

**Green Hydrogen Solutions**

**STAAQ Technology**

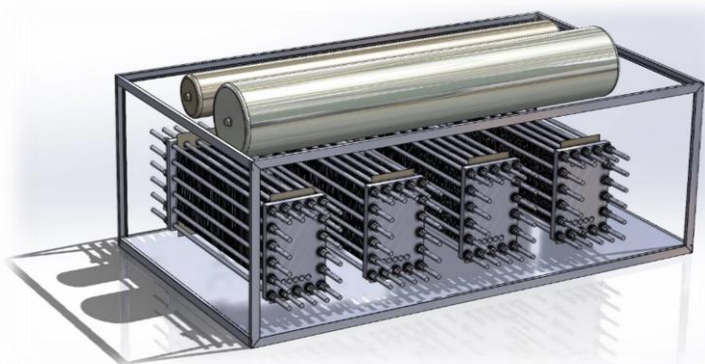
**Pitch deck**

[www.staaq-technology.com](http://www.staaq-technology.com)

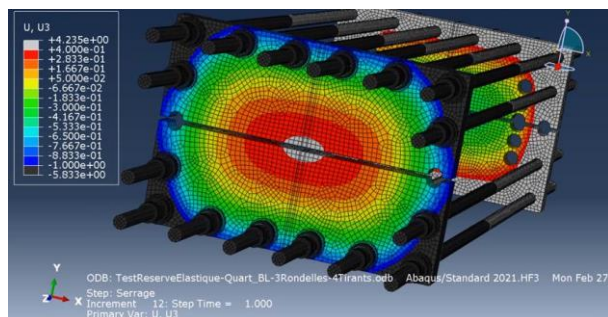
**November 2023**

# Investment Highlights

## STAAQ Technology is the missing puzzle piece to unlock the Hydrogen Economy with industrial scale PEM Electrolysis solutions

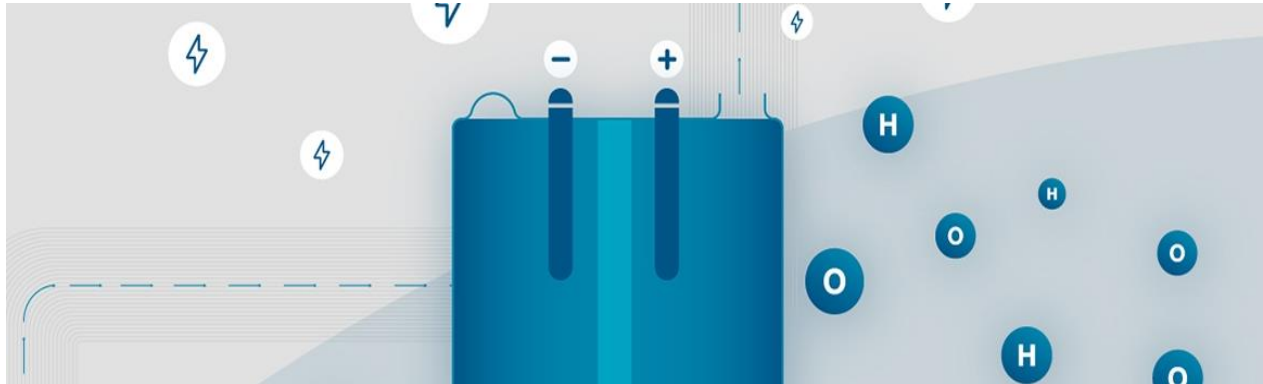


- **Flexible and resilient PEM Stack technology** solving the need for expanding hydrogen infrastructure
- Developing and manufacturing the critical components for the green hydrogen markets
- Solving the PEM stack scale-up problem
- Scalable business model that delivers consistent and recurring revenue, **with a 30 M€ revenue opportunity by 2025 to 185 M€ in 2027**
- **Patented technology** that provides critical performance benefits for a wide range of end markets, with a total estimated global market size of more than 240 GW by 2030
- **Experienced management team** delivering breakthrough technology in partnership with world class industrial partners



# Scaling-up green hydrogen production technologies

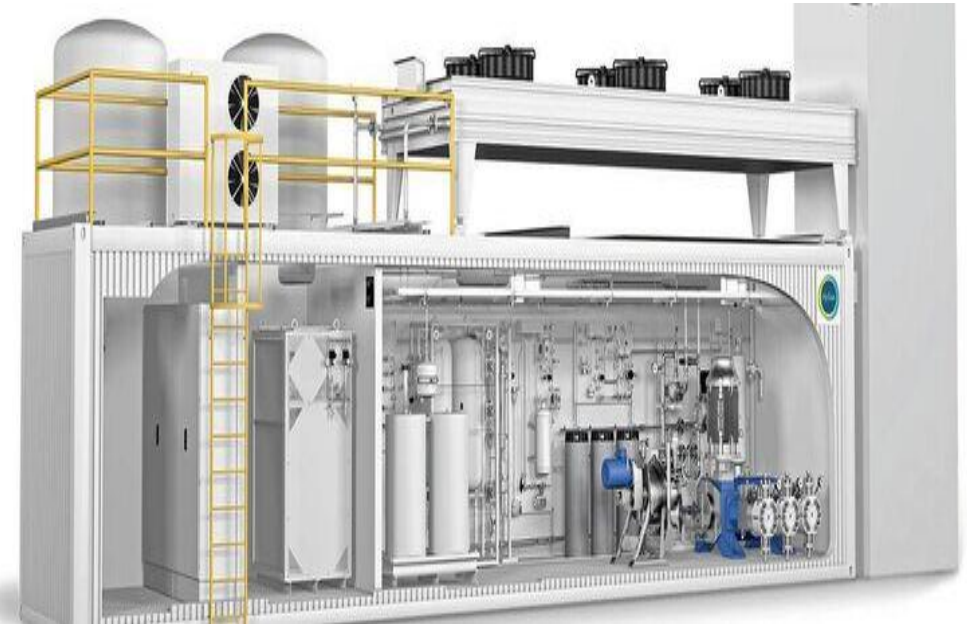
**STAAQ Technology is a company active in the field of decarbonized hydrogen production by water electrolysis.**



Water electrolysis is an electrochemical process that breaks down water ( $H_2O$ ) into dioxygen and dihydrogen using electricity.

There are three technologies of water electrolysis: alkaline, high temperature (HTE) and PEM (Proton Exchange Membrane) electrolysis.

The core of STAAQ Technology's current know-how is PEM electrolysis.



