

Institute
of Atmospheric
Pollution
Research

air
our natural
environment



Research and Technology at the Institute of Atmospheric Pollution Research

"UNDERSTANDING THE QUALITY OF THE AIR WE BREATHE"

Valerio Paolini, Ph. D.

September 27th 2019

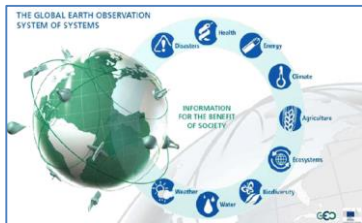


CNR - National Research Council of Italy
Institute of Atmospheric Pollution Research
<http://www.iaa.cnr.it>

ISTITUTE FOR ATMOSPHERIC POLLUTION RESEARCH

Operating Unit in Florence

- 5 Permanent
- 6 Temporary
- 1 Research Fellow



Operating Unit at MATTM – Rome

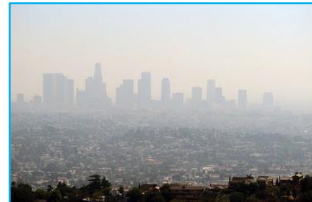
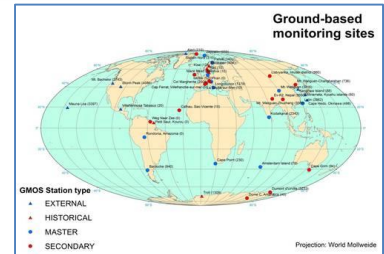
- 9 Permanent
- 23 Temporary

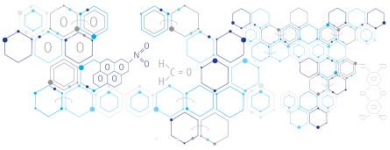
Head Office in MLIB – Rome

- 42 Permanent
- 13 Temporary
- 10 Research Fellows and PhD

Operating Unit in Rende – Cosenza

- 11 permanent
- 4 temporary
- 3 research fellows and PhD





CNR-IIA MISSION

Knowing about
and understanding
the quality of
the air we breathe
means believing
in sustainable
development and
acting to safeguard
future generations

