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Regional Training Course on Methods and Tools to identify Sources of Air Pollution and Apportionment in APM

The Portuguese Air Quality Monitoring Network

GOVERNO DE PORTUGAL

MINISTRY OF ENVIRONMENT
SPATIAL PLANNING AND ENERGY

Cláudia Martins
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Summary

- Air Quality (AQ) Legislation
  - Responsabilities
  - Main concepts
- Reporting Obligations to the COM
- National AQ Network
  - Requirements for approval
  - Typologies
- Process of data transmission
- Current national compliance
- IT Platforms
  - National level (AQI, Forecast)
  - EU level

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Air Quality Legislation CAFE Directive – 2008/50/EC

Directive 2008/50/EC (CAFE)

4th Daughter Directive (Heavy metals)

DL 102/2010/EC on ambient air quality and a cleaner air

- incorporates the last scientific and technological progress
- know-how acquired within the MS on the process of technical application in this field over the years that preceded

- establishing in a single document the air quality objectives, taking into account the standards, guidelines and programs of the WHO
- aimed at preserving the quality of ambient air when it is good and improve it in other cases.

Decision 2011/850/EU
on exchange of information and reporting on ambient air quality

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Legal framework under CAFE D → *DL 102/2010*

Key Elements

Merging of most existing legislation into a single Decree-law;

Responsabilities;

No changes on existing air quality objectives;

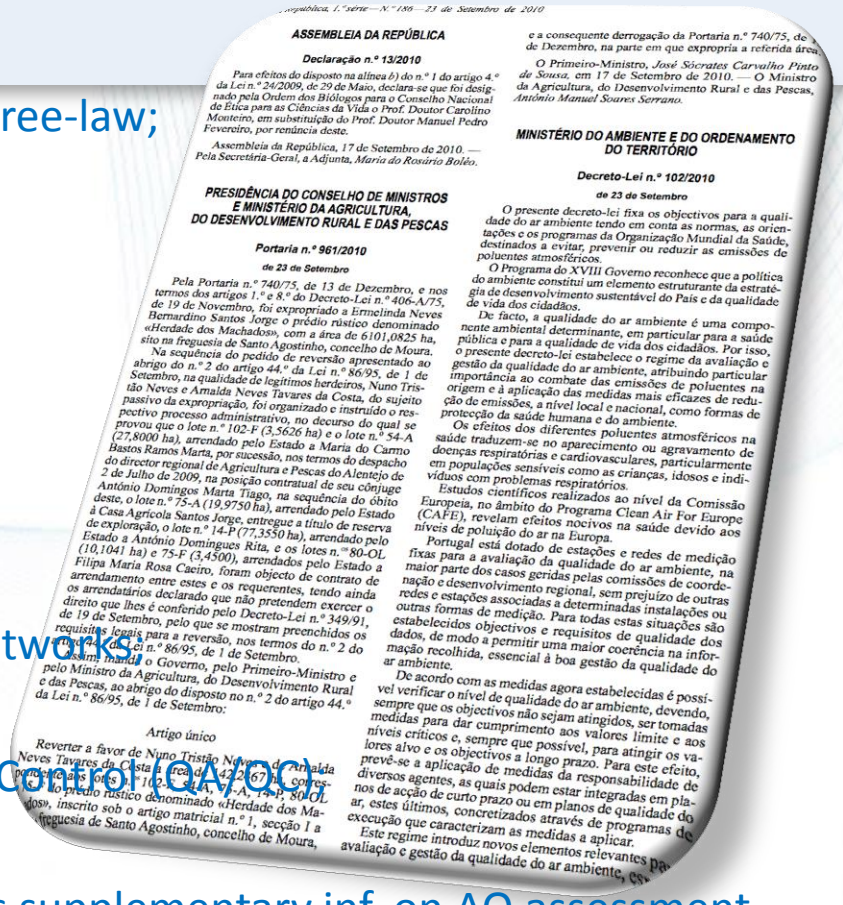
New air quality objectives for $PM_{2,5}$;

Better regulation of private air quality monitoring networks;

Improved procedures for Quality Assurance/Quality Control (QA/QC);

Make use of indicative measurements and models as supplementary inf. on AQ assessment

Possibility to discount natural sources of pollution when assessing compliance against LV



ASSEMBLEIA DA REPÚBLICA

Declaração n.º 13/2010

PRESIDÊNCIA DO CONSELHO DE MINISTROS E MINISTÉRIO DA AGRICULTURA, DO DESENVOLVIMENTO RURAL E DAS PESCAS

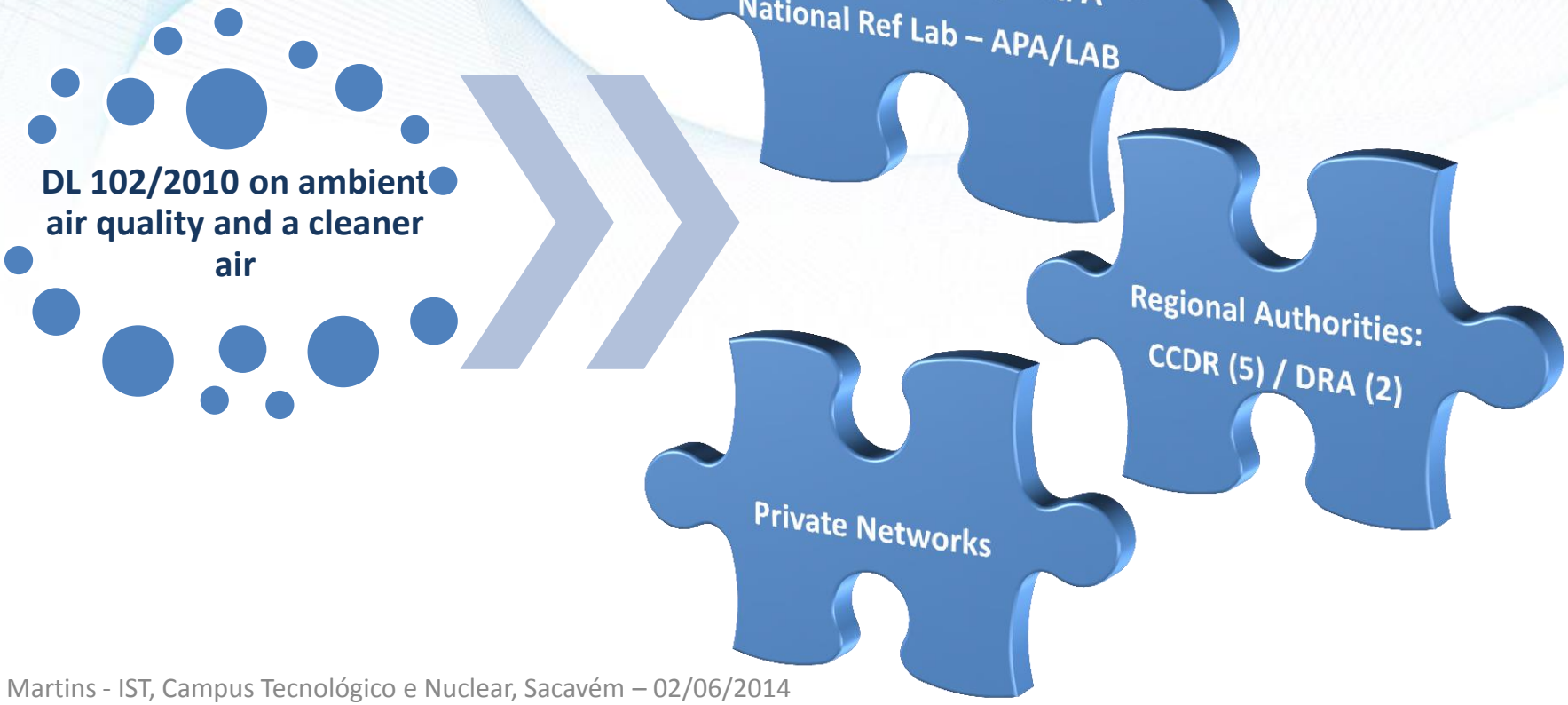
Portaria n.º 961/2010

MINISTÉRIO DO AMBIENTE E DO ORDENAMENTO DO TERRITÓRIO

Decreto-Lei n.º 102/2010

The decree-law for CAFE

Responsibilities



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The decree-law for CAFE

Responsibilities

Portuguese Environment Agency (APA):

National Authority for air quality:

- Coordinate the national Working Group on Air Quality;
- Approve measurement networks;
- Estabilish a $PM_{2,5}$ network for the AEI;
- Public information;
- Exchange of information to the Commission and EEA;
- DEG expert group member;
- Air Quality Committee member;
- FAIRMODE member;
- Prepare Technical Guidances.

