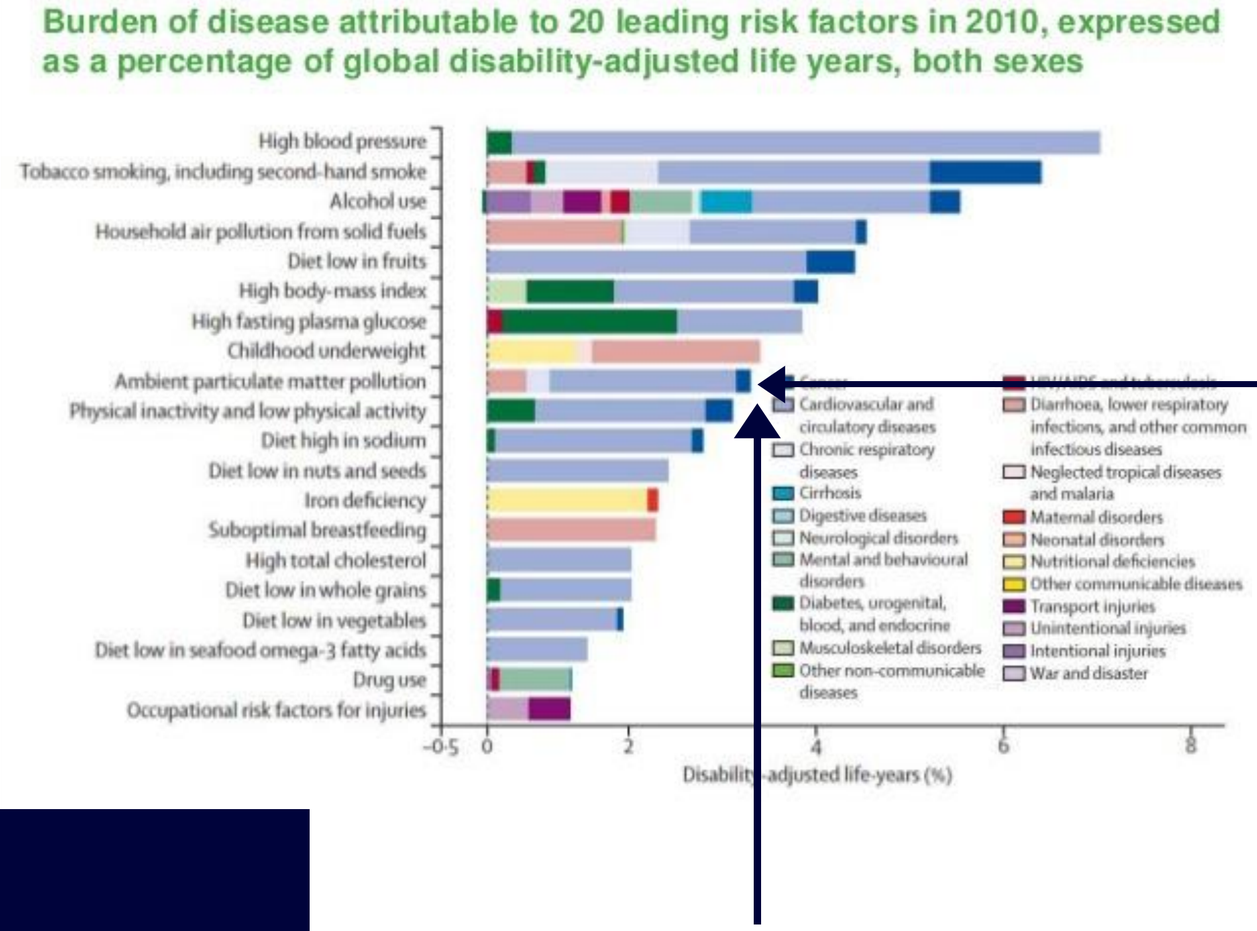
AEROPHILE GROUP

How to fight for a better air quality ?

An exemple **of citizenship awareness and technology innovation.**

Presentation – October 2022

In the world, air pollution is the **9th cause of early death**.



Source : world Health Organization, 2010

Outdoor air pollution by PM (particulate matter)

About 3 years less life for all of Humanity

Le Figaro, March 3, 2020

“Air pollution reduces life expectancy by 3 years“
https://bit.ly/3dkZkPH

AEROPHILE, French company founded in 1993, provides **new answers to the challenge of air quality** in our cities.

1 The Air Quality Balloon

Our huge tethered balloon, inflated with helium, rises naturally to an altitude of 300 m, with an "on-board laboratory" to measure and inform on the quality of the air in the city.

2 Para-PM

An innovative PM 10 & 2.5 capture system, highly efficient, modular and affordable, adapted for semi-open and open spaces.

3 The Aerophiltre

A highly effective depolluting urban furniture, a real fountain of clean air

1 Air Quality Balloon

SYMBOL OF THE FIGHT FOR BETTER AIR QUALITY IN PARIS

AEROPHILE ©

An awareness-raising project **supported by the Mayor of Paris since 2008**!

1.

Thanks to their color, the LEDs installed on the envelope of the Balloon indicate to the Parisians the level of pollution in the ambient air, according to the ATMO index provided by AIRPARIF.

The Balloon is self-financed thanks to the passengers.

It allows to see the capital up to 150 meters high and 300 meters for scientific flights.

