HYSILABS

HYDROGEN STORED AS LIQUIDS

HySiLabs | HSL Solutions™

Vision

A H_2 economy for a zero-carbon future.

Mission

Enabling massive H_2 logistics with a safe and cost-competitive solution.

60 patents

6 M€ total funding

18 employees

2022 1st system delivered

5 co-dev projects

This project has received funding from the **European Union's Horizon 2020** research and innovation programme under grant agreement No 101009244

UNION EUROPÉENNE
Fonds Européen de Développement Régional

RÉGION SUD PROVENCE ALPES CÔTE D'AZUR

Projet cofinancé par React-EU - Dispositif de relance de l'Union européenne en réponse à la pandémie de COVID-19

7 AFFORDABLE AND CLEAN ENERGY
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
12 RESPONSIBLE CONSUMPTION AND PRODUCTION

LES DEEP TECH
SOLARIMPULSE EFFICIENT SOLUTION JUNE 2019
GREENTECH INNOVATION

Financial

RÉGION SUD / INVEST
eit InnoEnergy Knowledge Innovation Community
European Commission
kreaxi
bpifrance

Ecosystem

France Hydrogène — Engagée pour la transition écologique
Capenergies
Hydrogen Europe

Executive summary

HySiLabs has conceived the 1st way to transport and store H_2 as any conventional liquid, using the existing infrastructures and with a zero-carbon basis.

By enabling massive H_2 logistics, a new way of conceiving long distance transportation for the molecule is possible.

HSL Solutions' USP: liquid state at standard conditions, carbon free, use of conventional liquid infrastructures, no energy input for releasing the H_2, suitable for on-board maritime applications.

HySiLabs provides H_2 to consumers together with partners of the value chain via Hydrogen Stored as Liquids solutions.

After proving the concept at large scale, HySiLabs is ready to go onestep further and industrialise its process thanks to a 15M€ fundraising.

Scalability will guide HySiLabs to make revenues starting 2025, to access the mass market in 2027 and to break even in 2030.

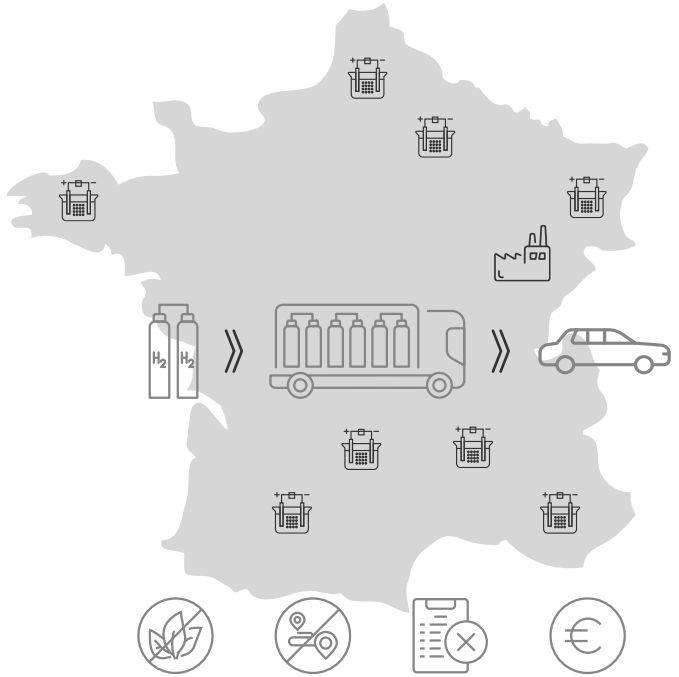
Hydrogen (H_2) is a key element in the energy transition…

« H_2 could meet up to 24% of the world's energy needs by 2050 »

(Bloomberg NEF 28.5.2020)