The decree-law for CAFE

Responsibilities

Portuguese Environment Agency (APA):

National Reference Laboratory:

- Approval of laboratories;
- Auditing of measurement stations;
- Intercomparison of methods;
- Guidelines on accuracy of measurements;
- Member of AQUILA;
- Coordination at national level of the European QA/QC programs.

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The decree-law for CAFE

Responsibilities

Regional Authorities

CCDRs and DRAs:

- Management and assessment of air quality;
- Ensure the accuracy of pollutants measured;
- Supplementary assessment (eg. indicative measurements);
- Dissemination to the authorities about exceedances of information thresholds and alerts;
- Development and monitoring the implementation of air quality plans;
- Approval of the private monitoring networks for public dissemination.

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The decree-law for CAFE

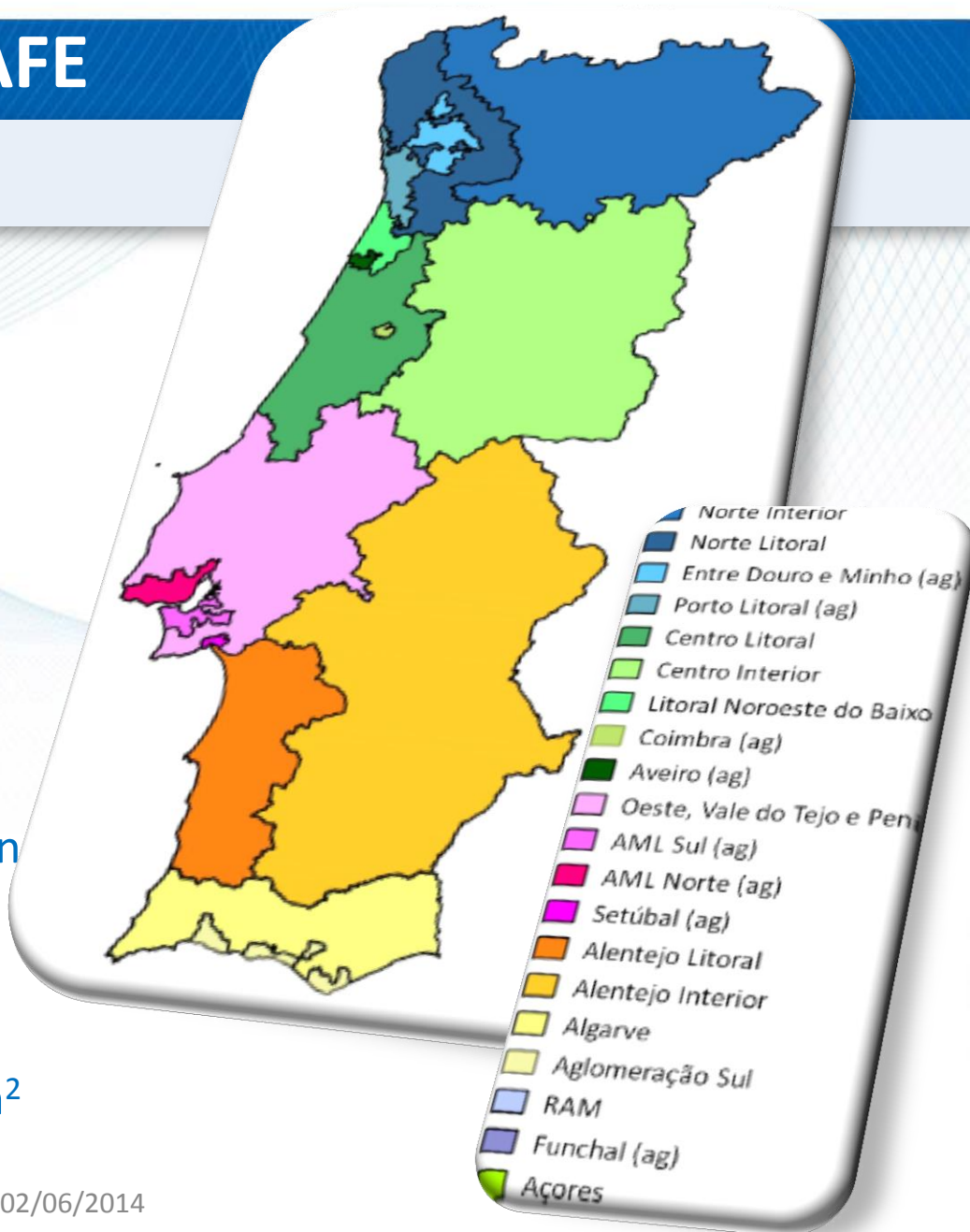
Definitions

Zone

- Geographical area of homogeneous characteristics in terms of air quality, land use and population density

Agglomeration

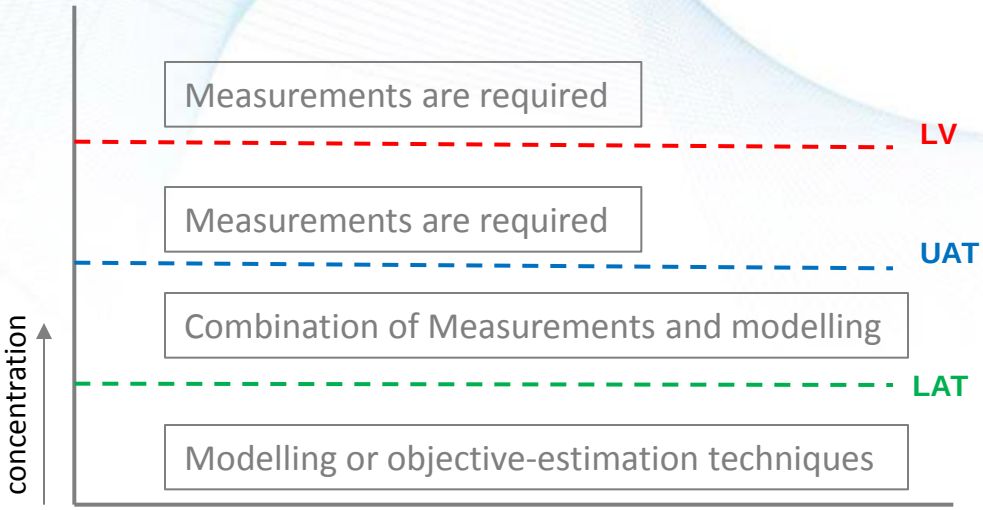
- Number of inhabitants higher than 250 000 (or)
- Number of inhabitants between 250 000 and 50 000 and population density > 500 hab./Km^2

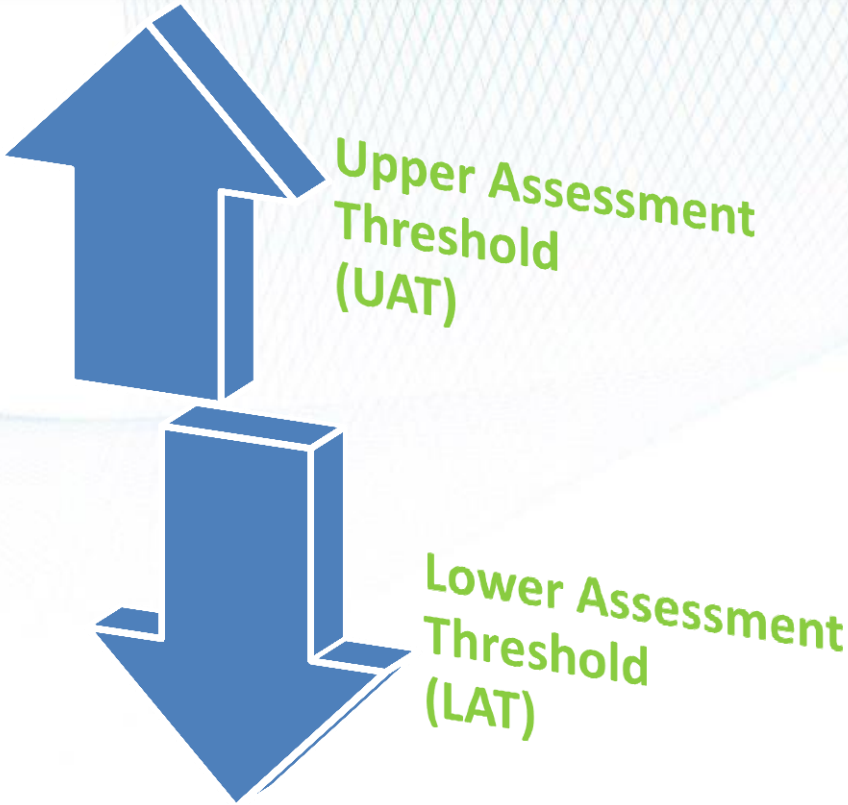


The decree-law for CAFE

Definitions

Level below which a specific AQ Assessment Regime may be used to assess ambient air quality