Overview of an electrolysis Hydrogen Production system

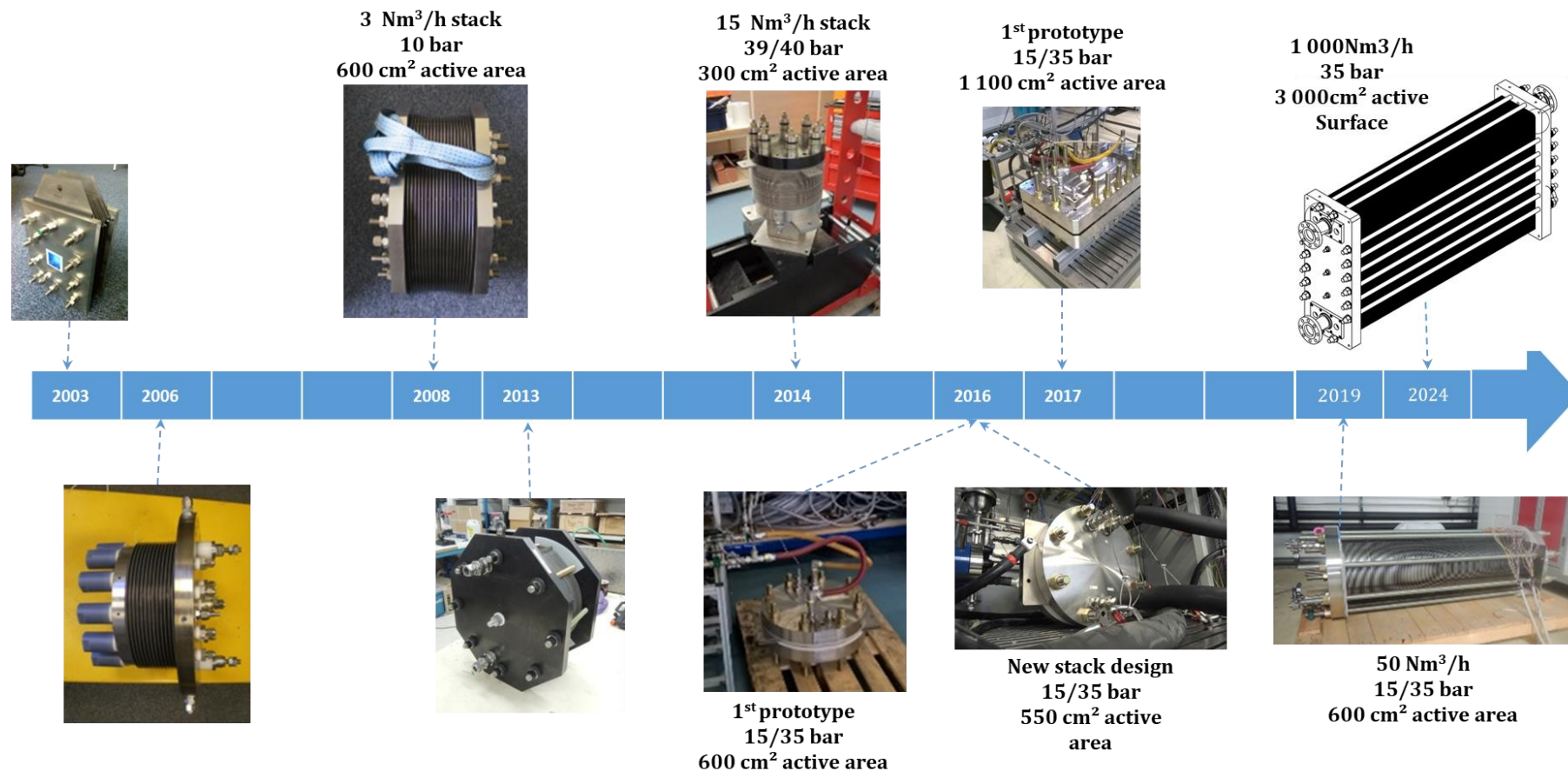


# Solving the PEM electrolysis scaling-up problem

**PEM technology is expected to cover 50% of the electrolysis market**

**This is not achievable based on the current state of the art**

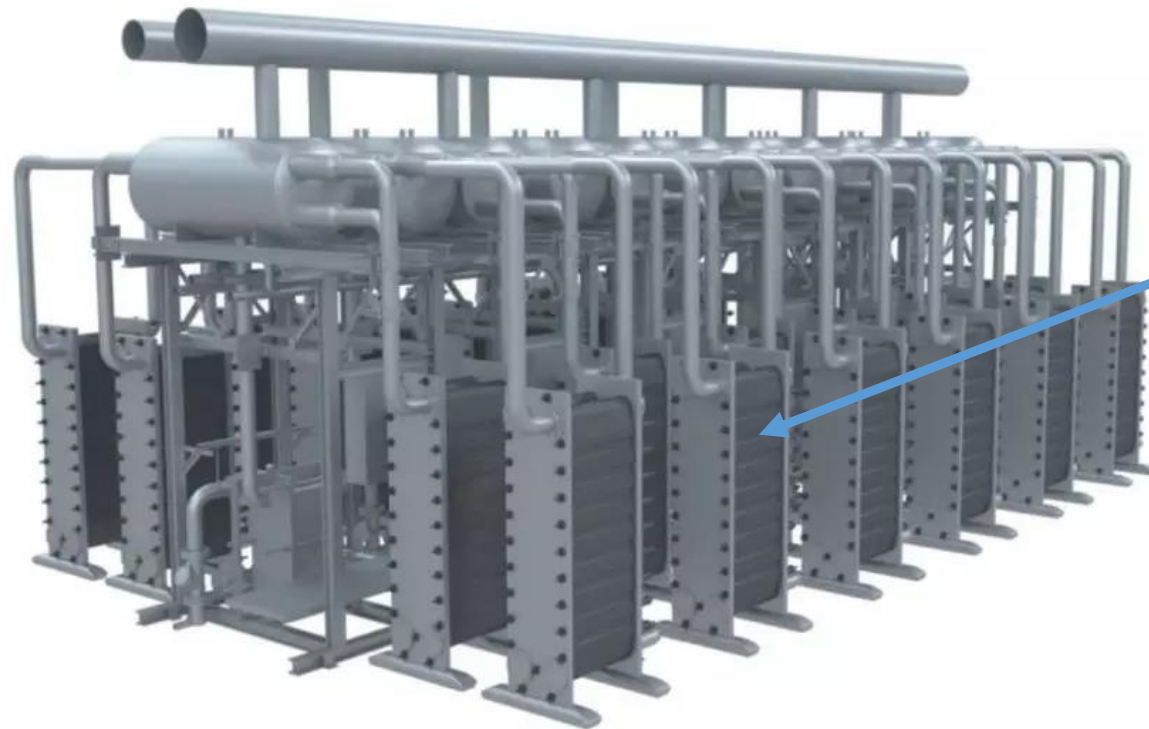
**Scale-up and technology improvement is required**



State of the art evolution in terms of rated power over the last 20 years.

# Solving the PEM electrolysis scaling-up problem

To increase electrolysis capacities while fostering economies of scale, it is essential to increase the unit power of each electrolyser. This is the main objective of STAAQ Technology: An industrial scale-up of PEM technology.



View of a stack in an industrial electrolyser.

