



## COMPANY PROFILE

## HYSYTECH COMPANY PROFILE

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# THE COMPANY



## HYSYTECH COMPANY PROFILE

### OUR COMPANY



**HYSYTECH** is an engineering company founded in 2003, specialized in the design, development and industrial implementation of **new turn-key process technologies and equipment**.

Our skills start from the know-how in chemical and process engineering, up to commissioning, monitoring and maintenance.

We operate mainly in the field of **generation, treatment and recovery of industrial gases, organic liquids and energy**, according to the best engineering practices, also through the implementation of our technologies.



## HYSYTECH COMPANY PROFILE

### OUR CLAIM

## *FILLING THE GAP*

When you're exploring a potential new project, it's easy to underestimate the size of the gap between where you are now and where you want to be. We help you to fill this gap.

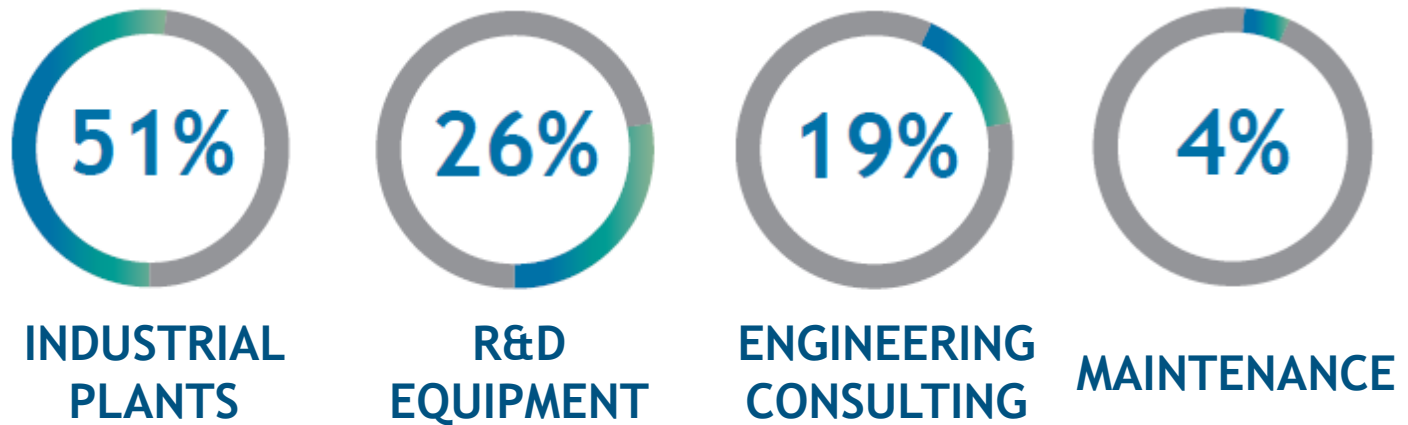
This feature makes HYSYTECH a flexible and all-around resource, capable to provide high quality and competitive services.