In agglomerations measurements are always required

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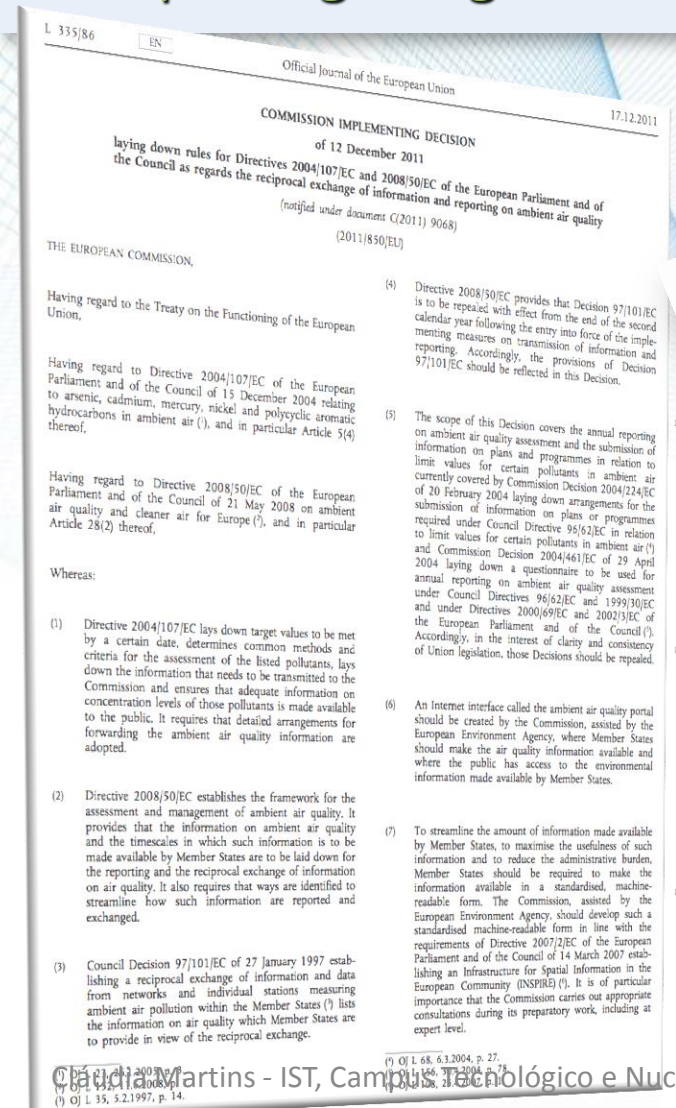
2011/850/EU Decision → *exchange of information*

Reporting Obligations → *e-Reporting*


L 335/86 EN Official Journal of the European Union 17.12.2011

COMMISSION IMPLEMENTING DECISION

of 12 December 2011

laying down rules for Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council as regards the reciprocal exchange of information and reporting on ambient air quality

(notified under document C(2011) 9068)

(2011/850/EU)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air (1), and in particular Article 5(4) thereof,

Having regard to Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe (2), and in particular Article 28(2) thereof,

Whereas:

(1) Directive 2004/107/EC lays down target values to be met by a certain date, determines common methods and criteria for the assessment of the listed pollutants, lays down the information that needs to be transmitted to the Commission and ensures that adequate information on concentration levels of those pollutants is made available to the public. It requires that detailed arrangements for forwarding the ambient air quality information are adopted.

(2) Directive 2008/50/EC establishes the framework for the assessment and management of ambient air quality. It provides that the information on ambient air quality and the timescales in which such information is to be made available by Member States are to be laid down for the reporting and the reciprocal exchange of information on air quality. It also requires that ways are identified to streamline how such information are reported and exchanged.

(3) Council Decision 97/101/EC of 27 January 1997 establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States (3) lists the information on air quality which Member States are to provide in view of the reciprocal exchange.

(4) Directive 2008/50/EC provides that Decision 97/101/EC is to be repealed with effect from the end of the second calendar year following the entry into force of the implementing measures on transmission of information and reporting. Accordingly, the provisions of Decision 97/101/EC should be reflected in this Decision.

(5) The scope of this Decision covers the annual reporting on ambient air quality assessment and the submission of information on plans and programmes in relation to limit values for certain pollutants in ambient air currently covered by Commission Decision 2004/224/EC of 20 February 2004 laying down arrangements for the submission of information on plans or programmes required under Council Directive 96/62/EC in relation to limit values for certain pollutants in ambient air (4) and Commission Decision 2004/461/EC of 29 April 2004 laying down a questionnaire to be used for annual reporting on ambient air quality assessment under Council Directives 96/62/EC and 1999/30/EC and under Directives 2000/69/EC and 2002/3/EC of the European Parliament and of the Council (5). Accordingly, in the interest of clarity and consistency of Union legislation, those Decisions should be repealed.

(6) An Internet interface called the ambient air quality portal should be created by the Commission, assisted by the European Environment Agency, where Member States should make the air quality information available and where the public has access to the environmental information made available by Member States.

(7) To streamline the amount of information made available by Member States, to maximise the usefulness of such information and to reduce the administrative burden, Member States should be required to make the information available in a standardised, machine-readable form. The Commission, assisted by the European Environment Agency, should develop such a standardised machine-readable form in line with the requirements of Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) (6). It is of particular importance that the Commission carries out appropriate consultations during its preparatory work, including at expert level.

(1) OJ L 23, 26.1.2005, p. 3.
(2) OJ L 152, 11.6.2008, p. 1.
(3) OJ L 35, 5.2.1997, p. 14.
(4) OJ L 68, 6.3.2004, p. 27.
(5) OJ L 68, 6.3.2004, p. 73.
(6) OJ L 108, 25.4.2007, p. 1.

IPR Decision

Decision 2011/850/EU covers the following types of information:

- Annual reporting on ambient air quality assessment: primary or aggregated data from different sources (measurement, modelling, objective estimation)
- Meta-Information about the assessment of air quality: description of measurement or modelling, definition of zones and assessment methods
- Information on plans and programmes

2011/850/EU Decision

What it is … → *e-Reporting*

- A system to communicate AQ information and the dataflows that should be in conformity, particularly with the requirements of INSPIRE Directive with respect to the standard transmission format through the XML code
- A standard and modern system that make use of IT allowing the operationalization of code translation and turns the process of QA/QC more expedited

- Automation of AQ reporting
- QA/QC
- Resources optimization medium/ long term

gives detailed guidance and recommendations to those responsible for the air quality data reporting

IPR Guidance

2011/850/EU Decision

Dataflows summary

DEM | EOI Decision | AQ Plans | Questionnaire | NRT Data

Dataflow Core

Zones (B)

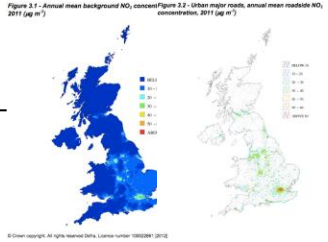
Assessment Regimes (C)

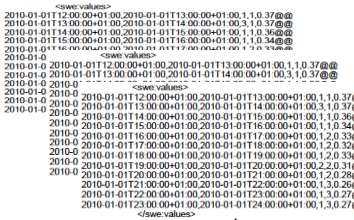
Assessment Methods (D)

NRT Data (E2a)

