

# GRAVIKY LABS

*Modular carbon capture and utilization  
into everyday products*

BEST INVENTIONS 2019

TIME

MIT | SOLVE

WINNER OF CIRCULAR ECONOMY 2020 COHORT

FASHION  
FOR

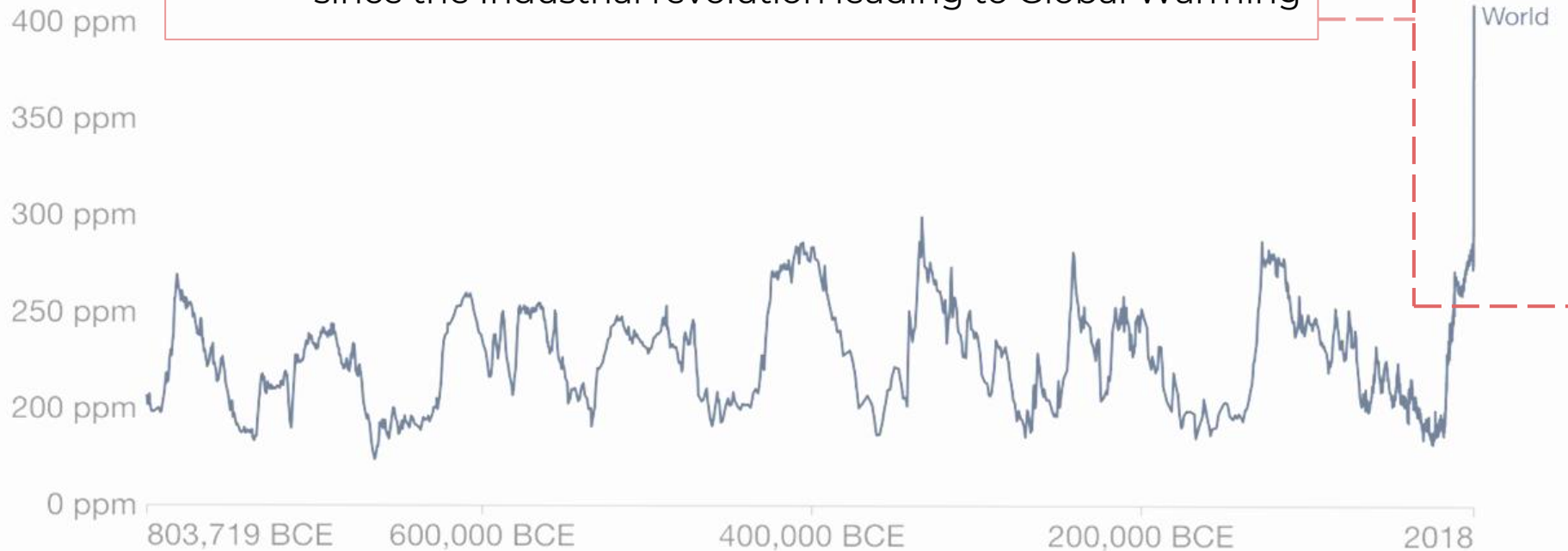
Investor

E<sup>14</sup>

Investor

# THE CLIMATE PROBLEM

We've added **1615 Billion Tonnes of CO<sub>2</sub>** into the atmosphere since the Industrial revolution leading to Global Warming



\*As per International Energy Agency

# OPPORTUNITY

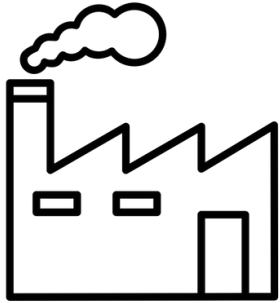
Capture and turn Carbon Emissions into the most common materials around us, that would otherwise have been made from petroleum



# Our Solution

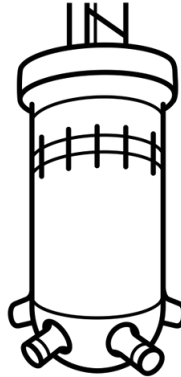
***We turn PM 2.5 emissions into everyday materials***

*that can scale and compete with conventional materials at price and features*



PM 2.5 Capture

Harvest PM 2.5 from  
polluting stacks



Sequestration

Graviky produces formulations for  
their products by upcycling PM 2.5  
to Carbon



Supply Chain Integration

Partners manufacture products  
based on our formulations.

# AIR-INK

**World's first commercial grade ink  
created from air pollution**

An industry and consumer recognized  
brand of inks made by upcycling Carbon  
emissions.

Our customers **replace conventional  
petroleum based products in their  
manufacturing via AIR-INK**





## **PANGAIA X AIR-INK®**

We partnered with Pangaia to create world's first apparel printed with carbon emissions.

Our partnership now includes developing solutions for other apparel/fashion brands for decarbonizing their printing.