## HYSYTECH COMPANY PROFILE

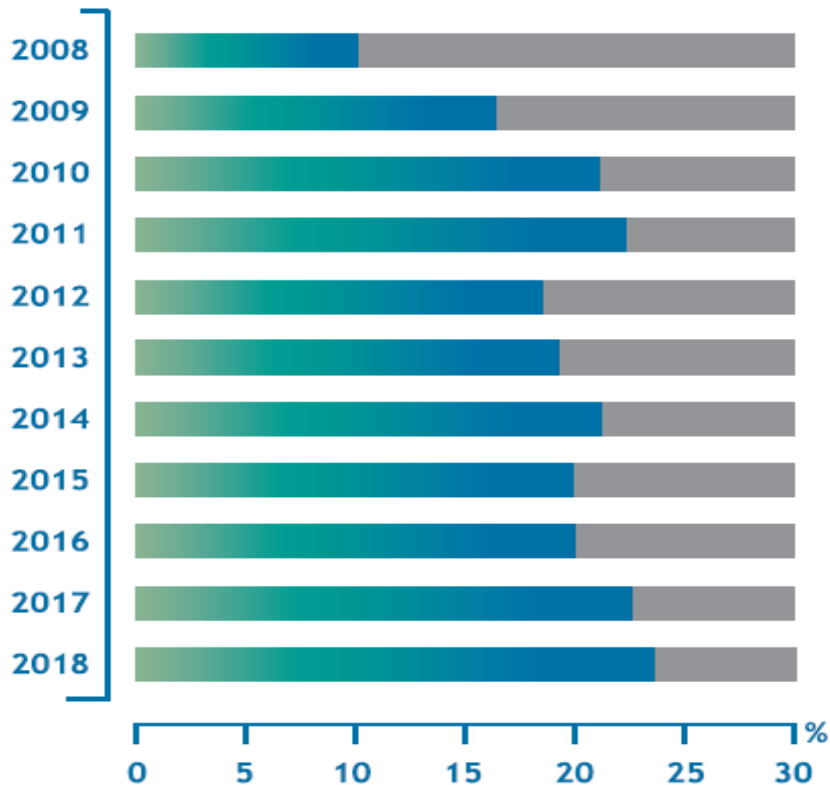
### TURNOVER BREAKDOWN

More than half of Hysytech's revenue comes from the **execution of industrial plants**, demonstrating our direct experience on this branch.



## HYSYTECH COMPANY PROFILE

### PROFIT \ TURNOVER



We are a private company that re-invests in its own differentiation and specialization.  
*[Results before internal investments in research and development.]*



## HYSYTECH COMPANY PROFILE CUSTOMERS & PARTNERS



NorSun





## HYSYTECH COMPANY PROFILE CUSTOMERS & PARTNERS









## HYSYTECH COMPANY PROFILE OUR PRODUCTS AT GLANCE



Hydrogen generation with  
Fuel Processing technology  
**(3 Patents)**



Biogas Upgrading technology  
**(2 Patents)**



Micro Liquefaction  
Technology  
**(1 Patent)**

## HYSYTECH COMPANY PROFILE PLANTS IN ITALY, HYDROGEN FROM NG AND BIOMETHANE

### Plug-&-Play solution for:

- High Purity Hydrogen (5-12 barg)
- Lowest Production Cost
- Lowest Installation Cost
- Low Power Consumption (<40 kW)
- Low pressure Natural Gas (20 mbarg)
- Fully automatic & ready to operate
- Small Scale (5-120 Nm<sup>3</sup>/h)





