



EU best practices of sustainable mobility

Valerio Paolini, Laura Tomassetti, Valeria Rizza and Francesco Petracchini

ISTITUTE FOR ATMOSPHERIC POLLUTION RESEARCH

Operating Unit in Florence

- 5 Permanent
- 6 Temporary
- 1 Research Fellow



Head Office in MLIB – Rome

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

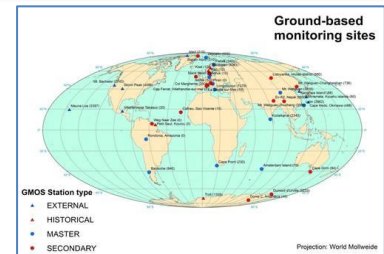


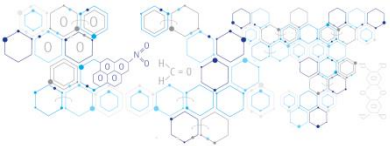
Operating Unit at MATTM – Rome

- 9 Permanent
- 23 Temporary

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

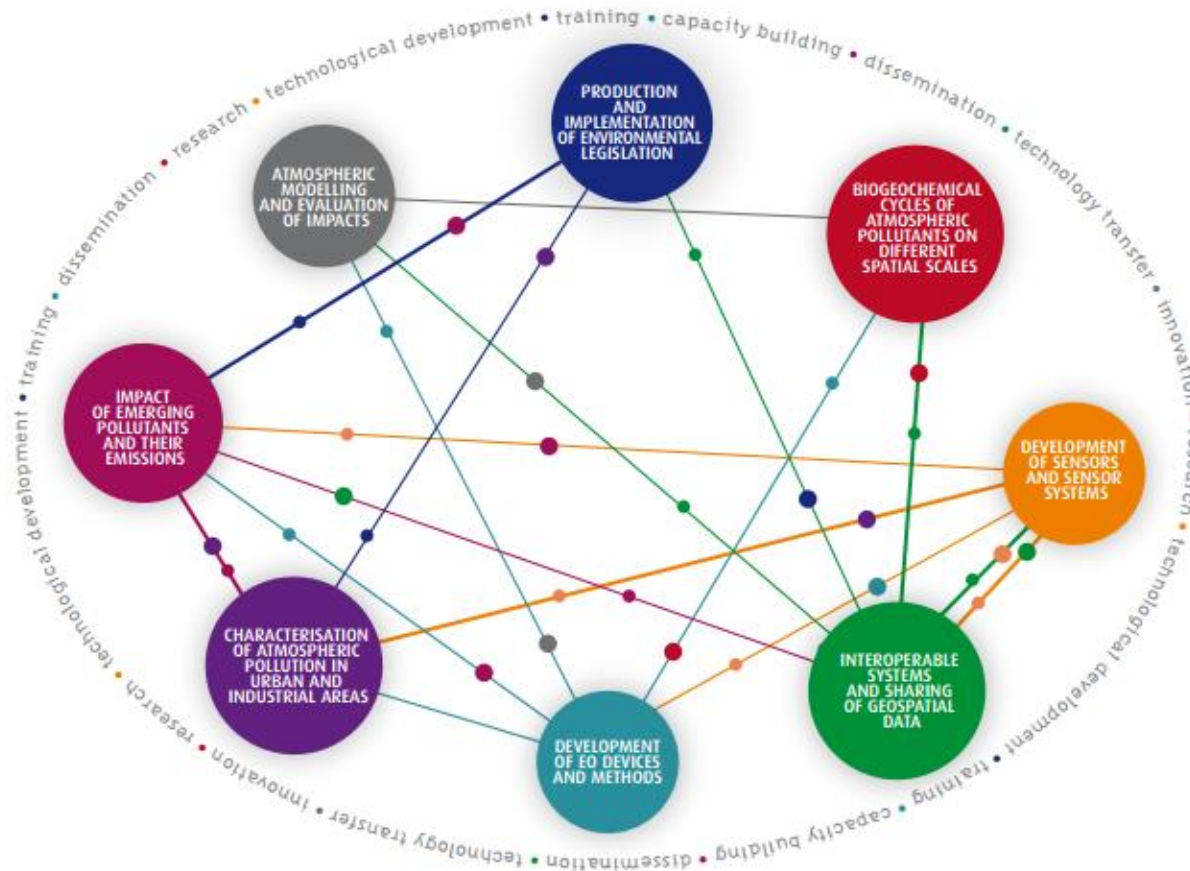
air
our
natural
environment

mis
sion

“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)



UNECE-LTRAP

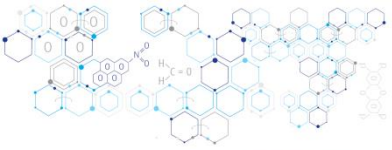
The Institute provides scientific support within the UNECE Convention on Long-Range Transboundary Air Pollution (CLRTAP).