Deal with Dell where AIR-INK is utilized to meet Dell's packaging sustainability needs

\*Trial in progress in US and Taiwan





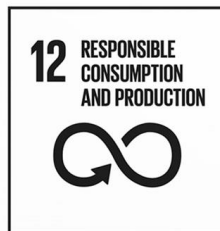
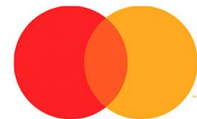
Graviky labs has partnered with Mastercard and Doconomy to create a physical, climate-friendly and biodegradable credit card. Printed with Air-Ink, the card is the first of its kind in the world.

Website: [Doconomy](https://doconomy.com)  
Cards go out in March



**Nathalie Green**

Doconomy member. 0 0 0 0 0 3 2 2



I am taking responsibility for every transaction  
I make to help protect the planet.

*Nathalie Green*  
Nathalie Green  
Doconomy member. 0 0 0 0 0 3 2 2

5412 7512 3412 3456

VALID THRU 12/30

SECURITY CODE 581



THIS CREDIT CARD IS MADE OF BIO-SOURCED MATERIAL.  
PRINTED WITH AIR INK RECYCLED AIR POLLUTION AND  
POWERED BY ENVIRONMENTAL DATA FROM ÅLAND INDEX



ÅLAND INDEX

ÅLANDSBANKEN + 358 204 29011, GEMALTO SGP U0000000A C





news, January 19, 2022

## Antalis strengthens its commitment to sustainable developments with creative partnership between Cocoon and Air-Ink



COCOON + AIR-INK™

# DRAWN TOGETHER



## Dell Technologies has a green vision to stop our love of gadgets killing the planet

By Jess Weatherbed last updated March 08, 2021

We have some work to do



Dell Technologies has a green vision to stop our love of gadgets killing the planet (Image credit: Dell/Future)

*“Dell is currently working with Graviky labs on a project to turn diesel exhaust waste into ink”*



Forbes

## PANGAIA's Game Changing Collaboration Draws Carbon From Air Pollution To Print Textiles



Brooke Roberts-Islam Senior Contributor @

Sustainability

I am an industry insider writing about sustainability and fashion tech



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*“The crux of their business is to **“mine unnatural resources”** that should not be in the environment and turn them into useful products”*

# TRACTION

Pilots in progress



Executed pilots worth 1.5M USD for Decarbonizing packaging and fabric printing

Upcoming pilots



Q2 2022 Pilots for Decarbonizing fashion materials

## IMPACT

Replaced 20 Tonnes of Conventional Inks. > **10 Tonnes of CO<sub>2</sub> Mitigated**

Grants/ Investors and Accelerators



\$ 170K Raised via SAFE and grants

# Introducing AIR - SYNTH

CO<sub>2</sub> capture and utilization at room temperature  
without heat, or pressure or toxic solvents