Istituto
sull'Inquinamento
Atmosferico

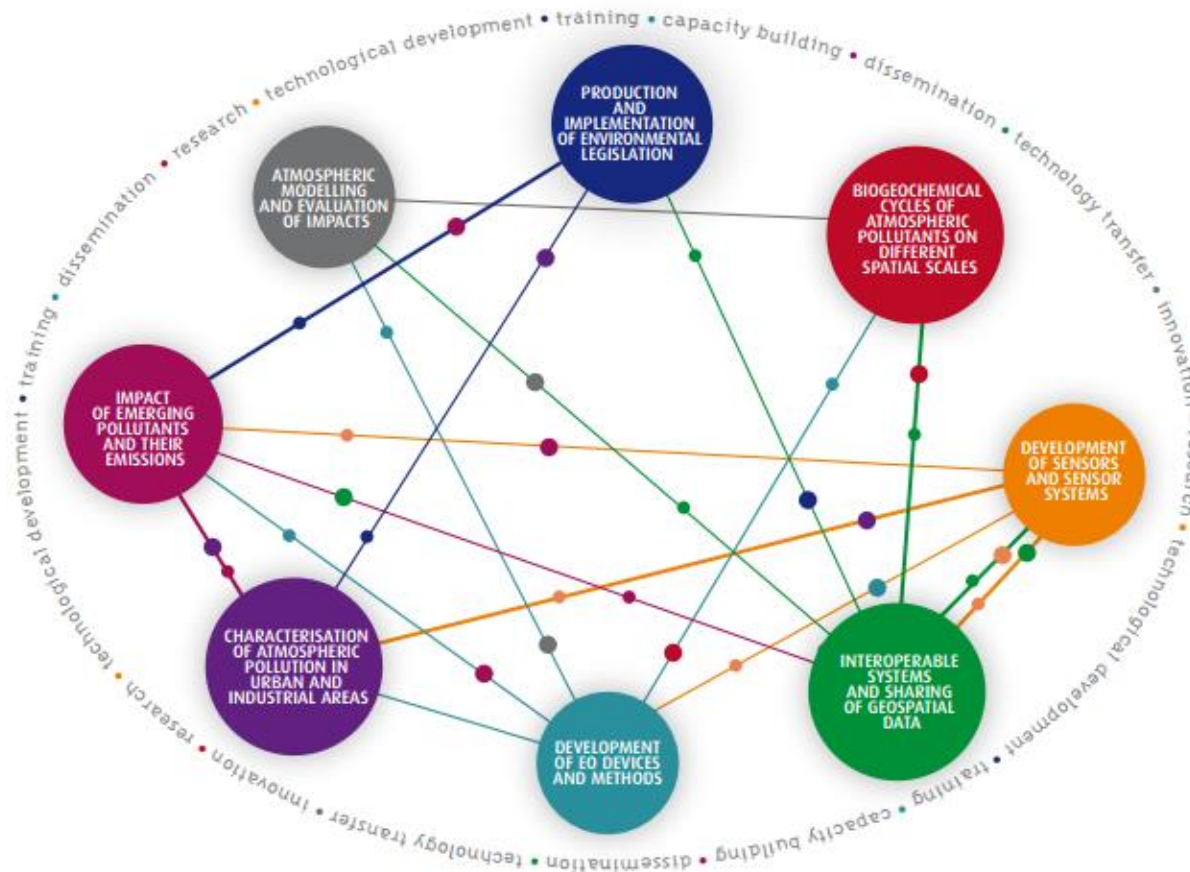
air
our
natural
environment

mission

“To improve knowledge concerning the multiple mechanisms regarding the emission, conversion and conveyance of atmospheric pollutants, combining multidisciplinary skills for the development of new and innovative technologies and study methods.”

Main CNR-IIA Research Fields

Interdisciplinary activities of the Institute in the sphere of Technological Research and Development. The Institute is organised into the following Thematic Areas:



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Cinzia Perrino

Research Area Coordinator

Office: MLIB

➤ Atmospheric Pollution in Urban and Industrial Area

“Studies on air quality are made to measure pollutant species, evaluation of changes in time and space of their concentration and the estimation of the sources.”



Mauro Rotatori

Research Area Coordinator

Office: MLIB

➤ Emerging Air Contaminants in Environmental Emissions

“In order to respond to the need of discipline national functions related to the monitoring of industrial emissions into the atmosphere and air quality, as well as quality assurance measures, activities and specific research they are conducted.”



Francesca Sprovieri

Research Area Coordinator

Office: RENDE - CS

➤ Pollutant Cycles Across Different Spatial Scales and in Polar Areas

“Study of the dynamics of pollutants in various environmental ecosystems and their mass transfer to the atmosphere-water-soil-snow-ice interfaces on a regional and global scale.”

Main CNR-IIA research fields

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Antonella Macagnano
Research Area Coordinator
Office: MLIB

➤ **High-performance sensors and sensing systems for monitoring air quality and environment**

“Design and development of nanostructured sensors and multiparameter sensor devices for monitoring real-time and in-situ of gaseous toxic air pollutants and particulate matter.”



Antonello Pasini
Research Area Coordinator
Office: MLIB

➤ **Global and Regional Atmospheric Modelling**

“In a complex system such as the atmosphere modeling allows us to do “experiments” that in reality we could not do and increase our knowledge.”



Rosamaria Salvatori
Research Area Coordinator
Office: MLIB

➤ **Developing OT (Earth Observation) Devices and Methods**

“The research activities aim to develop methodologies for the interpretation and integration of multi and hyperspectral optical imagery, radiometric measurements of field and environmental data in order to expand the knowledge of natural or man-made phenomena that can modify the territory.”

Main CNR-IIA research fields

Interdisciplinary activities of the Institute in the sphere of Technological Research and Development. The Institute is organised into the following Thematic Areas:



Stefano Nativi

Research Area

*Coordinator and **ESSI-Lab**
responsible*

Office: Florence

➤ **Geospatial Information and Environmental Knowledge-Sharing (GENS)**

“As part of the Institute’s activities, it has always been the need to make information easily produced actionable information that can be used by users with different needs (researchers, policy makers, stakeholders) and interfaced with computer systems with complex architectures..”



