



I S C L E A N A I R[®]

B R E A T H E Y O U R L I F E



**A I R P O L L U T I O N
A B A T E M E N T**

SOLUTIONS AND SERVICES EVERYWHERE

CLEAN AIR IS A NEED AND A RIGHT FOR PEOPLE, OUR DUTY IS TO DELIVER IT EVERYWHERE



MANY SOLUTIONS ALREADY INSTALLED IN WORKPLACES, INDUSTRIAL SITES AND URBAN SPACES, INDOOR AND OUTDOOR, TO IMPROVE HUMAN HEALTH AND WELL BEING



CLEAN AIR EVERYWHERE

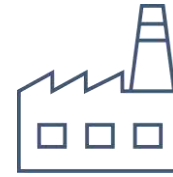
KEY ENABLING TECHNOLOGY (KET) and BEST AVAILABLE TECHNOLOGY (EU DIRECTIVE – IPCC 2008/1/CE)

Clean air cities



Intelligent service delivery platform and related solutions for social and economic goals, serving cities, citizens and Public Governments

Clean air workplaces



At surface level and distributed, serving people and the environment in all industries and working sites

Clean air buildings



As verticals: industrial and civil buildings, household – domestic markets, public and private locals/offices, malls, hospitals and clinics, etc.

Moving on environmental programs and initiatives to promote CLEAN AIR EVERYWHERE, operating at surface level (where we breathe)
 Education and culture developments for awareness, at the service of the people and the environment

“A filter-less air pollution abatement system able to clean a wide range of pollutants at ground level, for a healthier and more sustainable environment”

(EU Horizon 2020, “Seal of Excellence” and “GRANTS”)

APA abates a wide variety of pollutants:

- PMs
- NOx
- SOx
- O₃
- CO
- CO₂
- Heavy metals
- Hydrocarbons
- Pollens and spores



- Up to 99.7% reduction on particulate matter - PM10
- BAT – Best Available Technology (Directive EU - IPPC D2008/1/CE)
- Multi-patents disruptive filter-less water-based technology
- Low TCO, 0 waste, Energy Efficiency (SOLAR IMPULSE certified)
- Noise level as low as 38dB(A)
- Real-time & Cloud-based control, remotely or locally

The best and cost effective technology specifically designed for the abatement of air pollutants in people's living and working environments

Each APA system creates a bubble of clean air, for **approx. 25m of radius** (or approx. 2,000 m²)



APA's STRENGTHS



FILTER-LESS
TECHNOLOGY



MODULAR AND
MULTI-SHAPED



LOW RUNNING
COSTS AND REAL
ECONOMIC SAVING



WORKS INDOORS
AND OUTDOORS



NO SPECIAL
WASTE



INTERNET
OF THINGS AND
MULTIDISCIPLINARY
SERVICES



REMOTE
MONITORING
AND MANAGEMENT

APA CAN BE USED EVERYWHERE

URBAN SPACES, BUILDINGS, WORKING
AREAS AND ON POLLUTING SOURCES



INNOVATION

SUSTAINABILITY

PROJECTS, SOLUTIONS
and SERVICES

RELIABILITY

STAKEHOLDER
RELATIONSHIPS

QUALITY and
DIFFERENTIATION

WHY APA SYSTEM?

«Abates the widest spectrum of air pollutants, acting also as a network, at ground level»

Over than 6 years of validation have shown APA as the best innovative technology in terms of applications and practical ambient abatement solutions



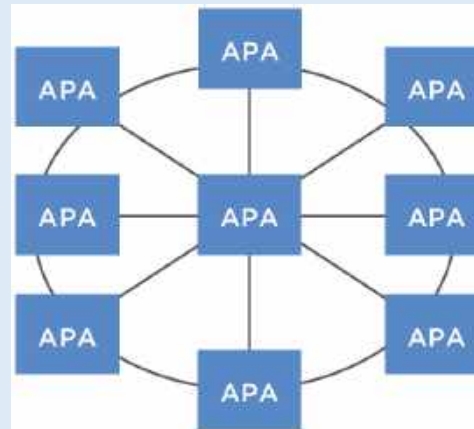
Pollutant	Time typically required to reach a 90% abatement	
	OUTDOOR	INDOOR
PM 10	1 to 3 weeks	2 to 5 days
NO	6 to 8 weeks	5 to 7 days
NO ₂	6 to 8 weeks	5 to 7 days
SO _x	5 to 10 hours	20 to 40 minutes
O ₃	3 to 8 hours	15 to 20 minutes

