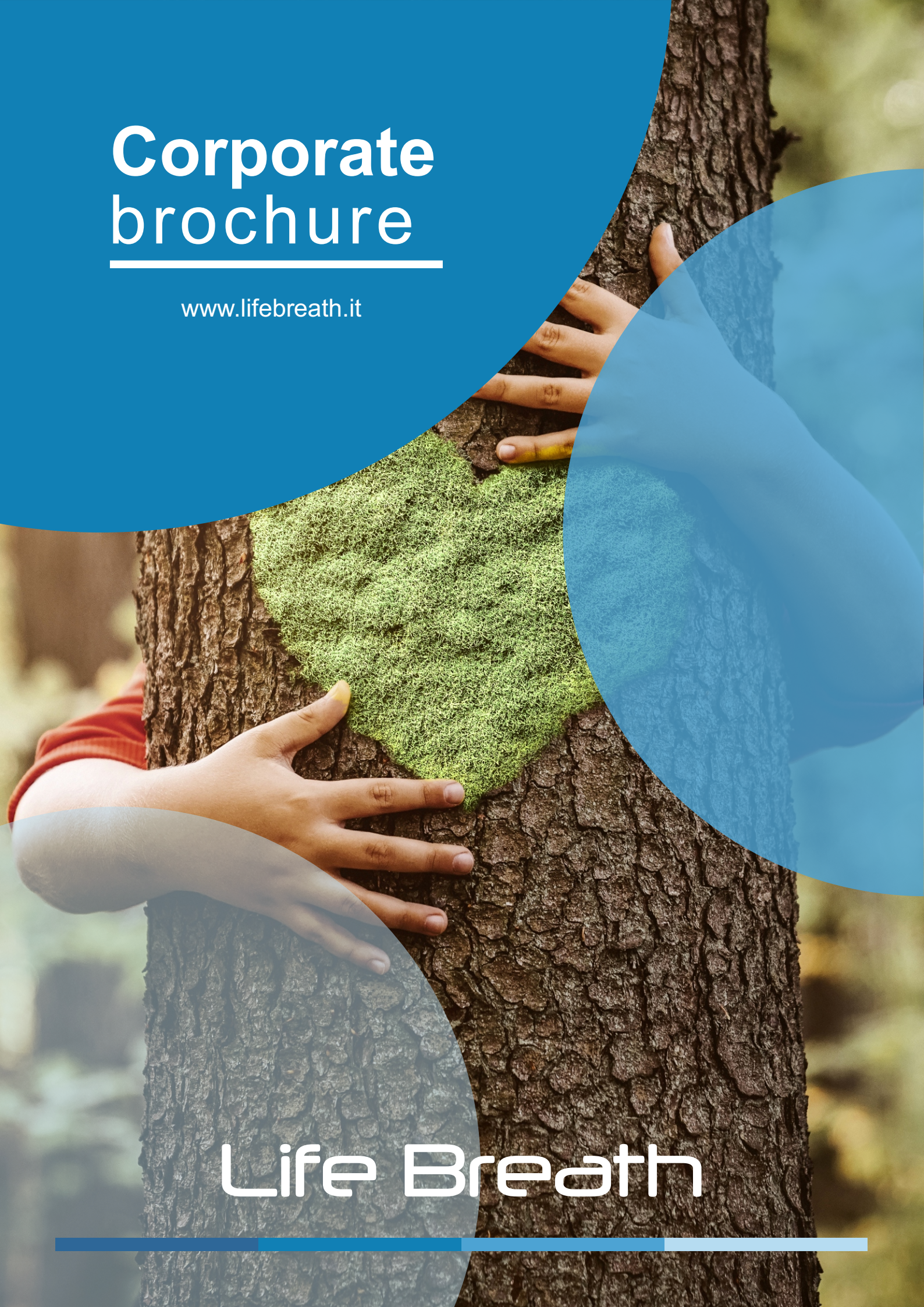
Corporate brochure

www.lifebreath.it



Life Breath

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Vision

We might not consider ourselves responsible for the condition of our planet, but if we don't act, we will become accountable.

We'd like to do our part

Sea & River Breath

About us

Life Breath

Life Breath was created as an innovative start-up by a pool of professionals in the renewable energy sector who brought their experience from years of study and collaboration with leading industries and universities to create a project that is now unique in its kind for the production of electrical and thermal energy using a wide range of materials from production waste.
The system does not produce any harmful emissions into the environment, neither solid, liquid nor gaseous. The aim is to improve the quality of life and to protect and preserve the environment in which we live. è migliorare la qualità della vita e tutelare e salvaguardare l'ambiente in cui viviamo.

