INNOVATION OF SUSTAINABLE PURIFICATION WITH WATER

watervation

Introduction - External

Last Updated:
2023 August

INNOVATION OF SUSTAINABLE PURIFICATION WITH WATER

MISSION

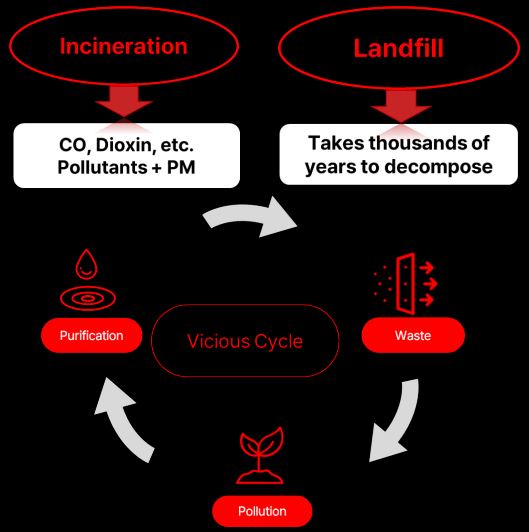
We provide solutions for greenhouse gas reduction and sustainable industrial development through **air purification module with water.**

Our **Water-Filter** technology generates no filter waste and less power consumption to lead the **Net-Zero pathway** which governments, industries and consumers can all participate.

PROBLEM

Current way of purification is not sustainable.

High Environmental Waste



High Energy Consumption

77%

of total GHG emissions by manufacturing plants come from energy consumption

High Carbon Emissions

80%

reduction in carbon emissions is needed by 2030 in high-emitting industries

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SOLUTION

We provide eco-friendly solution with no waste, less power consumption, effective purification and extensive application.

Module

- Water spray module with innovative technology
- Scalability to various high-emitting industries such as incineration plants, semiconductor, display, and steel manufacturers

GHG Abatement System

- POU (Point of Use) Scrubber (or GHG Abatement System) is used in chip manufacturing for chemical gas treatment and particulate removal.
- POU Scrubber consists of 'Burn/Plasma' Tower and 'Wet' Tower in which our module can be installed.

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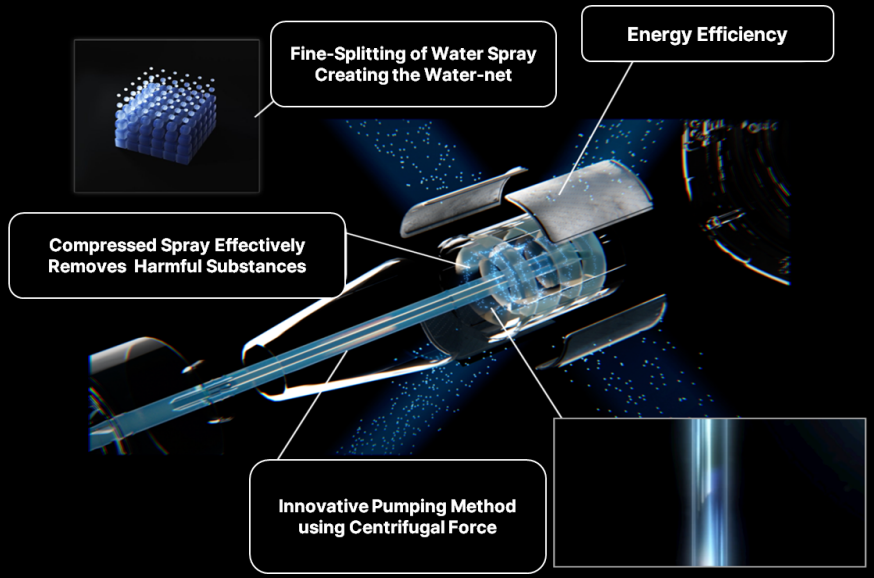
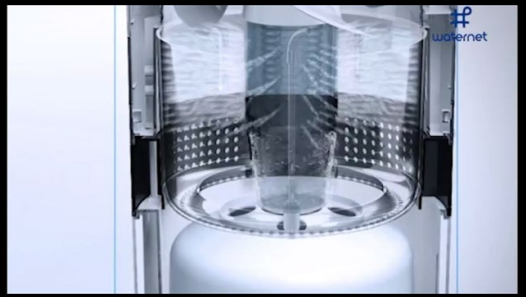
TECHNOLOGY



Our module can be installed in GHG abatement system (industrial) and air purifier system(commercial).