For an APA cluster at full capacity

Tecnology	kWh	Number of Interventions	Hours of maintenance
APA	0.5	1	14
Main Competitor	5	>10	205

Based on 5.000 hours (> 200 days) of trial in Rome

Unique and patented Distributed Intelligent Platform



- Sensors to monitor and control in situ and remotely in real-time (cloud-based)
- Provide real-time feedback and information on the network performance
- Ability to switch on/off remotely APA systems depending on ambient air quality levels, minimising even further the operating costs



Modular, scalable and flexible

INTELLIGENT SMART MULTI-PLATFORMS

Main solutions up to date for industrial sites, urban spaces, industries and workplaces (private and public)

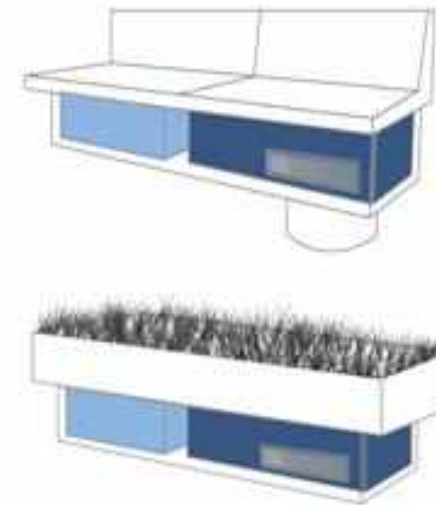
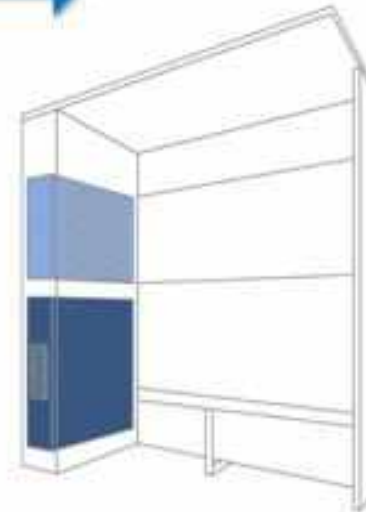
- Flexible, modular and scalable design, easy to install «as is», manage and integrate to pre-existing infrastructures
- Smart multiservice platform enabling wifi, IoT, AI, ADs and renewable supplies in a cluster of interconnected solutions, WHERE PEOPLE LIVE, at surface level

SMART = Sustainable, Measurable, Achievable, Realistic, Timely

TODAY



ENABLED



TOMORROW



APA RE-THINKS AND RE-DESIGNS ALL THE SPACES OF TOMORROW

“Both in working and urban areas and on some polluting sources, to improve the efficacy ”

URBAN

- Hospitals and healthcare structures
- Schools and nursery schools
- Museums, libraries, theatres and theme parks
- Shopping malls and galleries, restaurant chains
- Public and private offices and places
- Apartment blocks and residential complexes
- Parks, streets and meeting points
- Airports and ports
- Railway and underground stations and docks
- Bus and coach stops and stations
- Underground and surface car parks
- Petrol stations
- Tunnels, toll booths and refreshment areas

INDUSTRIAL

- Waste cycle management
- Centers for goods handling and transportation management
- Building and construction
- Chemical industry
- Production of dry food and pre-slaughter breeding farms
- Cogeneration plants
- Metal manufacturing and steel plants
- Manufacturing of plastic materials
- Marble working, manufacturing of ceramics and fiberglass
- Paint furnaces
- Mechanical workshops
- Manufacturing of wood, paper and cellulose

MAIN URBAN "POLLUTION FREE" INITIATIVES



CIAMPINO AIRPORT
(indoor and outdoor)