## HYSYTECH COMPANY PROFILE

### PLANTS IN ITALY, BIOMETHANE FROM MSW AND BIOMASS

acea



WASTE

EGEA  
L'ENERGIA DEL TUO TERRITORIO



AGRICOLTURE



## HYSYTECH COMPANY PROFILE

### LNG MICRO-LIQUEFACTION PLANT

- Gas Conditioning (Treatment)
- Cooling and Liquefaction



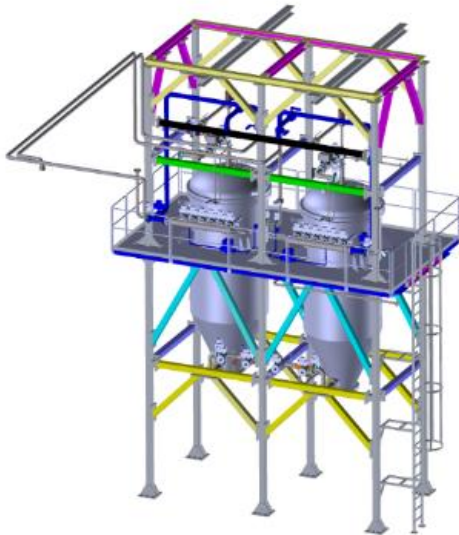




## HYSYTECH COMPANY PROFILE

### PROCESS PLANTS: GLYCOL RECOVERY UNIT (SINGAPORE)

- Detailed Engineering
- Procurement
- Construction



- Process Area & Utilities

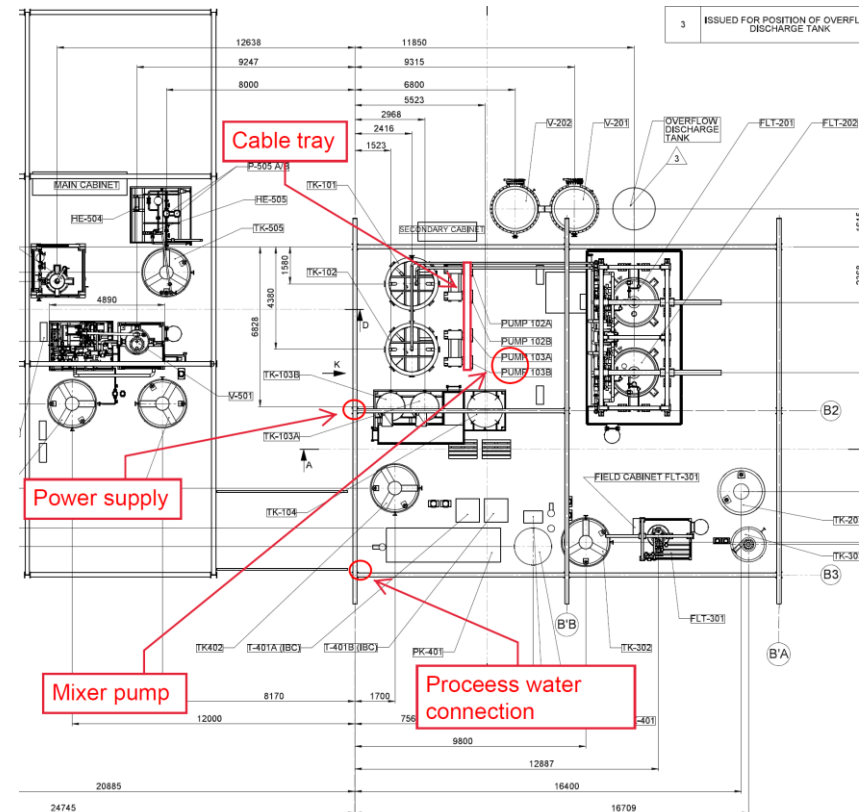


# HYSYTECH COMPANY PROFILE

## PROCESS PLANTS: GLYCOL RECOVERY UNIT (SINGAPORE)



- Detailed Engineering
- Procurement
- Construction



## HYSYTECH COMPANY PROFILE

### MODULAR UNITS & PILOT PLANTS: DISTILLATION COLUMN PACKAGE UNIT



- PED (CAT I, II, III, IV)
- ATEX (including group IIC)
- Skid Mounted Units
- (ISO-20, ISO 30, ISO 40, HC)