Who we are

we are a team who believes in this motto :

«The whole is greater than the sum of its parts" »

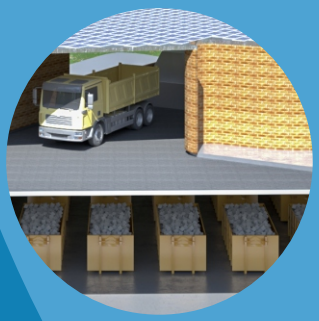
Aristotele

We believe in what we do by putting our passion and knowledge, the result of years of experience as professionals in the sector, each with their own specialisation, role and expertise.
All team members are always involved in the R&D of a project so as to motivate each one, for his part, to optimise not only his own resources but also to connect with the company structure, so that each part under development is handled by a team member who, motivated to success, carries out his role in the best possible way. The work has a specific value for each team member who considers her or his activity relevant and believes that it has a positive impact on company's objectives. Team members are not afraid to express their opinions or take decisions. They do not feel judged, but free to expose themselves, ask questions and have initiatives.

Installation site

The intrinsic potential of Breath is its adaptability, its versatility to any site without too many difficulties since the space required is considerably reduced and no particular geographical features are required. All types of organic material and plastics can be processed, thus avoiding further accumulation in landfills that are already on the verge of collapse.

Underground

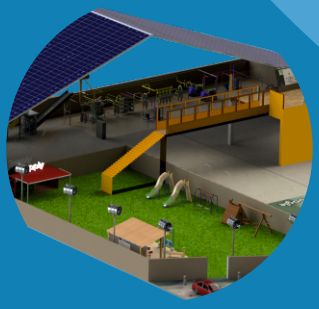


In this version, the plant is underground, with a loading system by means of an external trapdoor, inside which the material to be disposed of will be poured. Automated transport systems can be created to maintain external environmental decorum and convey all materials inside Breath without the need to build external infrastructures

On the Sea

In this case, we are installing Breath on a ship capable of disposing of the countless wastes found in all the seas of the world, with attention to those locations where sea currents tend to concentrate the greatest quantities. If the need arises, Sea Breath can intervene in environmental disasters.

On Ground



The machine is placed externally, on the ground in open spaces (warehouses, factories, etc.) adapting the various parts that make up Breath to the available architecture, or outdoors with a possible roof covering, by means of photovoltaic panels, thus increasing energy

Ports

Commercial ports and/or marinas lend themselves to the positioning of Breath, photovoltaic and wind power depending on the geographical characteristics of the installation site.
If we think of the amount of waste produced by cruise ships, we realise the savings in terms of time and pollution produced that this type of installation

Breath

An idea becomes reality only when "you" are aware of you, whoever is around you is not just a presence but part of a whole..

by Massimo Gazzetta

The operational control room is active 24 hours a day. Each installed system is connected via a V.P.N. and is constantly monitored, for anomalies that can be managed remotely the operator immediately upon receipt of the notice implements the solution. If physical intervention is required, the operator communicates with the local personnel and, with the help of L.B.'s A.I. software, coordinates the man on site. Life Breath's sales contract requires the customer, or the relevant personnel, to take part in training courses on routine maintenance and knowledge of all the operations necessary for the safety of the system, but above all of people.

In & Out

IN

Type of Material	Humidity	Quantity of material
	% (mass)	ton/year
BREATH		
Tyres	0	756
Polyethylene	0-5	411,6
Polyurethane	0-5	495,6
Epoxy resins	0-5	613,2
Spruce (pellets)	20	966
Common beech (wood)	30	1.008
Oak (wood)	30	1.108,80
Poplar (wood)	20	1.142,40
Spruce (pellets)	10	856,8
Common beech (pellets)	10	966
Coffee plantation	25	1.108,80
Olive pits	25	1.108,80
Municipal mix	35-70	3.528
Pollen**	35-40	2.100
Pulper waste	10	1.428

*Quantities calculated on 8400 hours of operativity per year.