FALLING WALLS  
**WINNERS 2021**

SCIENCE STARTUP OF THE YEAR

CO<sub>2</sub> Captured  
2.317 mL




AIR-SYNTH V1.1

AIR-SYNTH

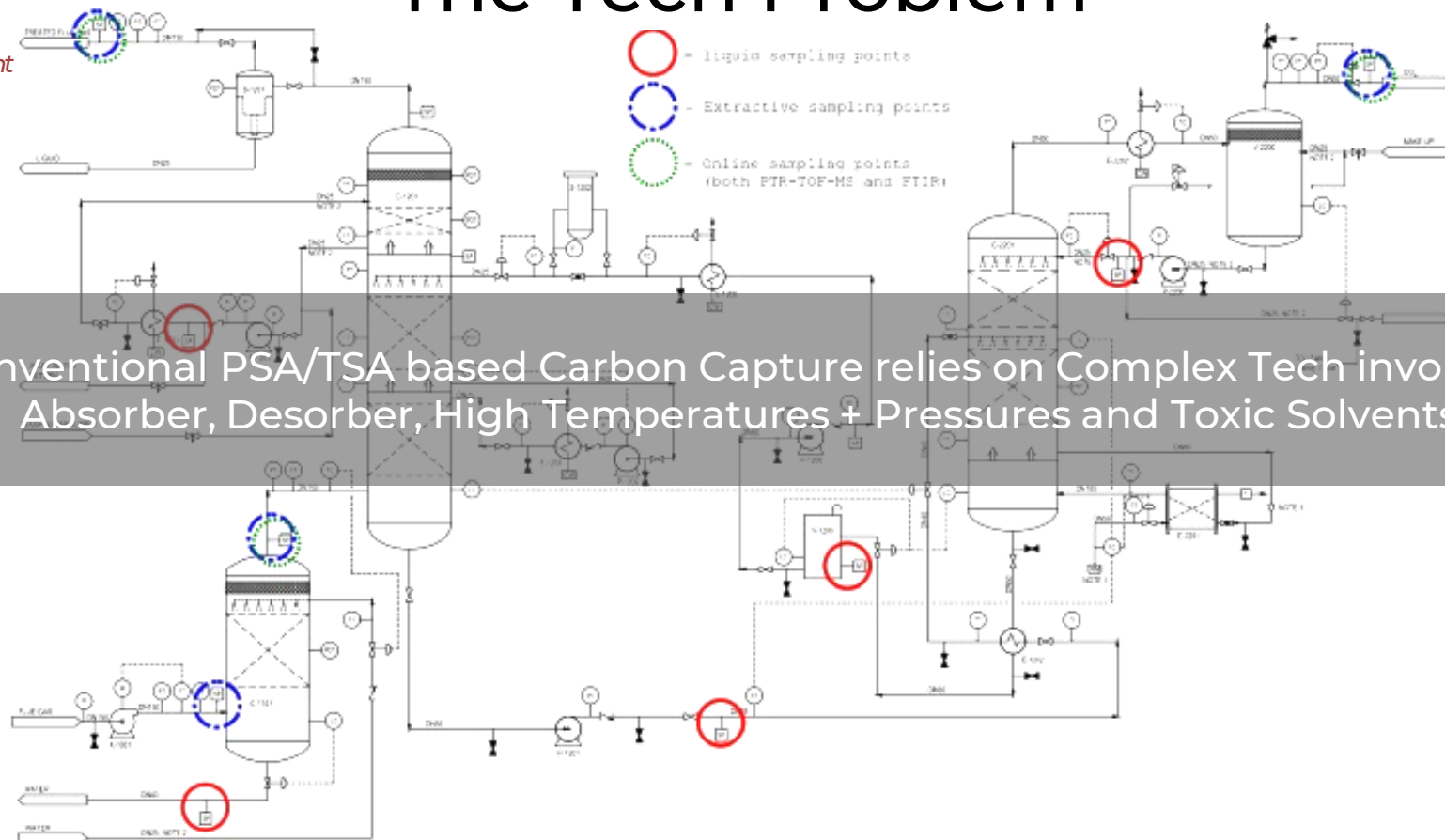
PERMANENT CO<sub>2</sub> CAPTURE  
AT ROOM TEMPERATURE & PRESSURE

AIR-SYNTH CORE

Ambient  
CO<sub>2</sub>

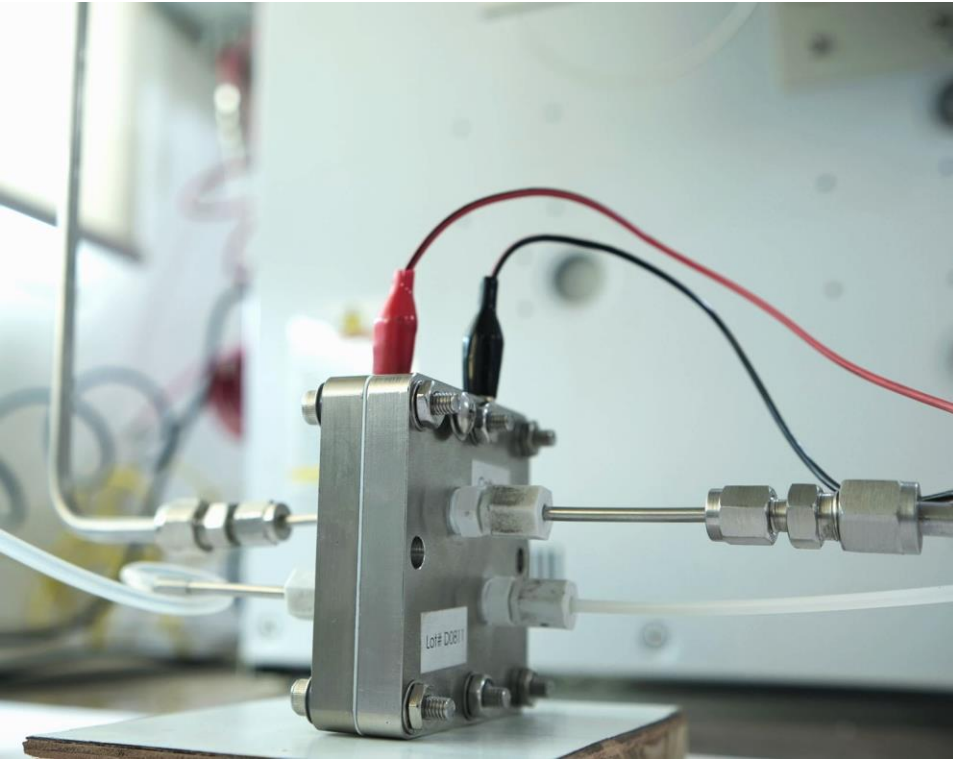
-  - liquid sampling points
-  - Extractive sampling points
-  - Online sampling points (both PTR-TOF-MS and FTIR)