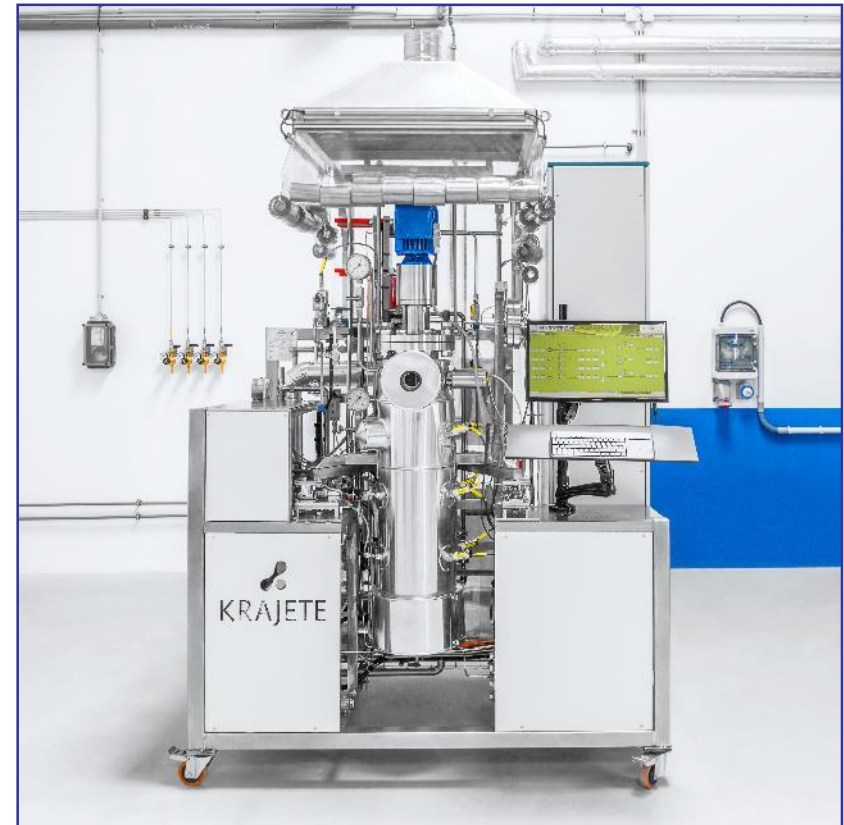


## HYSYTECH COMPANY PROFILE

### LAB PLANTS



Design, turn-key construction and certification of lab plants for the characterization of innovative processes aimed at collecting accurate and precise experimental data.





## HYSYTECH COMPANY PROFILE

### PRODUCT QUALIFICATION PLANTS



Design, turn-key construction and certification of product qualification plants to support the production processes, including automation for the execution of internal protocols or by certification bodies, including lot traceability.



## HYSYTECH COMPANY PROFILE

### GAS FEEDING STATIONS FOR STEEL MILL FURNACES



- PED (CAT I, II, III, IV)
- ATEX (including group IIC)
- Skid Mounted Units
- Container Units  
(ISO-20, ISO 30, ISO 40, HC)







## HYSYTECH COMPANY PROFILE ENGINEERING



- Project Development and Project Management
- Economic and Technical Due Diligence
- Contract Negotiation Assistance
- Technical and Economic Feasibility Assessment of Facilities Configuration, Projects, Patents or competing alternatives
- Business Plan Development and Support in order to obtain debt and/or capital from third parties
- Technology Transfer Assistance (UE, North America and BRIC countries)
- Technical and Legal Risks Analysis
- Conceptual Development
- EPC & EPCM
- Permitting Process Support (EIA, IPPC, Seveso, others)
- Energy Auditing & Process Troubleshooting
- General Engineering Services

## HYSYTECH COMPANY PROFILE

### MAIN ONGOING R&D PROJECTS



#### TERRA 2015-2019

Tandem electrocatalytic reactor for energy/resource efficiency and process intensification



#### CELBICON 2016-2020

Cost-effective CO<sub>2</sub> conversion into chemicals via combination of Capture, electrochemical and biochemical conversion technologies



#### STOREandGO 2016-2020

Innovative large-scale energy storage technologies & Power-to-Gas concepts after optimization



#### BioRoburPlus 2017-2021

Advanced direct biogas fuel processor for robust and cost-effective decentralized hydrogen production



#### ENDURUNS 2018-2022

Development and demonstration of a long-endurance sea surveying autonomous unmanned vehicle with gliding capability powered by hydrogen fuel cell



#### ENGICOIN 2017-2021

Engineered microbial factories for CO<sub>2</sub> exploitation in an integrated waste treatment platform



#### RECODE 2017-2021

Recycling carbon dioxide in the cement industry to produce added-value additives: a step towards a CO<sub>2</sub> circular economy



#### OCEAN 2017-2021

Oxaclac acid from CO<sub>2</sub> using electrochemistry at demonstration scale



#### LIFECAB 2017-2020

Biogas and digestate with controlled ammonia content by a virtuous biowaste cycle with integrated bio & chemical processes



#### PERFORM 2019-2023

Establishment of platform infrastructure for highly selective electrochemical conversions



## HYSYTECH COMPANY PROFILE CONSULTING



**Our experience** converges in the technological development of production processes, in the optimization of energy production and recovery, in environmental treatments and in the exploitation of by-products.

## HYSYTECH COMPANY PROFILE MONITORING, ASSISTANCE & MAINTENANCE



**HST monitors the performance of plants from its own Control Room, located in the workshop in Turin.**

- Remote monitoring and Assistance
- Scheduled Maintenance Service







## HYSYTECH COMPANY PROFILE

### GREEN CHEMISTRY & BUILDING BLOCKS



Complete plants for the production of basic chemical compounds from biological origin, starting from extraction from stabilized biological substrates to synthesis and purification

## HYSYTECH COMPANY PROFILE

### POWER-TO-GAS & METHANATION



**Production of Biomethane and Renewable Gas from CO<sub>2</sub> e H<sub>2</sub>.** The plants are available both on the basis of biological and single-stage catalytic methanation.

