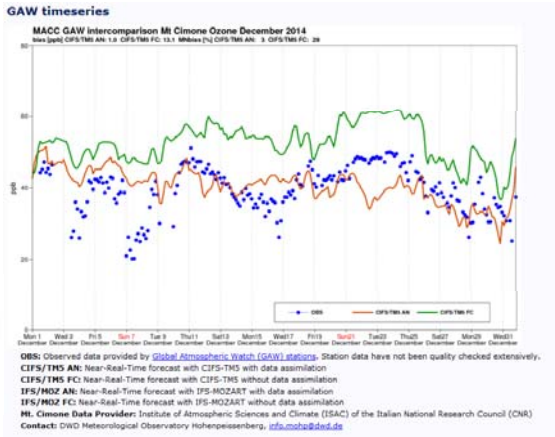
NRT data for model verification and assimilation: Italian GAW-WMO Stations and I-AMICA Observatories

Two high-mountain *GAW-WMO* observatories (**Mt. Cimone** – ISAC/CNR and **Plateau Rosa** – RSE Spa), already providing NRT data (O_3, CO) to MACC for the on-line model verification on global atmospheric composition.



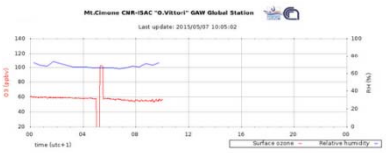


Evaluation of the MACC operational forecast system – potential and challenges of global near-real-time modelling with respect to reactive gases in the troposphere



Measurement programme in NRT delivery mode (in-situ):

"O. Vittori" Observatory (Mt. Cimone)



- O3, CO, NO, NO2, SO2,
- PM10, PM1, aerosol number concentration, size distribution, scattering and absorption coefficient, eq BC

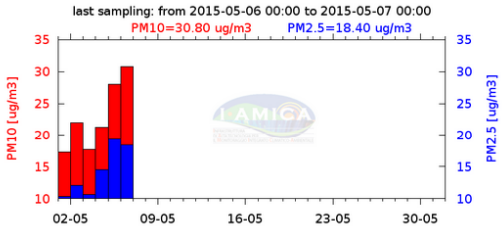
www.isac.cnr.it/cimone/realtime

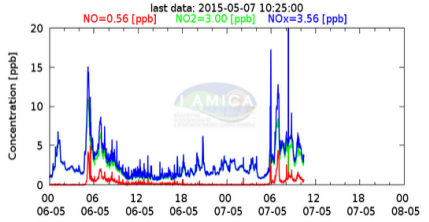
NRT data for model verification and assimilation: Italian GAW-WMO Stations and I-AMICA Observatories

From January 2015, 4 super-sites available in South Italy (Puglia, Calabria and Sicilia) for the continuous measurements of atmospheric composition. All the observatories are equipped by NRT data delivery system.

Measurement programmes in NRT delivery mode:

- O3, NO, NO2, SO2, CO, CH4, CO2
- aerosol number concentration, size distribution, scattering and absorption coefficient, eq black carbon, PM10, PM2.5
- Aerosol vertical profiling by LIDAR (ACTRIS – EARLINET) @ Lecce, Napoli, Lamezia Terme





http://www.i-amica.it/i-amica/?page_id=868