Conventional PSA/TSA based Carbon Capture relies on Complex Tech involving Absorber, Desorber, High Temperatures + Pressures and Toxic Solvents





# CONVENTIONAL ELECTROCHEMISTRY V/S AIR SYNTH



## Direct Feed Mode

Pipes feeding Concentrated  $\text{CO}_2$  and  $\text{H}_2\text{O}$   
& directing Resource Output +  $\text{O}_2$

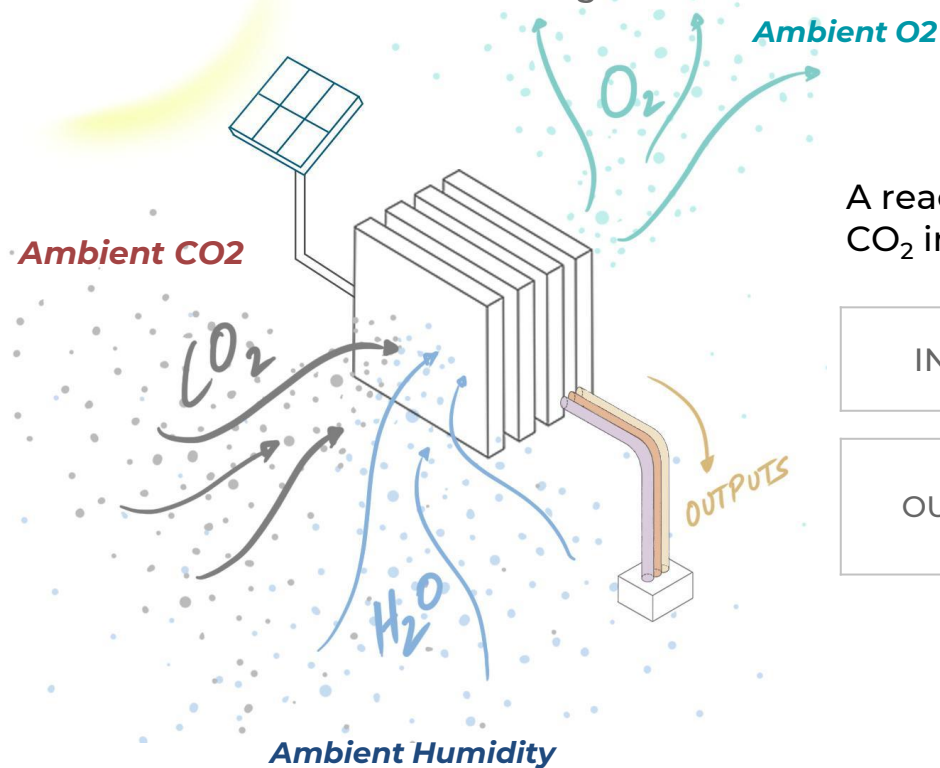


## Open Air Mode

Ambient  $\text{CO}_2$  and  $\text{H}_2\text{O}$  exposed to cell  
& directing Resource Output + release  $\text{O}_2$