It is seen by 400,000 people daily, to make all citizens aware of air quality issues.

The result of a unique partnership between the City of Paris, Generali, CNRS, Airparif and Aerophile.

2.

The public flies aboard a balloon operated and built by Aerophile, and discovers their city from an incomparable point of view, learning also on air quality issue. Journalists use the balloon as a visible symbol of the fight for a better air.

Generali is the sponsor and benefits from public visibility and recognition for its civic commitment.

The City provides an ideal location to collect real-time information on air quality and shows its citizens that the city is committed to this fight.

The CNRS is doing unique research thanks to this flying laboratory obtaining new and unique datas on atmospheric behavior.

Airparif is in charge of monitoring and providing information on air quality. Their indices are broadcasting in real time by balloon lighting.

Thanks to France Télévisions, information on air quality is widely broadcasted by the most popular television channel in Ile-de-France, France 3.

A **popular** air quality measurement tool that **makes the fight against pollution visible to the media**.

3.

CNEWS, June 2020

BFMTV, Avril 2020

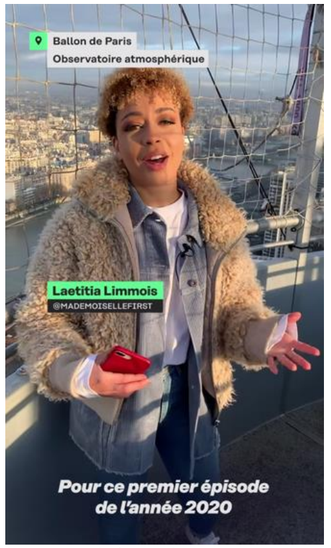
LCI, June 2020

France 3, April 2020

@stephaniestorys75
Franco-Chinese influencer
8,1 K subscribers on YouTube

@polkadotpassport
New Zealander Influencer
128 K subscribers on Instagram

Radio Nova, June 2020



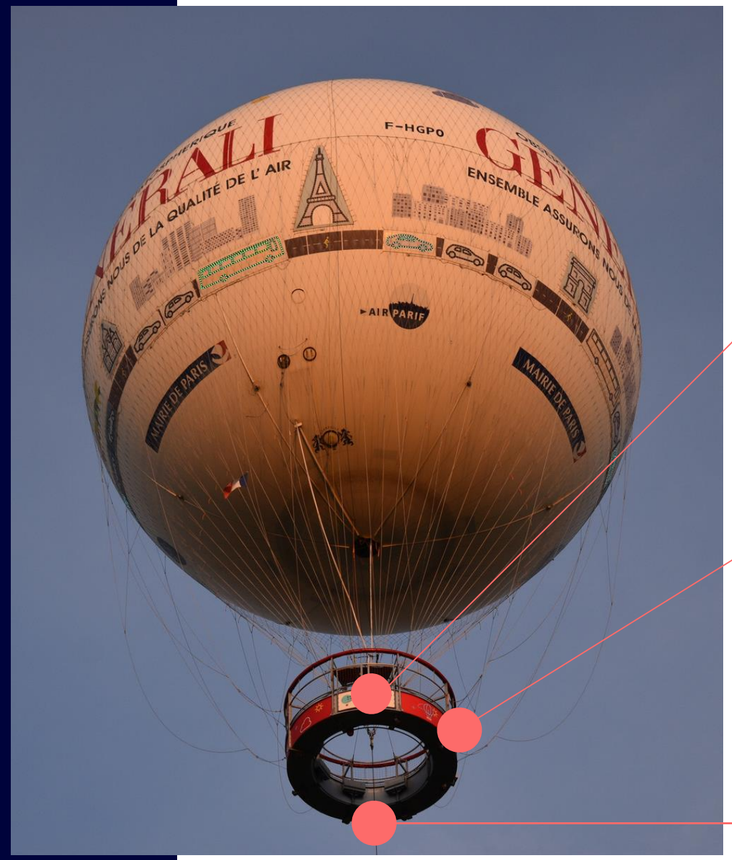
Loopsider, January 2020

@lydianexus
Dutch DJ
258 K subscribers on YouTube

A unique research tool for urban air quality **in the world**

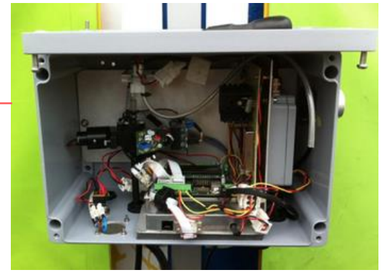
The GENERALI balloon of Paris **measures air quality from 0 to 300 meters above sea level using three devices attached to its gondola**.

4.



LISA, a CNRS laboratory, is conducting many balloon experiments and has notably installed this device which measures ozone continuously.

This instrument was developed as part of President Macron's "Make the planet great again" program. It measures the main pollutants: nitrogen dioxide, nitrogen monoxide, ozone and fine particles.



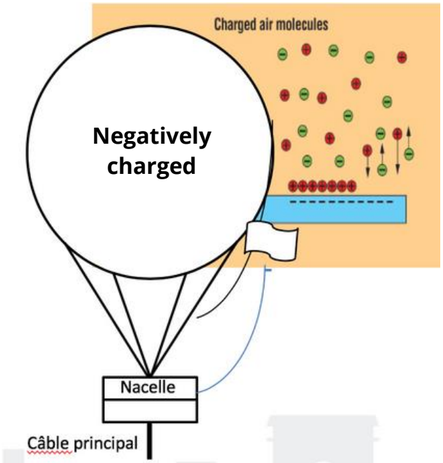
The LOAC, a unique instrument of its kind developed by the LPC2E laboratory of the CNRS, is equipped with a pump which sucks in the air and a laser which projects the dust thus collected, in order to count them and better understand their typology.