Measurement Techniques

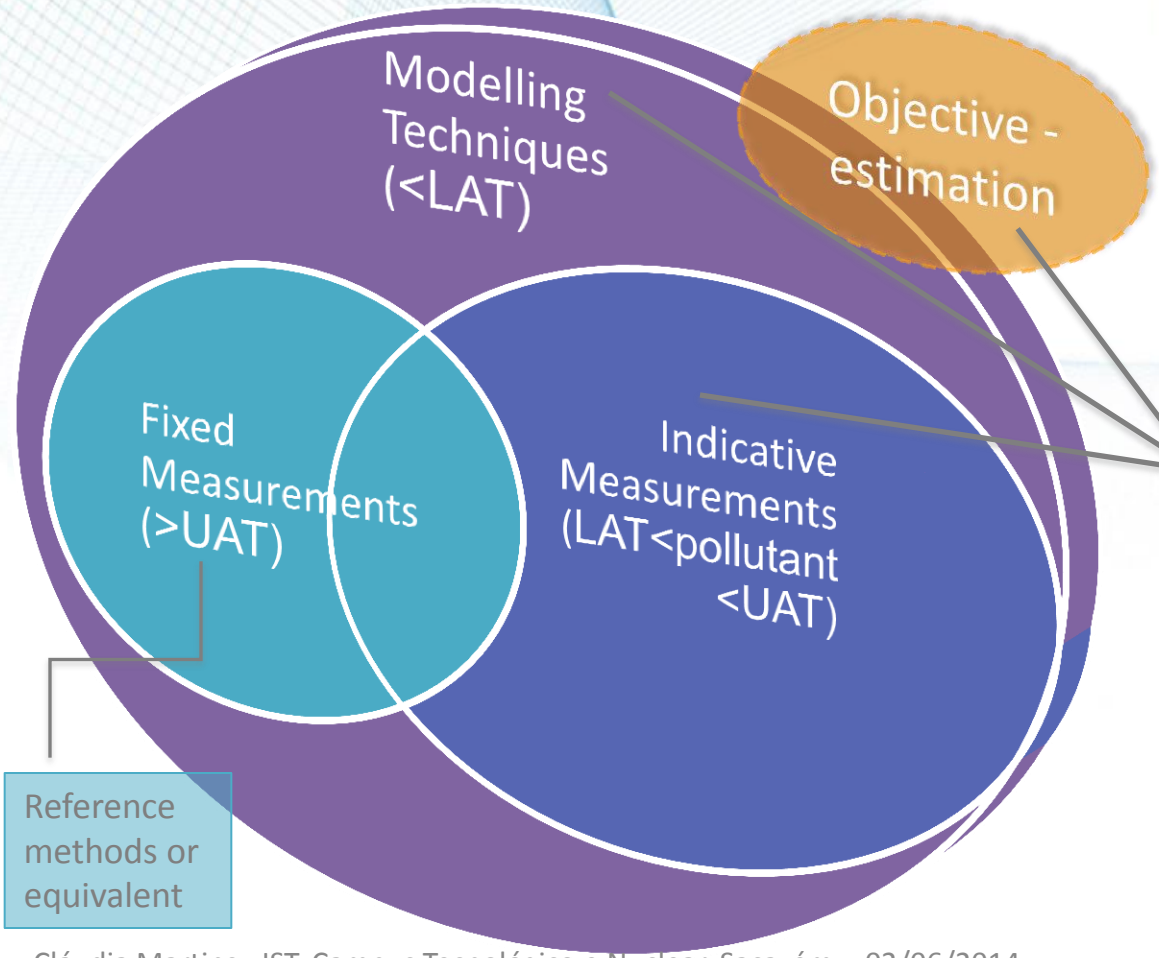
Modelling





AQ Network

Air Quality Assessment Regime



Assessment Techniques

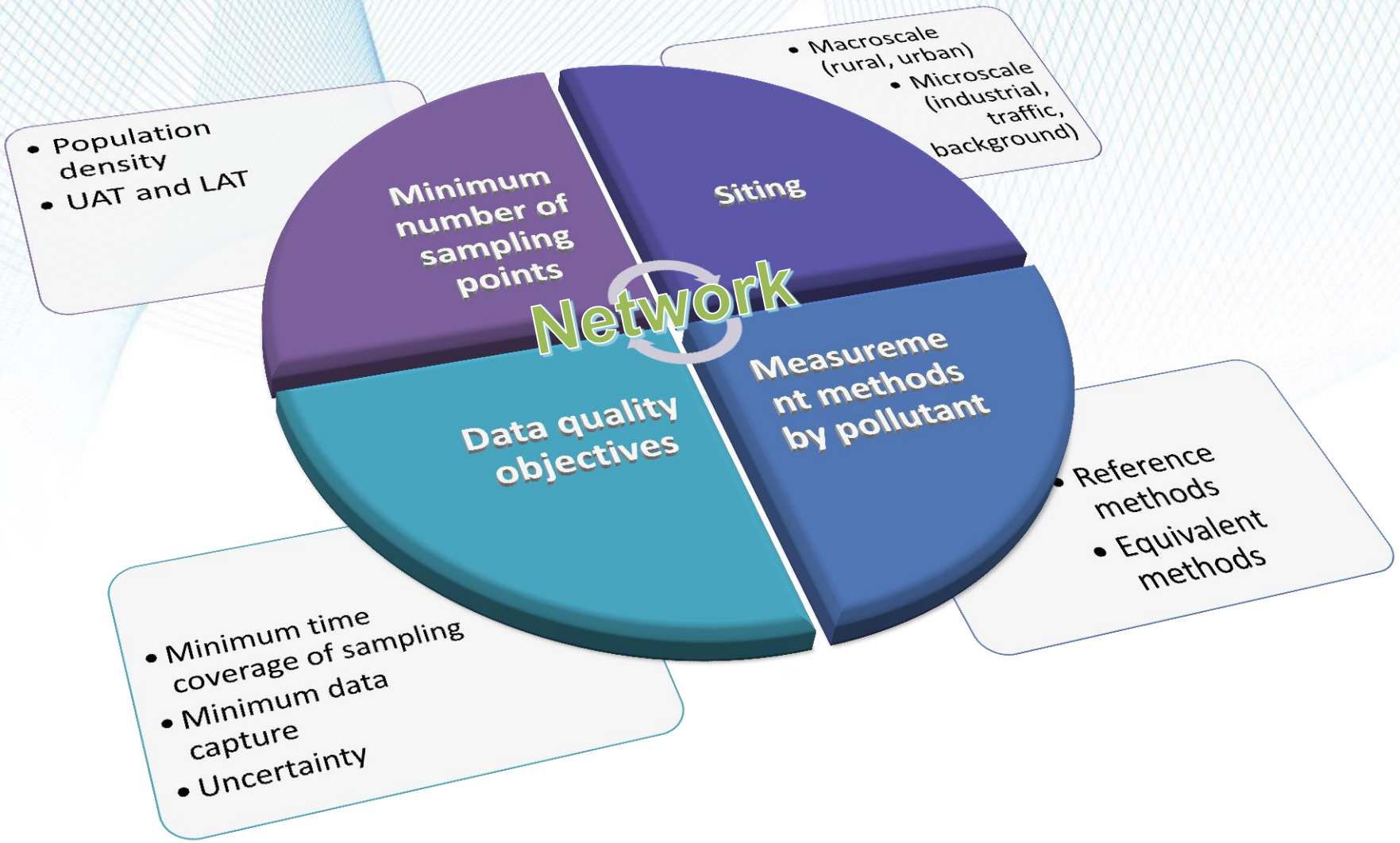
There is a need to understand their usage:

- classification of zone as part of the Aregime
- declaration of attainment of environmental objectives
- in relation to Reduction of fixed measurement
- give an increase of information to the Interpretation of spatial distribution of the ambient AQ

Modelling

- Used to forecast AQ
- Estimate the result of measures to monitorize the improvement of AQ

Requirements for AQ Network approval



AQ Network tipologies

Urban Network → AEI Network ($PM_{2,5}$)

Background Network → Natural Events other PAHs and heavy metals

Regional Network → EMEP; OSPAR

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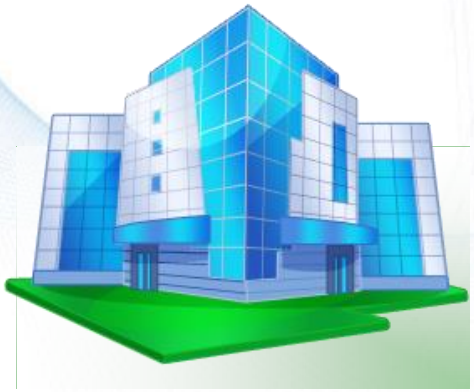
Process of Data Transmission→Data Management