# AIR - SYNTH REACTOR

Novel Electrochemical reactor design

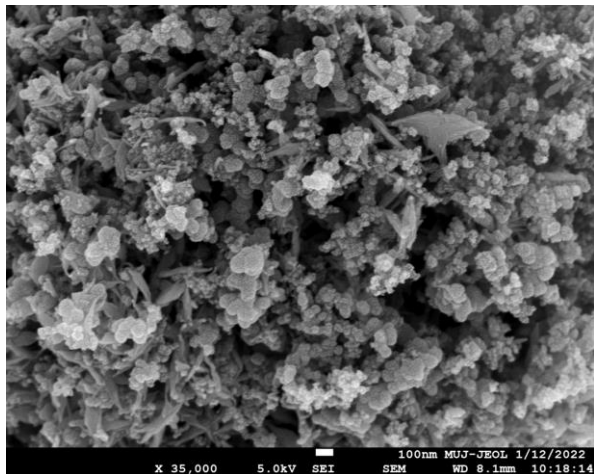


A reactor stack that can be configured for a range of CO<sub>2</sub> inputs

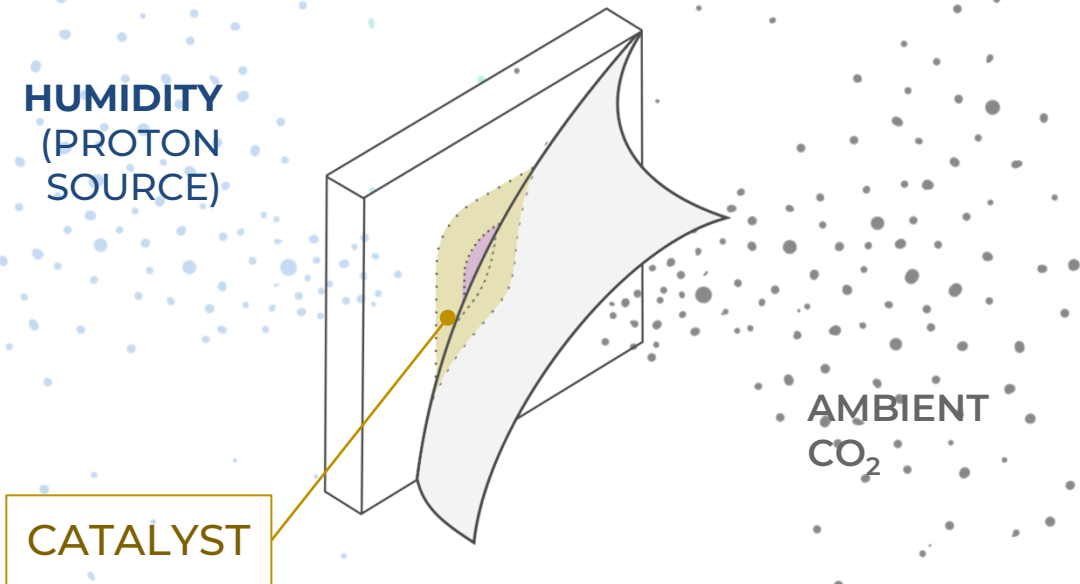
INPUT	CO <sub>2</sub>	Humidity	Solar Energy
OUTPUT	Petrochemicals (Ethanol, Ethylene, Formic Acid)		Oxygen

# AIR - SYNTH CATALYSIS

Patent pending **catalyst membranes** + with the ability to efficiently interact with ambient  $\text{CO}_2$  and ambient water vapors