Antonio Fardelli

Research Area Coordinator

Office: Rome

➤ **Transfer of Technical and Scientific Knowledge for the Production and Implementation of Air-Quality Legislation**

“The application, and transfer of technical/scientific knowledge in drawing up and implementing the environmental legislation in national, European, and international contexts.”

CNR-IIA Partnerships

The Institute is Partner of the following Research Programs:



The GEO Work Plan 2012-2015 includes the Health Task on Tracking Pollutants (HE-02)



 *Italy* 



UNECE-LTRAP

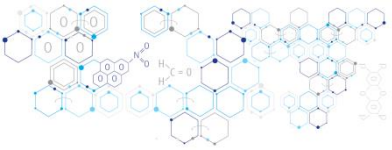
The Institute provides scientific support within the UNECE Convention on Long-Range Transboundary Air Pollution (CLRTAP).

UNECE-HTAP

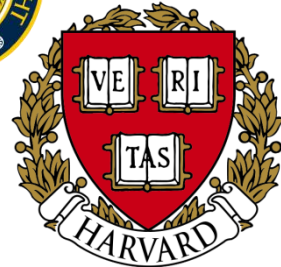
The Task Force on Hemispheric Transport of Air Pollution (TF HTAP).



UNEP Mercury Air Transport and Fate Research Partnership (UNEP F&T) – Advancing the Objectives of the 25th UNEP Governing Council



CNR-IIA PARTNERSHIPS



CNR-IIA *Coordination*

ERA-PLANET *Network*

Network Details

Participants	Countries	Joint Calls
41	19	0
Period	01/2016 - 12/2020	
Status	Active Network	
Network Type	ERA-NET Cofund	
Funding Framework	Horizon 2020	
Planned joint calls	N/A	

CNR-IIA COORDINATES THE:

The European network for observing our changing planet

The overarching goal of ERA-PLANET is to strengthen the European Research Area in the domain of Earth Observation in coherence with the European participation to Group on Earth Observation (GEO) and the Copernicus.



<http://eraplanet.meteo.noa.gr>

THE EXPECTED IMPACT IS:

to strengthen the European leadership within the forthcoming GEO 2015-2025 Work Plan. ERA-PLANET will reinforce the interface with user communities, whose needs the Global Earth Observation System of Systems (GEOSS) intends to address.

CNR-IIA *Coordination*

CNR-IIA COORDINATES THE:

It will provide more accurate, comprehensive and authoritative information to policy and decision-makers in key societal benefit areas, such as :

- **Smart Cities and Resilient Societies;**
- **Resource Efficiency and Environmental Management;**
- **Global Changes and Environmental Treaties;**
- **Polar Areas and Natural Resources.**



<http://eraplanet.meteo.noa.gr>

ERA-PLANET will provide advanced decision support tools and technologies aimed to better monitor our global environment and share the information and knowledge in different domain of Earth Observation.

CNR-IIA Projects

NATIONAL PROJECTS n.19

- 18 closed;
- 1 ongoing:
 - ✓ SMART ISLAND – MIUR



EUROPEAN PROJECTS n.30

- 25 closed;
- 5 ongoing:
 - ✓ ISAAC – HORIZON 2020
 - ✓ ERA-PLANET – HORIZON 2020
 - ✓ ENERGY OD – 7° FRAMEWORK PROGRAMME
 - ✓ BYTE – 7° FRAMEWORK PROGRAMME
 - ✓ ODIP – 7° FRAMEWORK PROGRAMME /HORIZON 2020



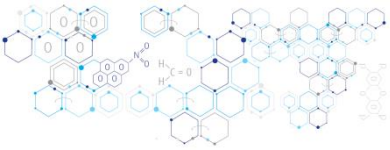
INTERNATIONAL PROJECTS n.7

- 6 closed;
- 1 ongoing:
 - ✓ UNEP – GEF



SCIENTIFIC CONSULTING n.12

- ✓ ENEL S.p.A., AEREOPORTI di ROMA, ILVA S.p.A., etc.