CCDRs – Commission of Coordination and Regional Development

Air Quality Monitoring Stations



APA – Portuguese Environment Agency

ATMIS Application – collecting the data from AQMS and sending to the DB server

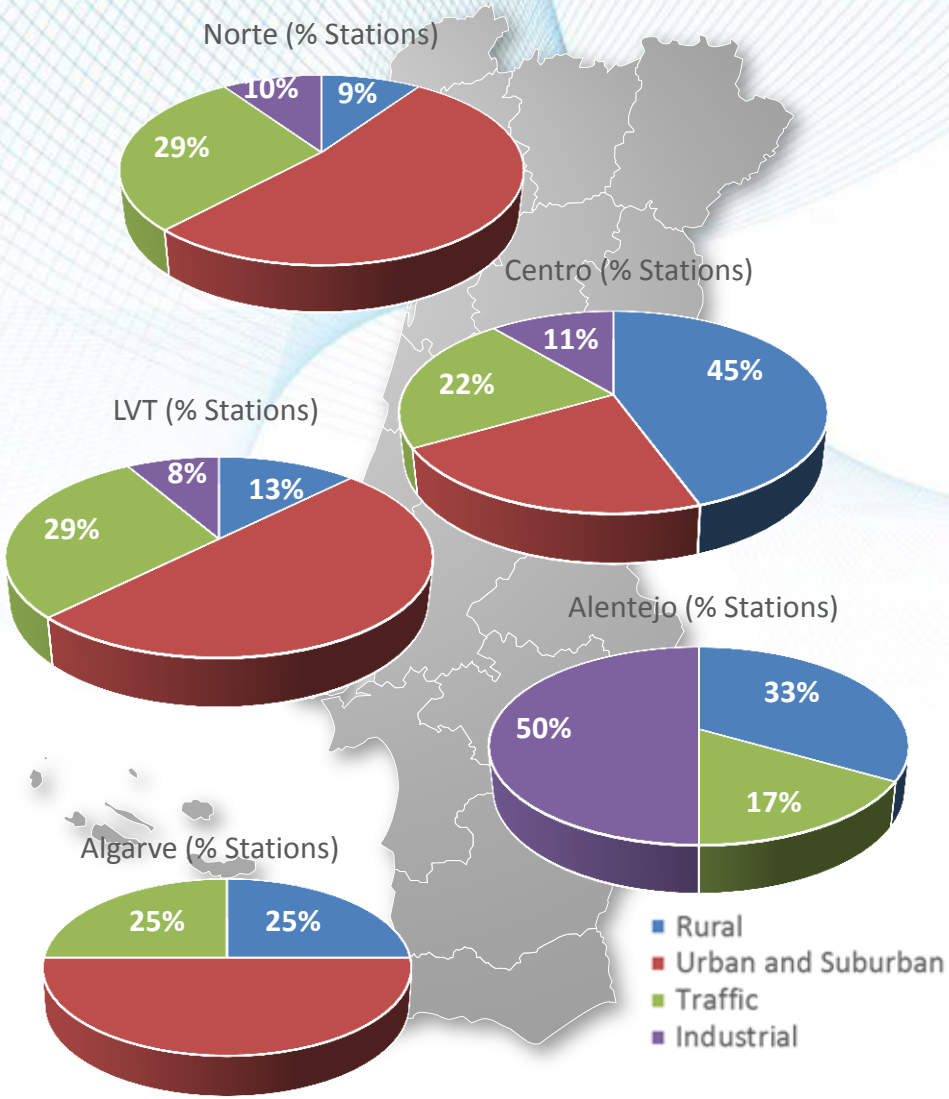
Several levels of Validation

Qualar

On-line Data Base

http://qualar.apambiente.pt

AQ Network – *Tipology of stations*

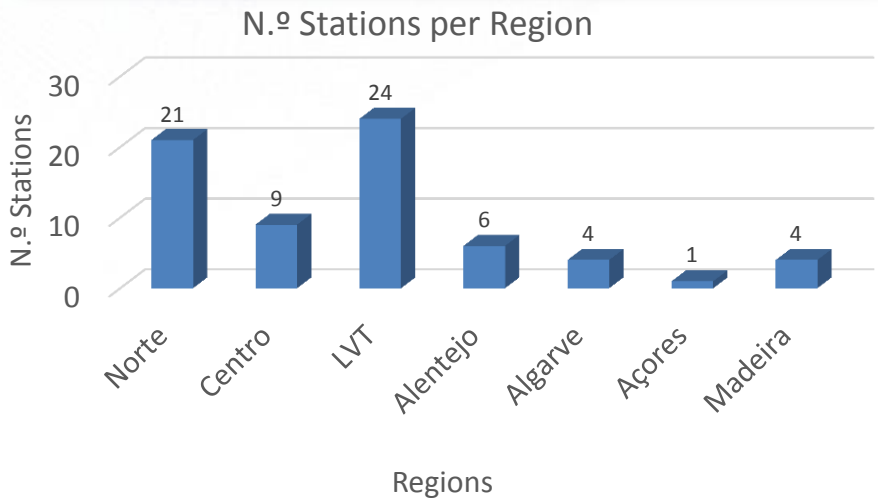


Stations by region

- There is a total of 69 operational stations.
- North and Lisbon and Tagus Valley are the regions with the higher number of stations, matching with the great urban areas of Lisbon and Oporto.

Tipology of stations

- According with its tipology allows to see the type of land use.
- The coastline is highly populated in comparison with the interior, red is the dominant color.



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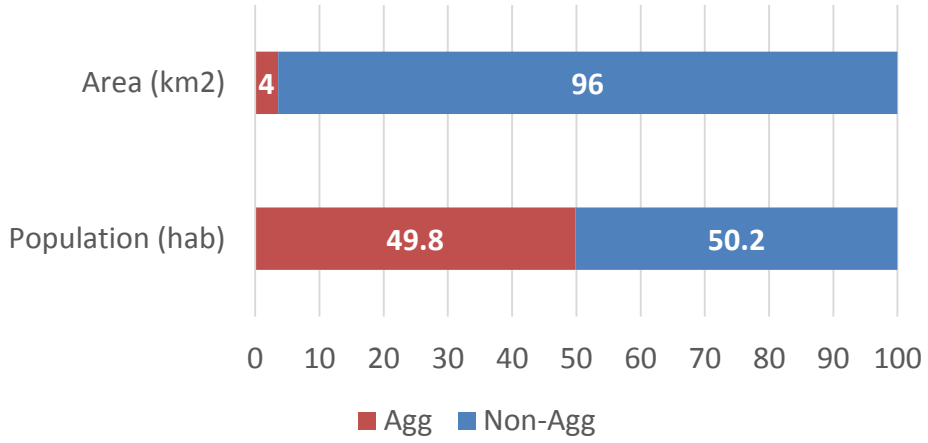
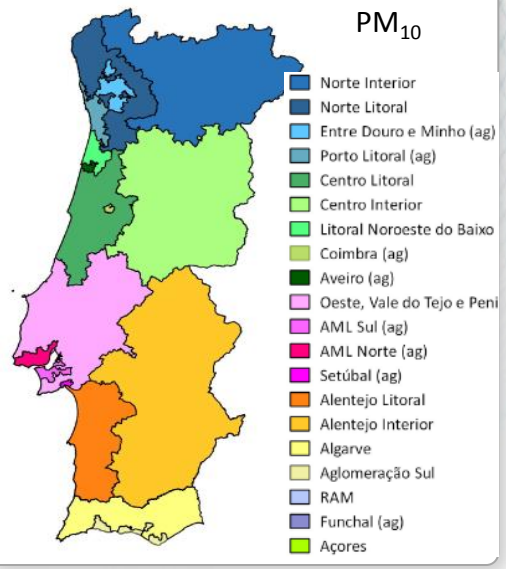
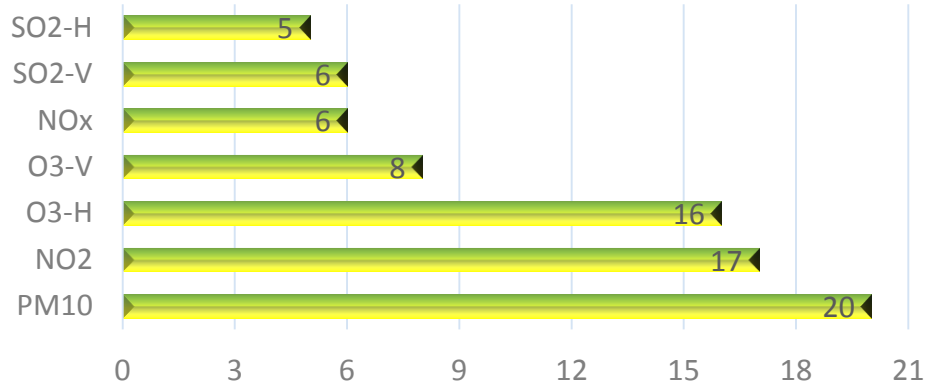
AQ Network – Zones by Pollutant