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



European Space Agency



MINISTERO DELL'ISTRUZIONE DELL'UNIVERSITA' E DELLA RICERCA



LEGAMBIENTE



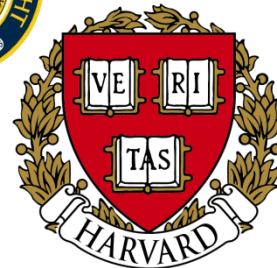
Norsk institutt for luftforskning
Norwegian Institute for Air Research



National Institute for
Environmental
Studies



Enel



Farnesina
Ministero degli Affari Esteri
e della Cooperazione Internazionale



ERA-PLANET Network

Network Details

Participants	Countries	Joint Calls
41	19	0
<hr/>		
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



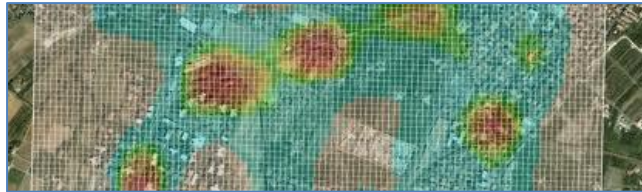
- **SCIENTIFIC CONSULTING n.12**

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

CNR-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)

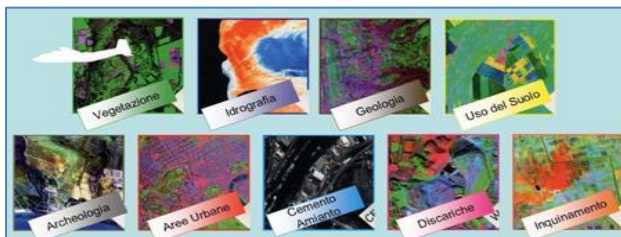


➤ Modelling:

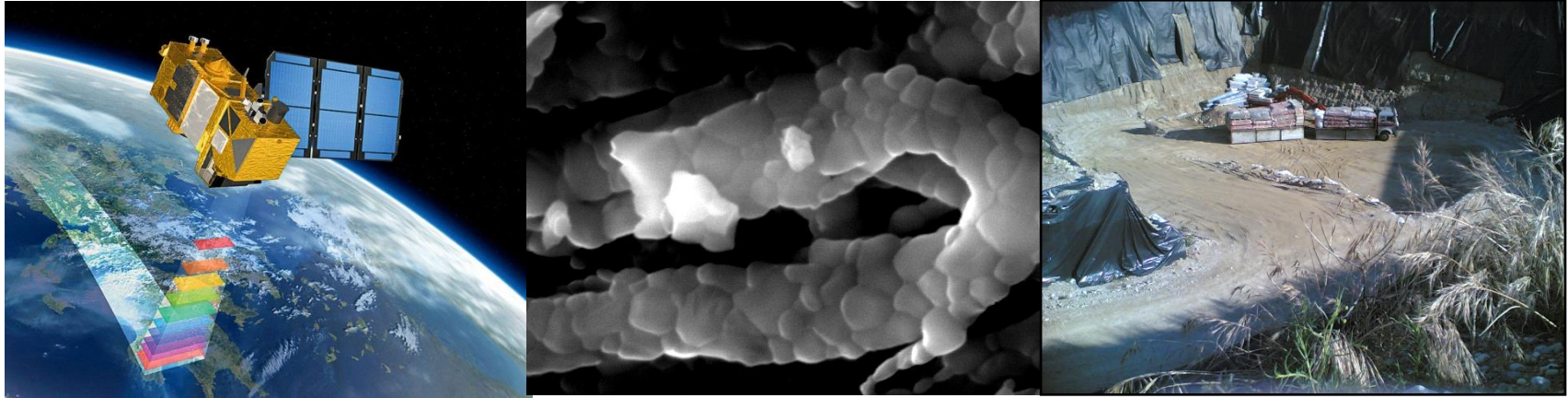
- Atmospheric numerical models (box → urban → reg./cont. → global)
- Receptor models
- Integrated Socio-Economic-Environmental models