CNR-IAA INFRASTRUCTURES

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 **MONITORING STATION**

 **ENVIRONMENTAL
CHEMISTRY
LABORATORIES**

 **MOBILE LABORATORIES**

 **LARA**

 **AMS**

 **COMPUTATIONAL LAB**

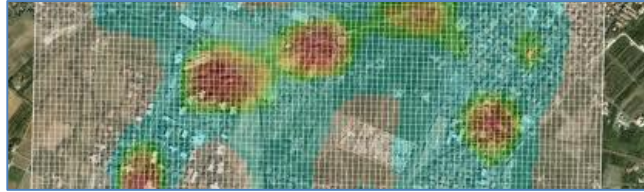
 **FIELD
CAMPAIGN EQUIPMENT**

 **WORKSHOP**

CNR-IIA Infrastructures and Devices

➤ Observation:

- Laboratories
- Mobile units
- Ground-based sites (urban, industrial, remote and polar areas)
- Off-shore sites (oceanographic campaigns)
- High-altitude sites
- Remote Sensing (MIVIS - aircraft, satellite)
- Proximal sensing (UAV, terrestrial Rover)

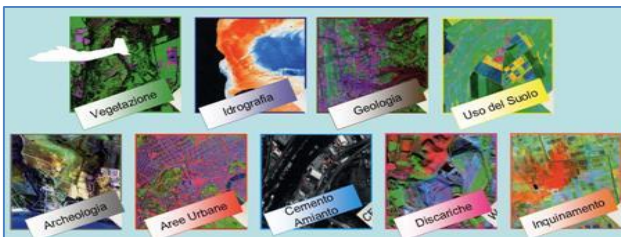


➤ Modelling:

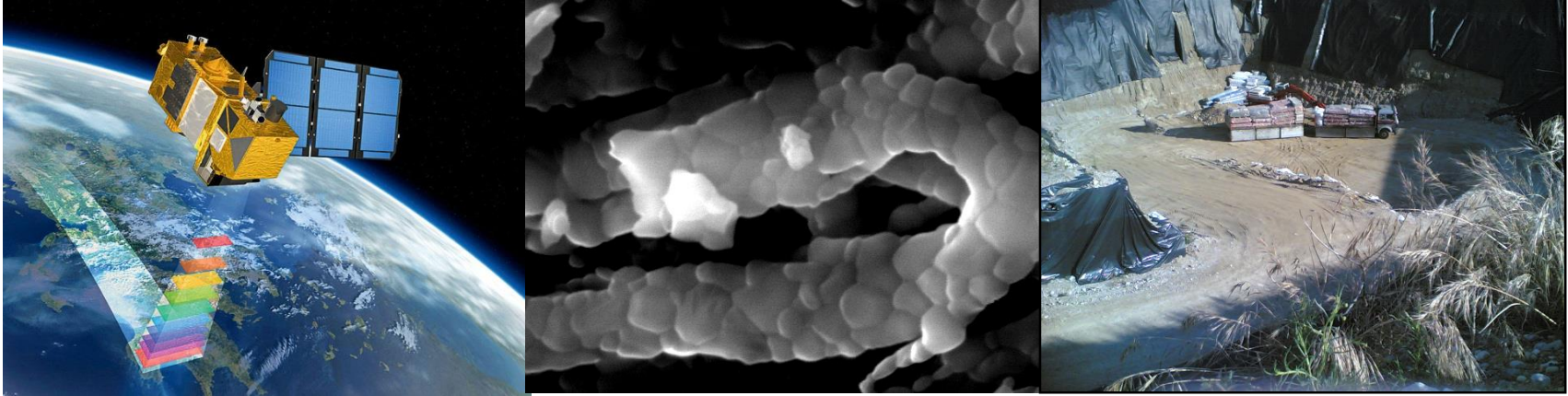
- Atmospheric numerical models (box → urban → reg./cont. → global)
- Receptor models
- Integrated Socio-Economic-Environmental models



