



SIA develops and builds in partnership with accredited national research centres and our industrial partner a solutions, inspired by nature. (biomimetic).



## ***POLLUTION AND CO<sub>2</sub> ABATEMENT SYSTEM***

The technological solution as being tested for certification of the effectiveness in abatement of polluting bacteria and viruses in indoor areas. The system is also a DAC (direct air capture) facility to capture and stabilize carbon dioxide.

## SIA BIOMSAIR

### SIA AIR

SIA develops and builds the products that proposes solutions, Inspired by biomimicry.

BIOMIMESIS, from the Greek βίος (life), μίμησις (to imitate), is the science that studies natural biological and biomechanical processes with the aim of translating them into useful technologies in the human context

### SIA TECHNOLOGY

Technological solution being tested for certification of the effectiveness in abatement of polluting bacteria and viruses in indoor areas

### SIA STRATEGY

Private company

Flexibility

Bespoke solutions

Integrated Purifications

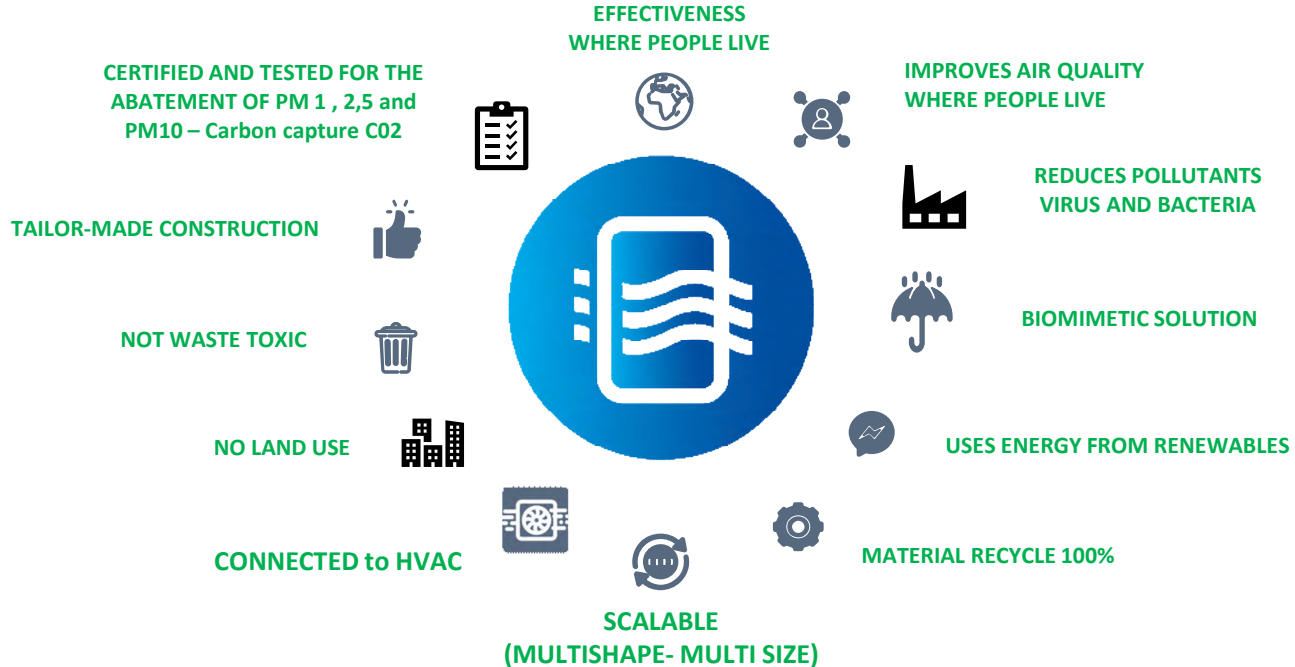
40 years Experience

R&D



# VALUES

FIGHTS CLIMATE CHANGE

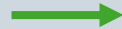


# PHILOSOPHY

## BIOMIMETIC WATER BASED FILTERLESS SOLUTION INSPIRED BY NATURE



### REMOVAL



*First reproducing the rainstorm, GHG\* and air pollutants are captured from the intake air*

### TRANSFORMATION



*then like seashell formation process GHG and air pollutant carbonates transforms into calcium bicarbonates*



### UTILIZATION

*of calcium bicarbonates is used to:  
de-acidify the sea water or  
Implement cement performance*



*The treated Air removed from GHG and Pollutants*

*will be rereleased in the environment improving the air quality  
Where people live*