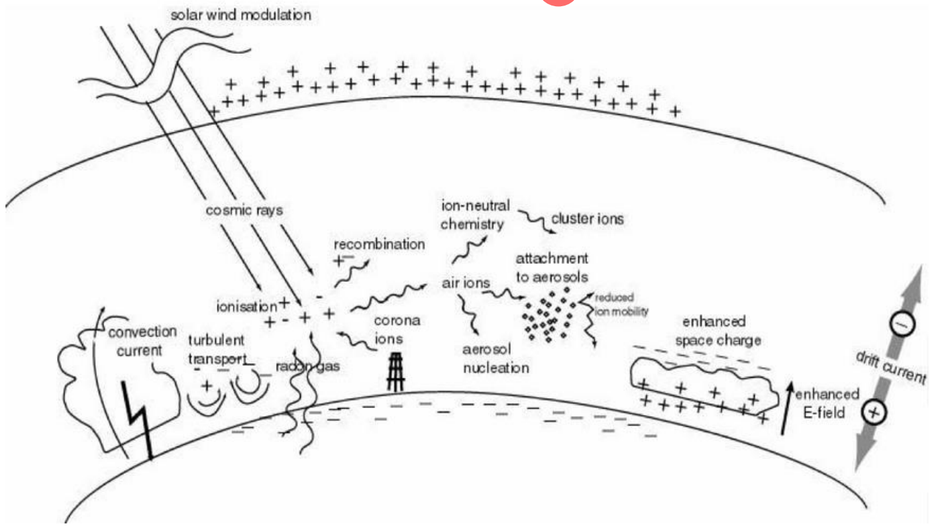
The Generali balloon **cleans up naturally**.

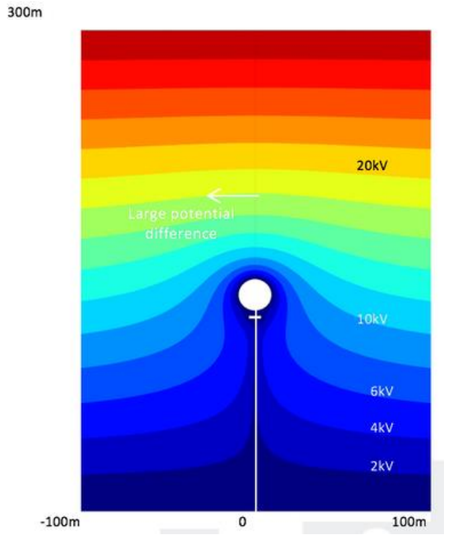
Thanks to atmospheric electricity, **the balloon attracts as many Particulate Matters as a surface area from 2.5 to 100 hectares depending on the wind's speed.**

5.

The balloon has the same potential as Earth and attracts fine positively charged particles.







Because the balloon **cleans up naturally**, it is quickly becoming dirty...

Thanks to a photocatalyst lazure, the **envelope is self-cleaning**.

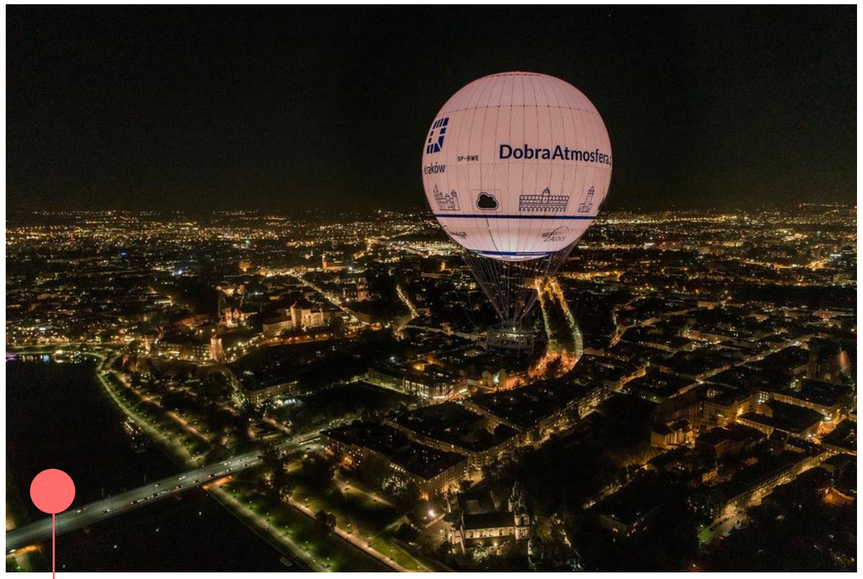
6.

with treatment

without treatment

The example of the Generali Balloon **inspires other cities**...

7.



Highly polluted, the city of Krakow (Poland) wished to equip itself with a balloon with the same properties as the one of Paris.

Theme park dedicated to plants and biodiversity, Terra Botanica in Angers (France) has also equipped its balloon with a LOAC, in order to raise public awareness of air quality.