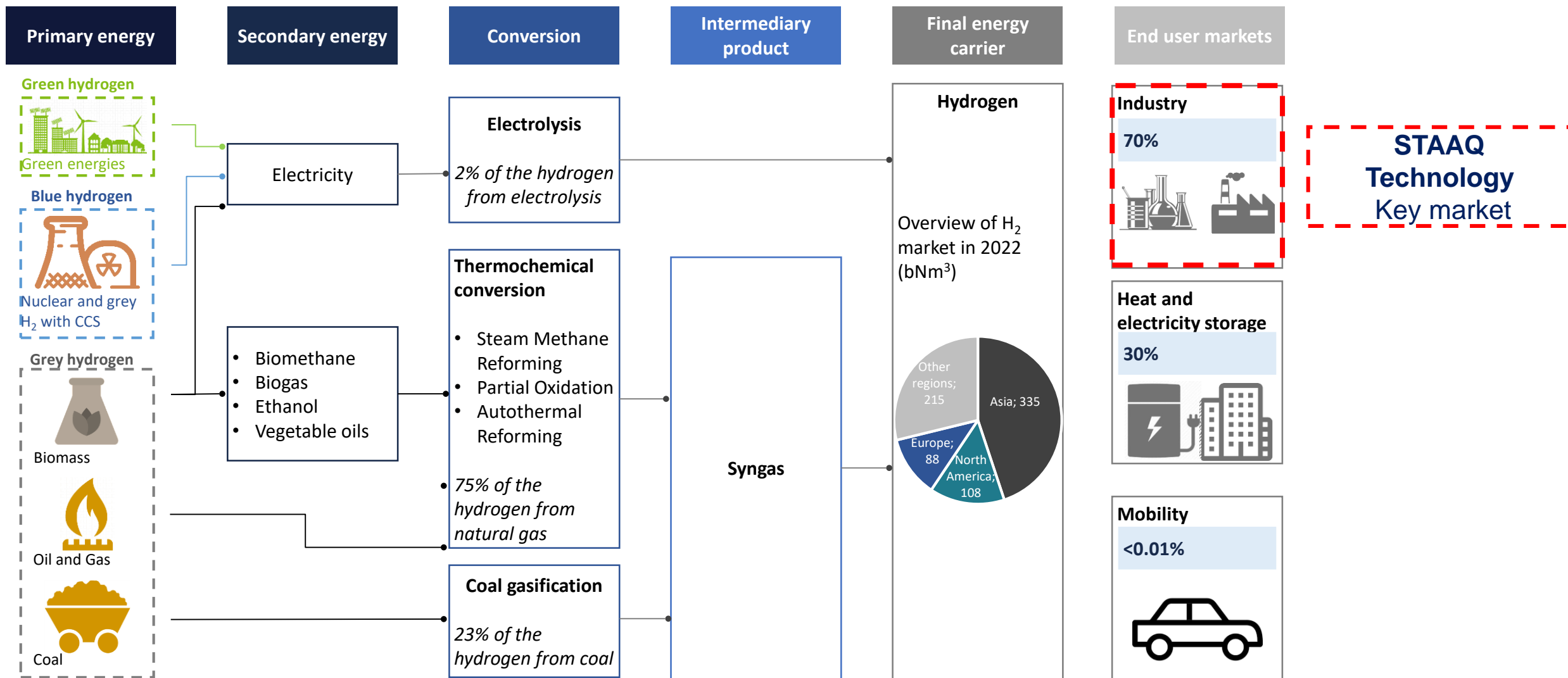
In current state of the art, this component has a rated power of hundred of KW.

STAAQ Technology will bring it to 5 MW and adapt it to an industrial environment

Our technology drives a strong **beneficial impact** on operator's **hydrogen production costs**.

# Use cases – STAAQ Technology focuses on the industrial market

**H<sub>2</sub> is a key energy carrier to implement transition to a low carbon economy switching from « grey » hydrogen production to « blue » and « green »**



# Use cases – STAAQ Technology focuses large scale applications

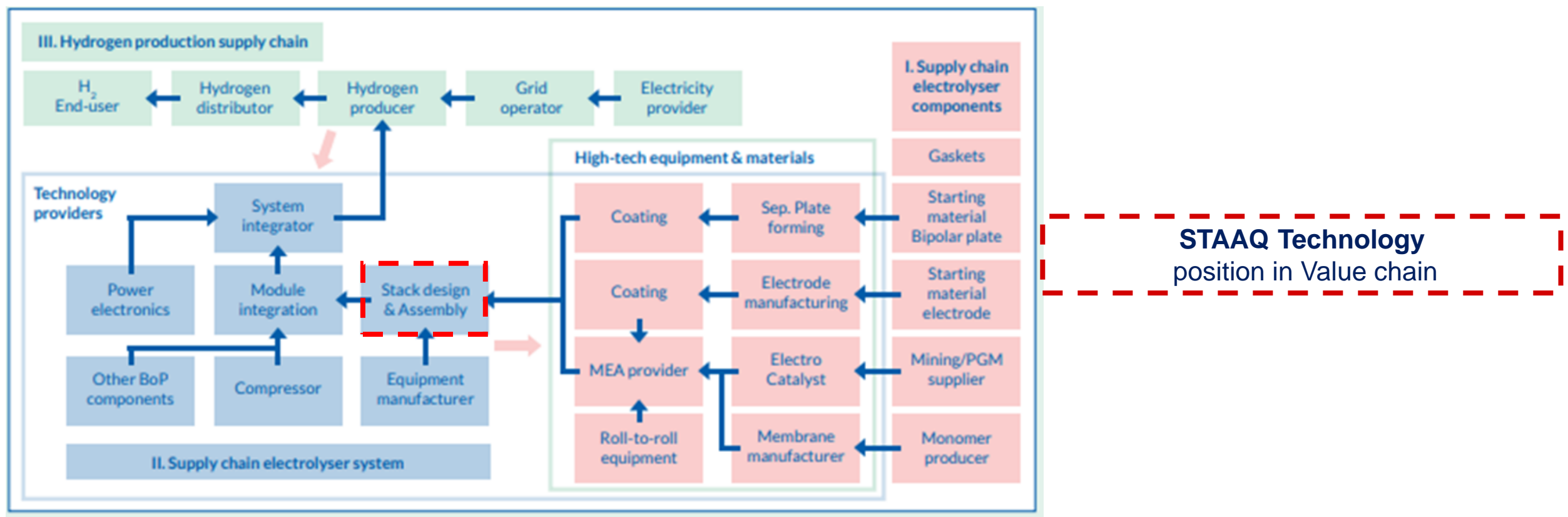
## Electrolyzer market segmentation – end-user market

Mature markets			Emerging markets						
Light industry			Large scale electrolyzers				H2 mobility★		Flexibility for electricity grid services
			Large industry		Renewable energy storage				
Priority market	Power plants	Float glass, metallurgy	Refineries	Ammonia	E-fuel/ Methanol	Power-to-gas (direct injection into gas grid)	FCEV, Bus, ferries, passenger trains	Truck, freight trains, cargo	Flexibility services
Usage	Alternator cooling	Thermal treatment	Hydrotreatment Hydrocracking	Feedstock	Feedstock	Storage of intermittent renewable electricity	Passenger mobility	Cargo mobility	Primary, secondary, tertiary reserve
H <sub>2</sub> demand (Nm <sup>3</sup> /h)	5 – 20	60 – 120	100,000 – 250,000	10,000 – 200, 000	1,000 – 75 000	2,000 – 200,000	100 – 4,000	100 – 4,000	> 5 MW (could be less if capacity are aggregated)
Typical size	25 – 100 kW	300 – 600 kW	Demo: 1 – 20 MW Commercial: minimum 50 – 100 MW			Demo: 5 – 10 MW Commercial: minimum 50 – 100 MW	Pre-commercial: 0.25– 0.5MW commercial: 1 – 20 MW		Depending on primary market (segments listed above)

**STAAQ  
Technology  
Key markets**

# Position in value chain

**STAAQ Technology positions itself on the core component of the electrolysis value chain**





# PEM Technology overview

## A competitive technology that offers cost reduction perspectives

### Higher reliability

- Slower degradation than Alkaline
- Longer lifetime
- Lower electrical cost

### Much lower maintenance

- No Potassium hydroxide implies longer lifetime of components
- Ease of use

### Reduction of ground footprint

- PEM electrolyzers are 3-5x smaller than Alkaline electrolyzers

### Faster response for intermittent operation

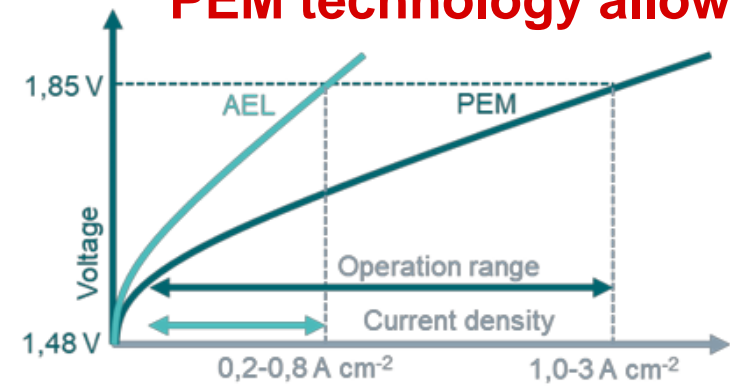
- From 0 to nominal power production in a few seconds
- Hydrogen production whatever temperature above 0°C of the electrochemical reaction

### Suited for primary energy storage solution

- Offers capacity to operate well beyond nominal power
- Enables primary storage as an add-on functionality to the hydrogen production

# Market technologies for electrolysis process - PEM VS ALKALINE

PEM technology allows to reach higher power levels and better operational efficiency.