# TEST EFFICACY PERFORMANCE

**TEST 1: The E.I.T project was intended to identify and choose the best innovation to a multiple site industry.**

**Results were monitored/provided by CEA (Centre Energie Atomique) and COMAU**



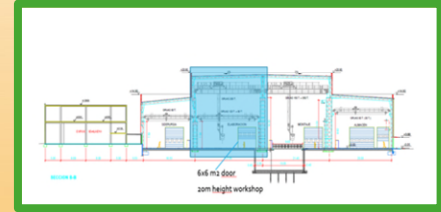
Painting Shop Area

Strong reduction above 90% of VOC's and above 60% Of PM



Milling Area

Strong reduction above 90% of VOC's and above 46% of PM



## TEST 2 : Milan Piazza Duomo Vs Piazza Cordusio

**Duration: Sep 2020 Aug 2021 (1 year study)**



The study proved that Biomsair solution are capable to improve the air quality in Urban area. PM<sub>10</sub> and PM<sub>2,5</sub> third party concentrations measurements in AREA 2 where constantly 50% less compared the one's monitored in Milan



Third party concentrations measurements in AREA 2 proved 8% CO<sub>2</sub> REMOVAL EFFICACY



# OUR CERTIFICATIONS



**TÜV Rheinland** is safety and quality in all areas of business and life.

A history of 150 years ,It' is one of the world's leading testing service providers with more than 20,600 employees and annual revenues of around 2 billion euros.

**TÜV Rheinland**, with highly qualified experts test technical systems and products around the world, support innovations in technology and business, train people in numerous professions and certify management .

**TÜV Rheinland** has been a member of the United Nations Global Compact to promote sustainability and combat corruption.



The **National Research Council (CNR)** is a national public research body with multidisciplinary competences, supervised by the Ministry of University and Research (MUR).

Every day, CNR faces the challenges of our time in many sectors: human and planetary health, environment and energy, food and sustainable agriculture, transport and production systems, ICT, new materials, sensors and aerospace, bioethics, quantum sciences and technologies.

The activities are carried out through a wealth of human resources of approximately 8,500 employees. The scientific network is made up of 88 research institutes and seven departments by macro-thematic area. An important contribution comes from collaborations, including international ones, with researchers from universities and companies.



More than 4,600 people around the world, committed to simplify complexities with a focus on energy transition, ESG and digitalization.

**RINA** core business is "business-to-society" we helps clients stay ahead of changes and grow sustainably.

We specialize in testing, inspection, certification and engineering solutions across a wide range of markets including, among others, marine, energy and mobility, real estate and infrastructure, space and defense, industry 4.0.

As **RINA**, we engage in partnering with customers in developing solutions to complex problems, while leveraging our expertise to anticipate and address any challenges along the way. Improving the quality of life and building sustainable values for future generations is the ultimate purpose that moves us every day.



# Removal efficiency performance certified by CNR (Italian national research center)

## Air Pollutants

<b>PM</b> 10 - 2,5 - 1 > 0,02	> 90%
<b>NO<sub>x</sub></b>	> 55%
<b>THC</b>	> 30%
<b>VOC</b>	> 30%

## GHG emissions

<b>CO<sub>2</sub></b>	> 20%
<b>CH<sub>4</sub></b>	> 30%
<b>Black Carbon</b>	> 90%

### POLLUTANTS (PM)

**Pollution** is the introduction of harmful materials into the environment. These harmful materials are called pollutants. Pollutants can be natural, such as volcanic ash. They can also be created by human activity, such as trash or runoff produced by factories. Pollutants damage the quality of air, water, and land. PM are various type and various value

### GHG STANDS FOR GREENHOUSE GASES.

**The greenhouses gases** are a group of gases in our atmosphere that trap heat from the sun, preventing it from escaping into space. Common GHGs are carbon dioxide, methane and nitrous oxide.

CARBON MONOXIDE (CO)  
OZONE (O3)  
NITROGEN DIOXIDE (NO2)  
SULPHUR DIOXIDE (SO2)

### POLLUTION AND GREENHOUSES EFFECTS ON HUMAN HEALTH

They are dangerous because present in the air we breathe, they can cause us damage as they penetrate deep into the lung and enter the bloodstream causing: cardiovascular (ischemic heart disease)

Cerebrovascular (stroke) and respiratory impacts.

Mortality from cardiovascular/ respiratory diseases.

Problems breathing, trigger asthma, reduce lung function

Adverse perinatal outcomes and lung cancer.. It is also the most widely used indicator for assessing the health effects of exposure to air pollution.

Black carbon is a major component of PM2.5 and a potent warming agent in the atmosphere and contributes to regional environmental disruption and accelerates glacier melting.