2 para(pm®

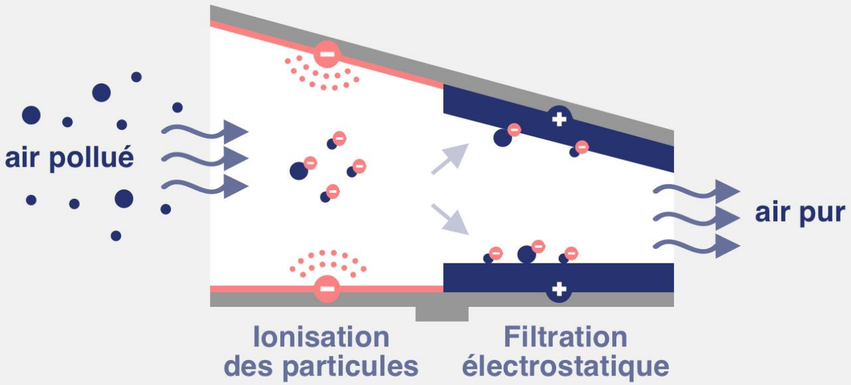
A VERY EFFICIENT, COST-EFFECTIVE AND MODULAR PM10 & PM2,5 CAPTURE SYSTEM

Para-PM

The Para-PM is an innovative technology to **purify the air in semi-open and open spaces**. Thanks to a patented process of ionization and electrostatic filtration, it **eliminates up to 95% of Particulate Matters** PM10 and PM2.5.

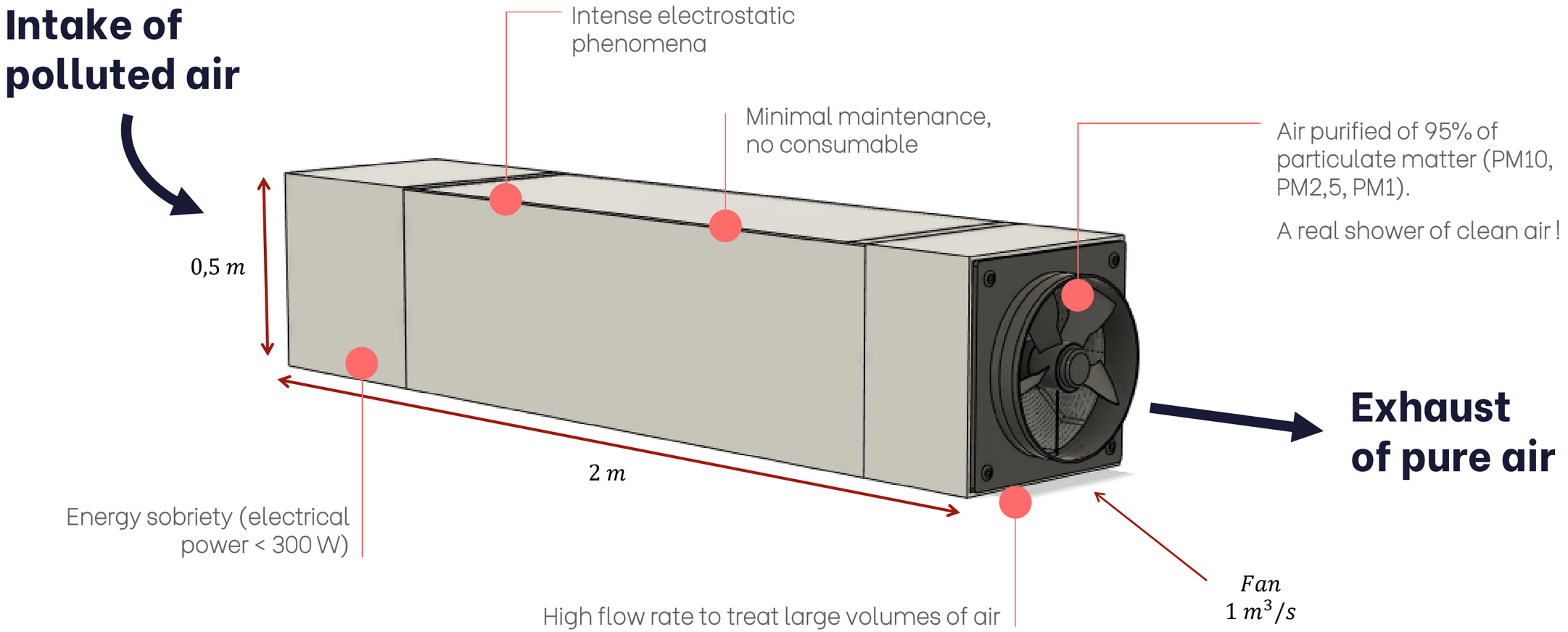
This **modular** system

- Treats large volumes of air (1m3/s per module of 200x50x50 cm)
- Consumes little energy (300 W per module)
- Captures all Particulate Matters, even the smallest ones, the most dangerous
- Sends the purified air directly to the people
- Requires little maintenance
- Less than 60 kg and 60 dB