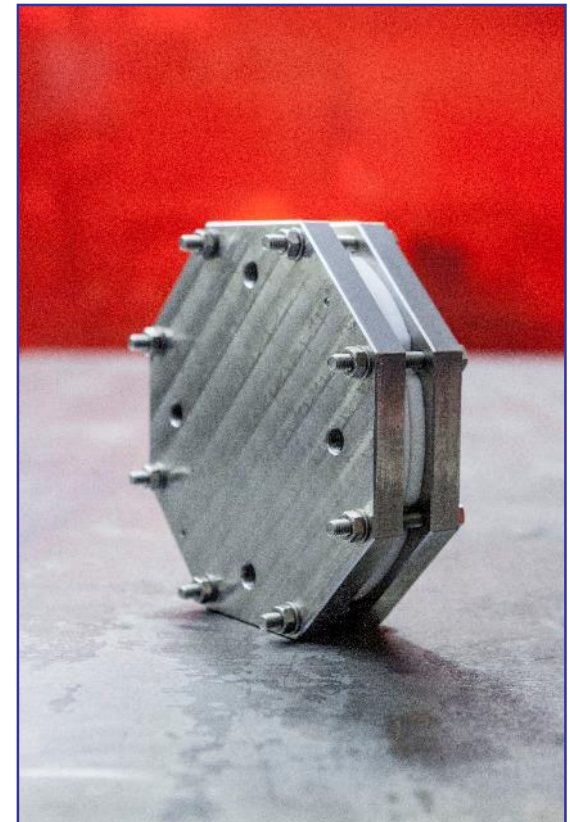
## HYSYTECH COMPANY PROFILE

### HUMIC & FULVIC ACIDS \ ELECTROCHEMICAL REACTORS



Plants for the extraction, purification and packaging of humic and fulvic acids from stabilized biological substrates.

Design and construction of **electrochemical plants and reactors** used both for advanced hydrogen generation and for the electrochemical synthesis of renewable substances.





## HYSYTECH COMPANY PROFILE

### FLUIDIZED BED GASIFICATION/TREATMENT OF VEGETABLE OILS & ANIMAL FATS FOR FUEL



**Fluidized bed gasification of waste and industrial by-products directly at the production site, generating gas to reduce consumption of methane, for the production of electricity or Biomethane.**

**Complete plants for fuel production, without chemical modification, suitable for cogeneration, starting from vegetable oils or animal fats, with high acidity.**