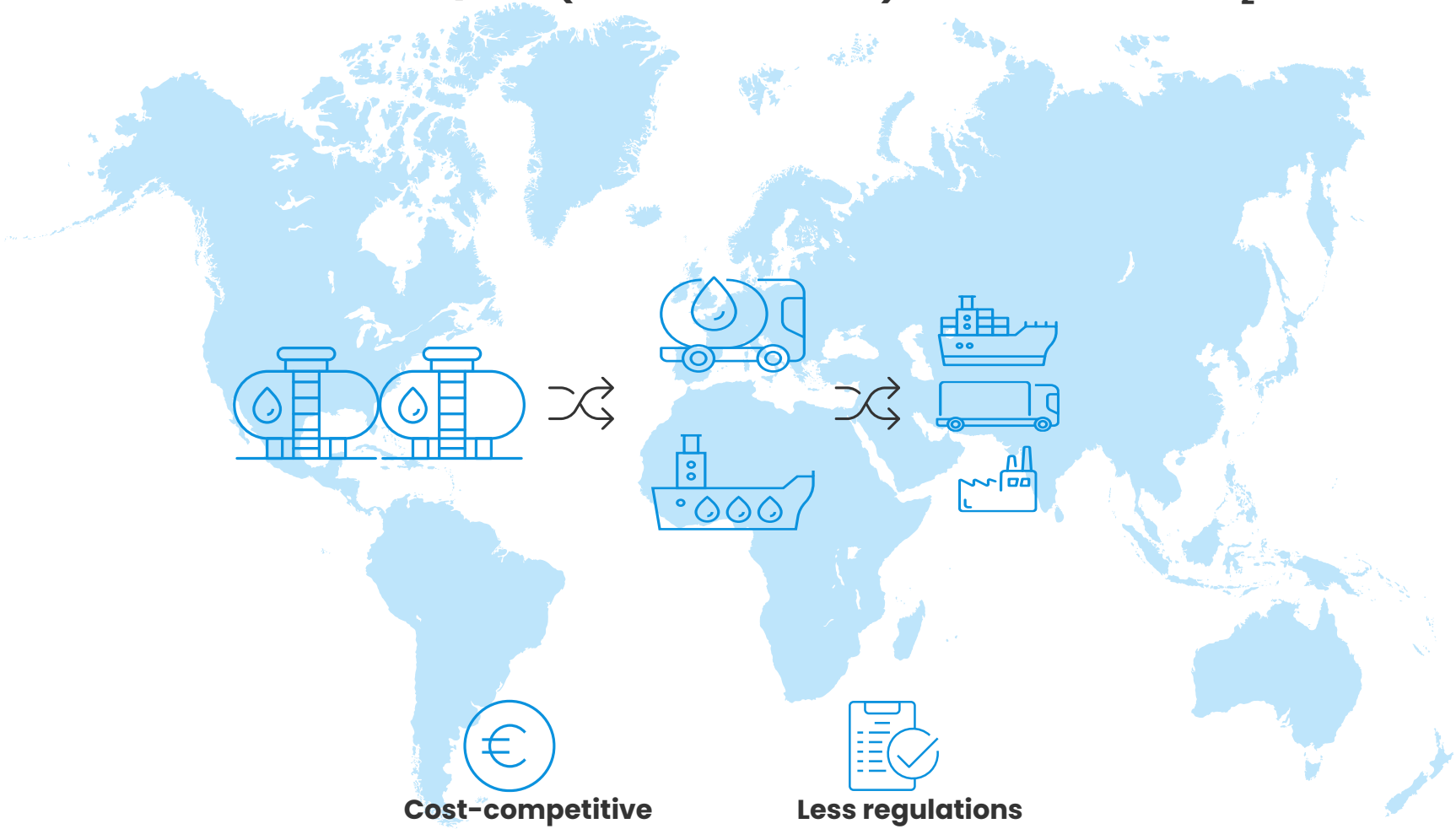
… but its logistics remain complex and expensive

H_2 transportation is limited to small distances and little quantities



A new way to transport green H_2

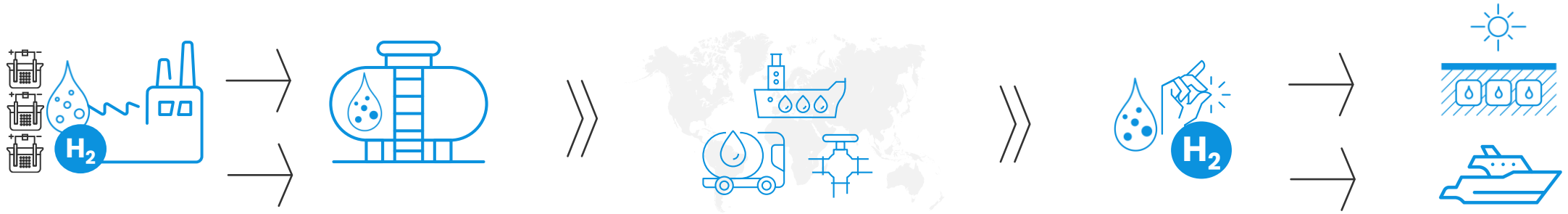
HYDROGEN STORED AS LIQUIDS (HSL SOLUTIONS™) ENABLE MASSIVE H_2 LOGISTICS*



* Long distance transportation and long-term storage of H_2

HSL solutions™ to easily store & transport H_2

HySiLabs has developed two innovative chemical processes to charge and release H_2 in and out of the carrier.