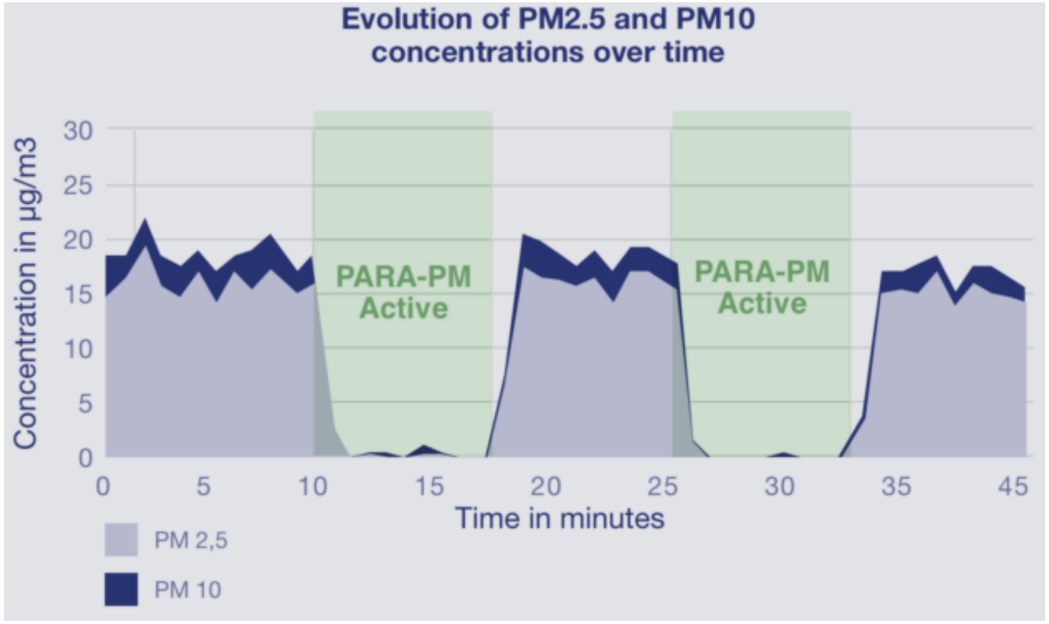
Para-PM

A **patented and highly-efficient device** to depollute outdoor air. A world-unique technology based on 10 years of experiments on the Generali Balloon in Paris.



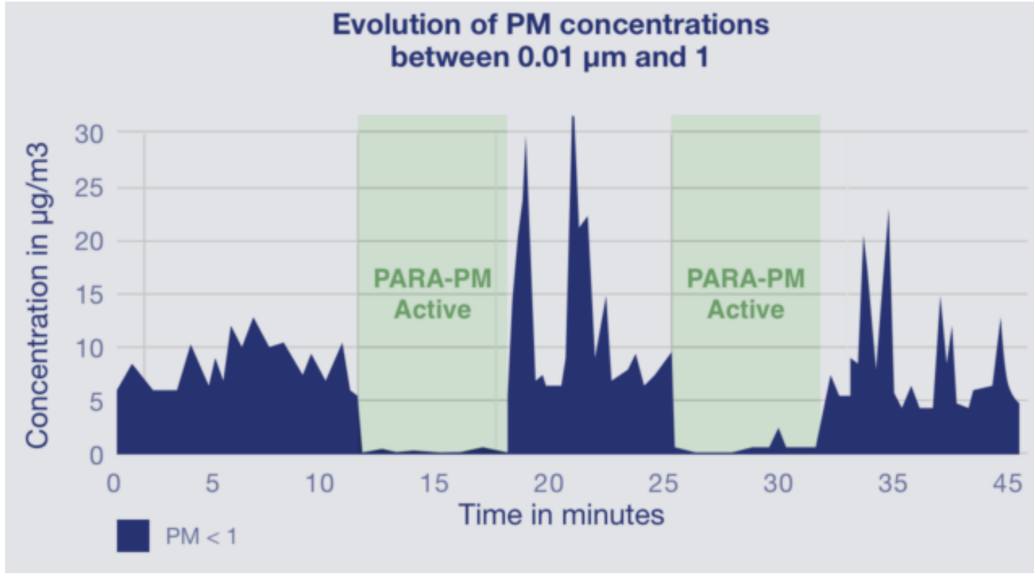
Scientifically proven

by two independent measuring systems (an optical counter and a condensation core counter) and validated by multiphysics numerical simulation models.



These measurements show that at least 95% of the PM10 and PM2.5 mass is trapped....

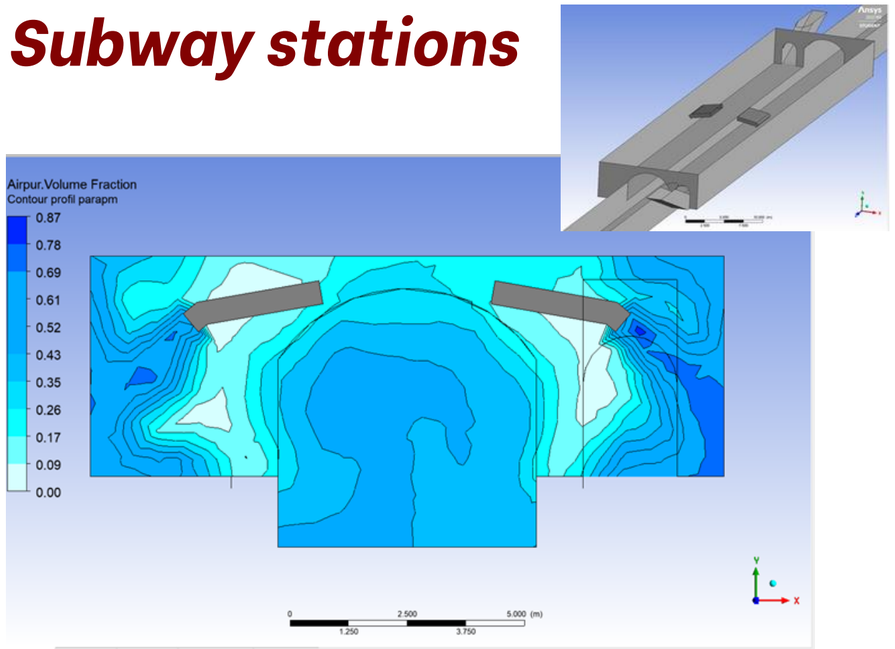
... including the smallest particles, which are dominant in number and extremely dangerous to health.