# CAPABILITIES AND ORGANIZATION





## HYSYTECH COMPANY PROFILE

### MAIN FACILITIES



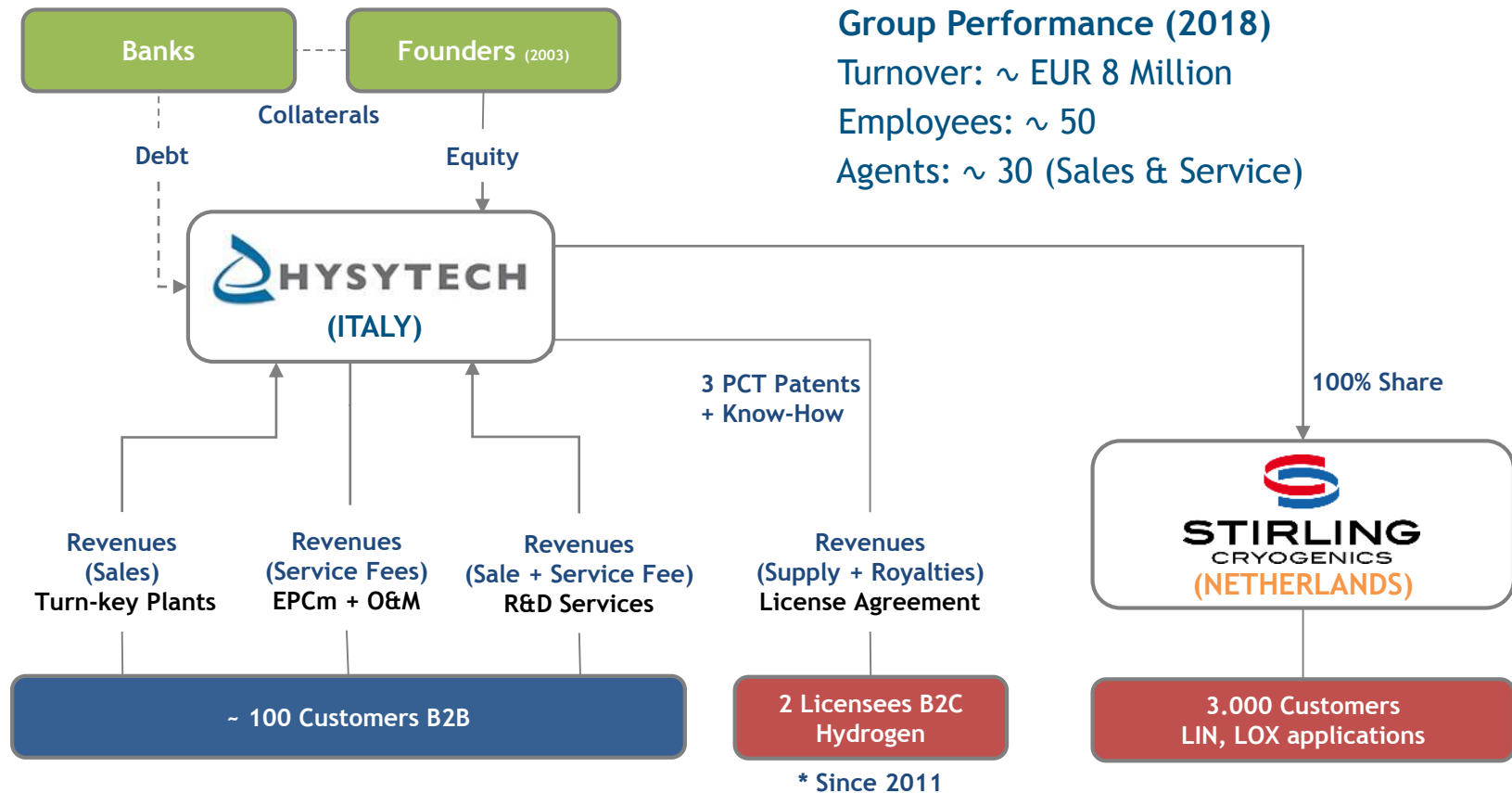
The company has most of the facilities needed for the **design**, as well of those required for **construction**, **assembling** and **testing** of chemical plants from lab-scale up to full industrial size:

- Software and High Performance Computers for mechanical, thermal stress analysis (SolidWorks), process and CFD simulations;
- Electronic Lab and supplies for power and signals circuits, including Electronic Control Board development for custom control hardware and software;
- Standard and Micro-machining systems, welding, pressure testing and equipment certification PED, U-Stamp, ATEX;
- Analytical equipment for on-line fuel gas analysis via IR and electrochemical analyzer.
- Custom and fully-automatic Burner Rigs for development, testing and manufacturing quality control for prototypes.
- Chemical Lab for trials, testing and analytic chemistry controls;

Labs, testing facilities and manufacturing workshop are hosted in a dedicated industrial environment of 3.000 m<sup>2</sup>.