➤ 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

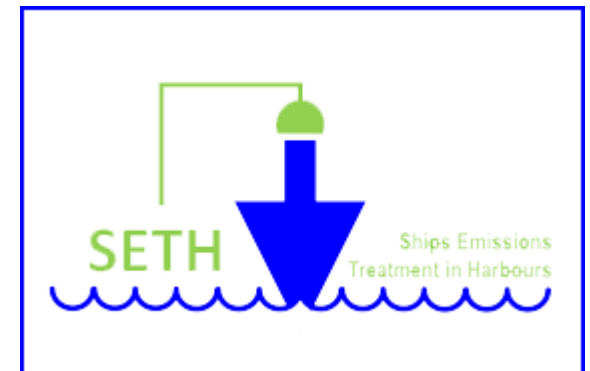
CNR-IIA regional projects



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



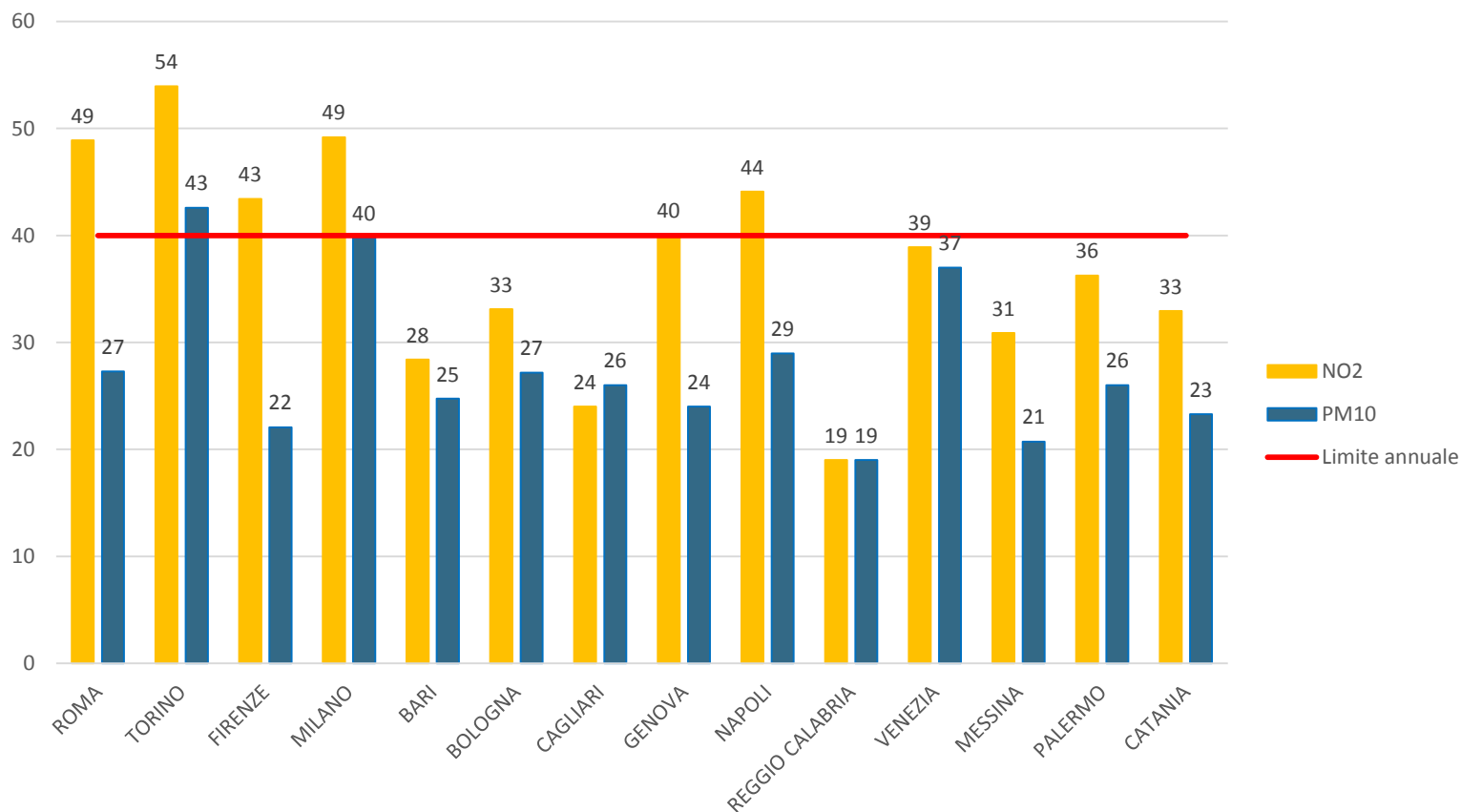
Small scale biogas digester in Calabria (Southern Italy)



