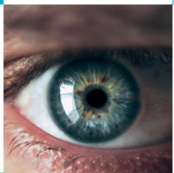
EIGA

THE EUROPEAN INDUSTRIAL GASES INDUSTRY



Facts & Figures 2022

May 2023

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"Sometimes known as the "invisible industry", Europe's industrial gases companies play a vital part in the widest spectrum of industries – including; manufacturing, chemicals, metals, food, electronics, space and healthcare – to name a few."

Philippe Cornille, General Secretary

In recent times, the Industrial Gases sector is becoming increasingly visible.

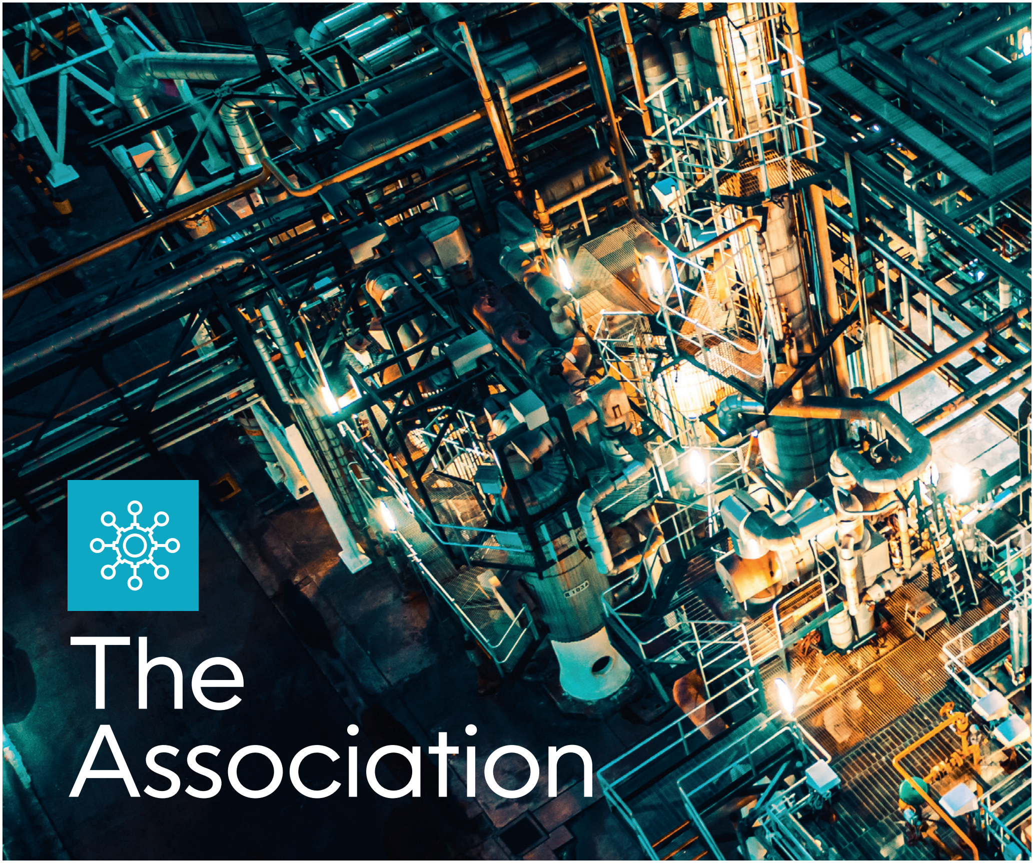
For instance, as a result of oxygen saving countless of Covid-patients' lives, or as a result of hydrogen being front and centre of the decarbonisation ambitions.

For a better understanding of the Industrial Gases sector, EIGA has produced this "Facts & Figures" booklet.

IG = Industrial Gas.

TPD = Metric Tonnes Per Day.