➤ GIS /Web GIS → Interoperable systems



CNR-IIA recent agreements



Agreement with Ministry of the Environment for asbestos detection and treatment



Agreement with Ministry of the infrastructures for smart mobility

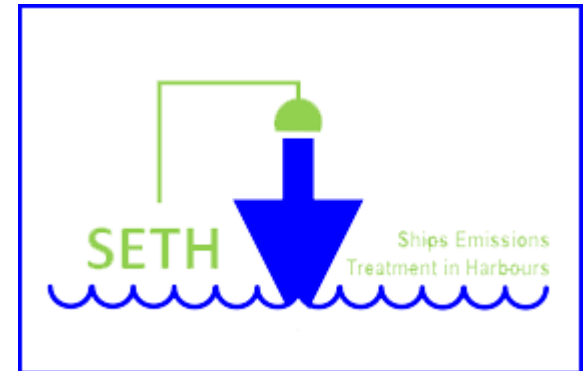
CNR-IIA regional projects



Biomass inventory and long term energy plan, Agreement with Administration of Lazio Region (Central Italy)



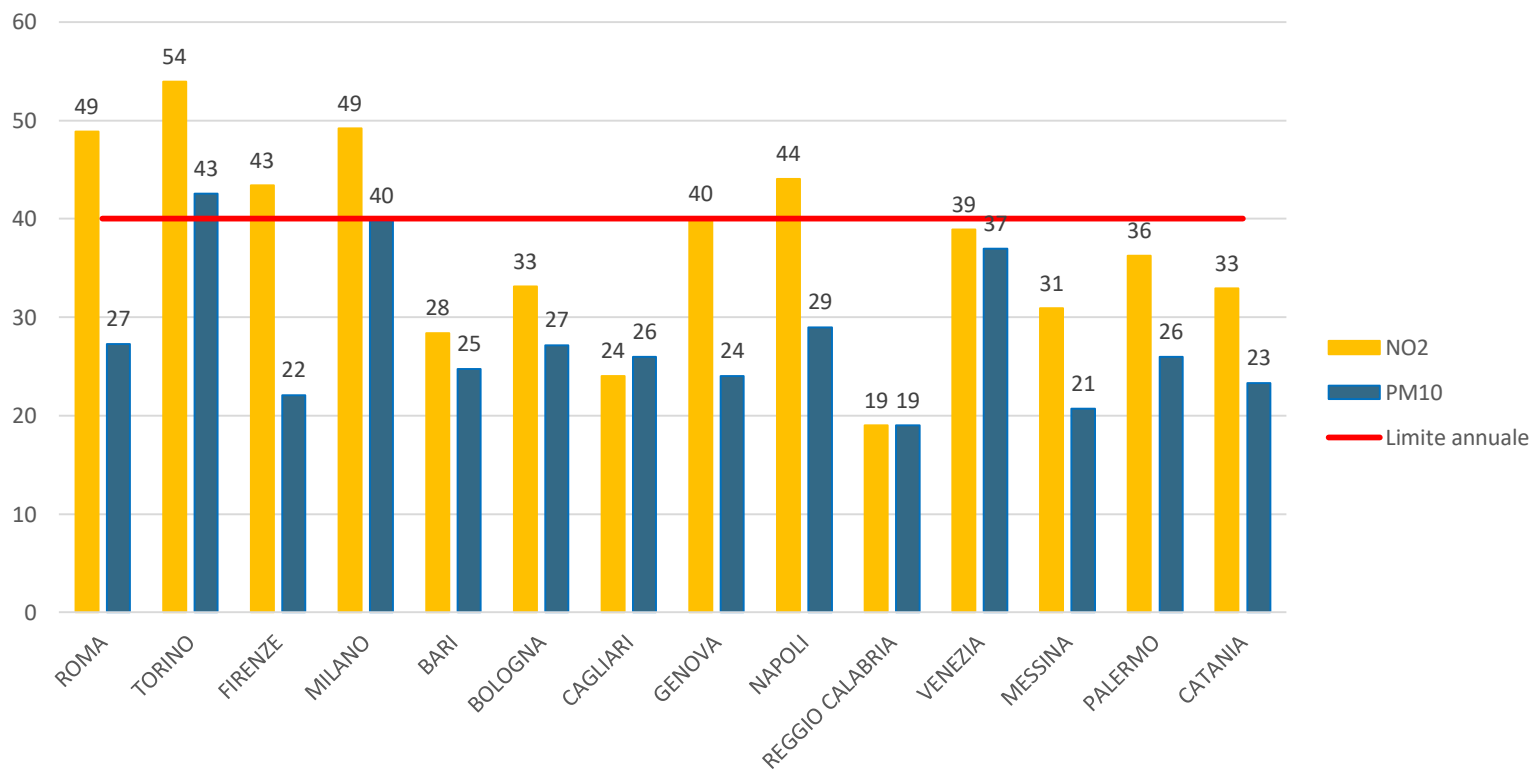
Small scale biogas digester in Calabria (Southern Italy)