Industrial processes to load the carrier with H_2 and energy

Charging reactor

H_2 + "SiO_2" + E → $[H_2SiO]_n$

Same logistics as conventional liquid fuels

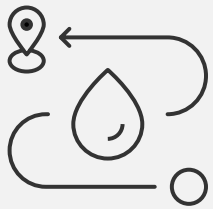
H_2 is released from HydroSil on demand without energy

Release reactor

$[H_2SiO]_n$ + n H_2O → 2n H_2 + "SiO_2" + Q

Energy efficiencies vary between 35 and 60%

Business Model



Enabling massive H_2 logistics

by

Selling H_2 with logistics partners

to

H_2 players:

- mobility
- long-term storage
- overseas transportation

using

H_2 Stored as Liquids (HSL Solutions™)
Patented solutions

Purpose and applications

Among all the H_2 usages, HSL Solutions are unbeatable on these three

Green H_2 transportation and H_2 hubs

- Building a pilot near a H_2 hub
- Total addressable market: 26% of the total H_2 market in 2030
  (IEA green H_2 project database; end-use sectors of non-captive H_2)

Ports

H_2 valleys

Heavy duty on-board applications

- Building a pilot to feed the demand
- Total addressable market: 32% of the total H_2 market in 2030
  (IEA green H_2 project database; end-use sectors of non-captive H_2)

Ship-owners

Dockyards

Strategic storage

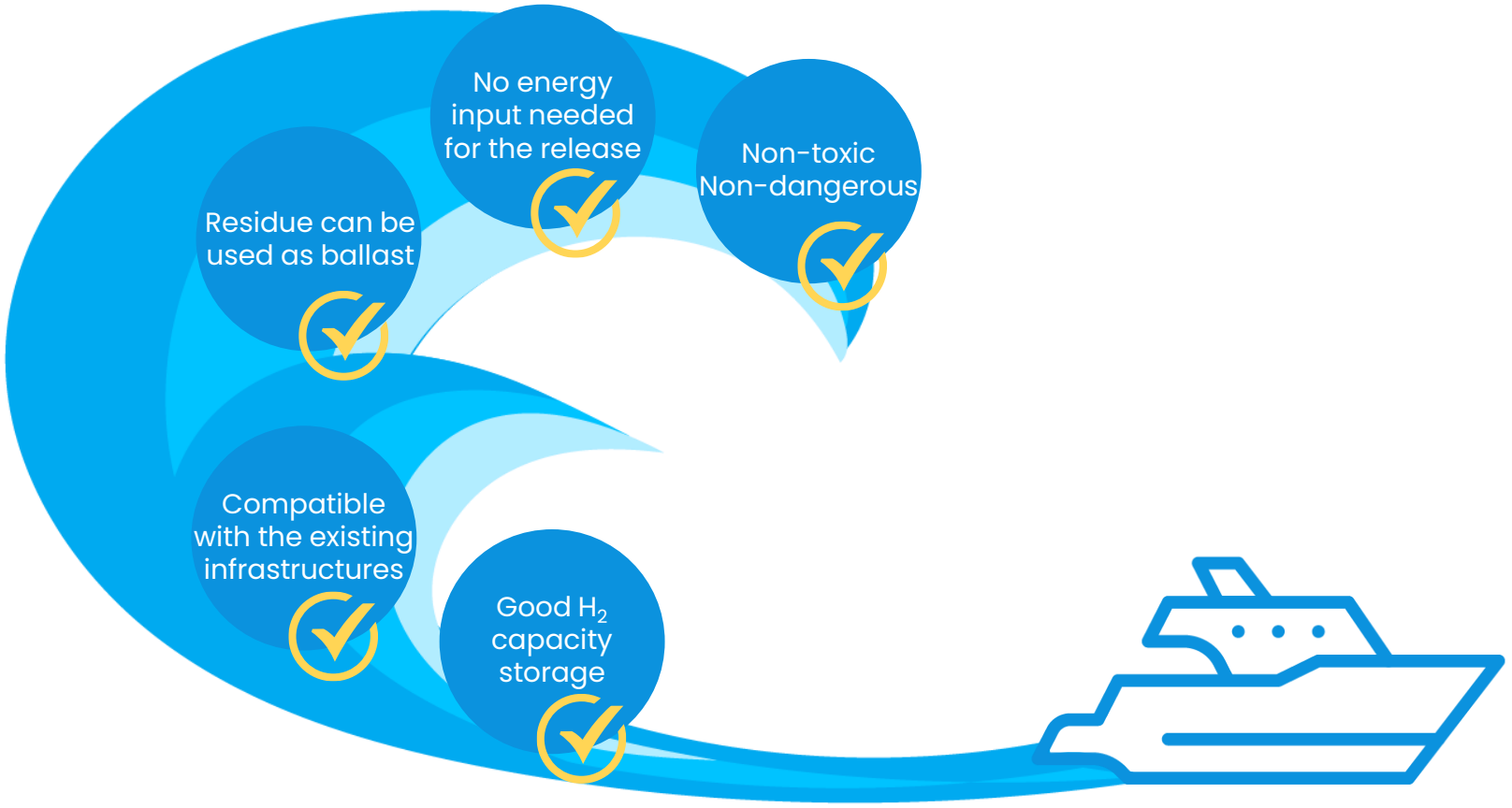
- Building a pilot with key partners from the sector
- Total addressable market: 1% of the total H_2 market in 2030
  (IEA green H_2 project database; end-use sectors of non-captive H_2)