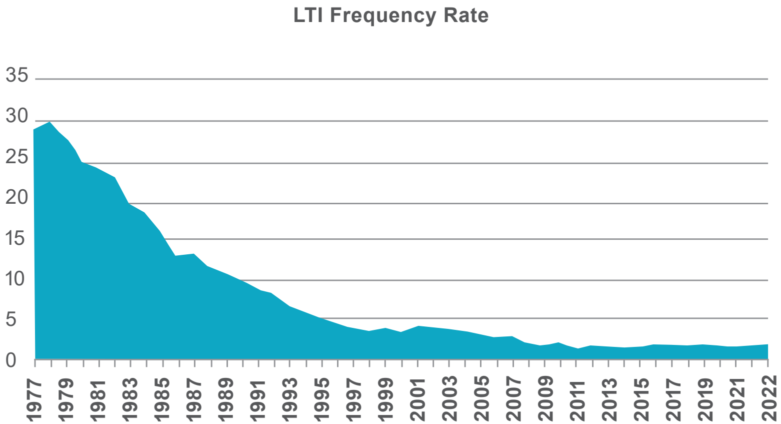
Data is for base **year 2022** and for EU27 unless specified otherwise.



The Association

IMPROVING SAFETY RECORD

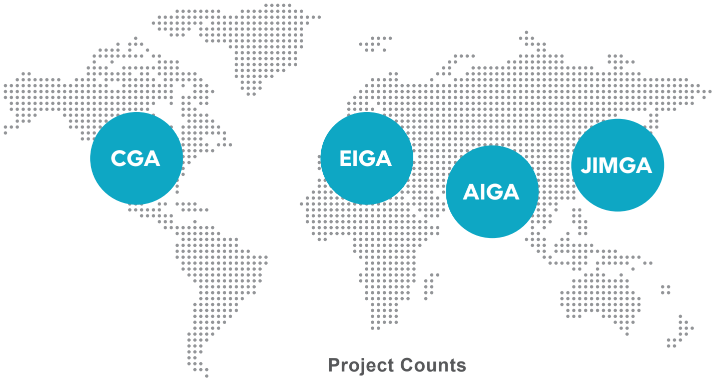
Lost Time Incidents (LTI) from across our industry show the effectiveness of our safety campaigns since the late 1970s with a tenfold reduction in LTI frequency.

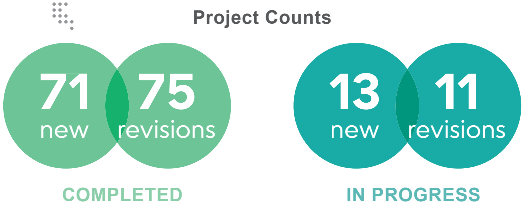


Source: EIGA

71 PUBLICATIONS HAVE BEEN GLOBALLY HARMONISED

The American, Asian, European and Japanese IG associations form the International Harmonisation Council to develop and promote a globally unified industry best practices. These harmonised publications enhance safety consistently, wherever Industrial Gases are produced, distributed or used.



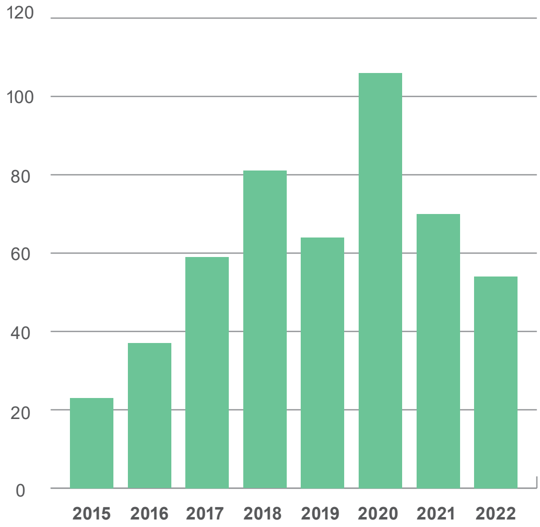


Source: EIGA

ON AVERAGE, ONE OR TWO PUBLICATIONS ARE PUBLISHED EVERY WEEK

The combined expertise of EIGA members is captured in over 500 publications. The largest portion is made available for all on our website.