SETH project: Ship emission treatment in harbours, funded by Friuli Venezia Giulia Region, Northern Italy

Mobilitaria

Concentrazione media annua NO2 e PM10



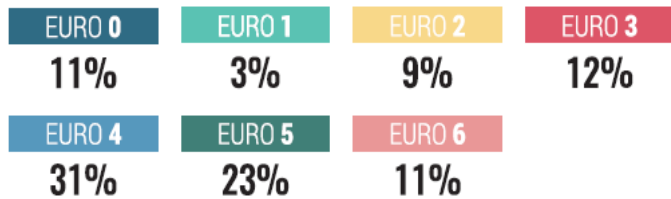
Mobilitaria

Milan

TIPOLOGIE DI AUTOVEICOLI **3.797** AUTOMOBILI/KM² AL 2016



DISTRIBUZIONE DEI **689.841 VEICOLI** AL 2016



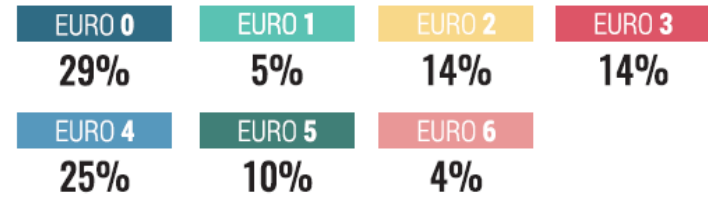
	NUMERO DI VEICOLI AL 2016	TASSO DI CRESCITA 2006/2016
BENZINA	405.484	-22%
GASOLIO	237.851	+13%
GPL	32.880	+381%
METANO	5.552	+289%
IBRIDE	8.390	+3.019%
ELETTRICHE	536	+453%

Neaples

TIPOLOGIE DI AUTOVEICOLI **4.480** AUTOMOBILI/KM² AL 2016



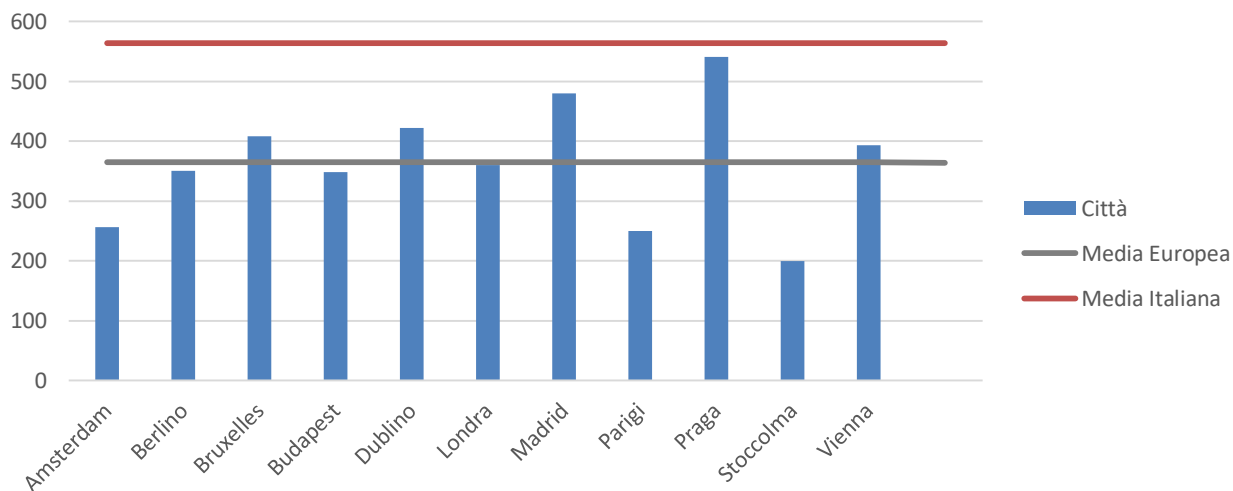
DISTRIBUZIONE DEI **533.147 VEICOLI** AL 2016



