

Producing Hydrogen ...

Differently



ZERO emissions



Europea Innovatio Counc





## The energy transition challenge



# 85% OF OUR ENERGY IS BASED ON FOSSIL FUELS COMBUSTION

Cheap, easy to transport, high energy density. Fossil fuels come with a price: high CO<sub>2</sub> emission combustion.

2021 – 36.4 Billions of Tons of CO<sub>2</sub> emitted



# WE NEED URGENTLY TO DECARBONIZE OUR ENERGY

To decarbonize our economies, progress on current technologies won't be enough. Investments in **disruptive technologies** are essential.

2050 - Net-Zero CO<sub>2</sub> emission goal



#### PARTLY BY HYDROGEN...

 $H_2$  is a highly promising solution: versatile in terms of supply and use, it can help decarbonize a range of sectors and will be part of the 2050 energy mix.

2050 – 10 Billions of Tons of H<sub>2</sub> needed



#### ...BUT ONLY IF 3 CONDITIONS ARE MET

- Produced without CO<sub>2</sub> emission;
- at a very large scale;
- at a competitive price.

Production Cost Objective : 2.50€ / kg H2 (on site)



Imagine... sustainable hydrogen without competitive cost



## Solution

Sakowin offers compact, modular and stackable for on-site hydrogen production on demand

In a mission to increase bankability and commercial viability of industrial application of onsite green hydrogen production



### Low-cost

Low in CAPEX and energy-efficient, the units produce green hydrogen at the cost of grey hydrogen.



### **On-site**

On-demand and on-site hydrogen using existing gas infrastructures avoids storage and transportation energy inefficiencies



### CO<sub>2</sub> Negative

Using **bio-methane**, we provide sustainable energy solution that also creates carbon. More than CO<sub>2</sub> neutral, we are CO<sub>2</sub> negative



### **Energy Efficient**

Methane decomposition uses **5x less electricity** than an electrolyser, allowing
to better preserve natural resources



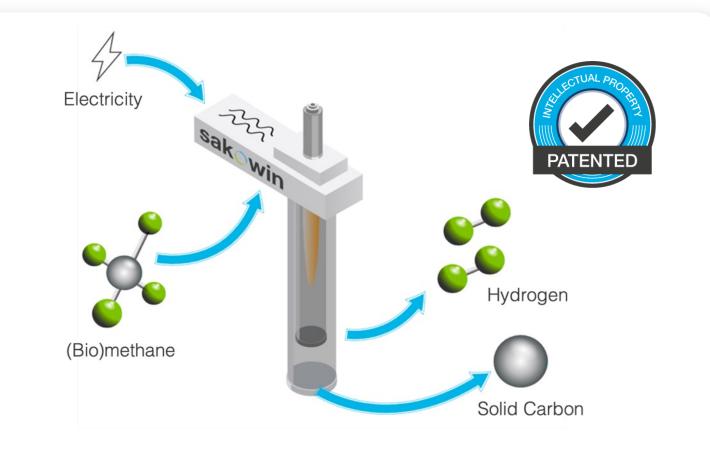
# Methane plasmalysis



**Microwave Plasma** 

On-site

On-demand



CO<sub>2</sub> free process

5x less electricity than electrolysis
highly efficient
Highly scalable, no catalyst



# South Beach scalability

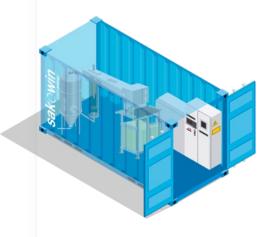


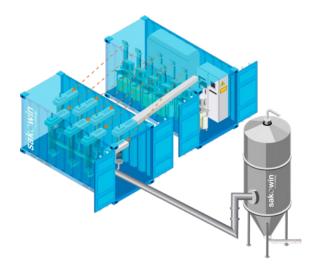
Compact, modular and stackable for on-site decarbonized hydrogen production on demand

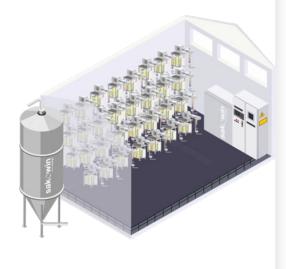
# POTENTIAL FOR 1€/kg H<sub>2</sub> ON-SITE