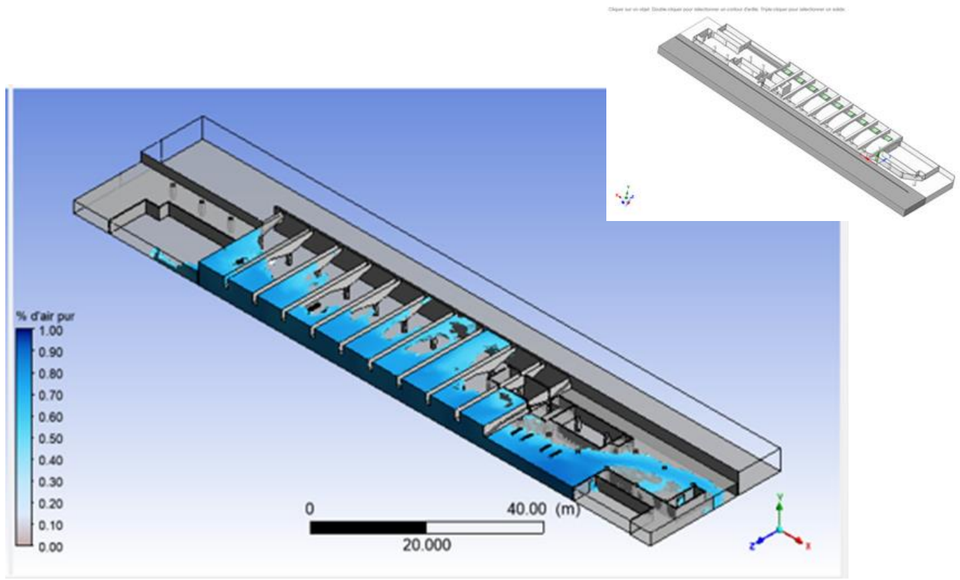
To clean semi-open spaces

A **modular system** for all kinds of indoor and outdoor spaces

Subway stations



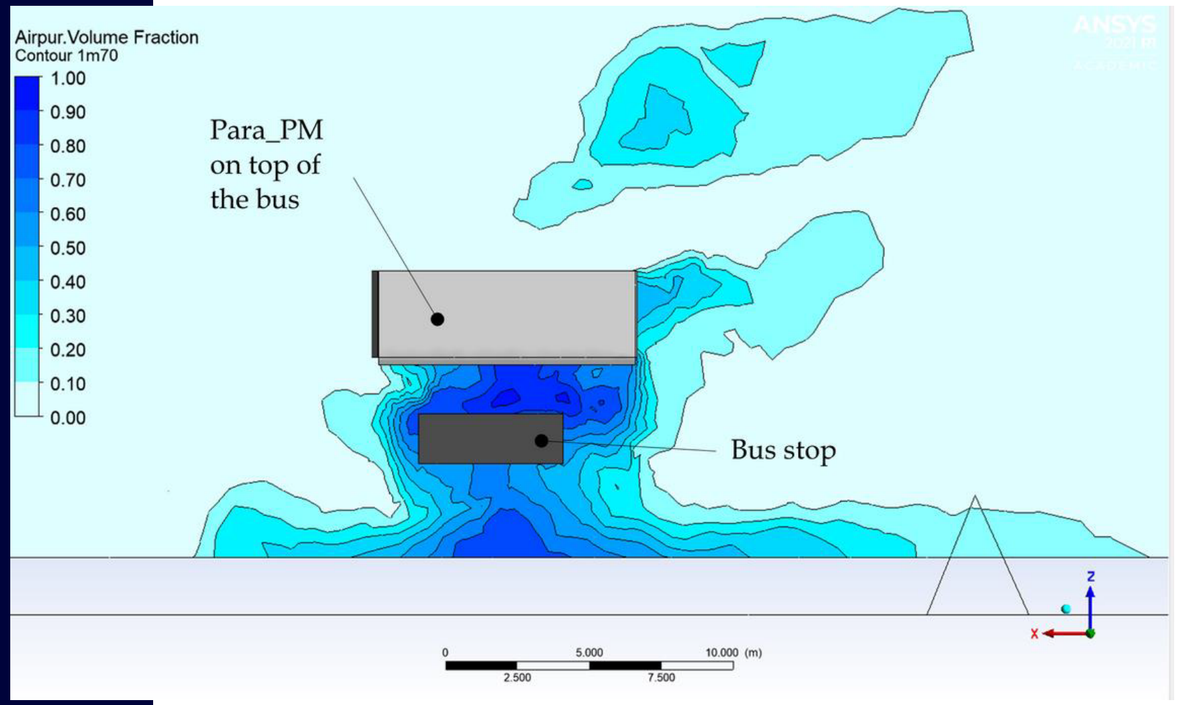
Underground parkings



To clean open spaces

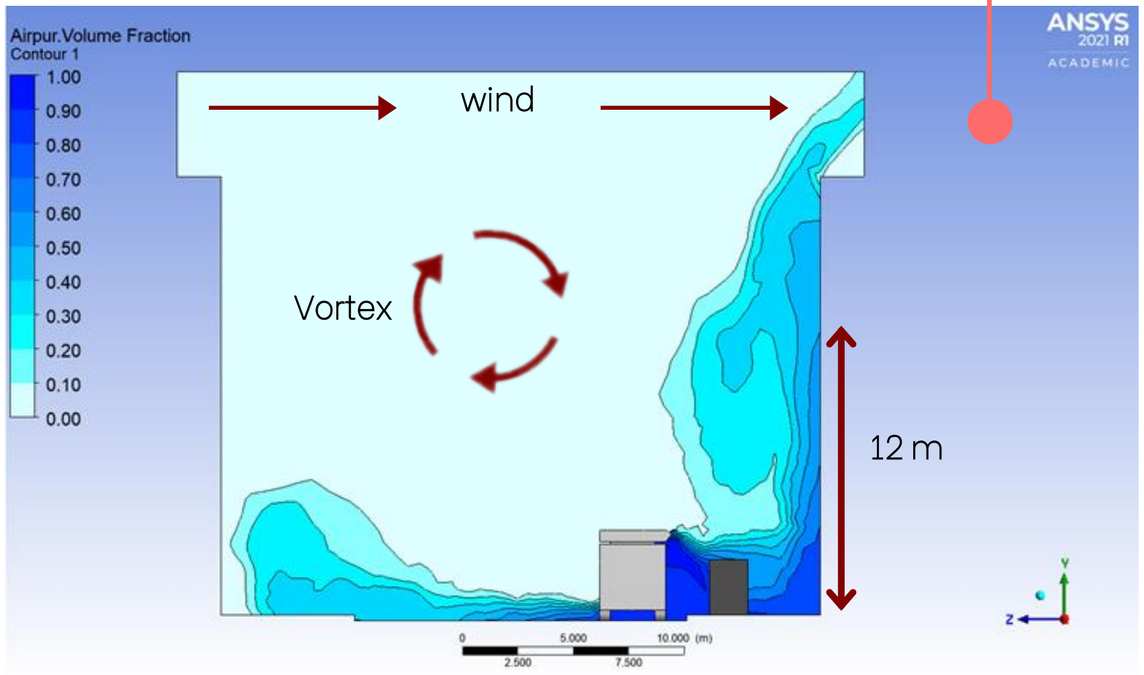
Mounted on buses shelters, the Para-PM creates islands of clean air at the edge of the street, directly where the pollution is emitted

PM concentrations are at least **divided by 2 and become negligible at the bus stop!**



With the **canyon effect** along the streets, vortexes diffuse the air purified by the Para-PM on the sides and up to 20m high.

A considerable local effect…



Para-PM technical specifications

Dimensions (⌀ x H)	200 x 50 x 50 cm
Maximum flow	3 600 m^3/h (1m^3/s)
Particulate diameter removal range	from 10 *nm* to 10 μm
Particular mass removal efficiency	> 90%
Energy power	300 W
Power supply	220 V
Weight	60 kg
Noise	< 60 dB
Maintenance	Bi-annual, replacement of the collector