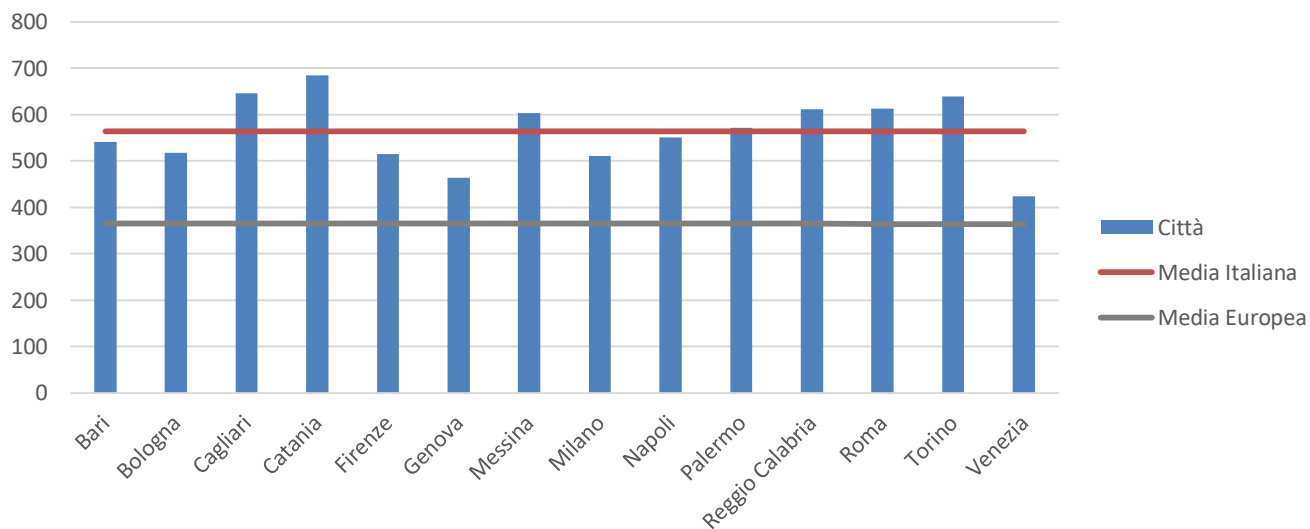
	NUMERO DI VEICOLI AL 2016	TASSO DI CRESCITA 2006/2016
BENZINA	322.849	-20%
GASOLIO	160.585	+27%
GPL	43.223	+114%
METANO	7.188	+268%
IBRIDE	499	+2.672%
ELETTRICHE	22	-42%