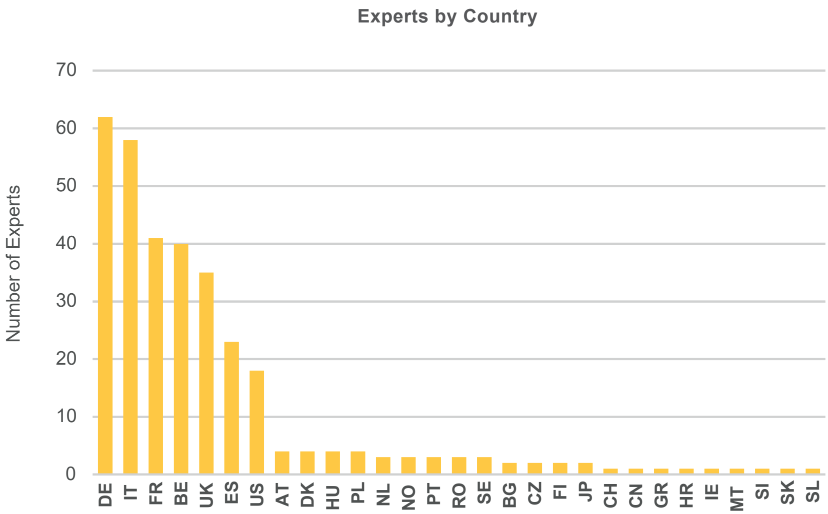
The Number of EIGA Publications



Source: EIGA

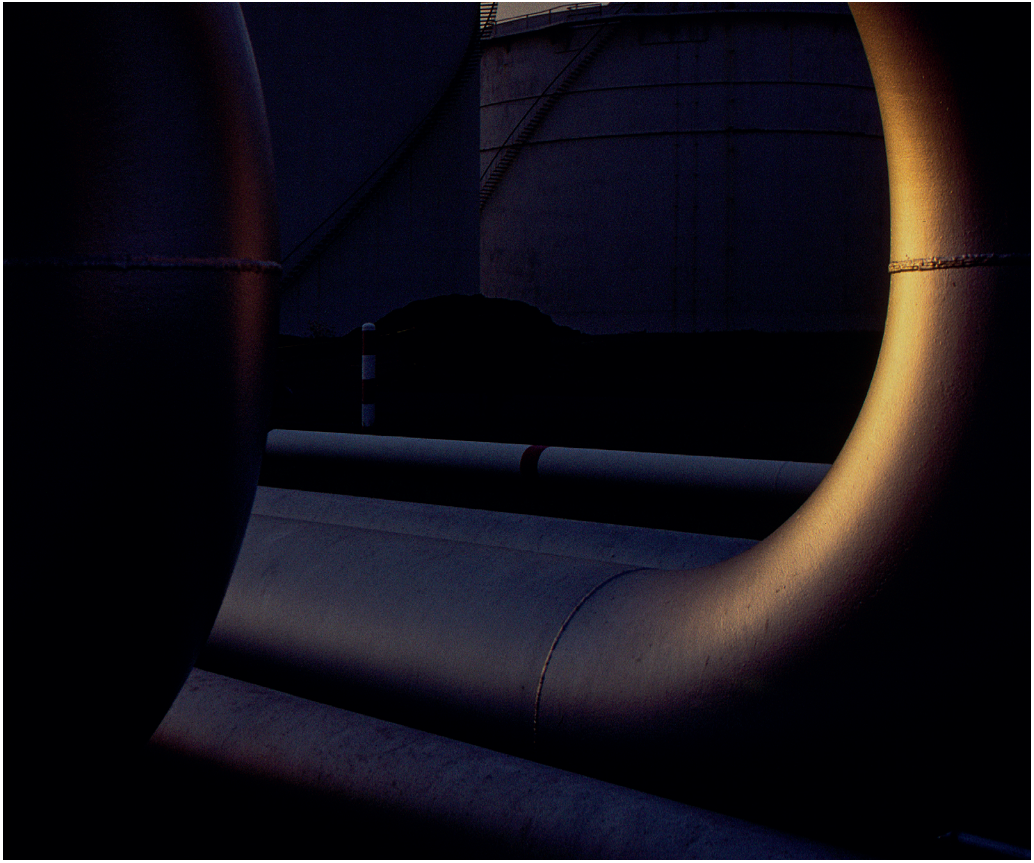
325 INDIVIDUAL EXPERTS POPULATE 57 ACTIVE WORKING GROUPS

Experts from all over Europe and beyond gather in EIGA working groups. On average such group comprises around 8 experts, and meets quarterly.