## HYSYTECH COMPANY PROFILE ORGANIZATION



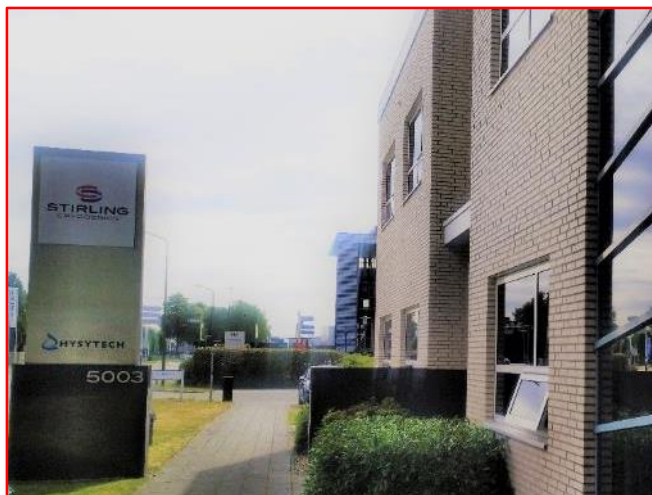
## HYSYTECH COMPANY PROFILE

### STIRLING CRYOGENICS



Office & Manufacturing

Science Park Eindhoven 5003, 5692 EB Son, NL



### Cryogenic Solutions

Stirling Cryogenics designs, builds and supplies cryogenic solutions based on the (reversed) Stirling thermodynamic cycle. Our Cryocoolers have a long history, a highly reliable track-record and efficiency, with **over 3,000 installations worldwide**, and they are considered a technological reference in the field of cryogenics with applications down to 15K (-258°C).

The application fields cover the liquefaction of gases such as N<sub>2</sub>, O<sub>2</sub>, Ar, Ne, H<sub>2</sub> and, more recently, CH<sub>4</sub>. In addition, we also provide applications for the subcooling of cryogenic liquids (i.e. sub-cooled LNG). Some of these typical applications are:

- High Temperature Superconductors (HTS)
- MRI magnet cooling
- Space simulation chambers & Space Observatories
- Nuclear applications and Research
- Biotech (Cryo-storage: Cell, Tissue, insemination)
- Healthcare (on-site LOX)
- LNG/Bio-gas liquefaction, Boil-off recovery and Maritime

## HYSYTECH COMPANY PROFILE

### STIRLING CRYOGENICS



**Cryogenic Solutions**  
Over 3,000 installations  
worldwide.





## HYSYTECH COMPANY PROFILE ORGANIZATION AND CAPABILITIES



**Main product is engineering focused on innovation to fill the gap.**

Technological Solutions

Project Management

Basic Detailed Engineering

Construction, Test and Certification

Operation & Maintenance

We develop technical solutions on **chemical processing, traditional and renewable energy, power generation and environment treatment.**

Our **international experience** and technological background covers several fields: Engineering Prototyping, Pilot Plant and Industrial Facilities EPCM, **Process and Technology Implementation.**

**We provide services:**

- Mainly in Europe (Italy, Germany, Austria, Switzerland, England, Netherlands, France, Spain, Belgium, Lithuania)
- But also frequently in Extra-European countries (U.S., Canada, Singapore, China, Taiwan, Saudi Arabia, Uruguay and Chile)

## HYSYTECH COMPANY PROFILE

### OUR SHAREHOLDERS



**Massimiliano Antonini**  
Chemical Engineer  
*Founder, CEO  
HR, Administration*



**Simone Solaro**  
Chemical Engineer  
*HSE, Procurement,  
Quality*



**Andres Saldivia**  
Chemical Engineer  
*Business Development,  
Communication*



**Corrado Farina**  
Mechanical Specialist  
*Design, Construction*



**Massimiliano Antonini**

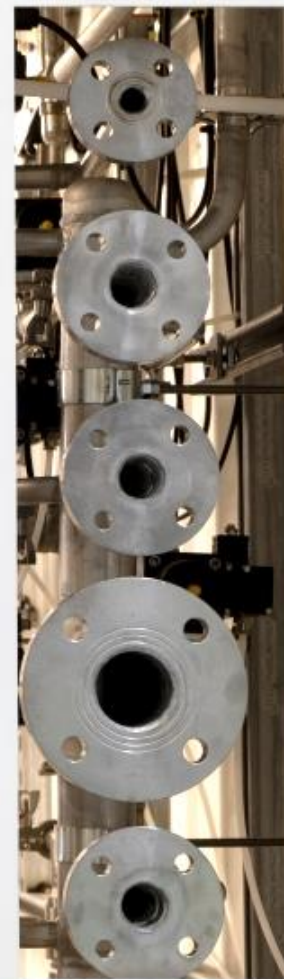
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