FE - SEM image of the Catalyst

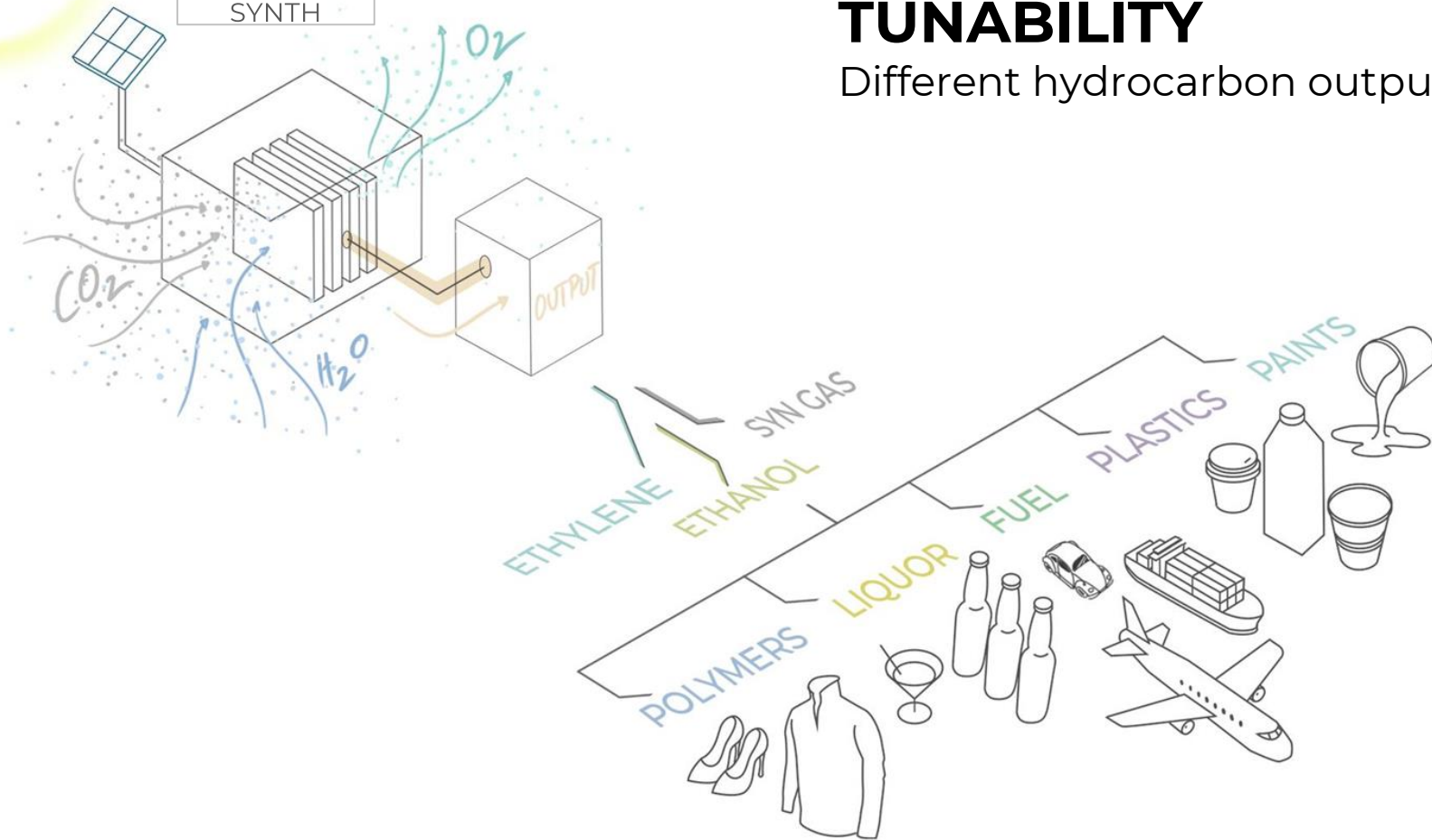




AIR -  
SYNTH

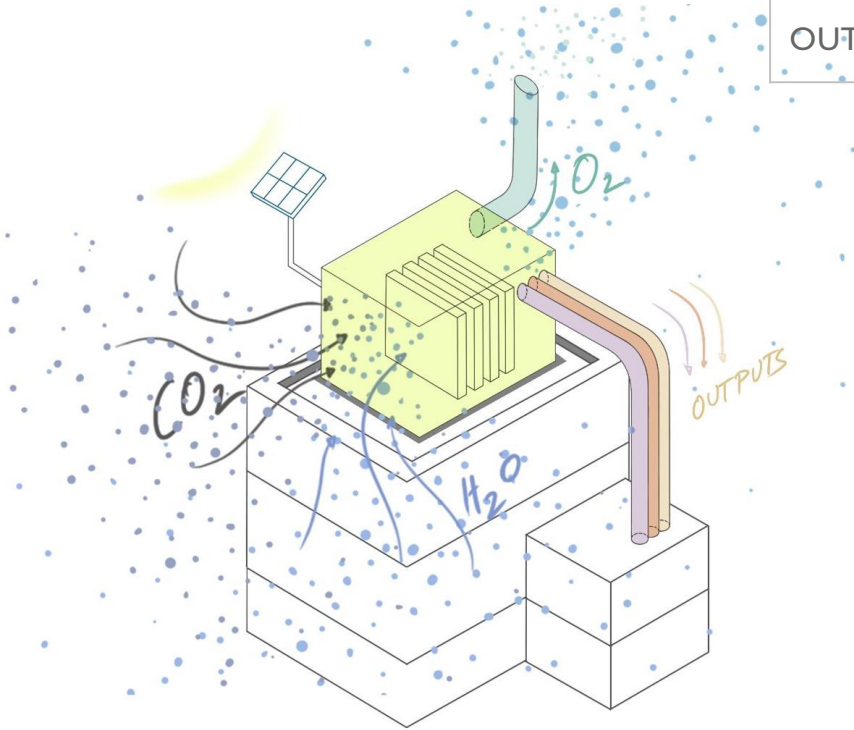
# TUNABILITY

Different hydrocarbon outputs



# SCENARIO 1 - Onsite Air to Petrochemical

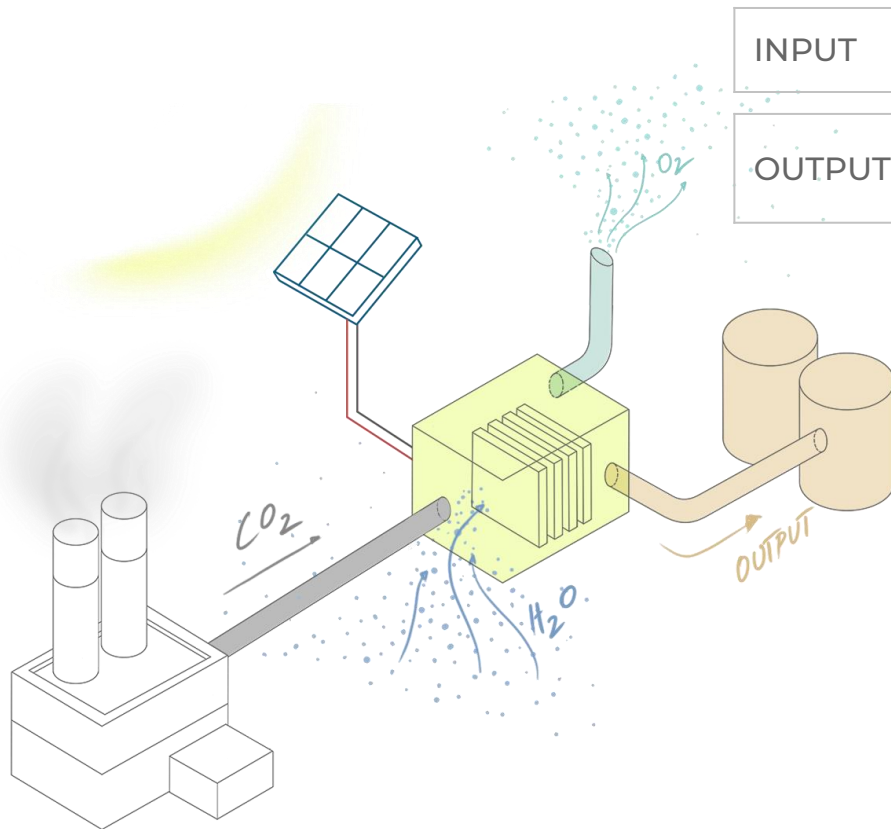
INPUT	Ambient CO <sub>2</sub> (0.04%)	Ambient Humidity	Solar Energy
OUTPUT	Customized Petrochemicals as required		Ambient Oxygen