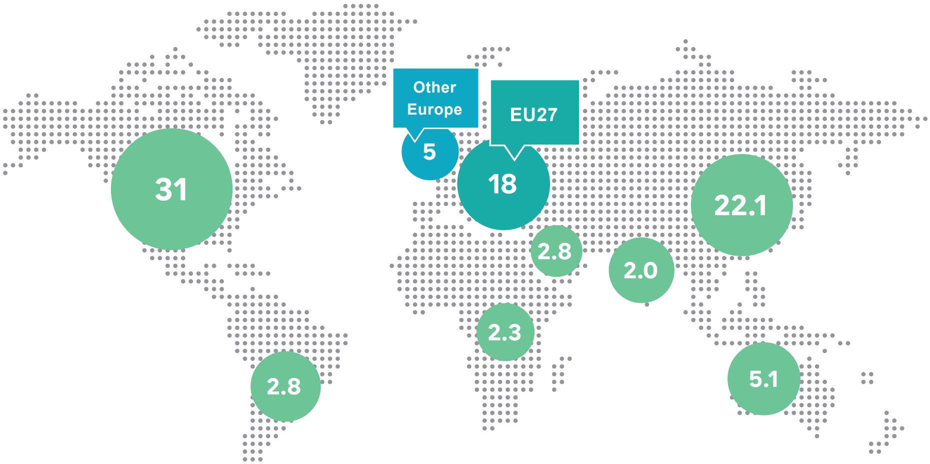
Source: EIGA

The Market



THE EU IS THE THIRD LARGEST IG MARKET IN THE WORLD

In 2022, the global industrial gas market achieved a market size of €91 billion. Although moderate volumes growth and normalising medical oxygen sales, the market has been experiencing a significant impact from energy prices, inflation, and currency exchange rates. This led to a record-breaking increase in sales for industrial gas companies worldwide.



Note: Exchange Rate €:$ 1.053 (Avg 2022)

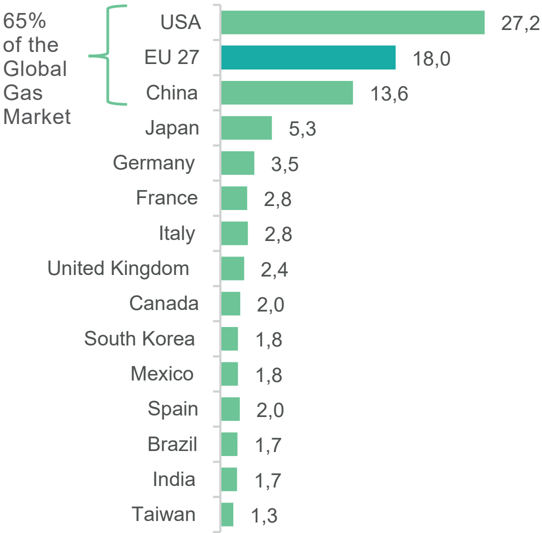
Source: gasworld Business Intelligence

THE EU27, USA AND CHINA ARE THE THREE LARGEST IG MARKETS

Germany, France, Italy and UK are the largest European Industrial Gas markets.

IG Market Size by Country (€Bn). 2022

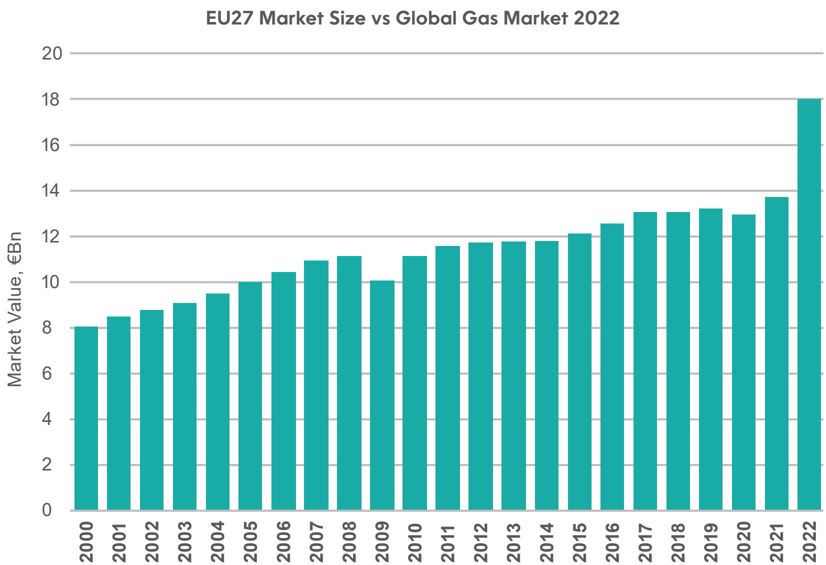
Top 10 Countries by the Size of the Industrial Gas Market