**Accessory required for HCl and NH3

&

OUT

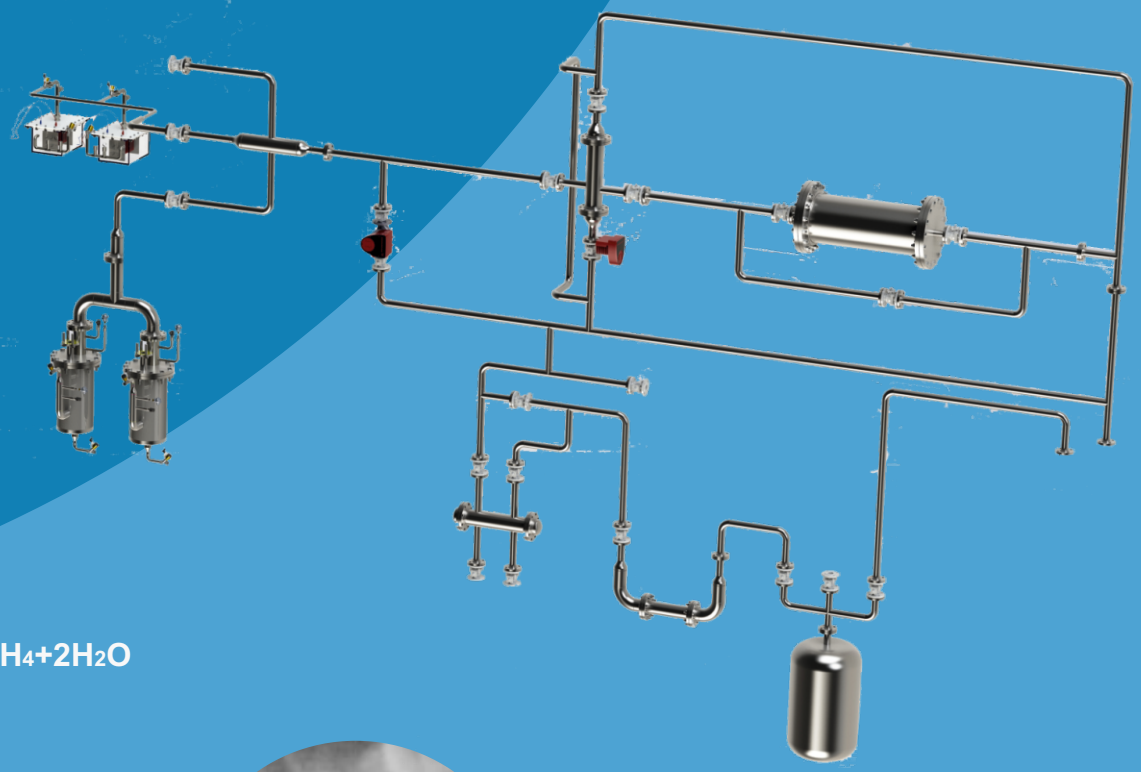
Description	U.M.	BREATH
Electricity	Kwe/h	125
Thermal energy	Kwt/h	237
Synthetic Methane	Smc/h	08-15
Hydrogen	Mol/h	4074.72
Nitrogen	Smc/h	70-90/h
Steam	K/h	117.45
Water	Lt/m	24.5-87.5

BREATH uses the principle of sublimation to transform biomass, plastic waste and various other organic materials into and various other organic materials into Syngas (synthesis gas), which is then used in an endothermic engine which, connected to an alternator, produces electricity. engine which, connected to an alternator, produces electricity. The post-combustion gases The post-combustion gases are channelled and sent partly to the reactor itself and partly to the CO_2 catalysts for sequestration. catalysts for CO_2 sequestration. At the same time, the condensation liquid contained in the combustible material is collected and then sent to the electrolysers for hydrogen capture. hydrogen capture.The CO_2 and hydrogen are then introduced into the methanation reactor, where the well-known Sabatier reaction takes place ($CO_2 + 4H_2 = CH_4 + 2H_2O$). At the output, we therefore obtain synthetic methane and water.

Patent n°

WO202020202023AI

The Methanation



$CO_2+4H_2=CH_4+2H_2O$

Paul Sabatier
Nobel Prize in 1912

The exhaust gas is sent to a catalyst where nitrogen is separated and extracted while CO_2 sequestration takes place. At the same time the filtered condensate liquid is fed into the electrolysers for H_2 capture. Both gases are sent to the methanation reactor where the Sabatier reaction takes place. Only the thermal energy of the post-combustion gases (600°C) is used to operate the reactor. Finally, the synthetic methane is stored in a special tank

Datasheet

Reactor Process Data

Material	Reactor Ansi 316 Reaction Room Ansi 310
T °C Process	1250°C
Weight	2275 Kg
T °C Steam output	270°C
T °C Syngas output	450°C

Elementary chemical analysis Syngas

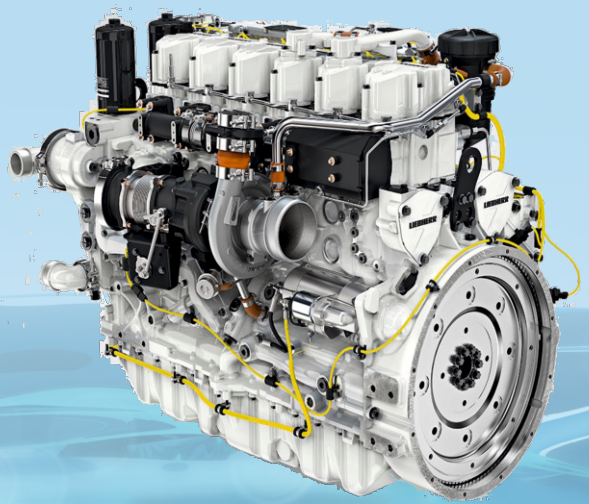
Syngas Quality	
O_2	-0,13%
CO_2	13,17%
CO	13,68%
H_2	15,95%
CH_4	21,97%
Val.Cal.Net.	11,6 MJ/kg
Q-hight	12547kJ/m3
Q-low	11332kJ/m3