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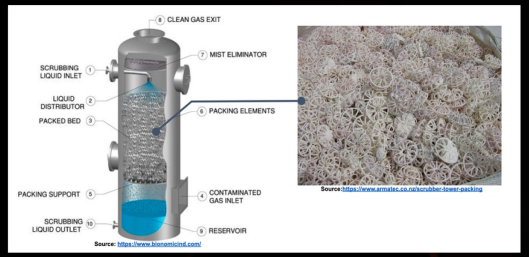
DIFFERENTIATORS

Current purification uses two methods of filtering.



(Industrial Scrubber) Plastic Packings and water

(Commercial) Bag Filter

Environmental Waste

Plastic Filter Waste

vs.

No Waste

Efficiency

Low Efficiency due to Channeling Effect

vs.

Consistency of Compressed Spray

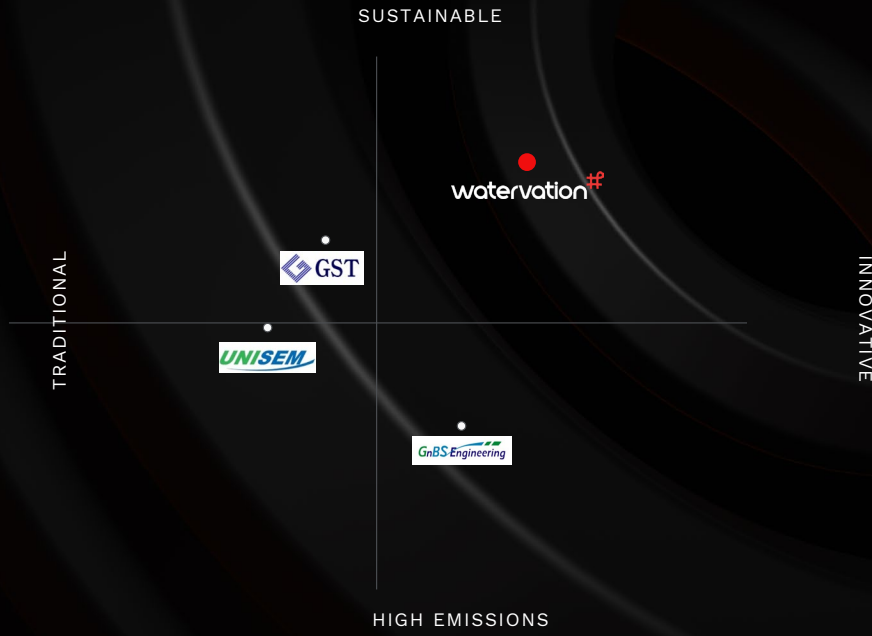
Maintenance

High Maintenance Cost due to Solid Byproduct

vs.

60% less Solid Byproduct

COMPETITOR ANALYSIS



Most POU abatement system in the market applies 'burn(plasma) + wet' type where wet type consists of plastic packings and nozzle spray.

Because of low efficiency in the wet tower, most of exhaust gas should be burned in the burn tower which leads to high energy consumption.

Watervation's filter-free POU abatement system ensures high efficiency and effective purification.

AWARDS & PATENTS

Awarded Gold Medal for outstanding performances at International Trade Fair - Ideas-Inventions-New Products Nuremberg (iENA) in 2018

Awarded Best Invention Medal for the Outstanding Green Invention at the World Competition of Green Inventions by International Federation of Inventors' Association (IFIA) in 2018

2 Core Technology Patents Registered

1) DOUBLE MEMBRANE APPRATUS FOR AIR CLEANING

2) WATER FILTERING APPARATUS OF CENTRIFUGAL EXTRACTING TYPE

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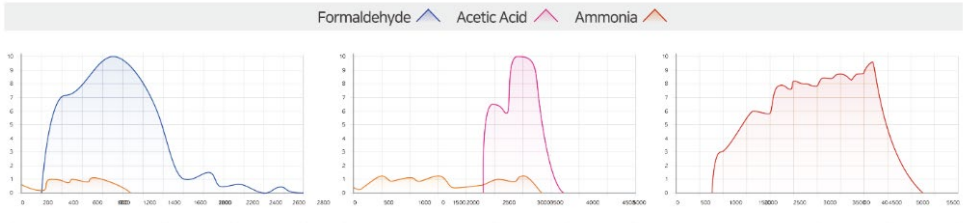
LAB-SCALE DATA