Cavern storage

Stockists

On-board mobility: the maritime sector

Last update: 01/03/22



Ongoing discussions

RESHIP
Achieving -35% energy saving on-board

H_2 feeder
Carburating ships between ports

Calanques project
Whole value chain around HydroSil on-board

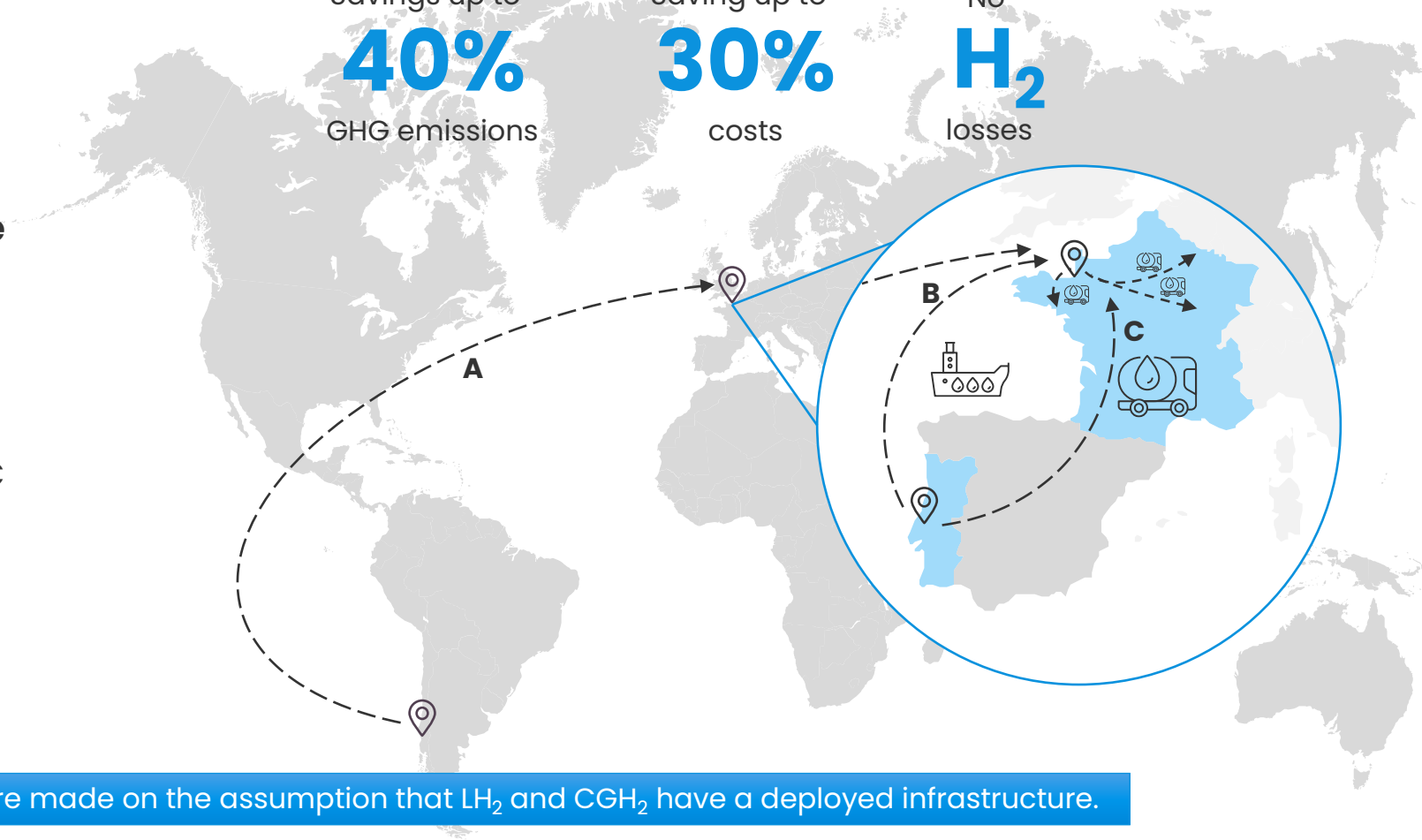
HydroSil-powered boat
Testing HSL Solutions™ on-board

A cost competitive solution for any use case

Savings up to*
40%
GHG emissions

Saving up to*
30%
costs

No
H_2
losses



Chile - France

By sea A**

- **12%** vs LOHC
- **13%** vs LH_2
- **21%** vs NH_3

Portugal - France

By sea B**

- **5%** vs LOHC
- **5%** vs LH_2
- **16%** vs NH_3

Portugal - France

By road C**

- **4%** vs LOHC
- **9%** vs LH_2
- **30%** vs CGH_2***

The data shown are made on the assumption that LH_2 and CGH_2 have a deployed infrastructure.