Source: gasworld Business Intelligence

EU27 MARKET GROWTH AVERAGED 4.4% PER YEAR IN 2012-2022

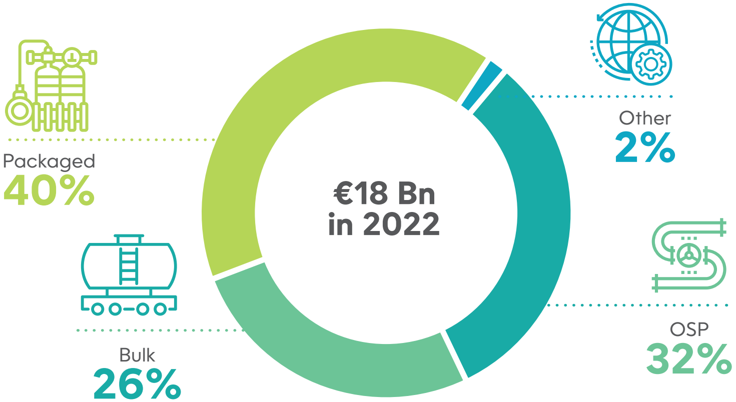
The EU market has experienced an increase in value over the last decade. In 2022, this growth was unprecedented and reached an all-time high.



Source: gasworld Business Intelligence

THE MODE OF SUPPLY, IN PERCENTAGE TERMS, HAS NOT CHANGED OVER THE LAST 20 YEARS

The EU gas market (by value) appears mature with packaged gases remaining the largest mode of supply.



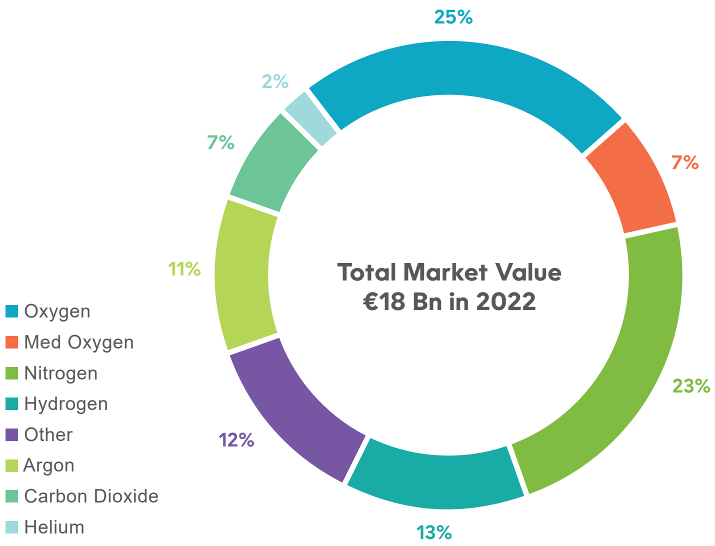
- **OSP** – onsite or pipeline gas supply;
- **Bulk** – gas supplied in liquid form to customers (incl. microbulk and tube trailer business);
- **PG** – compressed gas supplied in cylinders/bundles;
- **Other** – any other delivery of gas not covered by the above methods. This includes dry ice and revenues generated from licences and special chemical gases.

Source: gasworld Business Intelligence

OXYGEN AND NITROGEN REMAIN THE MOST WIDELY USED GASES IN THE EU27

Altogether O_2 (including medical) and N_2 account for about 55% of the gas market.