# PURIFICATION DEVICE

## Compact Direct air capture in bespoke solution

*Deployed In Urban/Industrial Areas*

*Near The Source Of Emissions*

- *Modulable*
- *Easily Scalable*
- *Customizable with cover any style*

➤ *Outdoor*

➤ *Indoor*

**AIR purification and CO<sub>2</sub> capture  
In one solution**



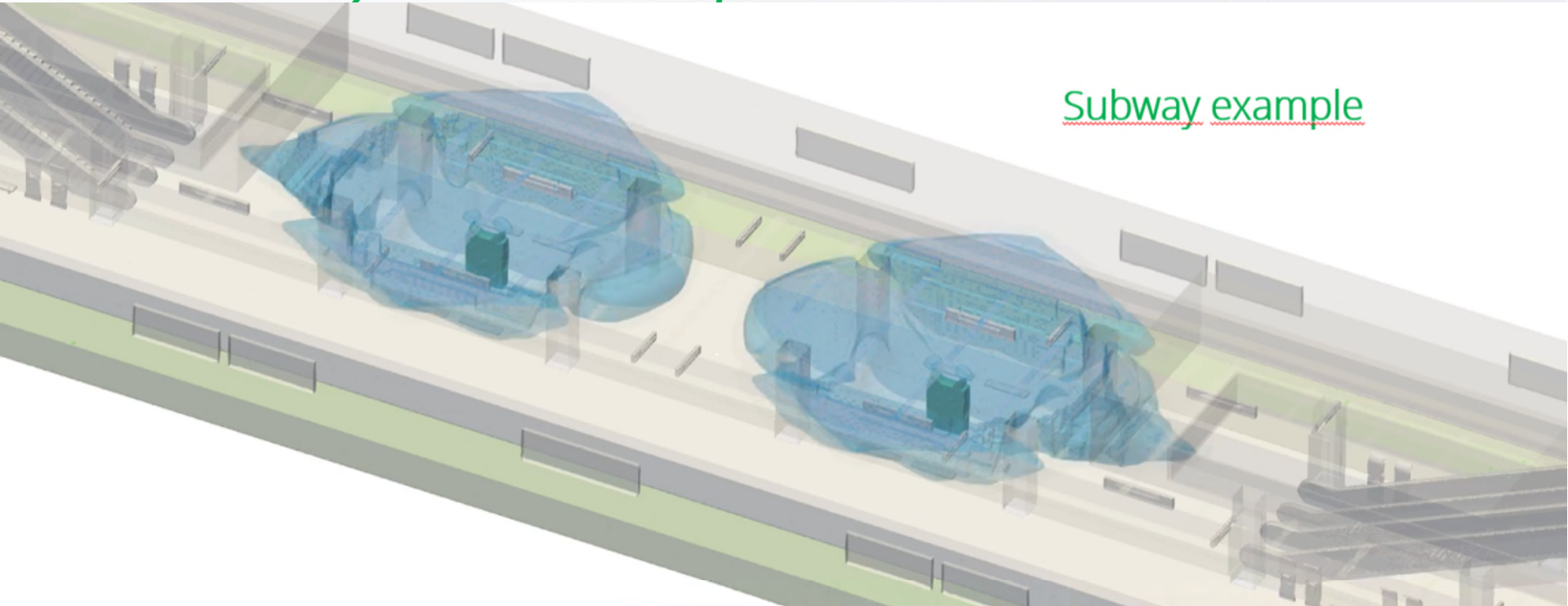




## THE METHOD

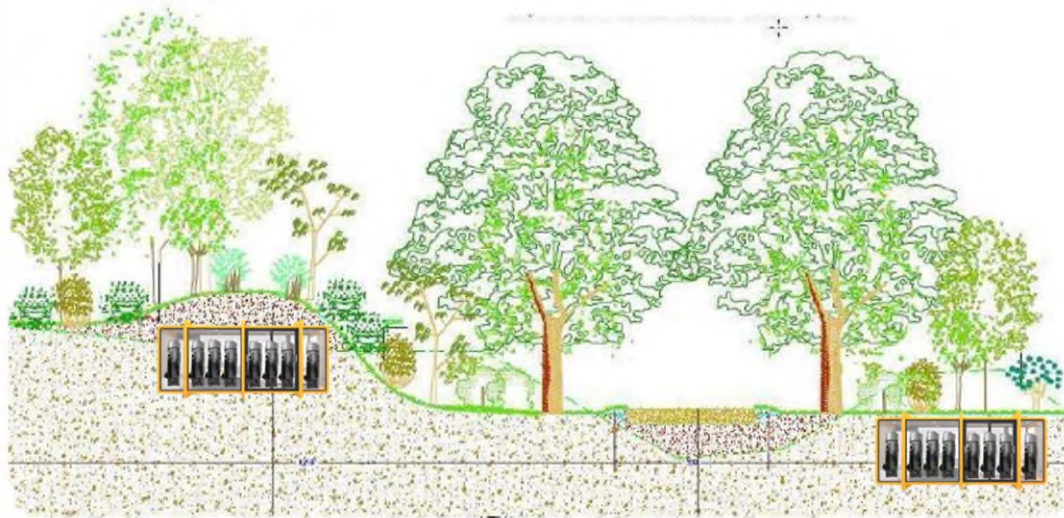
*is based on the installation of BIOMSAIR Purification machine creating an interconnected air pollutants & GHG emission removal network that can be remotely controlled (IOT) and provide real time data*