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

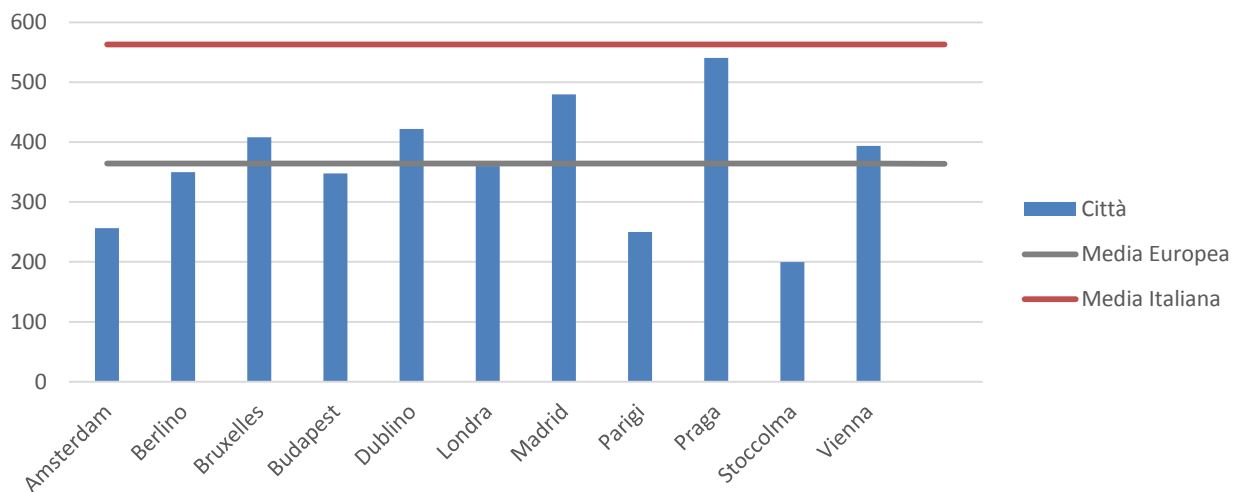
Mobilitaria

Average NOx and PM10 concentration

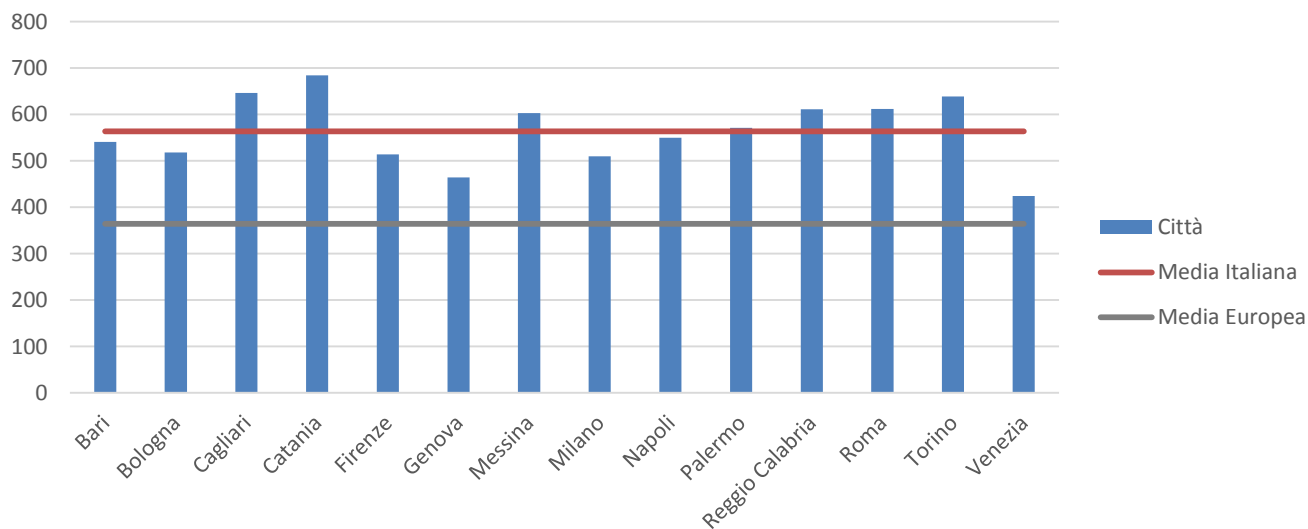


Mobilitaria

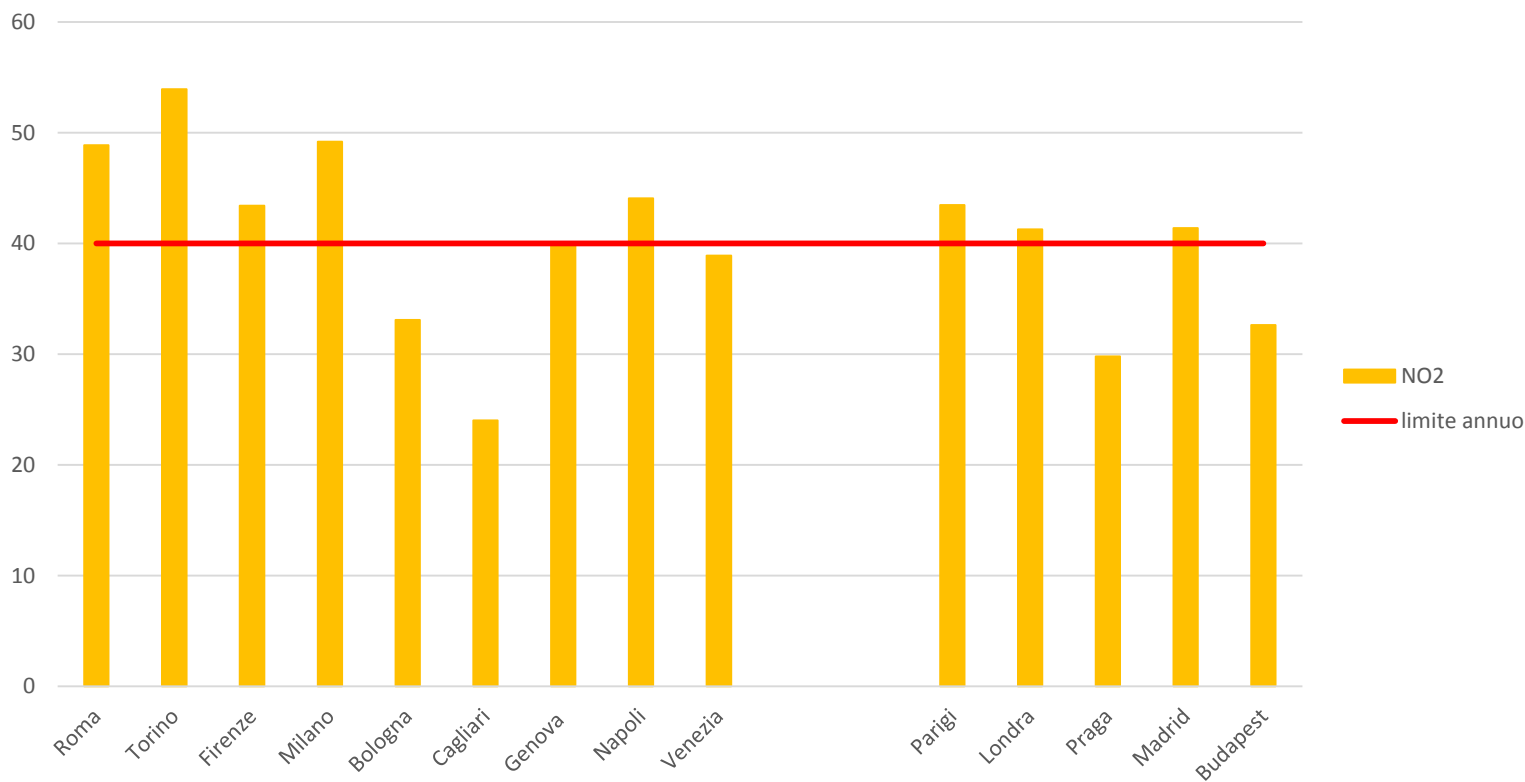