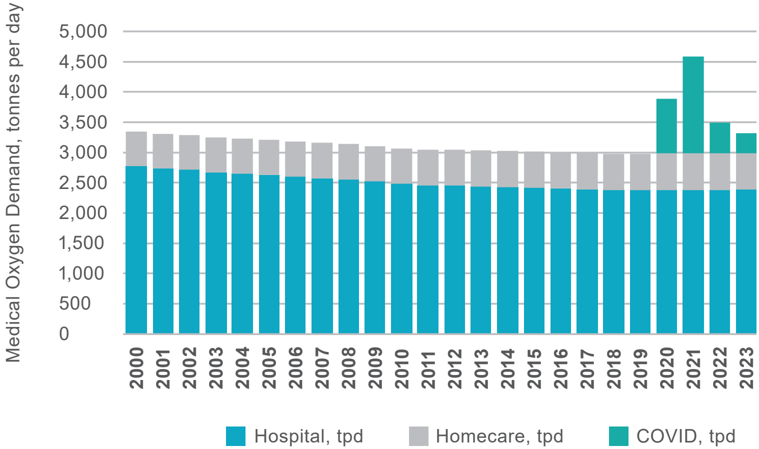
EU27 Gas Market Split by Gas



Source: gasworld Business Intelligence

AVERAGE MEDICAL OXYGEN DEMAND SIGNIFICANTLY INCREASED IN 2020-21 BUT DROPPED IN 2022

The COVID pandemic significantly influenced the rise in demand in 2020/21 but dropped in 2022. Homecare oxygen continues to grow versus hospital uses.

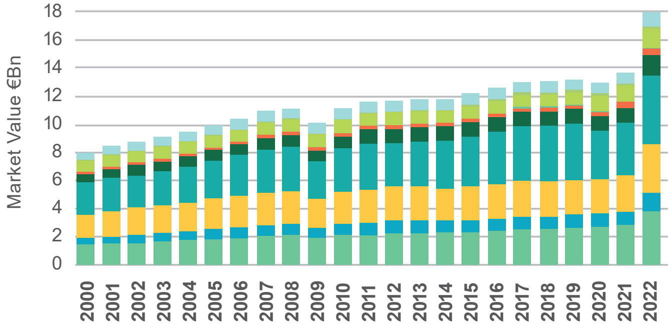


Source: gasworld Business Intelligence

FOUR INDUSTRIAL SECTORS ACCOUNT FOR OVER 70% OF THE IG MARKET

Chemicals, Refining/Energy, Metallurgy and Food sectors have all driven growth in the EU over the past 20 years. Electronics sector is a new driver, which potentially will be stronger than the traditional sectors of growth.

Gas Market Split by End User



Source: gasworld Business Intelligence

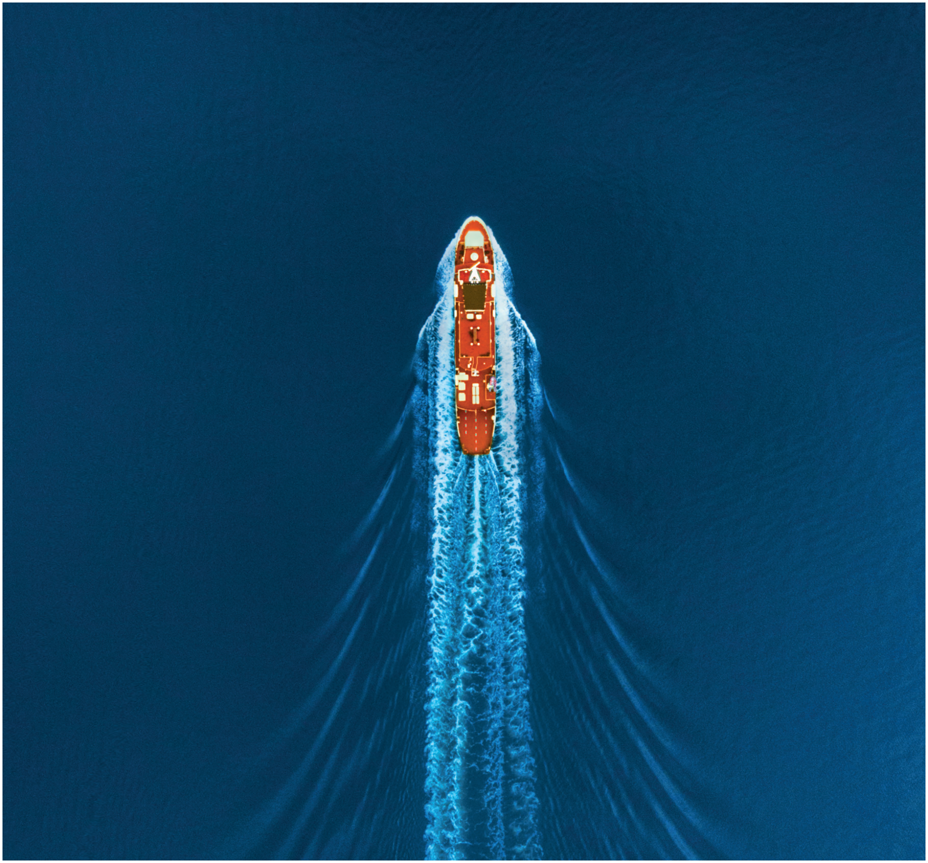
- **Chemicals** – basic chemicals, plastics, rubber, petrochemicals, pharmaceuticals;
- **Refining & Energy** – refineries, nuclear energy;
- **Metallurgy** – ferrous, non-ferrous metals manufacturing;
- **Manufacturing** – fabricated metal products, machinery, vehicles, trains, aerospace etc;
- **Food** – food, drinks, tobacco;
- **Electronics** – electronic products/elements manufacturing;
- **Pulp & Paper** – pulp and paper manufacturing;
- **Healthcare** – mostly medical oxygen for hospitals (liquid and gaseous);
- **Glass** – glass manufacturing;
- **Others** – waste & water treatment, fire extinguishers, R&D.