INCINERATOR - PADOVA



WASTE TREATMENT - CECINA



CLEAN AIR MALL - ROME



POLLUTION FREE SCHOOL - ROME

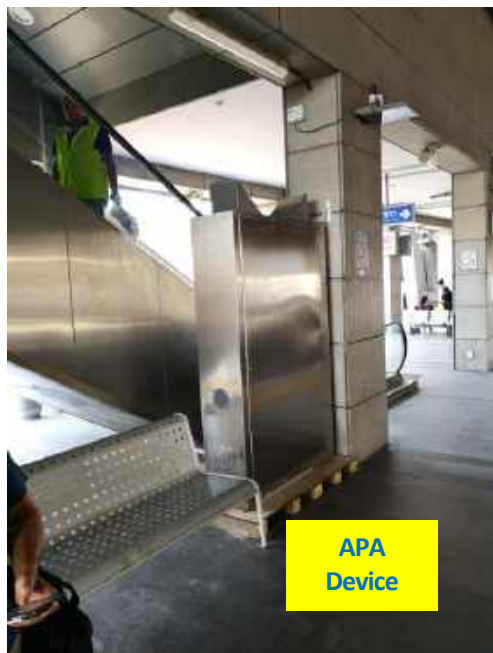


1ST SMART CLEAN AIR CITY L'AQUILA

RECENT URBAN "POLLUTION FREE" INITIATIVES



Italy – G7 Summit
Taormina
Demonstrator May 2017



APA Device



Precision Monitoring

Israel - Tel Aviv Rail Station
Completed deployment in Dec 2019



France - Engie Paris
Completed deployment in Dec 2019



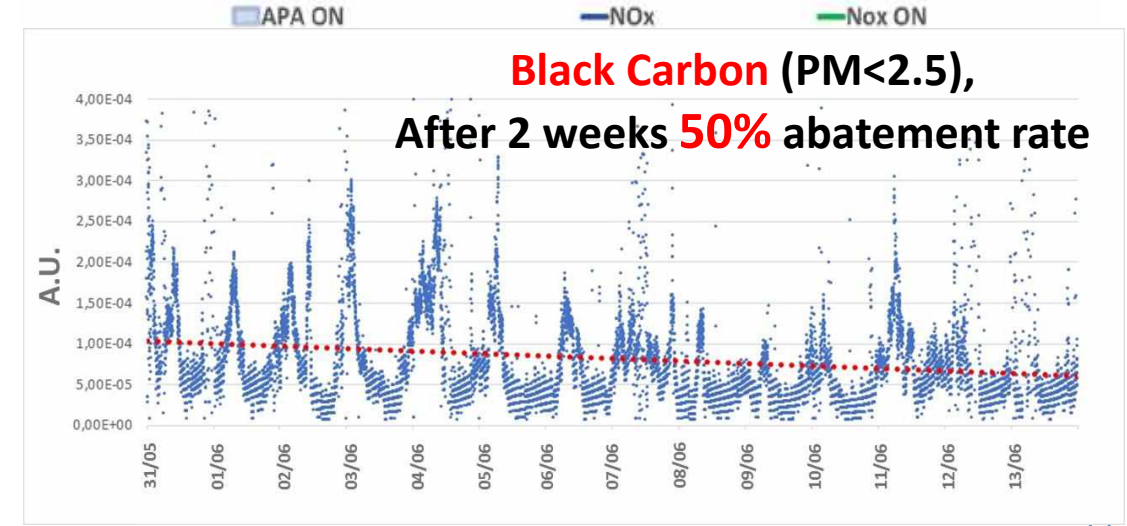
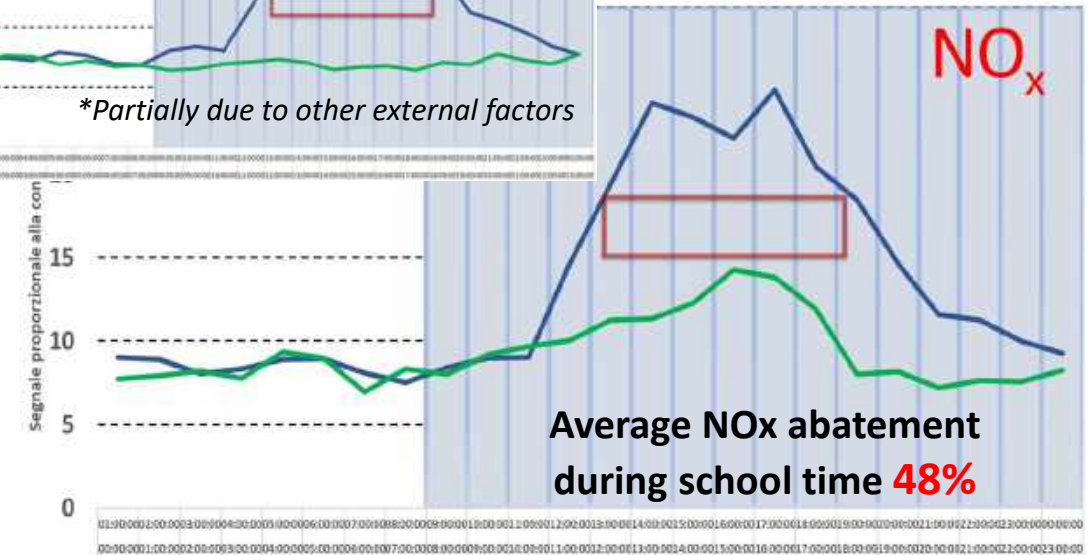
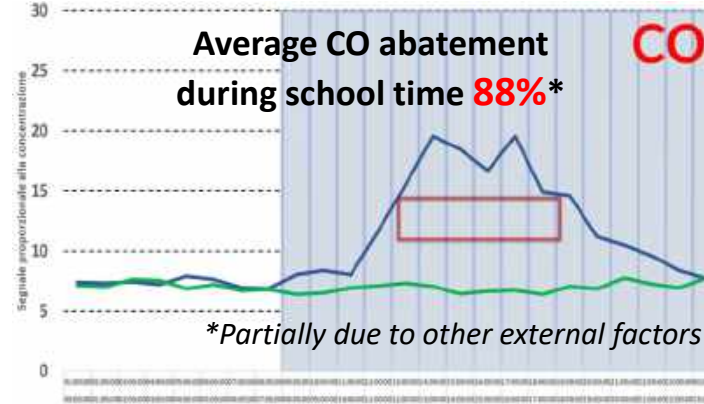
MEASURED RESULTS