Current density
Power density
Efficiency
Pressure operation
Reactivity
Reliability
Durability / Life cycle
Investment cost

TODAY	
Alkaline	PEM
-	+
--	+
+	0
-	+
-	+
-	0
++	0
0	-

TOMORROW	
Alkaline	PEM
0	++
-	++
+	+
0	++
0	++
-	0
++	+
0	0

# Know-how and technologies mastered by STAAQ Technology

## TECHNOLOGICAL

- PEM electrolysis hydrogen production technologies
- Definition, implementation and operation of R&D resources in the field of PEM electrolysis
- Design of PEM electrolysis stacks, including medium and high-pressure applications
- Design and sizing of PEM electrolyzers
- Design/sizing of components and subsystems required for PEM electrolysis

## HUMAN RESSOURCES

- The current staff is made of engineers encompassing a pragmatic business approach.



## INDUSTRIAL

- Definition, implementation and operation of PEM stack production units
- Definition, installation and operation of means of PEM electrolyzers production units
- Design and deployment of hydrogen production facilities useful for the synthesis of chemical products, including all subsystems (electrolysis cells, power supplies, fluid treatment unit, sensors, automation, hydrogen storage ...)

## COMMERCIAL

- Knowledge of the hydrogen ecosystem
- Understanding hydrogen production by electrolysis markets
- Knowledge of national and European funding institutions and mechanisms
- Knowledge of the majority of players in the hydrogen production ecosystem at the international level
- Ability to contract with industry players (end customers, integrators, project developers, etc.)

# Key Human Resources – the Core Team

**STAAQ Technology was founded by Olivier Sins, Fabien Auprêtre et Frédéric Amar.**

The founders worked together in different contexts for several years before founding STAAQ Technology and have complementary profiles.

	<b>Olivier Sins President</b>	<ul style="list-style-type: none"><li>▪ President since 2021</li><li>▪ Previous experience at Areva H2Gen (Head of Sales), John Cockerill (Head of Sales) Engie (Hydrogen Offtake Developer)</li><li>▪ Key knowledge of global H2 ecosystem, strong H2 professional network and business development skills</li></ul>	<b>+ 30y exp</b>
	<b>Fabien Auprêtre CTO</b>	<ul style="list-style-type: none"><li>▪ CTO since 2021</li><li>▪ Unique technical expertise in H2 electrolysis, stack design, manufacturing and operation.</li><li>▪ Key knowledge of PEM technology, with proven track record of numerous PEM stack design and associated innovations</li></ul>	<b>+ 25y exp</b>
	<b>Hervé Mennrath Industrial director</b>	<ul style="list-style-type: none"><li>▪ Industrial director since 2022</li><li>▪ Former Managing Director of several Air Liquide's subsidiaries</li><li>▪ Key ability to design and deploy manufacturing facilities with proven track record in H2 electrolysis</li></ul>	<b>+ 35y exp</b>
	<b>Frédéric Amar COO</b>	<ul style="list-style-type: none"><li>▪ COO since 2021</li><li>▪ Previous experience in renewable energy and aerospace (project, contract, finance management positions)</li><li>▪ Key ability to build and implement business cases/strategies by incorporating technical, financial, managerial, risks aspects in a consistent way</li></ul>	<b>+ 25y exp</b>
	<b>Gautier Vadon Head of R&amp;D</b>	<ul style="list-style-type: none"><li>▪ Head of engineering since 2022</li><li>▪ Previous experience at Areva H2Gen (Lead Mechanical design)</li><li>▪ Key expertise in mechanical design with proven track record of numerous PEM stack design and associated innovations</li></ul>	<b>+ 15y exp</b>



# STAAQ Technology background & History

**2023**

**D**



## INITIAL PRODUCTION

STAAQ Technology works on the production of MW size PEM stacks.

## FIRST INSTITUTIONAL SUPPORT

STAAQ Technology obtains a first grant from the Public Investment Bank in support of its “MegaScale” PEM technology scaling up project.

**Mai 2021**

**B**



## CREATION OF STAAQ TECHNOLOGY

First customers identified and financing in place. STAAQ Technology is created in May 2021.

**August 2022**

**C**



## PREPARATORY PHASE

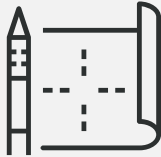
Clarification of the project, products, services and the business model.

**A**

**2019**



# STAAQ Technology Key Achievements



## Research and development

- ✓ Design, test of a 250 KW stack
- ✓ Patents : 2, and 3 application in preparation for a Multi MW stack
- ✓ Initial design of high-power PEM stacks (from 1 to 5 MW)
- ✓ Manufacturing process design for of high-power PEM stacks (from 1 to 5 MW)
- ✓ Undergoing nego with ADEME for development of a high-power stack test bench (2,6 M€ project)
- ✓ Undergoing discussion with IDF region for manufacturing facilities set-up



## HR

- ✓ Definition of STAAQ Technology HR organization
- ✓ Initial Engineering and Industrialization team in place with 6 engineers recruited
- ✓ In 2023 STAAQ Technology is a project totalizing 10 people, of which 6 are company shareholders.
- ✓ Core team (5p) has an average relevant professional exp of 25 years



## Sales

- In 2022 STAAQ Technology closed its first fiscal year with a revenue of 230 k€
- First contract signed in 2021 (500 k€) design of a 250 KW stack
- Second contract under nego for 2,3 M€
- Initial consulting and trading services
- Pipe of European customer projects identified with a pipe of 3,4 GW (10 times STAAQ Technology BP objectives)
- 5 prospects under nego on the extra European markets for the technology licensing



## Market Intelligence

- Market intelligence online tool "H2-tracker" is operational and allows tracking of H2 projects progress worldwide
- In 2023 STAAQ Technology will further develop its digital strategy and strategic data acquisition by increasing presence on social networks and starting its own technology conference platform

# Green Hydrogen Economy : A fast-growing market in its infancy

## Demand for clean H2 keeps growing

### 2021 has been a record year of electrolysis deployment:

- More than 200 MW of capacity entering operation in 2021
- **threefold increase on 2020**

### Installed capacity:

- Total installed capacity has reached 0.5 GW in 2021
- It was about 1.4 GW at the end of 2022
- **5,5 GW expected end of 2023**

### Long term perspective:

- Realization of all the projects in the pipeline could lead to an installed electrolyser capacity of **240 GW** by **2030**
- Equivalent to a **79% Annual Growth**

### Hydrogen Economy: (42 countries have released a H2 strategy by Feb-23)

- Government funding for hydrogen continues to grow in key markets and reached **\$146 billion** to 2030.
- EU member states have allocated **\$11.51** billion to the H2 sector in 2022 & around \$24 billion is available each year across the EU.