<2.5€/kg H<sub>2</sub> without carbon valorization and before industrialization









South Beach 100 kW, 1 module

Production of ~200 kg/day

South Beach 800 kW, 8 modules

Production of ~1.6 t/day

Custom made scale up 10 / 50 / 100 MW or more

Production of several hundreds t/day



# Perfectly circular

Energy system

### Solid carbon

- ✓ POSITIVE
   ENVIRONMENTAL IMPACT
   (650 k tons of CO₂ avoided by 2030)
- ECONOMICALLY VALUABLE (current and future markets)

Tomorrow's market 30 Billion tons of solid carbon by 2050



Batteries



Building material



Agriculture



Today's market

28 million tons

\$23 billion world

Carbon Black

sakowin



## 21 People Team

Highly experienced team in plasma, physics, chemistry, fluid dynamics, modeling, electronics, industrialization, finance, business development



**Gérard Gatt,**Founding President &
Business Development

35 years' experience in growing companies (in Europe and USA), one of the first 17 employees at Citrix Systems (NASDAQ).



Ph.D. Laurent Levin Cofounder, Scientist Advisor

30y+ experience in R&D having worked as renewable energy expert in large groups, post-doc at Stanford University



PhD. Marilena Radoiu Microwave plasma expert

Expert in microwave plasma technology and CEO of Microwave Technologies Consulting



**Yves Georges** 

Co-founder, Business Development, Advisor

Expert in R&D and business roles within energy and transport sectors managing sales budgets of €200M+



Mathieu Schmitt Business development & Strategic Partners

Operational skills in strategy, project management and digital marketing. Previously worked in the Digital Customer Engagement Team at Amadeus.















**6** engineers



14

scientific partners



### **Market Traction**

Market access through OEM & SI: industrial partnerships already established



15 in 2025



CO<sub>2</sub>-free industrial process for materials



H<sub>2</sub> refueling station for airports



CO<sub>2</sub>-free oil & gas extraction



H<sub>2</sub> refueling station for farms & biomethane



Maritime CO<sub>2</sub>-Free LNG Ships



H<sub>2</sub> refueling station for trucks, trains, ...











**DISCUSSIONS** 

WITH

**SEVERAL** 

**POTENTIAL** 

**PARTNERS** 





# Collaboration with the VzDI Association

- Operation of Industrial Processes
- The VzDI association has chosen SAKOWIN for their hydrogen production pilot platform in Zug











































# Investment plan milestone-based

**IM€** indus.

2021



SAINT-GOBAIN



03/2022

2.5M€ Grant & loan Bpifrance

06/2022 2.5M€ Grant European Innovation



Financing steps

2023 - 2024

4M€ EQUITY OVER 2 YEARS (incl. 2M€ EIC secured)

6 kW Prototypes, 100 kW Demonstrator and bring 100 kW South Beach Module @ TRL 9



2025

TBD M€ (incl. 2M€ EIC secured)

Scale-up, Industrialization & Worldwide Sales

## 2026





Product Release

### 100 kW

South Beach Module

Scale-up, Industrialization & Worldwide Sales



### **Technology Optimization and Scale-Up**



2022

3 kW Prototype

TRL 6

2023

6 kW Prototype

TRL 7

2024

100 kW demonstrator

Integration and demos with OEMs

TRL 8

2025

Product Release 100 kW SB Module

TRL9



### **Business Model**

### **Revenue & EBITDA Forecast**



**PROJECTIONS UNTIL 2030** 

€223M

CUMULATIVE REVENUE €39M

CUMULATIVE EBITDA

- SOLID SALES PIPELINE OF 7 M€



800k€/module



# A future without CO<sub>2</sub>

# Thank you

Gérard Gatt, President <u>gerard@sakowin.com</u>

### **AWARDS**



| 06/2021 | H2 Hub Airport Winner   |
|---------|---|
| 05/2021 | Forum National Eco-entreprises (Energy award)                                 |
| 10/2021 | Energy for Smart Mobility Forum (Energy award)                                |
| 11/2021 | Pollutec (special jury prize)   |
| 11/2021 | BlueInvest readiness  |
| 2021    | Award World Impact Summit   |
| 12/2021 | Gazelle Accelerator - Aerospace Valley –<br>EIT Manufacturing (finalist, 2nd) |
| 03/2022 | Réseau Entreprendre member  |
| 03/2022 | BPI - DeepTech label  |

### **MEMBER OF**



### **FINANCIAL SUPPORT**





03/2022 World Material Forum (finalist)



# METHANE NEEDS

# 7 TIMES LESS ENERGY

## THAN WATER

to produce the same amount of hydrogen

 $2H_2O \Rightarrow 2H_2 + O_2$ 

**570** kJ/mol

 $CH_4 \Rightarrow C + 2H_2$ 

**75** kJ/mol