Potential Deployment site:  
Polymer Factory

Direct Ambient Air Capture and  
Utilization of Greenhouse Gases (CO<sub>2</sub> + Humidity)

# SCENARIO 2 - CO<sub>2</sub> Upcycling



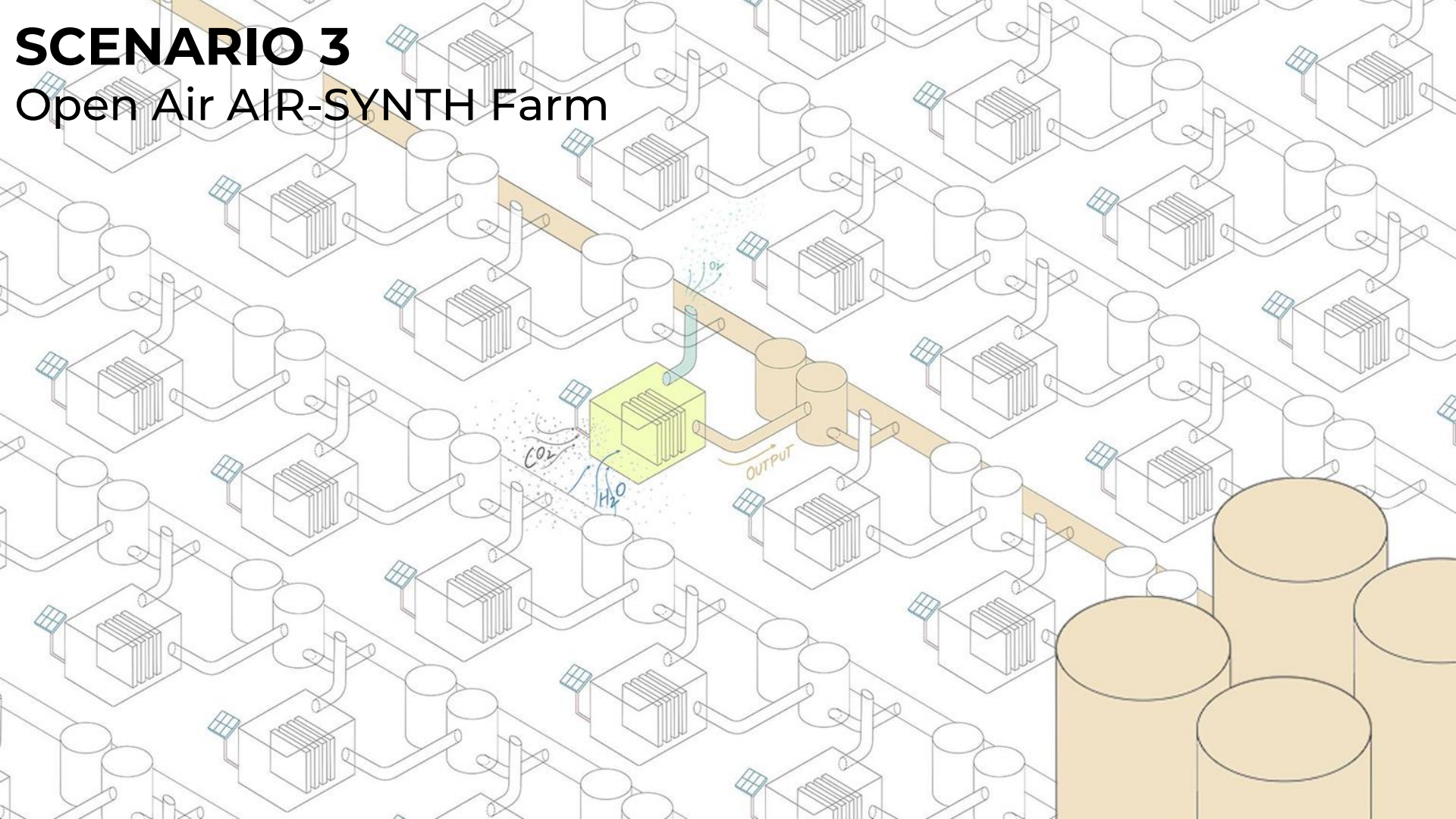
INPUT	Flue Gas	Humidity	Solar Energy
OUTPUT	<i>Petrochemicals</i> (Ethanol, Ethylene, Formic Acid)		Oxygen