Percentage of Area *vs* Population per type of zone (agg /non-agg)



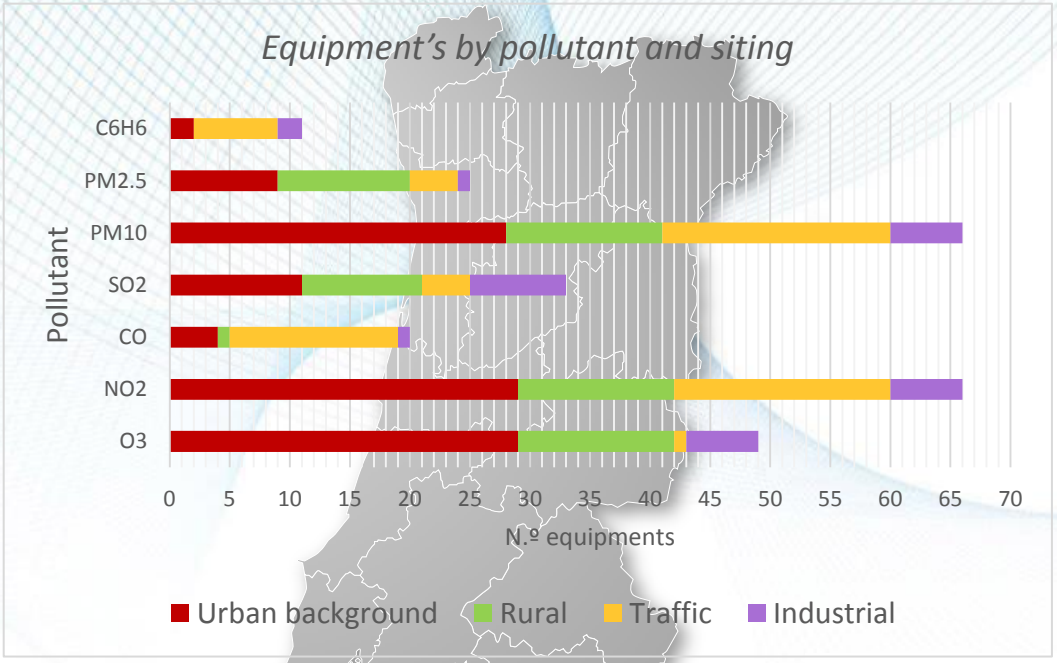


Number Zones per pollutant

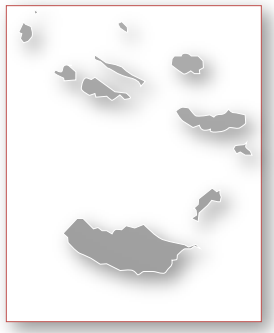


- 1 zone defined for Heavy metals, B(a)P, CO, C_6H_6, $PM_{2.5}$, Pb (covering all national territory)
- PM_{10} is the pollutant for which we have the delimitation more disaggregated
- For some specific pollutants (NOx, O3-V, SO2-V), only non-agg are designated for the correspondent air quality objective (vegetation and ecosystem)
- There is a small area correspondent to 4 % regarding agglomerations, which is related with large urban areas, where are located the most part of the population.

AQ Network - *Equipments*



- Higher number of equipments for PM_{10} and NO_2 which are located at the urban sites and in sites influenced by traffic.
- The O_3 equipments are mainly distributed by urban background sites and rural environment.



	O3	NO2	CO	SO2	PM10	PM2.5	C6H6
Urban background	29	29	4	11	28	9	2
Rural	13	13	1	10	13	11	0
Traffic	1	18	14	4	19	4	7
Industrial	6	6	1	8	6	1	2
Total	49	66	20	33	66	25	11

Urban background Rural Traffic Industrial Total

Current national compliance

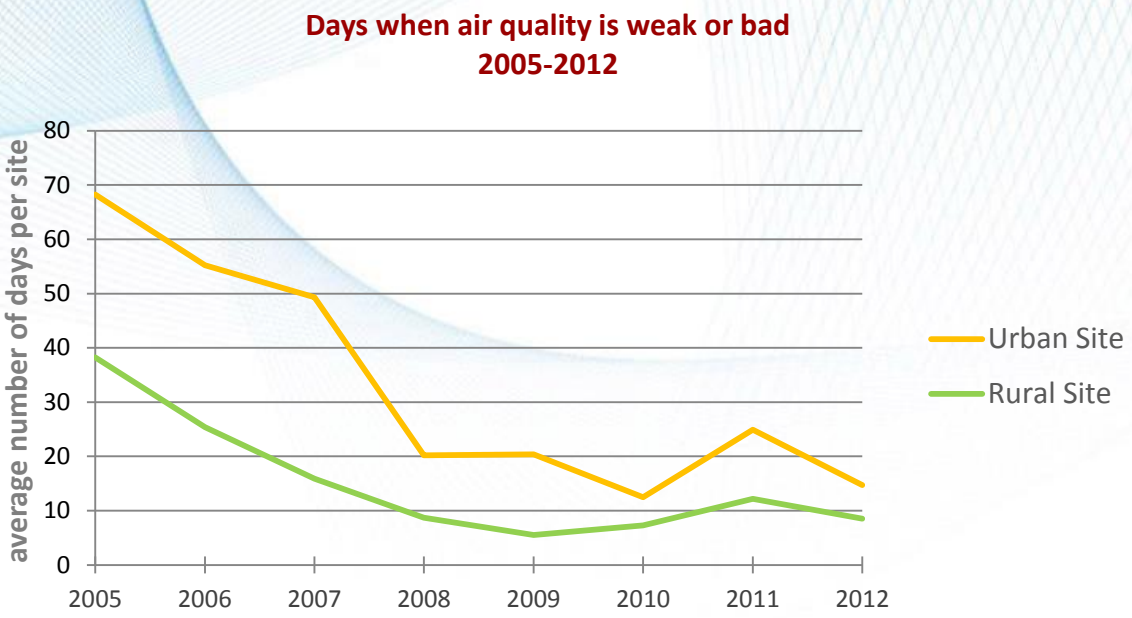
Poluente	Hourly Limite Value	Daily Limite Value	Annual Limite Value
Nitrogen dioxide NO_2	200 μgm^{-3} (not to exceed 18 times/year)	-	40 μgm^{-3}
Particulate matter PM_{10}	-	50 μgm^{-3} (not to exceed 35 times/year)	40 μgm^{-3}