Subway example



## OUTDOOR APPLICATION

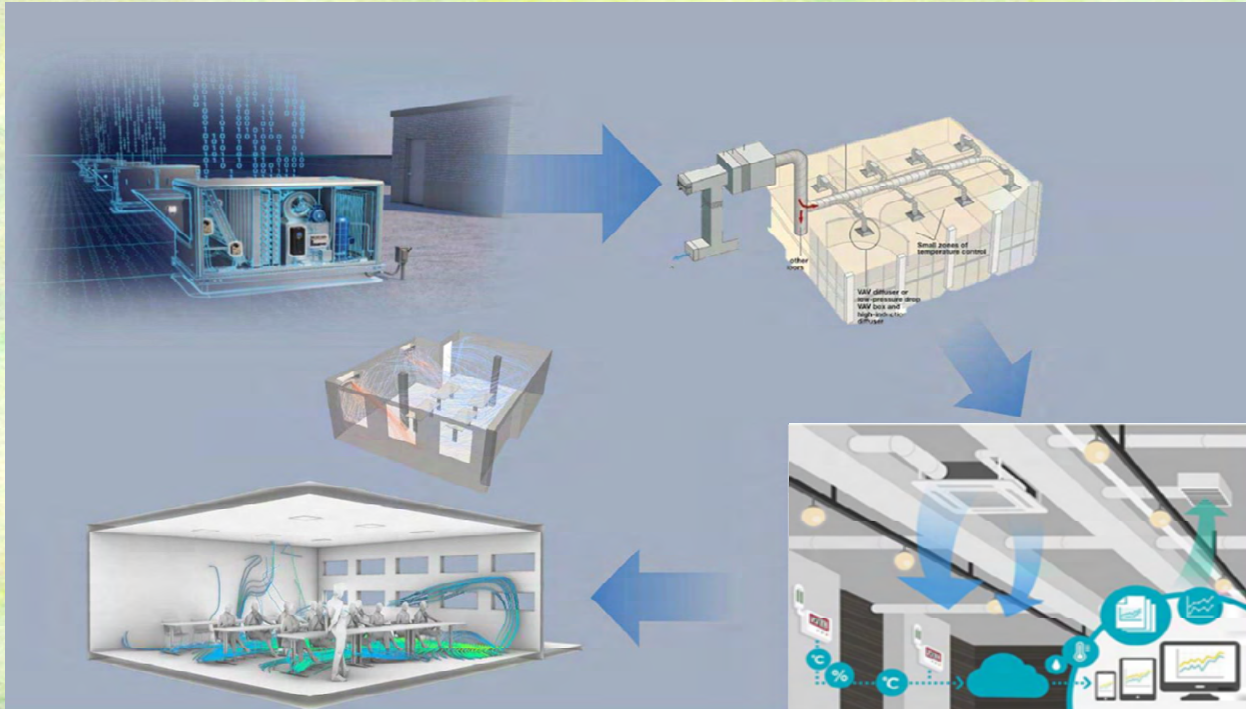
### OUTDOOR DEVICE



THE OUTDOOR DEVICE CAN BE DEPLOYED ALSO UNDERGROUND TO NOT DISTURB THE LANDSCAPE.

## HVAC APPLICATION

PRE HVAC-DEVICE THE DEVICE CAN BE INSTALLED BEFORE THE HVAC SYSTEM TO PURIFY THE AIR ENTERING THE BUILDING. IN THIS WAY, THE AIR INTRODUCED INTO THE BUILDING HAS ALREADY BEEN PURIFIED FROM POLLUTION, VIRUSES AND BACTERIA.





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