Data recorded in emission

Oxigen	Carbon Monoxide	Nitrogen Oxides	Total Organic Carbon	Carbon Dioxide
O2	CO	NOx	TOC	CO2
UNI EN 14789:2006	UNI EN 15058:2006	UNI EN 14792:2006	UNI EN 12619:2006	
%	ppm	ppm	mbC/m3	%
21,02 21,09	43,7 45,8	- -	89,0 56,2	0.05 0,03
20,07	12,8	-	21,1	0,04

Maintenance of the Engine

Operation	After start-up	Every 800 h	Every 1600 h	Every 15.000 h	Over 25.000 h	Over 50.000 h
Leak test	X	X				
Bolt check	X	X				
Oil change and analysis	X	X				
Change oil filter	X	X				
Operating data recording	X	X				
Adjust pistons and spark plugs		X				
Check starting procedure	X	X				
Measure starting pressure		X				
Adjust valve clearance		X				
Change spark plugs			X			
Check compression pressure			X			
Check throttle valve	X		X			
Check gas filter	X		X			
Check air filter	X		X			
Check sampling sensor	X		X			
Check cooling system	X		X			
Check ignition timing	X		X			
Check crankcase pressure	X		X			
Check exhaust gas pressure	X		X			
Check air/emissions ratio	X		X			
Check calibration of sensors				X		
Measure axial shaft play					X	
Replace liners					X	
Measure connecting rods					X	
Replace elastic bands					X	
Replace heads						X
Replace crankshaft bearings						X



The values given in the tables are only an indication of the actual O&M programme. The actual programme will depend on parameters such as climatic conditions, altitude, location, quality of raw materials, O&M cost, etc.

Maintenance of the Filtration System

Filter A

Fuels	Cleanings Intervals	Replacement turbulators	Replacemnt seals
Wood chips	400 h	1 time a year	10 times a year
Pellets	500 h	1 time a year	10 times a year
Plastic waste	240 h	1 time a year	10 times a year
Organic waste	200 h	1 time a year	10 times a year
Special waste	200/500 h	1 time a year	10 times a year

Filter B

Fuels	Cleanings Intervals	Replacement seals	Reactivation Activated carbons	Replacement Ceramics
Wood chips	400 h	10 times a year	22 times a year	2 times a year
Pellets	500 h	10 times a year	22 times a year	2 times a year
Plastic waste	240 h	10 times a year	22 times a year	2 times a year
Organic waste	200 h	10 times a year	22 times a year	2 times a year
Special waste	200/500 h	10 times a year	22 times a year	2 times a year

Cyclones

Fuels	Cleanings Intervals	Reactivation Activated carbons	Replacement Ceramics	Replacement seals
Wood chips	400 h	4 times a year	1 time a year	1 time a year
Pellets	500 h	4 times a year	1 time a year	1 time a year
Plastic waste	240 h	4 times a year	1 time a year	1 time a year
Organic waste	200 h	4 times a year	1 time a year	1 time a year
Special waste	200/500 h	4 times a year	1 time a year	1 time a year

CO_2

Beijing

China is not joking either: research presented in 2017 reveals that pollution has caused 1.8 million deaths

New York

The European Union's target is to reduce local CO2 emissions by 55% by 2030. Efficient and effective management of municipal waste is the key to curbing climate change.

Turin

Italy is one of the worst countries in Europe: more deaths from road accidents, with 1,500 deaths per million inhabitants. Our country records some 91,000 premature deaths a year from air pollution, compared with 86,000 in Germany, 54,000 in France, 50,000 in the United Kingdom, and 30,000 in Spain. Nine out of 10 people live in places with pollution levels higher than those recommended by the World Health Organisation.

Contact

Matteo Denicolò
matteo.denicolo@lifebreath.ch
+41 79 8252940

Massimo Gazzetta
massimo.gazzetta@lifebreath.it
+39 011 6185921 Int.201

Monica Milone
monica.milone@lifebreath.it
+39 011 6185921 Int.202

Life Breath S.r.l.
Via Legnano, 26
10128 Torino
Italy

Life Breath R&D
Via Acqui, 67
10098 Rivoli (TO)
Italy

Life Breath Int. sagl
Via Ronco di Santa Croce, 1a
6826 Riva San Vitale
Switzerland

Telefono: +39 011 6185921
Email: info@lifebreath.it