100 % REDUCTION IN FORMALDEHYDE

100 % REDUCTION IN ACETIC ACID

100 % REDUCTION IN AMMONIA



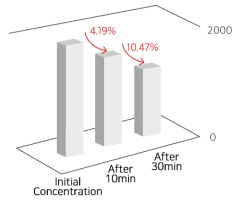
	Concentration Level	Effectiveness
Formaldehyde Initial Concentration	9.909	
Formaldehyde End Concentration	0.00	100% reduction

	Concentration Level	Effectiveness
Acetic Acid Initial Concentration	9.74	
Acetic Acid End Concentration	0.00	100% reduction

	Concentration Level	Effectiveness
Ammonia Initial Concentration	9.37	
Ammonia End Concentration	0.00	100% reduction

The above test was conducted by the Korea Testing & Research Institute as follows./ Tested Product: Air purifying equipment (WT-01)/ The above test was conducted with the sample provided by the client and shows the test method (SPS-KACA002-132:2021(Indoor air purifier) – Reduction effectiveness of harmful gasses (Ammonia, Formaldehyde, Acetic acide)) ./ The above test is based on KS Q 5002 (Article 4.2.2) numerical rounding method / Input (220V 60Hz).

10.47% REDUCTION IN CARBON DIOXIDE



▪ Sample : 100% tap water

	CO2 Concentration	Effectiveness
Initial Concentration	1843	
After 10min	1766	4.19%
After 30min	1650	10.47%

Test # TBK-2022-006531. Test report on the performance of air purifier on carbon dioxide/

The test method was based on "KS C9314 2019 (air purifier)" and a certain amount of carbon dioxide was injected so that the concentration in the chamber reached a level of about 2000 ppm, and then the injection was stopped. By using fourier-transform infrared spectroscopy (FT-IR), it was measured for 30 minutes for each condition and recorded the change in carbon dioxide concentration. The use and calibration method of FT-IR was based on "KS I 0587:2018 (method for measuring the volume flow rate of Non-CO2 온실가스 (CF4, NF3, SF6, N2O) used in semiconductor and display processes)"

PRODUCT ROADMAP

2025 2026 2027 2028 2029

WVG Module in POU Scrubber

POC — Domestic Expansion of Wet Tower Sales

Samsung Display
SK Hynix Plasma-Wet

POU Scrubber

POC / Scrubber Sales — POC/ Scrubber Sales

Samsung Display Line Expansion
SK Hynix Line Expansion

LG Display
Amkor Technology
Korea

Exhaust Gas Abatement System

Product Development — POC/ Scrubber Sales — Global POC/ Sales

Samsung / LG Display
SK Hynix / Amkor Tech Korea

Global Chip Manufacturer
TSMC/Intel

Plant Scrubber

Product Development — Domestic Sales

SK Ecoplant/ POSCO/ Seah Steel

Odor Reduction Business

Product Development — Domestic Sales

Target Market

- POU Scrubber Manufacturer (DAS, GST, Unisem, etc.)
- Semiconductor/Display Companies
- Semiconductor/Display Companies + Other High-Emitting Industries
- High- Emitting Industry (Steel, Cement, etc.)
- Barns/ Sewage Treatment Plant/ Car Industry

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GO-TO-MARKET PLAN

2023

Pilot Scale Experiments with

Samsung Semiconductor & SK Hynix (on-going)

Pre-seed investment < $100K

2024

Minimum Viable Product

Pre-A $4M

2025

Experiment & Improvements

2027

Global Sales

2029

User growth

Pilot-Scale

Ongoing Pilot-Scale PoC with Samsung Semiconductor & GST (scrubber company). Primary focus is to reduce solid by-product, CO2 reduction and Nox + Sox reduction

MVP

WVG Module that can be installed in POU scrubber

Scale-Up

- Product Scale-up: From WVG Module to POU Scrubber to Exhaust Gas Abatement System
- Market Scale-up: From Semiconductor to Steel/Cement Plants to Sewage Treatment Plant (GHG Abatement + Odor Reduction)

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LEADERSHIP TEAM

Kelly Joung

CEO

Multiple project management & business development experiences
1X founder experience

Michael Seo

CTO

Multiple project management at Samsung Semiconductor
Joint patent application with Samsung Electronics

Christine Kim

CGO

Experiences in international organization and gov't agency
Multiple stakeholder engagement experiences

Jay Joung

COO

Founder of a marketing firm with 100+ stuff
Multiple platform development and product launch

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LET'S START WITH WHAT WE CAN DO NOW

watervation

www.watervation.co.kr

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