«Pollution free School» Initiative, measurements as at June 2018



ROME
Giuseppe Bagnera School

APA cleaned in few weeks the pollutants inside and in the surrounding of schools, reducing pupils' exposure



BENEFITS: A CASE

- 7 APA platforms
- Configuration as a cluster of pollution absorbers distributed in the area of application



APA Totem



APA Panel

- **In 24h >600,000 m3 of air purified** - (A volume similar to the Indira Gandhi Arena)
- **In 1 year -> free public purified air >230 million of m3** - (Equivalent to the air breathe by 63,000 children over 1 year)
- **>70 kg of PM removed** - (Equivalent to 500,000 vehkm or 8,000 veh/day in 200m road hotspot)

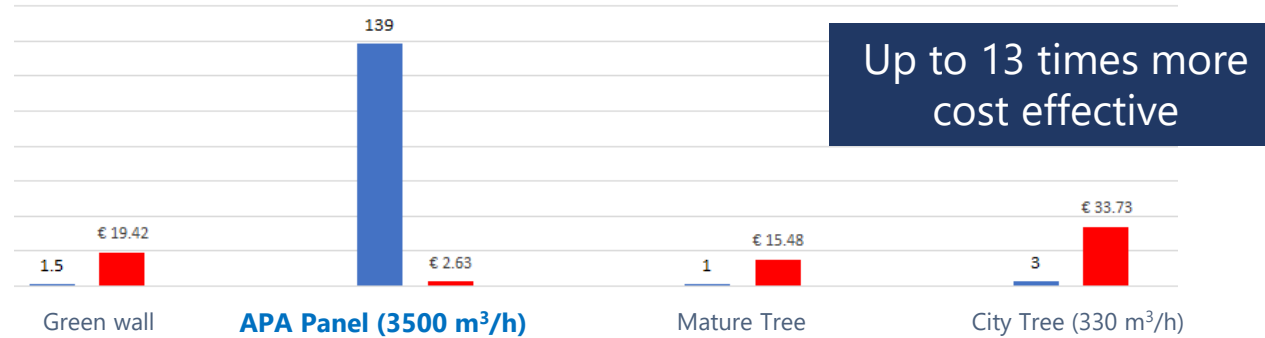


APA VERSUS OTHER SOLUTIONS



**AIR POLLUTION
ABATEMENT**

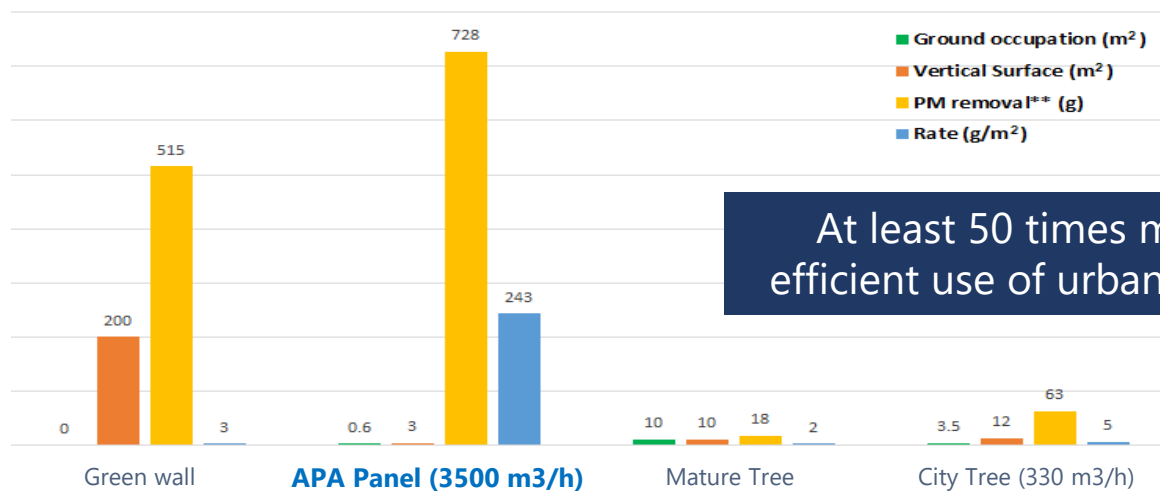
Comparative cleaning power (number of trees equivalent per m² of land occupied) and Cost (for each gr of PM removed over 3 yr period)



Up to 13 times more cost effective

each gr of PM removed can cost as low as £2.2 over 3 yr period with APA compared to up to £28.7 of other solutions

Comparative chart (refers to a 3 month period calculation)



At least 50 times more efficient use of urban space

APA can remove up to 243g/m² of PM compared to the next best alternative solution (5g/m²)

Alternative Technologies



Green wall




Mature tree



CityTree



APA COMPETITIVE ANALYSIS

<i>Features</i>	Technologies					
		<i>Filter</i>	<i>Scrubber</i>	<i>Bio-filter</i>	<i>Electrostatic (ESP)</i>	<i>Others (in general)</i>