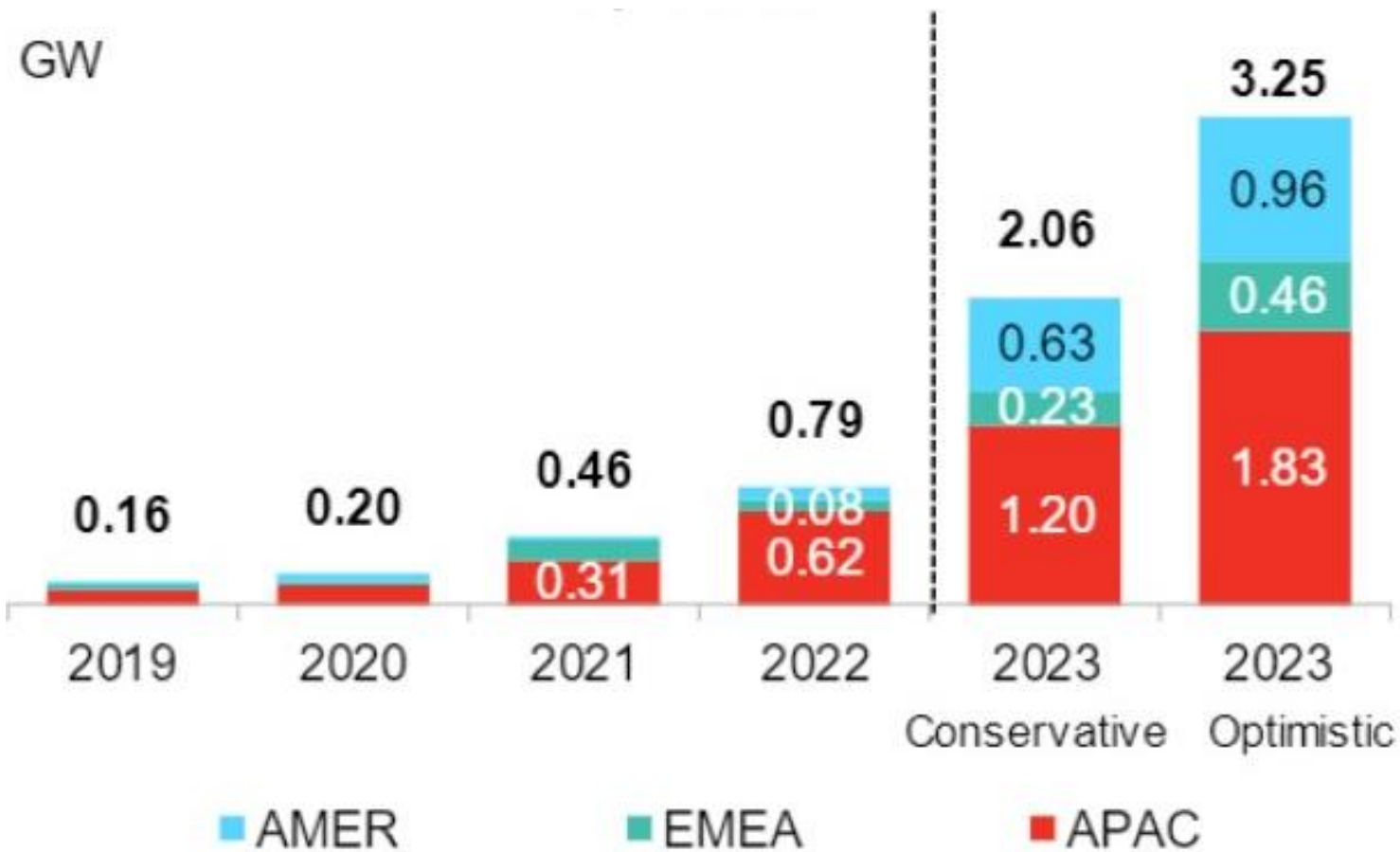
An additional **\$872.9** million state Aid in EU funding for H2 will become available in autumn 2023.



Distribution of main large-scale projects (534) announced as of May 2022

# Global Electrolysis Capacity Installed Base

Latest figures confirm market exponential growth and balance market share between Alkaline and PEM.