## Potential Deployment site

Deploying Reactor next to rich streams of captured CO<sub>2</sub>, next to carbon capture site, oil refinery stacks.

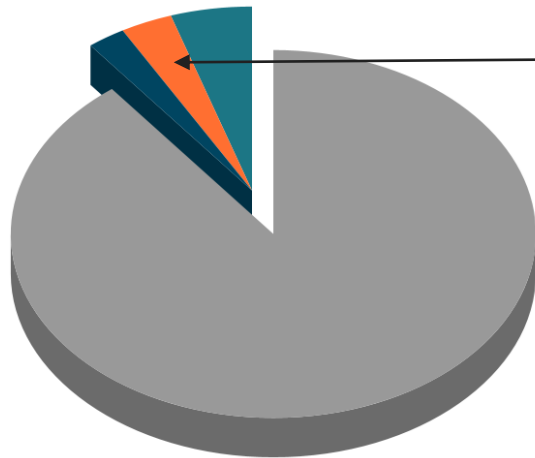
# SCENARIO 3

## Open Air AIR-SYNTH Farm



# MISSION 2030 AND ONWARDS

Green House Emissions by Sector



Mitigate ~ 1 GT CO<sub>2</sub> annually

Disrupt plastics, fuel, liquor, apparel, paints market > USD 60 Billion

● Others (Energy, Agriculture) ● Chemicals ● Construction Material ● Petrochemicals

# MEET THE TEAM



**Anirudh Sharma**  
*Co-founder & CTO*  
*MIT Alum, Forbes*  
*30 under 30, MIT*  
*TR 35*



**Nikhil Kaushik**  
*Co-founder & CEO*  
*CPA, EY Alum, FP*  
*100 Leading Global*  
*Thinkers*



**Dr Ravi Kumar**  
*Lead Electrochemist*  
*PhD, IISER Pune*



**Dr Ajay Saini**  
*Lead Chemist*



**Aishwarya Das**  
*Head of Strategy*



**Rajdeep Savenkar**  
*Industrial Designer*

We are a close-knit group of ex founders, scientists, engineers, designers passionate towards material science and climate impact

## Advisors



**Dr Pattie Maes**  
*Director, Fluid*  
*Interfaces*



**Dr Christine Ortiz, Professor**  
**MIT**



**Dr Terry Clayton**  
*Director, EFI*  
*Imaging*

# Appendix

# AWARDS & RECOGNITION





## Dell Technologies has a green vision to stop our love of gadgets killing the planet

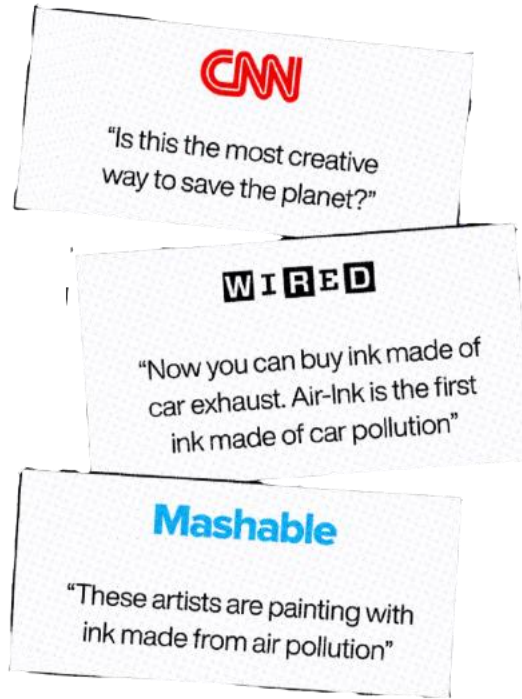
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Naomi Campbell launches **Pangaia x AIR-INK** Collaboration 2021  
Product: <https://thepangaia.com/pages/airink>

Naomi Campbell stunts in the latest pieces from the Pangaia X AIR-INK® by Jenke Ahmed Tailly collection.