Europe: motorisation rate



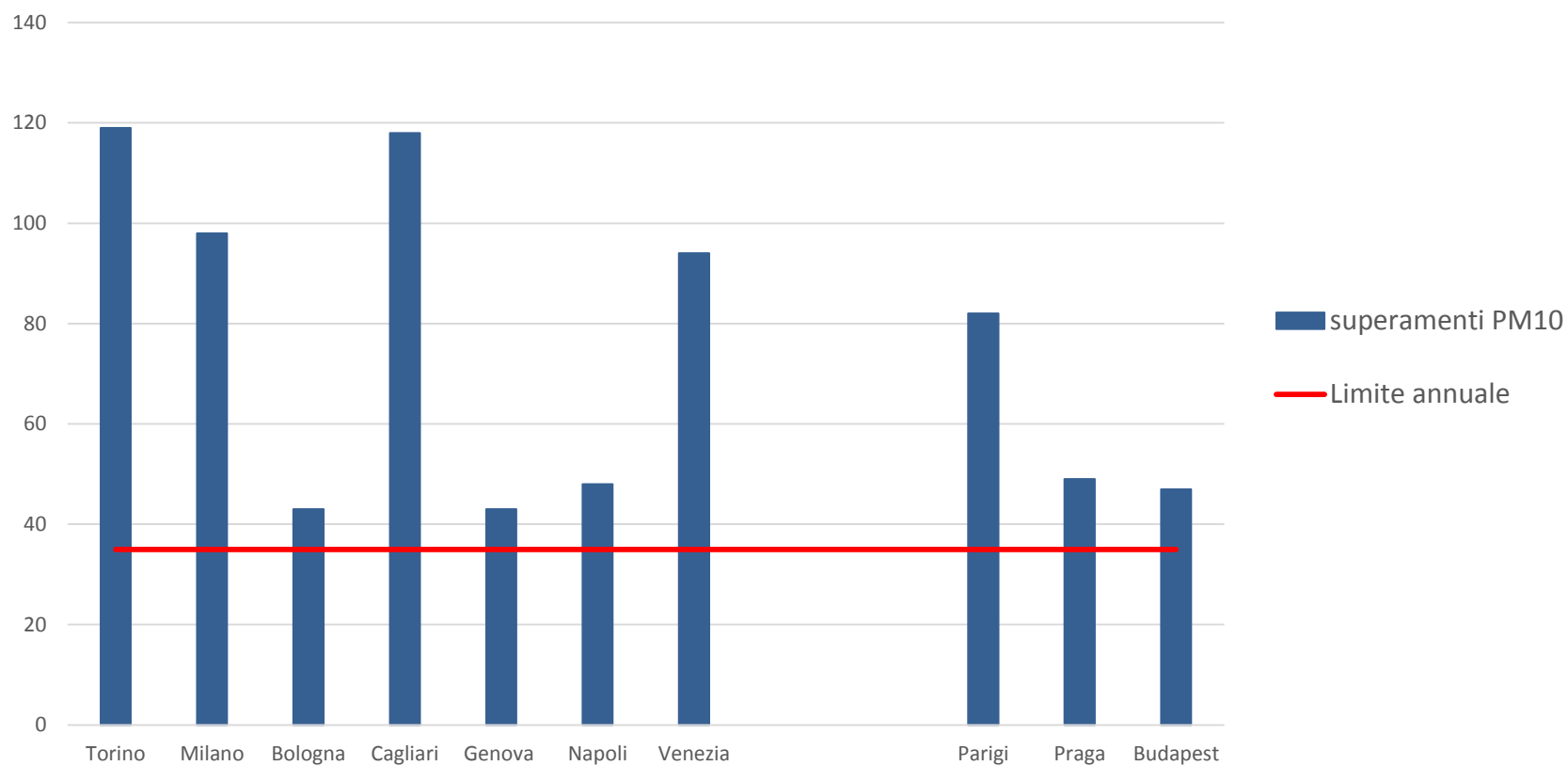
Italy: motorisation rate



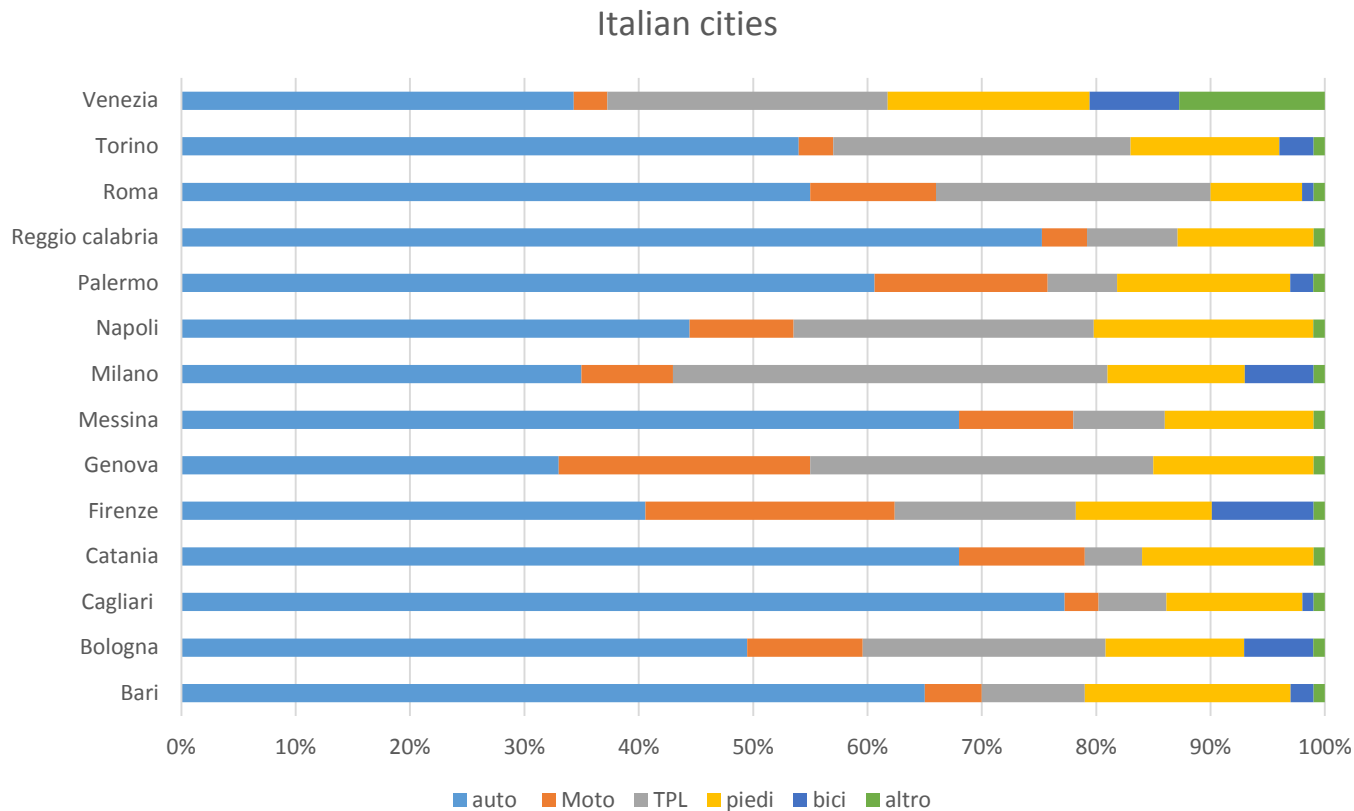
NO2 exceedances



PM10 exceedances

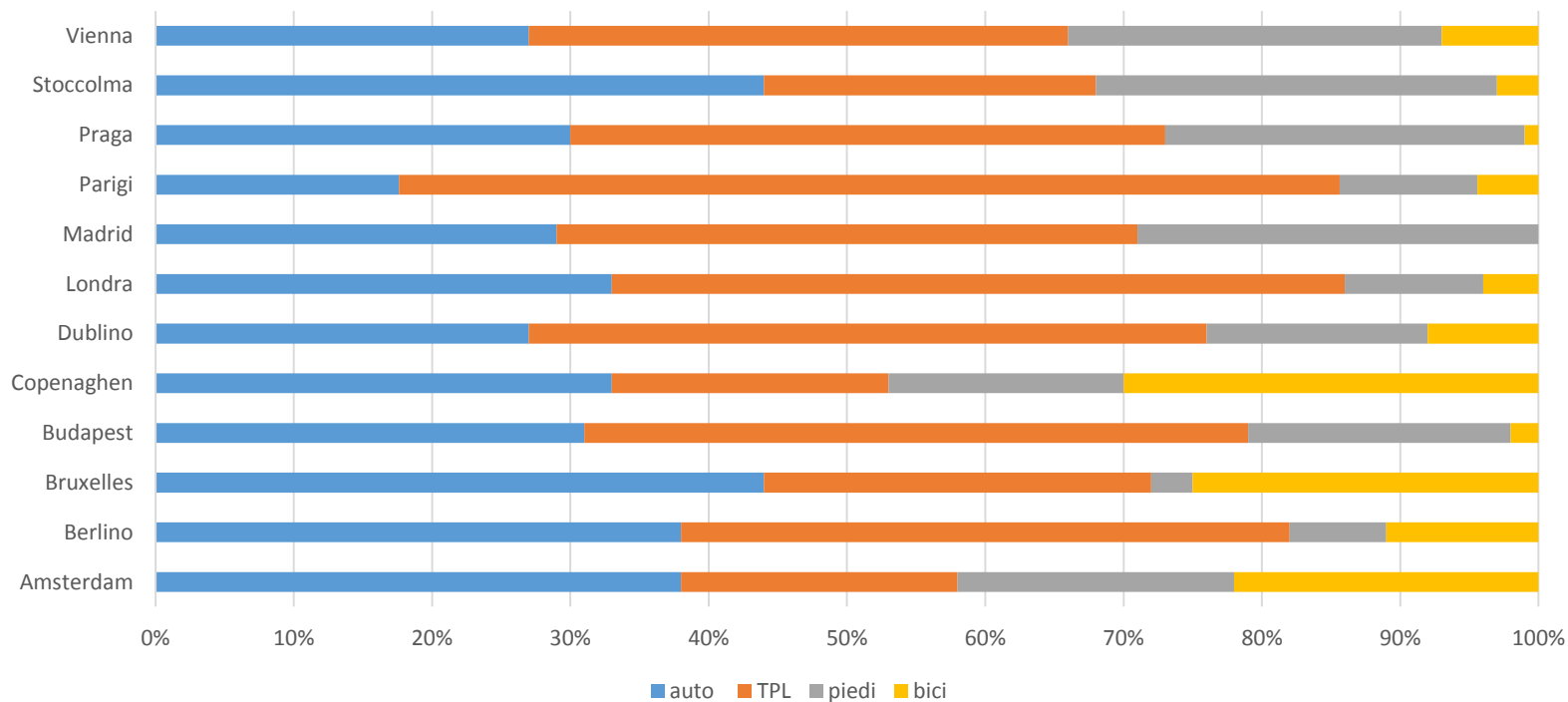