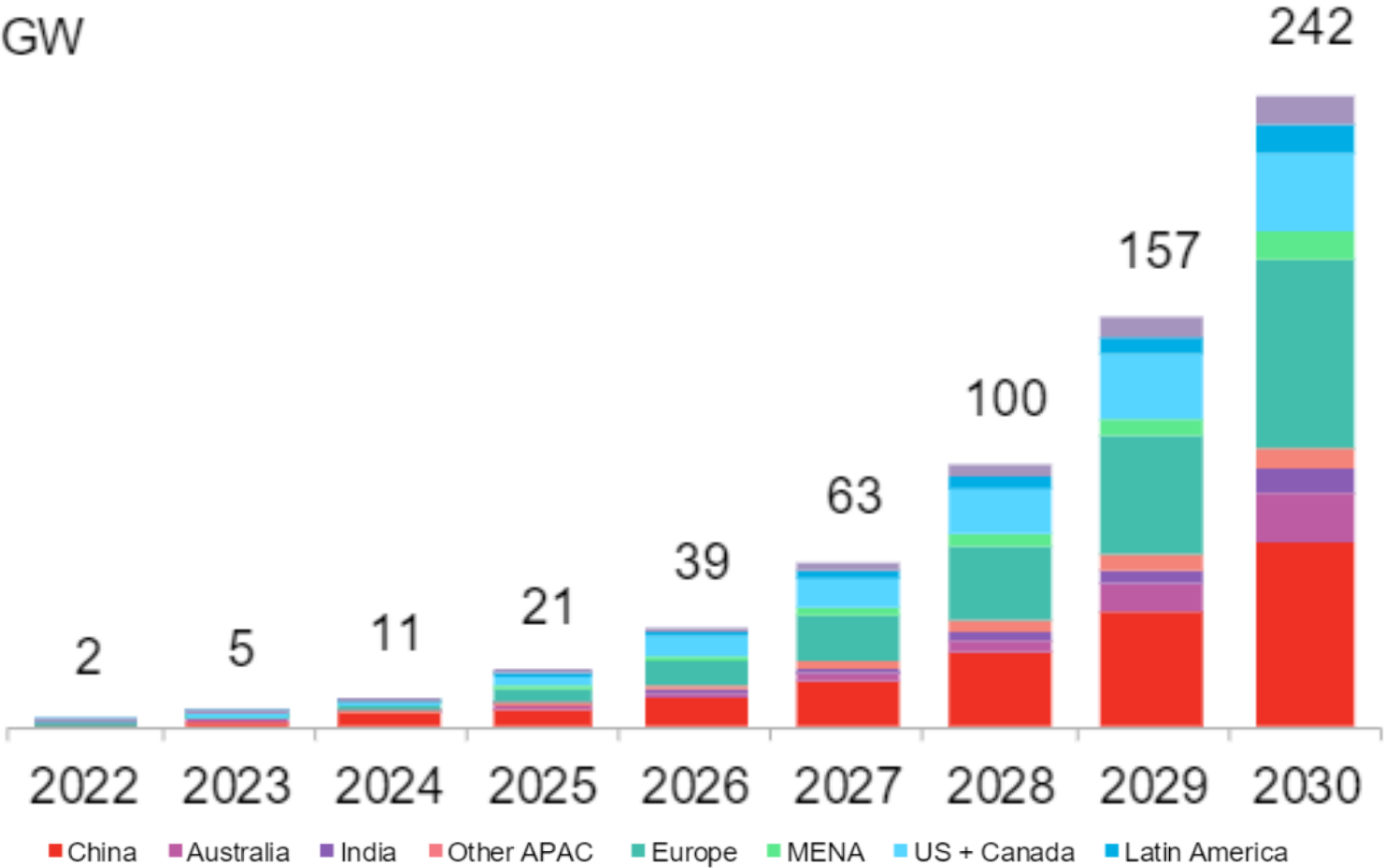


2020 : +25%  
2021 : +130%  
2022 : +73%  
2023 : +150%



# Green Hydrogen Economy has big expectations

## Electrolyzer cumulated installed capacity Forecast, Equivalent to a 79% Annual Growth



Cumulated Electrolyzer Delivery forecast for EU 140 GW

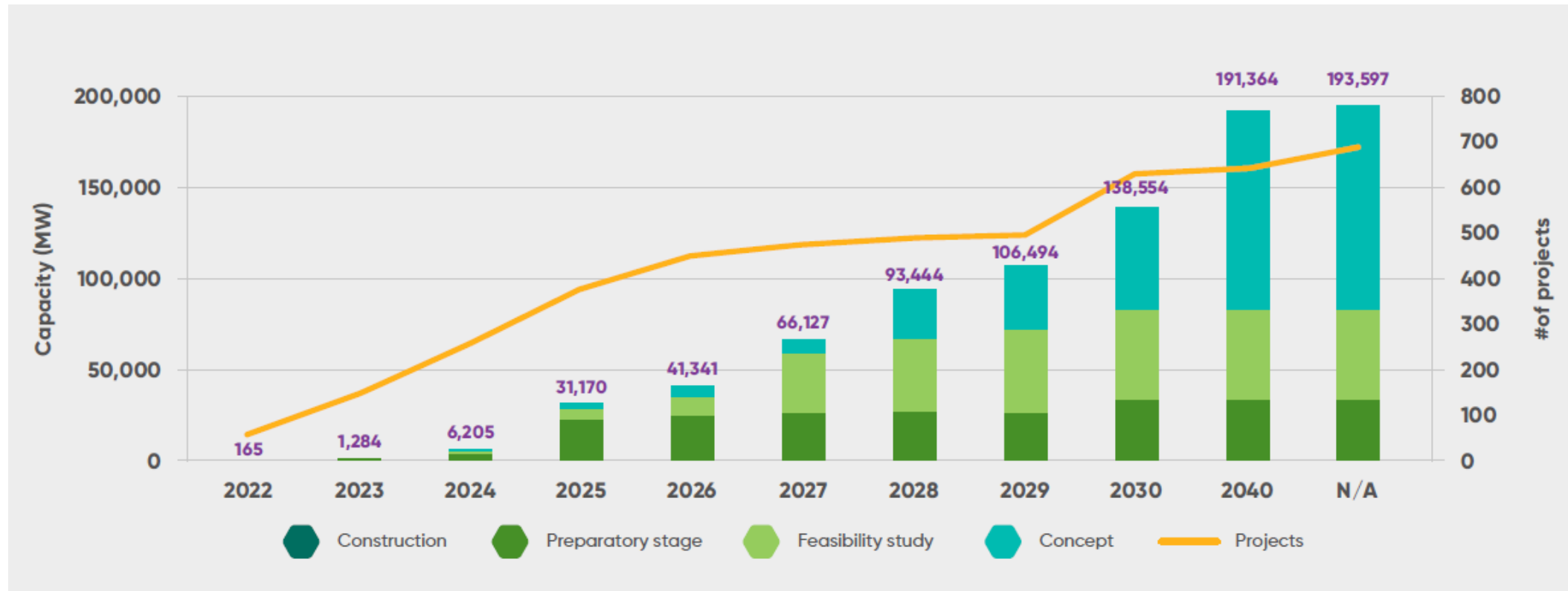


\*BNEF report H1-2023 and Hydrogen Europe / Clean Hydrogen Monitor Nov. 2022.

# European project pipeline 2022 - 2040

Hydrogen EUROPE - Fit for 55: shifting from fossil gas to renewable and low-carbon gases

Current projects pipeline covers more than 3 times the objectives set by EU with 140MW cumulated



Cumulative Planned PtH projects (2022 – 2040)

# STAAQ Technology European Pipeline

MW targeted	2024	2025	2026	2027
Denmark	100 MW	150 MW		350 MW
Germany	130 MW	100 MW	1 150 MW	270 MW
Greece				1 440 MW
Finland		165 MW		
France		250 MW	1 000 MW	100 MW
Morocco	200 MW			
Netherlands		200 MW		900 MW
Portugal			400 MW	
Spain	50 MW	200 MW	200 MW	
Sweden		171 MW		
Romania	100 MW			
UK	40 MW	10 MW		300 MW
<b>Total targeted Project</b>	<b>620 MW</b>	<b>1 246 MW</b>	<b>2 750 MW</b>	<b>3 360 MW</b>
<b>WIN Project</b>	<b>15 MW</b>	<b>150 MW</b>	<b>300 MW</b>	<b>350 MW</b>
<b>Turn Over</b>	<b>9,8 M€</b>	<b>87,8 M€</b>	<b>165,8 M€</b>	<b>182 M€</b>

## Targeted projects :

- Green hydrogen production
- Industrial power production capacity
- Already funded
- Technology : PEM or non-already chosen
- Operational launch scheduled 2 years after the order contractualization

## Development strategy :

- STAAQ Technology has direct contacts with the project owners
- Project will be address mainly through industrial partnerships in order to provide a complete electrolyser

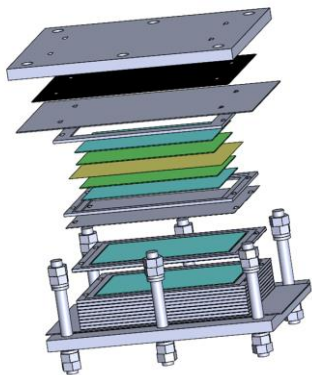
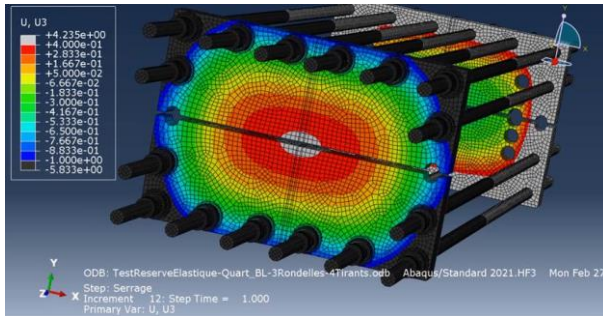
## Business hypothesis :

- We aim to convert around 12% of our commercial pipe into orders from 2025

# Business Model

**STAAQ Technology is the missing puzzle piece to unlock the PEM Electrolysis technology**

- Developing and manufacturing the critical components to **solve the PEM stack scale-up challenge**
- **Patented technology** that provides critical performance benefits for a wide range of industrial markets,
- **Experienced management team** delivering breakthrough technology in partnership with world class industrial partners



## Products

Develop, Manufacture  
& Sell

European markets

Manufacturing  
facilities in France

Direct sales to end  
users

## Intellectual property

Develop, License &  
Royalties

Export markets

Local manufacturing  
in partnership

## Services

Expertise, Operability  
& Durability



















All markets

Maintenance and  
refurbishing

Technological/industria  
l support



# Competitive Landscape

Company	Country	Creation	Years in PEM Techno	Products		Stack size	Current density at iso stack efficiency (85%) (+++: >2A/cm <sup>2</sup> ; ++: >1 A/cm <sup>2</sup> ; +: c.0.4A/cm <sup>2</sup> ; -: c.0.2A/cm <sup>2</sup> )
				PEM	Alkaline		
		2014	22	✓	✗	From up to 1MW	++
		1927	23	✓	✓	Up to 500kW	-
		2001	18	✓	✗	Up to 270kW	++
		1927	8	✓	✗	Up to 750 kW	+
		2009	10	✓	✓	Up to 1.25MW (PEM)	++
		1970'	15	✓	✗	Up to 1MW (Claims 5MW)	+++
		2016	23	✓	✗	Up to 1,4 MW	++
		2003	8	✓	✗	Up to 1 MW	-
		2010	15	✓	✓	Up to 1MW	-