* Compared to other carriers ** Real business cases based on ongoing discussions (other cases available) *** 350 bars, Type IV

The most competitive solution

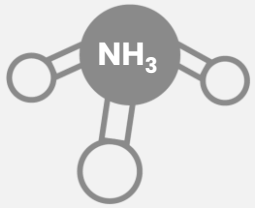
HYSILABS
HYDROGEN STORED AS LIQUIDS

Earth friendly

Liquid, Stable, Safe

On demand release without energy input

- ✓ Liquid, stable, safe
- ✓ Earth friendly
- ✓ No energy needed to release H_2
- ✓ Non-organic molecule
- ✓ Use of conventional infrastructures

Liquid Organic Hydrogen Carriers		✓ Liquid, stable, safe ✗ Earth friendly ✗ No energy needed to release H_2 ✗ Non-organic molecule ✓ Use of conventional infrastructures
Ammonia		✗ Liquid, stable, safe ✗ Earth friendly ✗ No energy needed to release H_2 ✓ Non-organic molecule ✓ Use of conventional infrastructures
Pressurized/ Liquefied H_2		✗ Liquid, stable, safe ✓ Earth friendly ✓ No energy needed to release H_2 ✓ Non-organic molecule ✗ Use of conventional infrastructures

Already committed with major players

SUNtoX
Solar Energy for Carbon-Free Liquid Fuel

Start: September 2020
Duration: 3,5 years

Photoelectrochemical H_2 production

TOYOTA · ENGIE · LGI sustainable innovation · DIFFER · EPFL · HZB Helmholtz Zentrum Berlin · Lightfuel Sunlight to hydrogen · CEA

Supported by:

Horizon 2020

H2-gate

Start: January 2021
End of phase 2: April 2022

Massive importation and storage of H_2 (1Mt/y)

EVOS · Port of Amsterdam

QualifHY

Start: November 2021
Duration: 2,5 years

Test bench of the release process and connection with a fuel cell.

Arts Sciences et Technologies et Métiers · ENOGIA The Small Turbine ORC Company · Helion Hydrogen Power

Supported by:

RÉGION SUD PROVENCE ALPES CÔTE D'AZUR · Investissements d'avenir

TOYOTA STARTUP ACCELERATOR

Start: January 2022
Duration: 6 months

Accelerating HySiLabs' development and delivering a POC

TOYOTA

Supported by:

ISDI DIGITAL TALENT

MoU & LoI signed with major players

Willingness to use HSL solutions™

Markets

Non-captive green H_2 market in 2030

Worldwide	Europe
140B€	**75B€**
Served Addressable Market	
72B€	**34B€**
Served Obtainable Market	
14B€	**2B€**

Production site capacity

20%

Market share

These data have been stablished following a realistic scenario of hydrogen deployment according to the IEA forecasts and data (2030)

Timeline | Next steps

Recycling prototype

Release reactor (15 kW)

1st hydrosil powered boat

22

3 release pilots (10t/y H_2)

3 charging pilots (10 t/y H_2)

50 M

3 large charging plants (10 Kt/y H_2)

Mass market

75

10 large release systems (10 kt/y H_2 each)

1 massive charging plant (100 kt/y H_2)

10 large charging plants (10 kt/y H_2 each)

100 release systems (1 kt/y H_2 each)

2023

2024

2025

2027

2030

Release Charge

Talents

Chemical experts

Business developers

Process engineers

Project managers

Our values:

We **look** for the **simplest** and **fastest** way to get things done with the **maximum** impact.

We **think** big and strive for **excellence**.

We **challenge** the **norms** and **push** boundaries.

Focus on core team

Pierre-Emmanuel Casanova

Chairman

MSc2 in sustainable development and innovation management from North Carolina University

Co-founded HySiLabs in 2015

Pierre-Emmanuel has a solid business and management expertise, completed with MBA training. Pierre-Emmanuel manages the company's growth, establishes a strong industrial network and sets strategic partnerships.

Vincent Lôme

CTO

PhD in Biotechnologies, Automation, and Chemistry from Aix Marseille University

Co-founded HySiLabs in 2015

Vincent has a strong scientific background, and he successfully oversees the technical development that led to their current ground-breaking solution and manages the scientific aspects (IP, sub-contractors, etc.).