MODAL SPLIT



MODAL SPLIT

EU cities



Mobilitaria

Milan

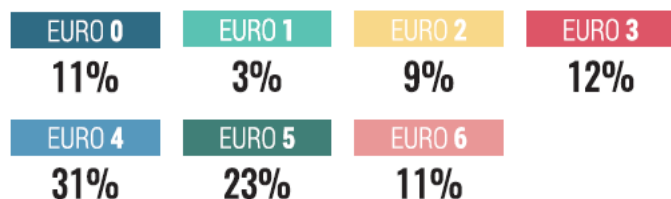
TIPOLOGIE DI
AUTOVEICOLI

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

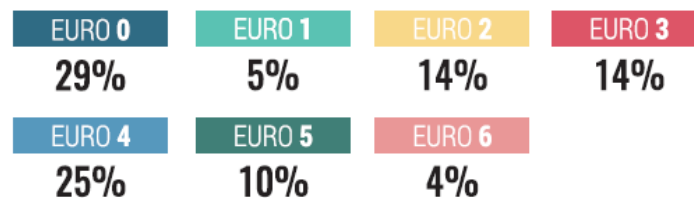
TIPOLOGIE DI
AUTOVEICOLI

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%

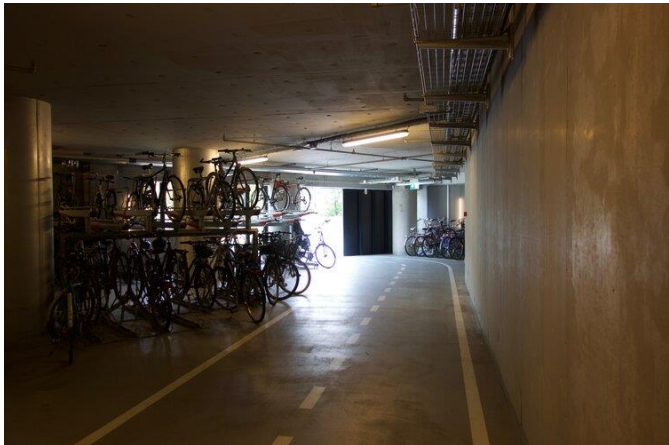
EU BEST PRACTICES

BIKE INFRASTRUCTURES

COPENAGHEN

150 milion euro in a decade.