Mobilitaria

Europa: tasso di motorizzazione



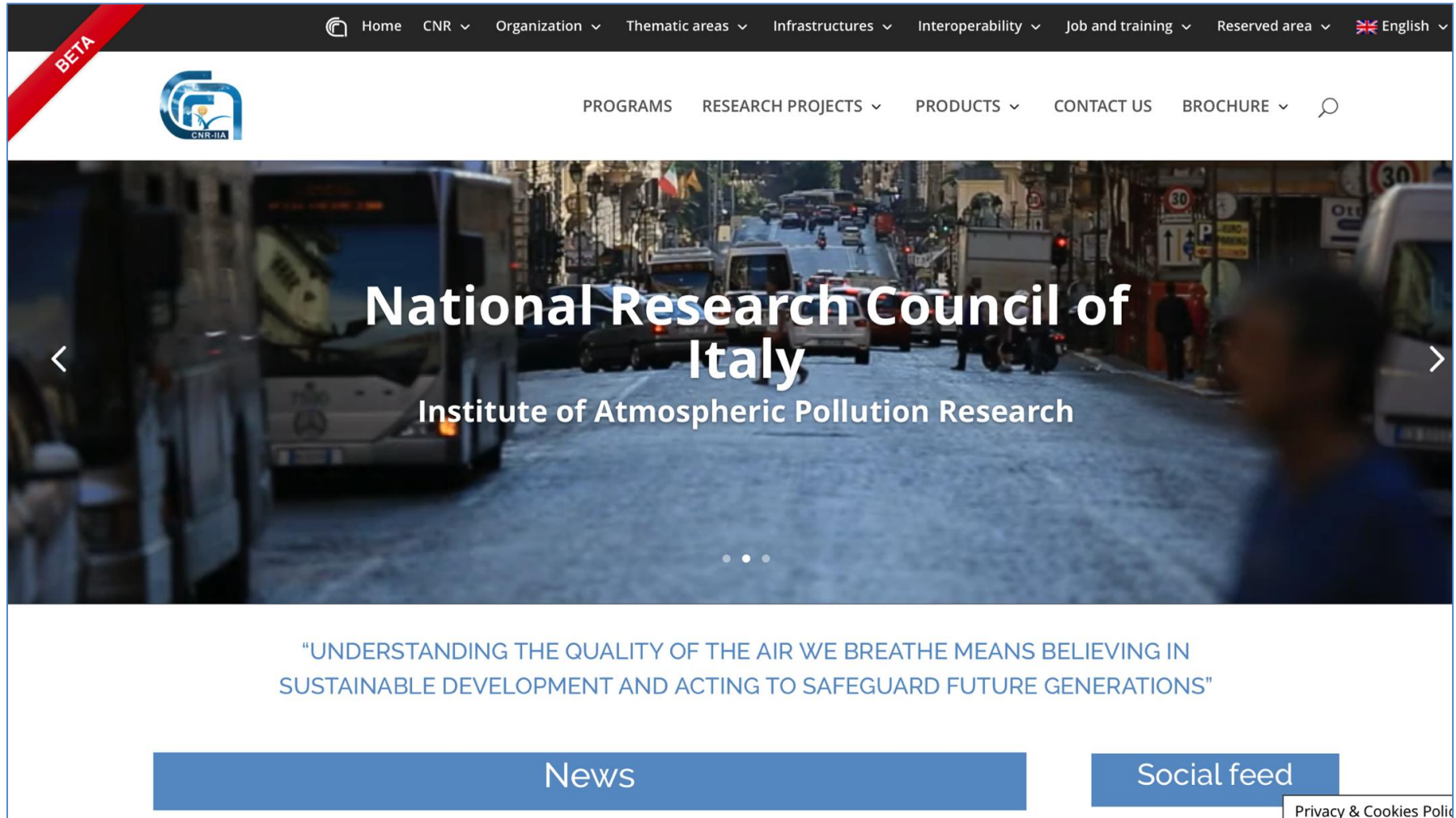
Italia: tasso di motorizzazione



Thanks for your attention!

Valerio Paolini v.paolini@iia.cnr.it

Further information: www.iia.cnr.it



The screenshot shows the homepage of the National Research Council of Italy, Institute of Atmospheric Pollution Research. The page features a dark navigation bar with a 'BETA' banner on the left. The main navigation menu includes Home, CNR, Organization, Thematic areas, Infrastructures, Interoperability, Job and training, Reserved area, and English. Below the navigation bar is a search bar and a secondary menu with PROGRAMS, RESEARCH PROJECTS, PRODUCTS, CONTACT US, and BROCHURE. The main content area is a large image of a busy city street with a white bus and cars. Overlaid on the image is the text 'National Research Council of Italy' and 'Institute of Atmospheric Pollution Research'. Below the image is a quote: 'UNDERSTANDING THE QUALITY OF THE AIR WE BREATHE MEANS BELIEVING IN SUSTAINABLE DEVELOPMENT AND ACTING TO SAFEGUARD FUTURE GENERATIONS'. At the bottom, there are two blue buttons: 'News' and 'Social feed'. A 'Privacy & Cookies Policy' link is visible in the bottom right corner.

BETA

Home CNR Organization Thematic areas Infrastructures Interoperability Job and training Reserved area English

PROGRAMS RESEARCH PROJECTS PRODUCTS CONTACT US BROCHURE

National Research Council of Italy
Institute of Atmospheric Pollution Research

“UNDERSTANDING THE QUALITY OF THE AIR WE BREATHE MEANS BELIEVING IN SUSTAINABLE DEVELOPMENT AND ACTING TO SAFEGUARD FUTURE GENERATIONS”

News Social feed

Privacy & Cookies Policy