Urban / hotspot problem → Road Traffic Problem

Ozone
Summer excedeences
Long-term objective/ target value

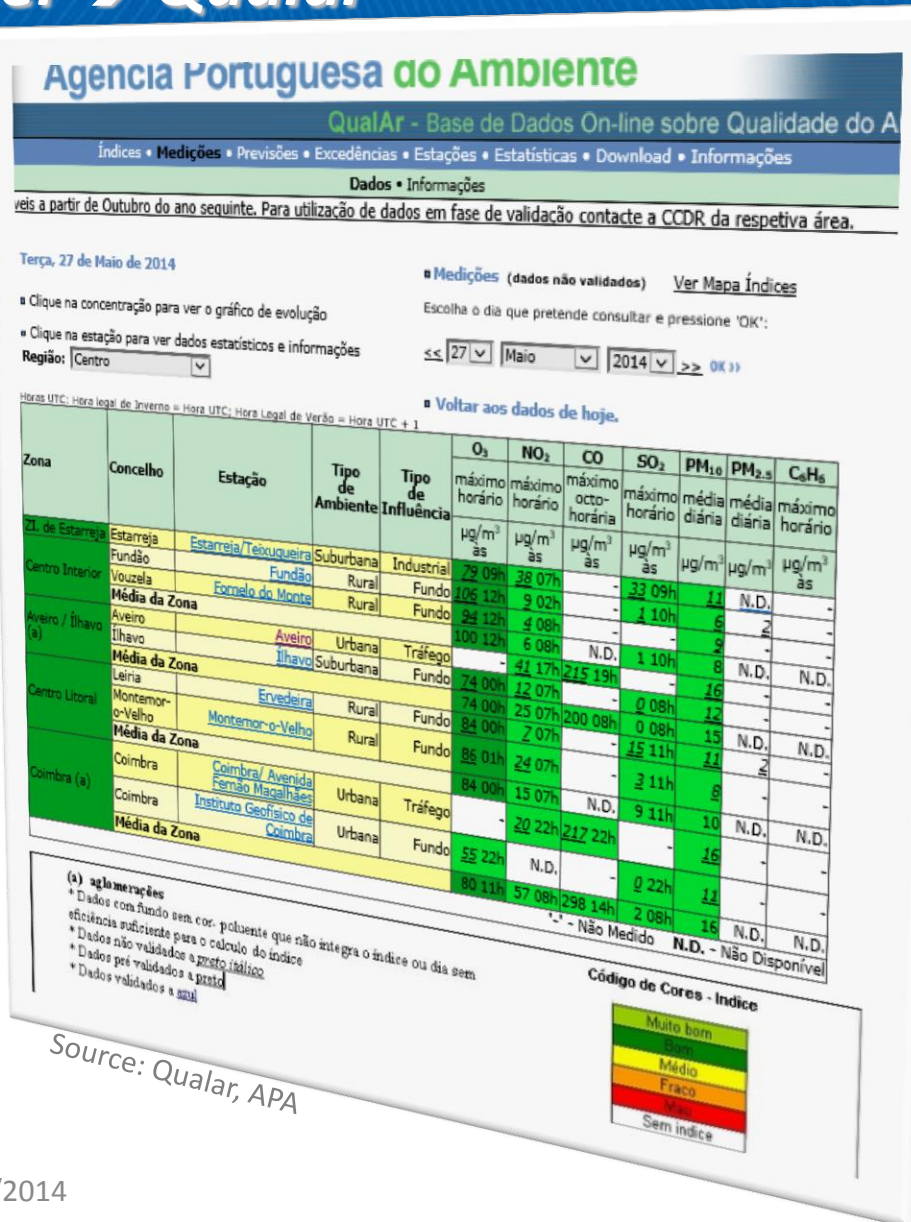
→ Regional Problem

Indicator based on AQ Index



IT Platforms → *National Level → Qualar*

- It is assigned a specific color to each AQI category to make it easier for people to understand quickly whether air pollution is reaching unhealthy levels.



Source: Qualar, APA

Qualar – Forecasting AQI

AGÊNCIA PORTUGUESA DO AMBIENTE

Previsão do índice de qualidade do ar para:

Quarta, 28 de Maio 2014

Cidade	Índice QA	Poluente(s)	Comentários:
Aveiro	Bom	Ozono	----
Braga	Bom	Ozono	----
Coimbra	Bom	Ozono	----
Faro	Bom	Partículas/Ozono	----
Lisboa	Bom	Partículas/Ozono	----
Porto	Bom	Partículas/Ozono	----
Setúbal	Bom	Ozono	----

Legenda:

Partículas – média diária prevista de partículas (PM_{10})

Ozono – máximo diário horário previsto de ozono (O_3)

Apresenta-se o(s) poluente(s) com previsão de pior nível previsto

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Comentário:

Em caso de dificuldades associadas à recepção da previsão do IQA contactar: 960493216

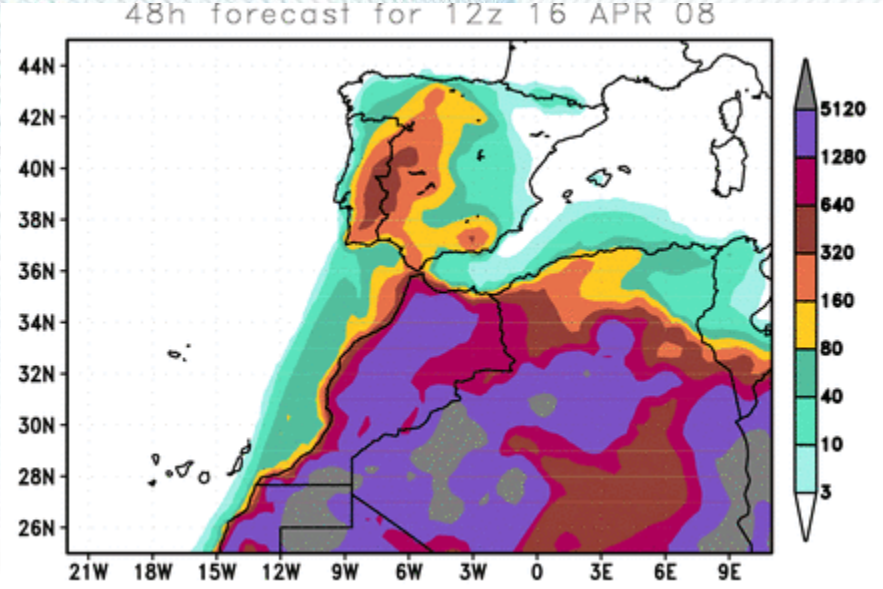
Previsão baseada nos modelos de qualidade do ar da Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa e da Universidade de Aveiro (http://qualar.apambiente.pt)

Source: Qualar, APA

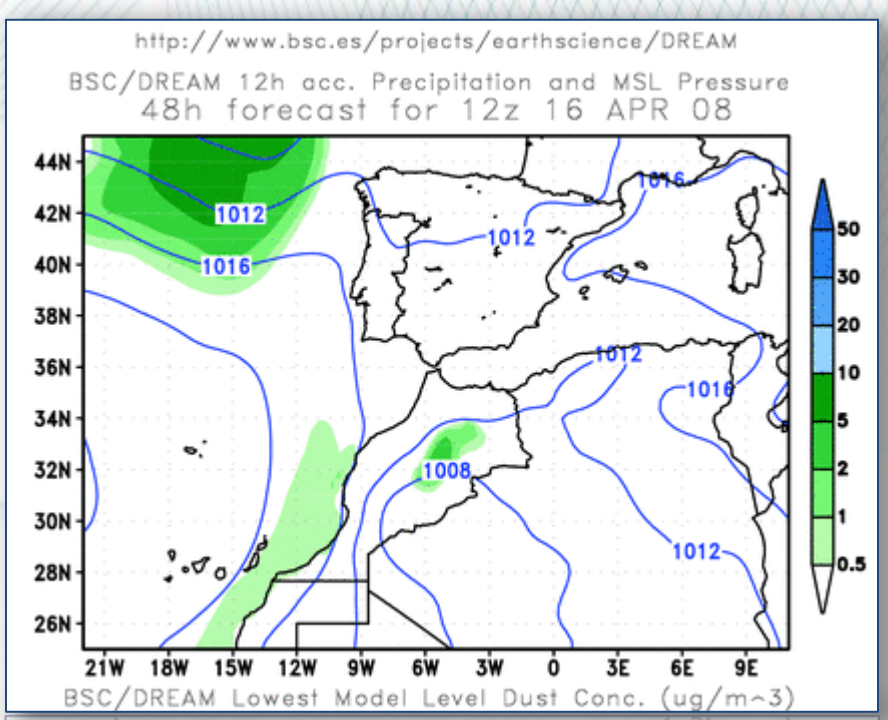
- Forecast of AQI for the following day given at 5 pm of the current day
- Set for 7 cities (district capitals - Porto, Braga, Aveiro, Coimbra, Lisboa, Setúbal e Faro)
- Based on combined forecast under 2 AQ models (developed by UA and FCT-UNL)

- More effective initiation of short term action
- Reduce the possibility of exposure through public warning

Natural Event Forecast → PM_{10}



Source: http://www.bsc.es/projects/earthscience/DREAM



- The suspension PM concentrations feature many times high levels due to natural events (Sahara dust)
- MS have the possibility to make use of a methodology to demonstrate that exceedances are attributable to natural sources → Portugal makes use of this possibility through a metodology that was developed with spain