Corine Dubruel

CEO

With a dual French and Swiss nationality, she is graduated from Grande Ecole Centrale Paris, Distinction in Economics (Master of Sciences).

Within energy players like ENGIE, GE, ABB, Corine held several general management roles. Before joining Hysilabs as CEO, Corine Dubruel, was responsible for the global strategy, sales growth and public affairs for Plug Power Europe.

Rémy Benoît

Deputy CTO

PhD in Organic Chemistry from Rouen University, brings his long experience as director of several chemical plants, as well as his expertise in chemistry and plant management (BASF, PCAS, Ashland). Rémy is the project expert in chemistry and industrialization and will be working on the scaling up of the process to prepare the transfer to the clients.

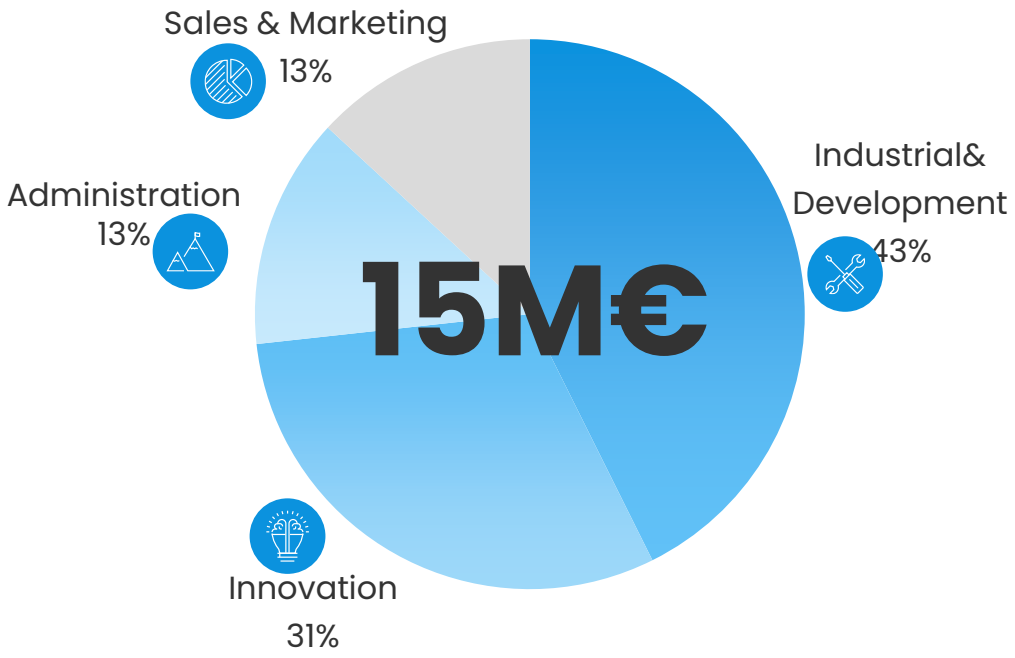
15 M€ series A fundraising

6M€ previously raised (equity + grants)

Horizon 2020 EIC Accelerator and BPI Deeptech winners

Up to 5M€ agreed by the EIC Fund for this series-A

Up to 3M€ subventions



Keep gathering the best talents:
Up to 46 full-time employees*

Start commercial force:
Be present in Europe, America, and Asia*

Maintain IP expertise and keep innovating:
+6 patents / year

Stay pioneers:
Dominate the industry

Scale-up our unique solution:
Have built 6 pilots*

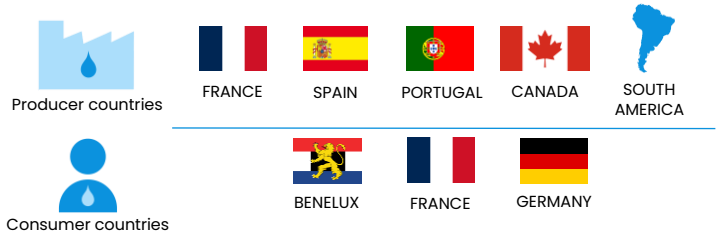
* In 2025

P&L of HySiLabs

2022 **2024** **2025** **2027** **2028** **2030**

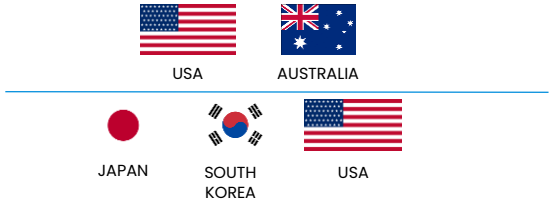
10M€ series

- Scale-up HSL Solutions™:
  Up to TRL 8/9 (Charging & Release)
- Co-development:
  6 pilot sites(Charging & Release)
- Scale-up HySiLabs as a company:
  General Management, Sales, and Industrialisation
- Go-to-Market Strategy & Action plan with first strategic countries:



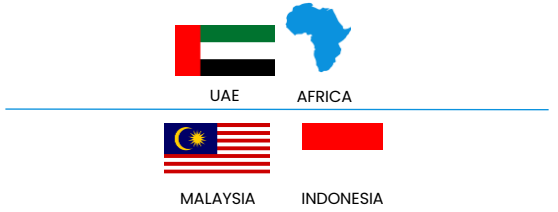
50M€ series

- Improve HSL Solutions™ through pilot sites monitoring
- Financing & Construction of the first industrial plant (10kt/y)
- Pre-commercialisation phase with implementation of sales tools & pricing policy with turn-over in 2027
- Increase Marketing & Communication
- Extend business development geographical coverage:



150M€ series

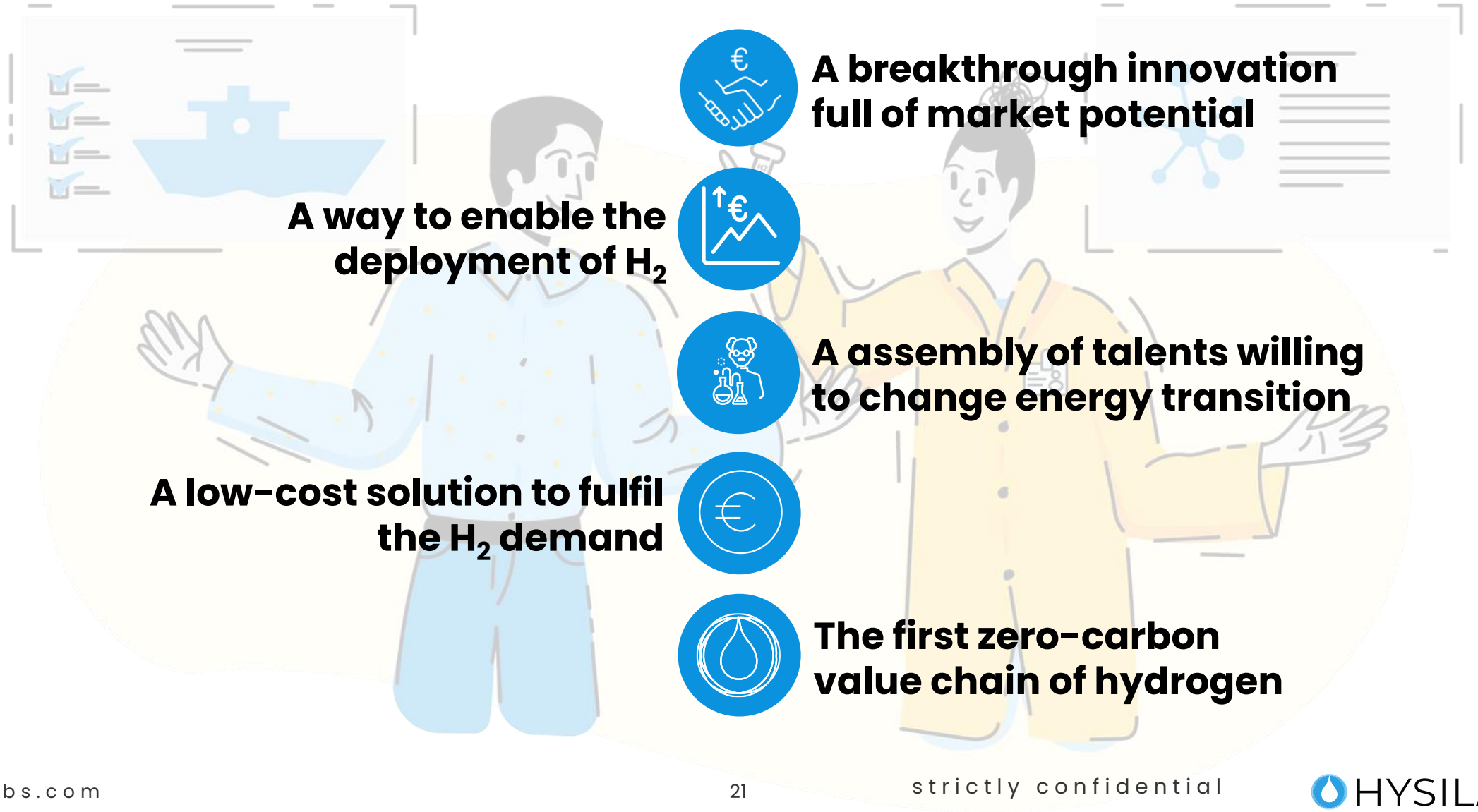
- Scale-up Industrial roadmap up to 10 plants 10kt/y together with a deployed release systems network
- Financing & Constructing first massive plant (100kt/y)
- Mass Market commercialisation:
  Turn-over 1B€ 2030
- On-board maritime strategy
- Extend business development geographical coverage:



P&L of HySiLabs

K€	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
CA HySiLabs (H2 Provider)	8	100	200	300	400	400	23 310	350 210	700 210	1 050 210
Turnover - total	**8**	**100**	**200**	**300**	**400**	**400**	**23 310**	**350 210**	**700 210**	**1 050 210**
COGS - CA Baseline	**0**	**0**	**0**	**0**	**0**	**0**	**10 576**	**158 642**	**317 283**	**383 635**
Gross margin	**8**	**100**	**200**	**300**	**400**	**400**	**12 734**	**191 568**	**382 927**	**666 575**
Sales&Marketing expenses	**180**	**549**	**650**	**715**	**995**	**1 005**	**1 010**	**1 040**	**1 045**	**1 745**
Total Selling expenses - Labor	145	485	560	620	880	880	880	880	880	1 565
%RH / CA	1813%	485%	280%	207%	220%	220%	4%	0,25%	0,13%	0,15%
Total Selling expenses - Overheads	35	64	90	95	115	125	130	160	165	180
General & admin expenses	**178**	**613**	**656**	**660**	**1 114**	**1 114**	**1 351**	**1 351**	**1 351**	**1 523**
Total Admin expenses - Labor	36	305	305	305	505	505	505	505	505	505
Total Admin expenses - Overheads	142	308	351	355	609	609	846	846	846	1 018
Innovation expenses	**891,5**	**1 136**	**1 586**	**1 652**	**1 859**	**1 845**	**1 759**	**1 581**	**1 664**	**1 532**
Total Innovation expenses - Labor	487	550	610	730	870	870	870	870	870	870
Total Innovation expenses - IP	106	181	208	237	274	295	349	301	394	327
Total Innovation expenses - Overheads	299	405	769	685	715	680	540	410	400	335
Industrialisation expenses	**0**	**60**	**120**	**120**	**1 295**	**1 265**	**1 265**	**1 265**	**1 265**	**1 250**
Total Industrialisation expenses - Labor	0	60	120	120	1 130	1 130	1 130	1 130	1 130	1 130
Total Industrialisation expenses - Overheads	0	0	0	0	165	135	135	135	135	120
Subsidies	**-355**	**-1 288**	**-1 118**	**-1 113**	**-2 053**	**-2 115**	**-29 300**	**-29 274**	**-29 220**	**-241 870**
Operating margin	**-887**	**-970**	**-1 694**	**-1 734**	**-2 810**	**-2 714**	**36 648**	**215 605**	**406 822**	**902 396**
Taxes	**-212**	**-227**	**-317**	**-330**	**-372**	**-369**	**8 810**	**53 585**	**101 373**	**225 292**
Dont impots	*0*	0	0	0	0	0	9 162	53 901	101 706	225 599
Dont CIR	*212*	227	317	330	372	369	352	316	333	306
Financial interest							2 670	13 349	26 698	46 272
Net income	**-675**	**-743**	**-1 377**	**-1 404**	**-2 438**	**-2 345**	**25 168**	**148 671**	**278 752**	**630 831**
Depreciation of investments Pilots&Plants		106 373	106 550	177	1 298	1 121	11 209	51 558	101 995	172 834
Working capital variation	-1,33	-17	-33	-33	-67	-67	-2 122	-31 928	-63 821	-111 096
Net cash from operating activities		**105 614**	**105 140**	**-1 260**	**-1 207**	**-1 290**	**34 255**	**168 301**	**316 926**	**692 569**
Investment in plants and equipment		-212 747	-530	0	-7 849	0	-242 705	-970 819	-1 213 524	-1 779 455
Net cash from (used in) investing activities		**-212 747**	**-530**	**0**	**-7 849**	**0**	**-242 705**	**-970 819**	**-1 213 524**	**-1 779 455**
Fund raising round	104	10 000			50 000			150 000		
Changes in financial assets and liabilities		-100	-100	-100	-100	-100	177 984	695 754	809 016	1 143 130
Net cash from (used in) financing activities		**9 900**	**-100**	**-100**	**49 900**	**-100**	**177 984**	**845 754**	**809 016**	**1 143 130**
Increase (decrease) in cash	**-500**	**-97 233**	**104 510**	**-1 360**	**40 844**	**-1 390**	**-30 467**	**43 236**	**-87 582**	**56 245**

HySiLabs is



A breakthrough innovation full of market potential

A way to enable the deployment of H_2

A assembly of talents willing to change energy transition

A low-cost solution to fulfil the H_2 demand

The first zero-carbon value chain of hydrogen

Enabling massive hydrogen logistics for all kind of applications

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9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

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