<i>Possible use cases</i>	Indoor – Outdoor – Industrial areas	Indoor - Industrial areas	Indoor - Industrial areas	Indoor - Industrial areas	Indoor - Industrial areas	Indoor - Industrial areas
<i>Scalability</i>	High – Distributed at surface level	Low	Low	Low	Low	Low
<i>Range</i>	Radius \approx 25 m per Unit / At the emission source (special solutions)	At the emission source/ Confined areas	At the emission source/ Confined areas	At the emission source/ Confined areas	At the emission source/ Confined areas	At the emission source/ Confined areas
<i>Maintenance costs</i>	Low (simple water refills & ordinary maintenance required)	High (frequent and need of special treatments of waste disposals)	High (frequent and need of special treatments of waste disposals)	High (frequent and need of special treatments of waste disposals)	High (extremely frequent and complex cleaning of electrostatic plates, special treatment of waste disposals)	High
<i>Total Costs of Ownership - TCO</i>	Low (no need for special waste disposals)	High (recurring costs)	High (recurring costs)	Very high (recurring costs for bioreactor, refills and disposal)	Very high (recurring costs)	High
<i>Energy consumption</i>	Low	High	High	Low	High	-

PEOPLE HAVE IMAGINED IDEAL CITIES AND GOOD PLACE TO WORK, SINCE EVER

RECENTLY URBAN PLANNERS, ARCHITECTS AND DESIGNER PARTICULARLY HAVE DIRECTED THEIR ATTENTION TO THE TYPES OF INFRASTRUCTURE THAT CAN PROVIDE A GREATER QUALITY OF LIFE, SAFEGUARD AND SECURITY AND THE BEST FOR THE HUMAN HEALTH AND WELL – BEING NOT ONLY ENVIRONMENTAL PROTECTION



AIR POLLUTION
ABATEMENT

BREATHE YOUR LIFE