# STAAQ Technology “MegaScale” project Vs. competition

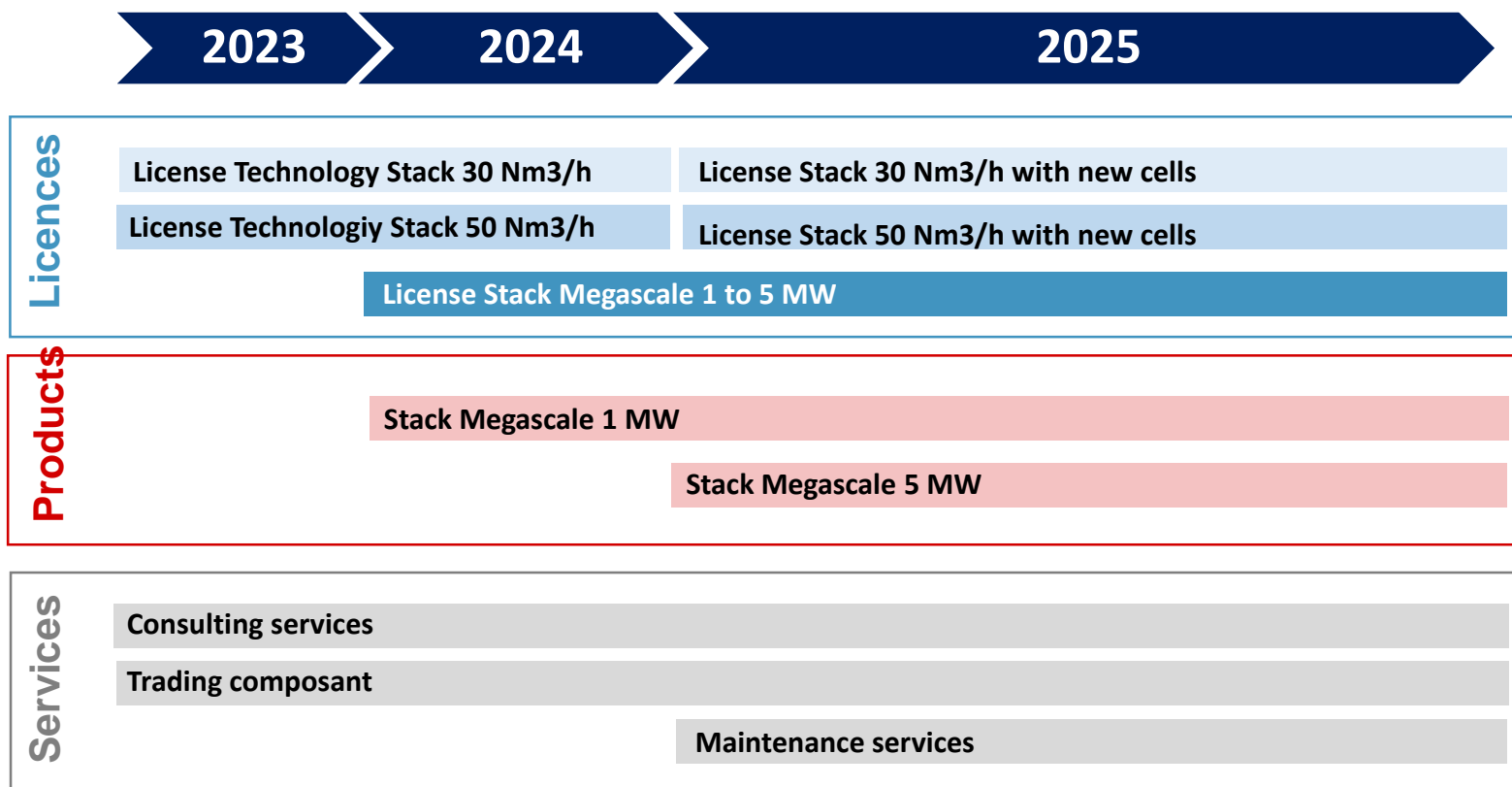


- More beneficial
- Less beneficial



# New products and services roadmap

The offer will be enriched accordingly to our Business growth and R&D developments



## Licenses :

- Already under commercialization for Export markets
- From 2024, STAAQ Technology will be able to sell licenses with our new innovative patented cell design which will be more efficient and sustainable

## Product :

- Thanks to our patented technology and our production facilities, STAAQ Technology will be able to commercialize industrial stacks from 1 to 5 MW

## Services :

- STAAQ Technology offers its expertise to clients and partners through consulting services
- STAAQ Technology manages the supply chain for high value-added components for clients under license scheme
- STAAQ Technology will ensure the maintenance of the products sold

## Industrial growth is driven by investments in facilities and production capacity



### Production facilities

- **Industrial building of 3000 to 3500 m<sup>2</sup> to host development and production activities :**
  - Location: South Paris, close to the Parisian hydrogen ecosystem
  - Offices: 400 m<sup>2</sup> (Management, engineering, sales, project management, support functions)
  - Industrial activity :
    - Area 1 = 400 m<sup>2</sup>: Material reception and storage of parts under a 2x10T overhead crane with double hoist
    - Area 2 = 800 m<sup>2</sup> : Cleaning machining : isolated by partitions to install machining and cleaning machines
    - Area 3 = 800 m<sup>2</sup> Assembly workshop
    - Area 4 = 600 m<sup>2</sup> Installation of test benches with hydrogen production: installation of an extraction in the roof to evacuate and dilute the hydrogen
- **Moulds required for series production:**
  - Moulds for injection moulding of PEM stack frames
  - Moulds for sealing solution of the stacks
- **Electrical grid connection : 1,2 MW**



### Production capacity

- Initial production capacity of **150 MW** per year at the end of 2023 :
  - That is, approximately 15 stacks of 1 MW nominal power per month
  - Expansion and automation of production capacity to 250 MW by the end of 2024
- Possibility of expansion to 500 MW per year in 2026 by adding a second production line
- Ramp-up of the production team according to the increase of production capacities



# Presentation of the forecasted P&L

Forecasted P&L					
En K€	2023	2024	2025	2026	2027
<b>Turnover</b>	<b>545</b>	<b>3 425</b>	<b>27 553</b>	<b>102 213</b>	<b>182 775</b>
<b>Purchases consumed</b>	0	0	8 625	65 279	123 070
<b>Gross Margin</b>	545	3 425	18 928	36 934	59 705
Gross Margin rate	100%	100%	68,70%	36,13%	32,67%
<b>Capitalized production</b>	0	0	1 200	1 200	1 200
<b>Grants</b>	77	500	0	0	0
<b>Global Margin</b>	<b>622</b>	<b>3 925</b>	<b>20 128</b>	<b>38 134</b>	<b>60 905</b>
Purchases and external expenses	68	1 726	1 462	1 812	2 071
Taxes and Duties	1	14	27	34	37
Payroll expenses	100	1 680	3 205	3 977	4 367
<b>EBIDTA</b>	<b>453</b>	<b>505</b>	<b>15 434</b>	<b>32 311</b>	<b>54 430</b>
Ratio EBIDTA / TO		14,74%	56,02%	31,61%	29,78%
Amortizations	0	336	1 365	1 624	1 727
Exceptional Products	94	479	1 557	1 665	1 253
<b>EBIT</b>	<b>547</b>	<b>648</b>	<b>15 626</b>	<b>32 352</b>	<b>53 956</b>
Corporate income tax	132	158	3 906	8 088	13 489
<b>Net Income After Tax</b>	<b>415</b>	<b>490</b>	<b>11 720</b>	<b>24 264</b>	<b>40 467</b>

- **Gross Margin = CA – Purchases consumed**
- **Global Margin = Gross Margin + Capitalized production**
- **Payroll Expenses is including Salary increases and bonuses**
- **Financing Need : 2 M€**