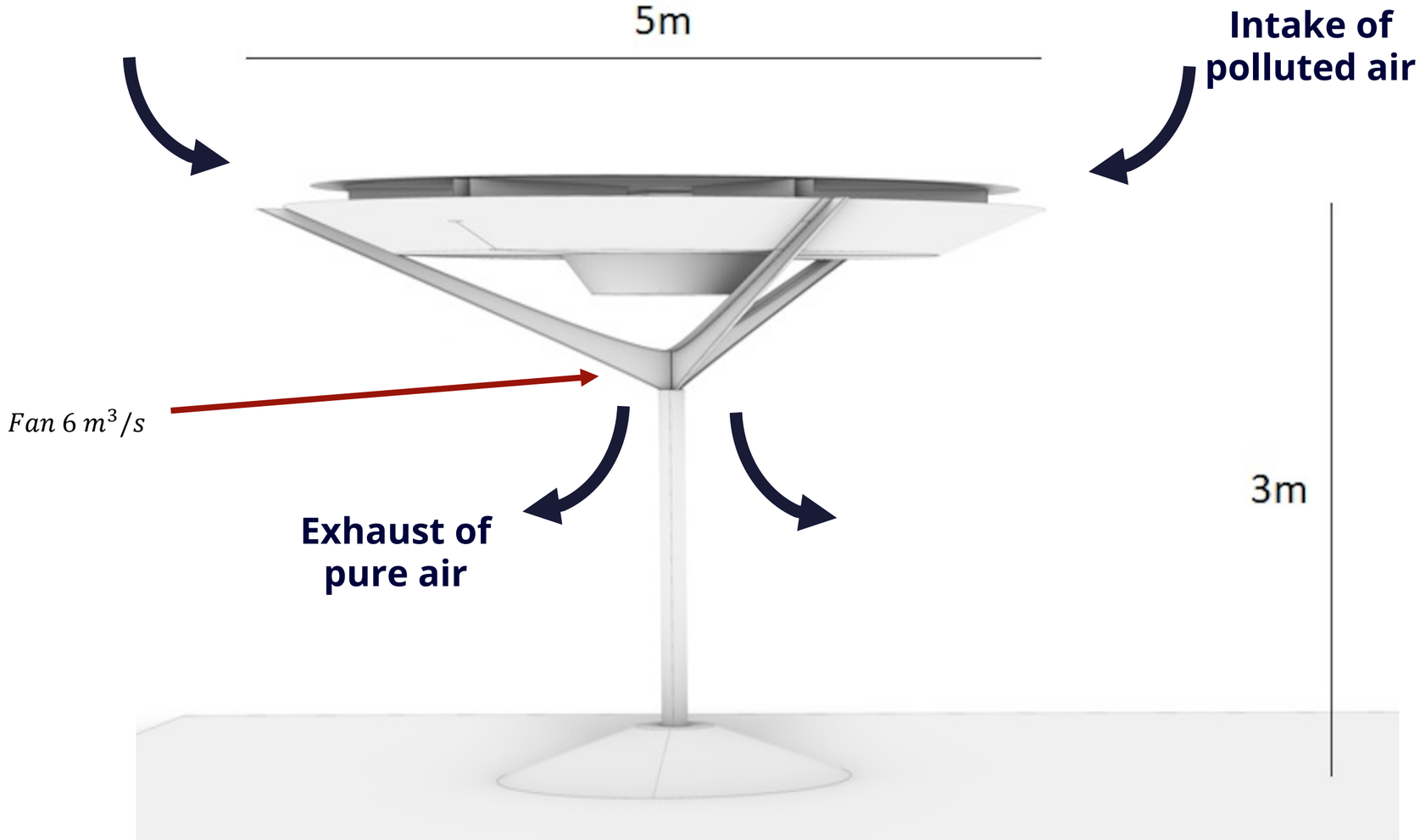
3 AEROPHILTRE

A FOUNTAIN OF CLEAN AIR

A VERY EFFICIENT DEPOLLUTING URBAN FURNITURE

The AEROPHILTRE

An application of Para-PM, a **depolluting urban furniture** for a real “clean air fountain” !
For all types **of public or private spaces, indoor or outdoor**, included **school yards**.

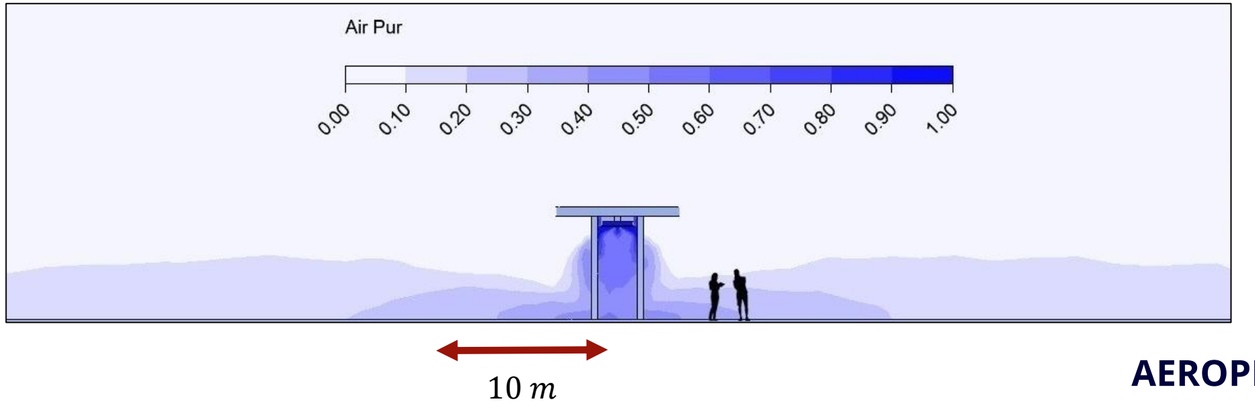


A clean air fountain for large areas

This urban furniture

- treats very large volumes of air ($6m_3/s$, equivalent of 9 Olympic swimming pools per hour)
- requires little power (1,8 kW), could be provided by solar panel on top
- captures all types of Particulate Matter, even the smallest and most dangerous ones
- distributes the purified air directly to the people
- requires a minimal maintenance
- can be also used as a shelter and public ligthing

Well adapted for Schoolyards



*Pure air (at 100% in blue) diffused at à **6 m³/s***

Chosen for 2024 Olympic games

The AEROPHILTRE has won the SOLIDEO tender to be installed on the ”Athlets square“ for the 2024 Olympic Games in Paris Saint-Denis, in France.

7 AEROPHILTRE will clean the equivalent of 60 Olympic-sized swimming pools of air per hour, i.e. a volume of 150 000 m3 per hour.

Technical specifications for the AEROPHILTRE

Dimensions (⌀ x H)	5m x 3m
Maximum flow	21 600 m^3/h (6m^3/s)
Particulate diameter removal range	from 10 *nm* to 10 μm
Particular mass removal efficiency	> 90%
Energy power	1 800 W
Power supply	220 V
Weight	3 tonnes
Noise	< 60 dB
Maintenance	Bi-annual, replacement of the collector

THANK YOU!

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