INTERNATIONAL HELIUM TRADE

Total worldwide demand is approximately 174 Nm^3 in 2022 of which Europe accounts for 35%. New large capacity (55 Nm^3) due on-stream by 2025 is expected to change the flow/trade in Helium.

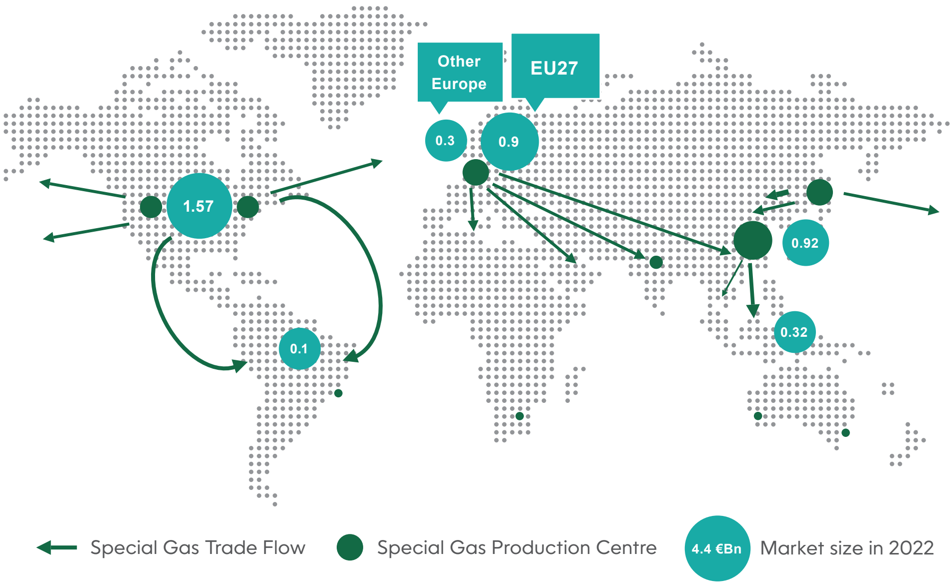
Helium Trade Flow   Helium Production Centre   Future Helium Production

Source: Spiritus Consulting



TRADE IN SPECIALTY GASES

There are many types of special gases and electronic gases traded across the globe. The EU both manufacturers and trades special gases and is the third largest special gases market in the world.