# Target investment: 2 M€ to accelerate our growth and meet our 2027 objectives

## Our Objectives for the period 2023-2027:

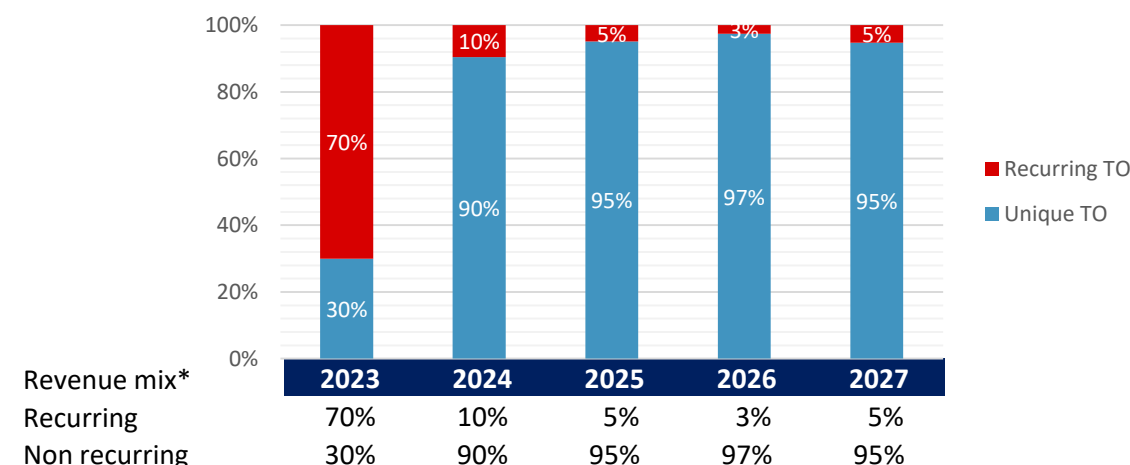
- Develop an European production capacity for multi-megawatt PEM stacks → 500 MW by 2027
- Become a recognized player in the design, production and marketing of PEM stacks → 5% Market shares by 2027
- Deploy our technologies by leveraging our disruptive value-sharing business model for non-European markets → 1 license per key country

	2023	2024	2025	2026	2027
Products (M€)	0,0 M€	0,0 M€	12,1 M€	92,6 M€	173,4 M€
Licenses (M€)	0,4 M€	3,2 M€	15,4 M€	9,3 M€	6,9 M€
Services (M€)	0,1 M€	0,5 M€	0,2 M€	0,3 M€	2,6 M€
Total TO (M€)	0,5 M€	3,7 M€	27,7 M€	102,2 M€	182,8 M€
EBITDA	0,4 M€	0,5 M€	15,4 M€	32,3 M€	54,4 M€
CAPEX	0,0 M€	1,7 M€	5,6 M€	1,3 M€	1,2 M€
OPEX	0,1 M€	3,4 M€	3,5 M€	4,6 M€	5,2 M€
Team	11	16	31	38	41

## The partner we're looking for:

- A Financial Partner involved in the Hydrogen sector to support our growth, and our production and marketing strategy
- We are looking for an investment of **2 M€ in Equity**

## Recurring Revenue VS Unique TO

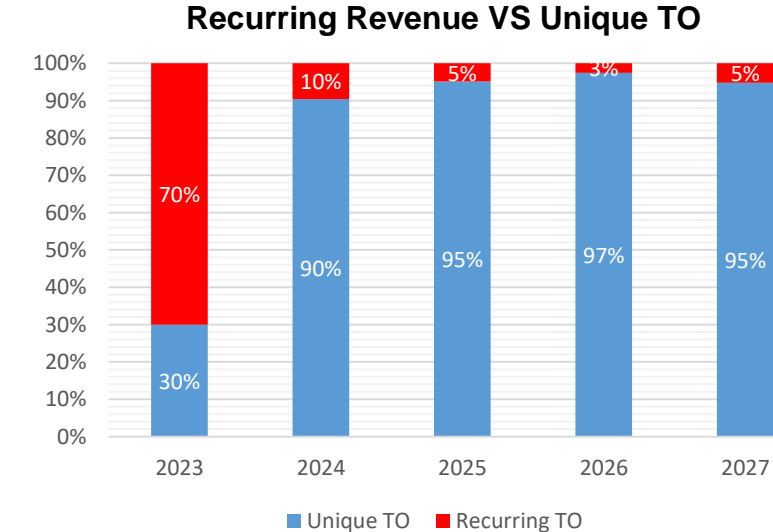
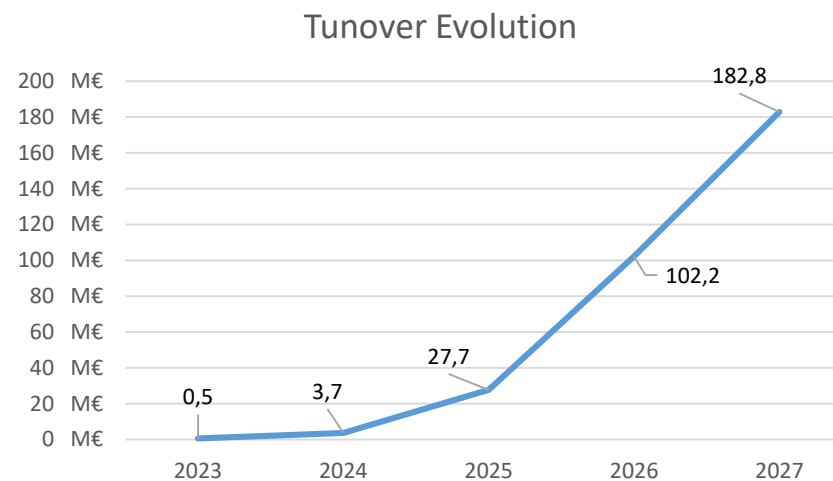
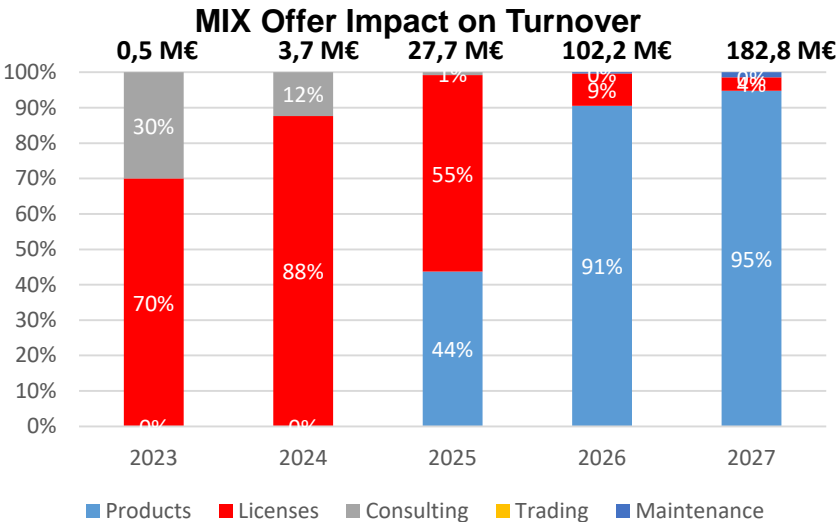


# Presentation of the volumes and composition of the Turnover

	2023	2024	2025	2026	2027
Products (MW)	1	15	150	300	350
Licenses	2	3	-	-	-
Consulting (MD)	700	100	100	100	100

Maintenance

$$CA_{maintenance} = 3\% \sum_{i=1}^n CA_{producti}_{-1} \quad \text{Where } n = \# \text{Year}$$



- **Products** : Sales figures based on the current probalized project pipeline
- **Licences** : Megascall licenses are already under negotiation with India, China and South Korea
- **Consulting** : STAAQ Technology offers its expertise to clients and partners through consulting services
- **Maintenance** : Turnover is directly correlated to the sale of products of the previous year and will be a recurrent revenue for STAAQ Technology

# Thank you



[www.STAAQ-technology.com](http://www.STAAQ-technology.com)



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