Dedicated train line for bike users
Connection with Malmö (Sweden).



Maersk Tower
950 bicycle slot



BIKE INFRASTRUCTURES

Amsterdam

Leading tests on specific traffic lights for bikes, and waiting places ahead cars.

Next steps:

- New bike bridges
- Boats for bikers
- Further parking areas



(C) Baby Routes

BIKE SHARING

London

Santander Cycles (Bixi, tested in Montréal, Canada).
July 2010: 315 bikes with stations in 8 districts
Today: 8.000 bikes and 400 stalls.



BIKE SHARING

PARIS

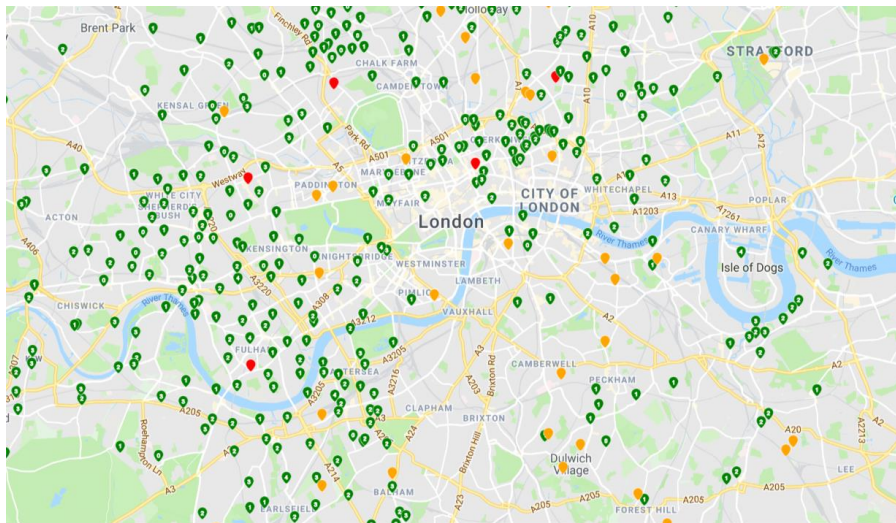


In 2018 Velib became Velib Metropol:
E-bike extended to 60
municipalities in the metropolitan
area.



CHARGING STATIONS

Source London



100% green energy
Currently 1000 charging stations
2000 charging places by the end of 2020.

ZERO EMISSION LPT

EU market:
2018: saled 650 e-bus
2025: 160.000 per year
(Interact Analysis)

Geographical differences:
Netherland, UK, France, Poland and Germany
alone are 50% of all EU e-bus (T&E)

C40 - Fossil Fuel Free Streets Declaration

1. Buy only zero emission bus by 2025;
2. Create a large zero-emission area by 2030.

40 cities including

- Paris
- London
- Copenhagen
- Amsterdam
- Barcelona
- Berlin
- Moscow
- Oslo
- Rome
- Rotterdam
- Warsaw

ZERO EMISSION LPT

Paris

- No diesel bus since 2014: only hybrid, CNG or electric.
- Zero-emission fleet foreseen in 2025.

Copenhagen -

Since 2019 all new bus are zero-emissions.

London

- All 2 floor buses are hybrid since 2019.
- All 1 floor buses will be hybrid by end of 2020.
- By 2037, all (9.200) bus in London will be zero emission.



ZERO EMISSION PRIVATE MOBILITY

Berlin

- Over 1.100 charging places by June 2020.
- Energy and climate protection programme of Berlin (BEK)
- No fossil car by 2050



ZERO EMISSION PRIVATE MOBILITY

Copenhagen

Today 85% is zero emissions

By 2025, all private cars must be zero-emissions.

By 2025, 100% of private non-cars vehicles (e.g. trucks etc) must use alternate fuels (biomethane, biodiesel etc).



ZERO EMISSION LOGISTICS

Paris

Utilib: A fleet of 100 e-cars for companies.

Objective: no diesel by the end of 2020



ZERO EMISSION LOGISTICS

Berlin

Programme Welmo - Business related electromobility
Funding low emission vehicles for SMEs.



ZERO EMISSION LOGISTICS

Amsterdam - Green Deal Zero Emission City Logistics. Objective: no emissions from logistics in 2025. Signed by +50 stakeholders.



Amsterdam Logistic Cityhub

Electric boats for transportation of goods.




Final remarks


- Connections between air quality and urban mobility
- Modal split, motorization rate, LPT offer and demand
- Bike and e-bike sharing and infrastructures
- Zero-emissions LPT
- Zero emission private mobility and logistics

Thanks for your attention!


Further information: www.iaa.cnr.it








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National Research Council of Italy

Institute of Atmospheric Pollution Research

◀ ▶

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

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