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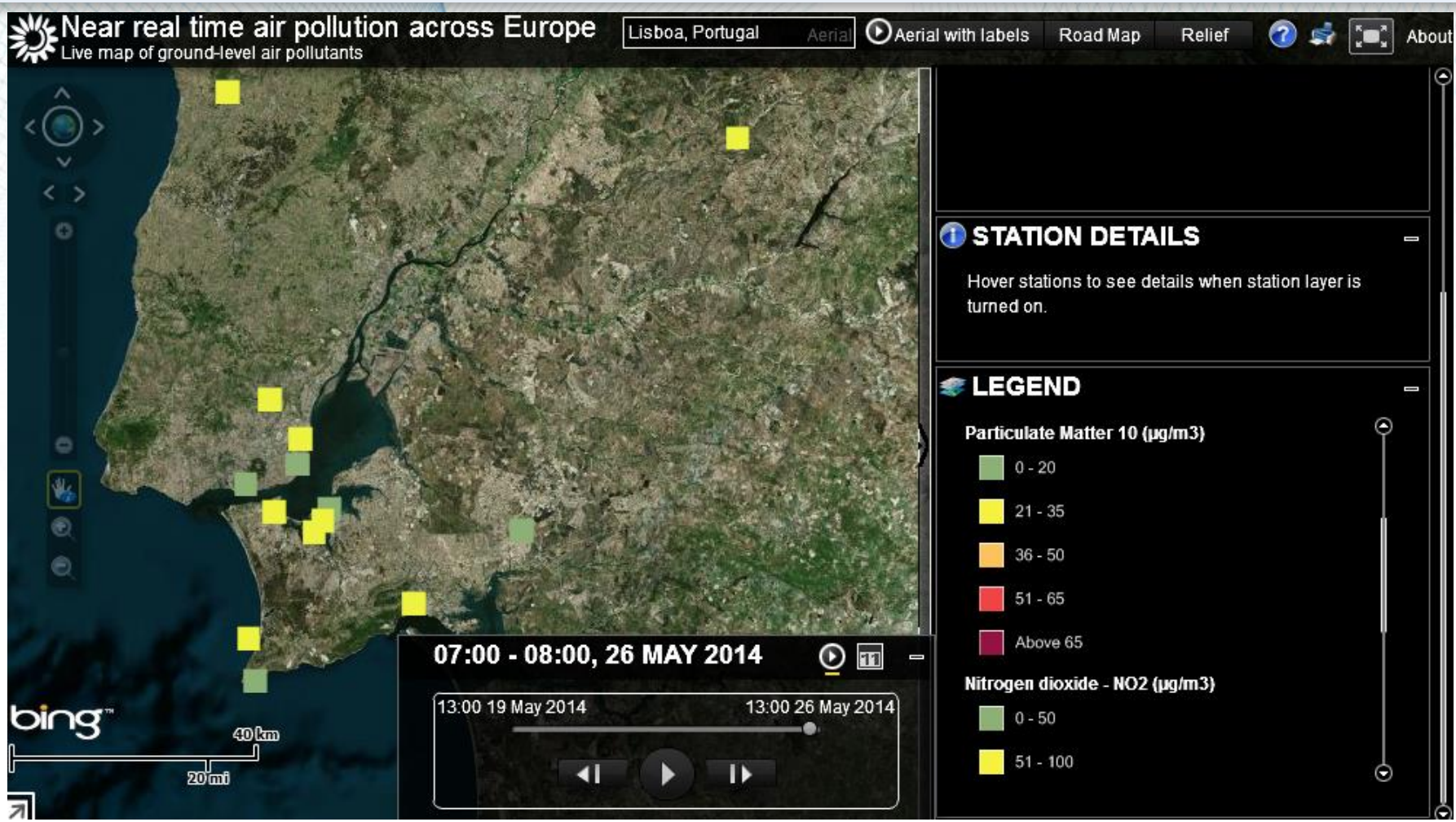
IT Platforms → *EU Level*

Up-to-date air quality maps for Europe (provisional data including O_3, PM_{10}, NO_2)

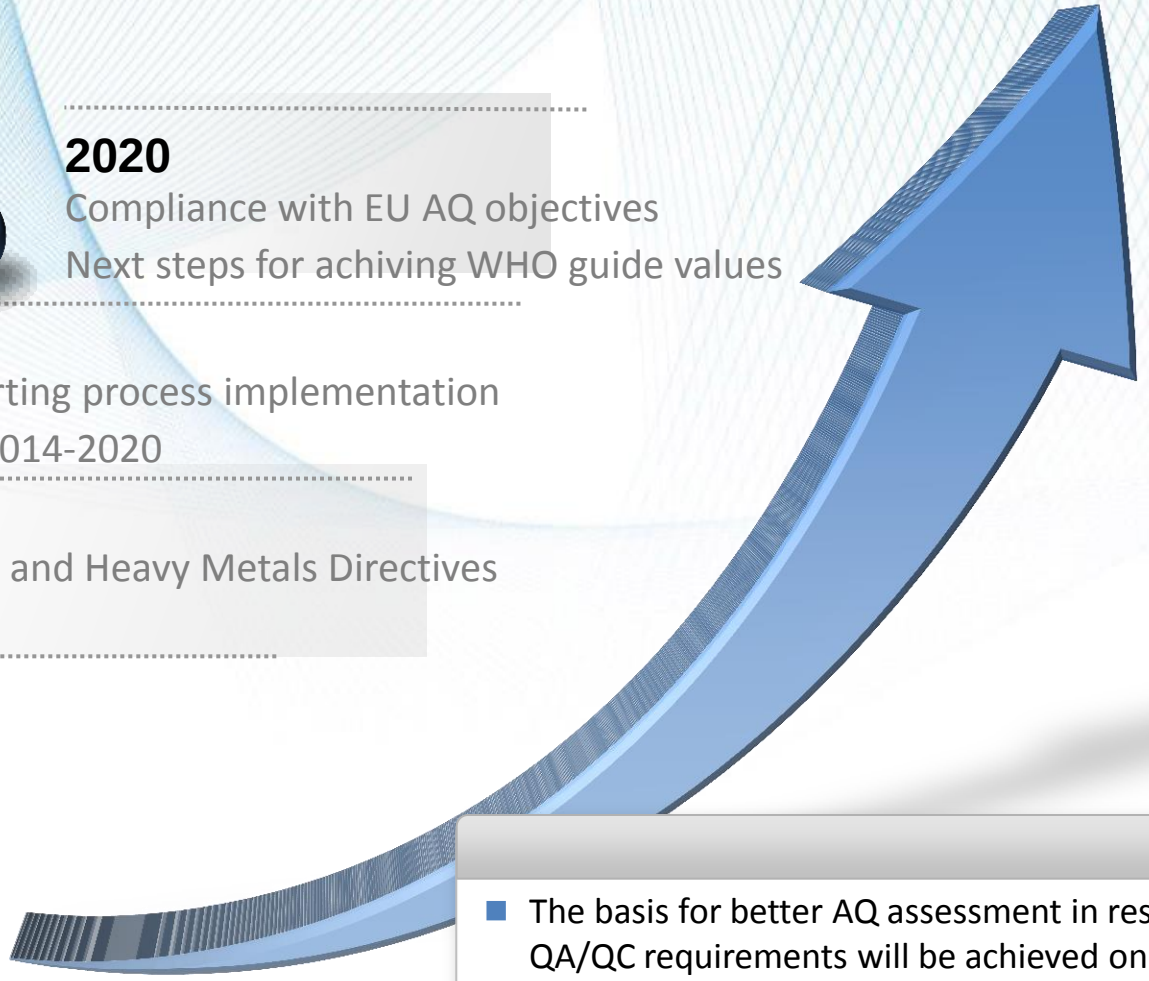


Milestones towards AQ XXI century ➔ Next Steps

2020
Compliance with EU AQ objectives
Next steps for achiving WHO guide values

2014
e-Reporting process implementation
NAQS 2014-2020

2010
Transposition CAFE and Heavy Metals Directives into National Law



- The basis for better AQ assessment in respect with QA/QC requirements will be achieved only by improving the quality of our Networks.
- Lead to a better source apportionment

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Towards Clean Air

Thank you