Source: Spiritus Consulting

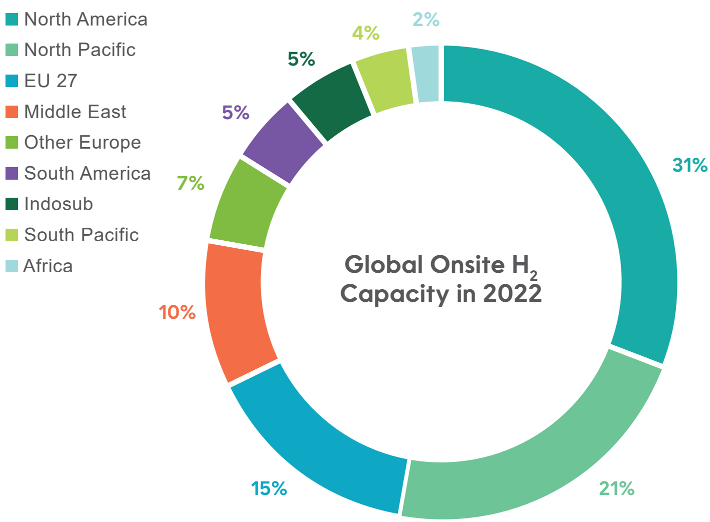
Decarbonisation

H2

HYDROGEN PRODUCTION CAPACITY IN EUROPE

The EU27 traditional hydrogen business is currently the 3rd largest market worldwide. Current blue & green installed capacity in EU27 is 15%.

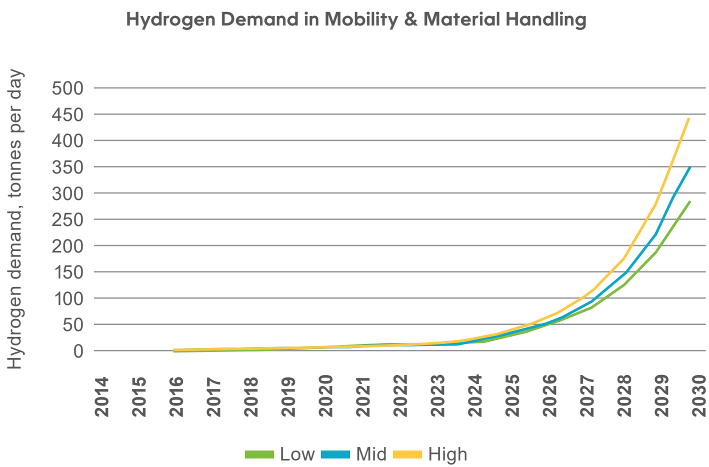
Installed Capacities 2022



Source: gasworld Business Intelligence

THE HYDROGEN ECONOMY – THE NEW OPPORTUNITY

The EU is speedily embracing the energy transition and hydrogen is expected to play an ever-increasing role – especially in mobility within Europe. The transition has already begun but the most growth is expected to take place post 2030.

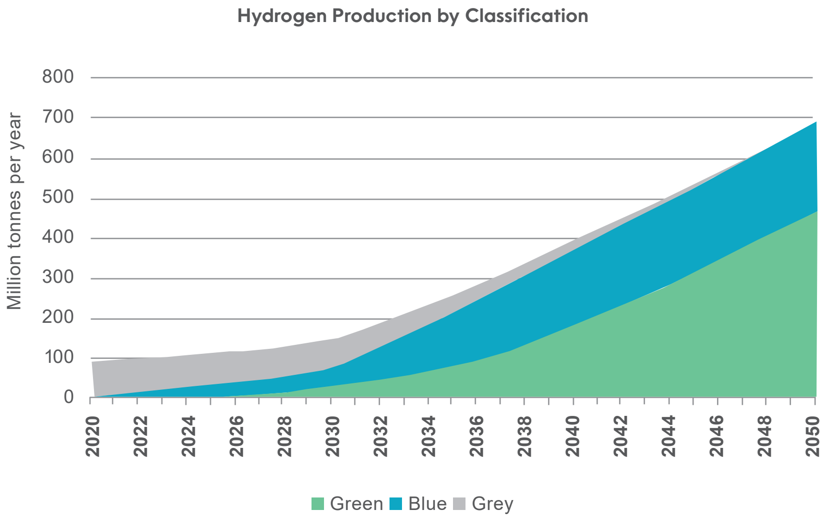


Scenarios of the hydrogen demand growth

Source: gasworld Business Intelligence

HYDROGEN PRODUCTION WILL SWING FROM GREY TO GREEN

Aiming for Net Zero by 2050 – Europe will invest in alternative and cleaner hydrogen production methods over the next 3 decades.

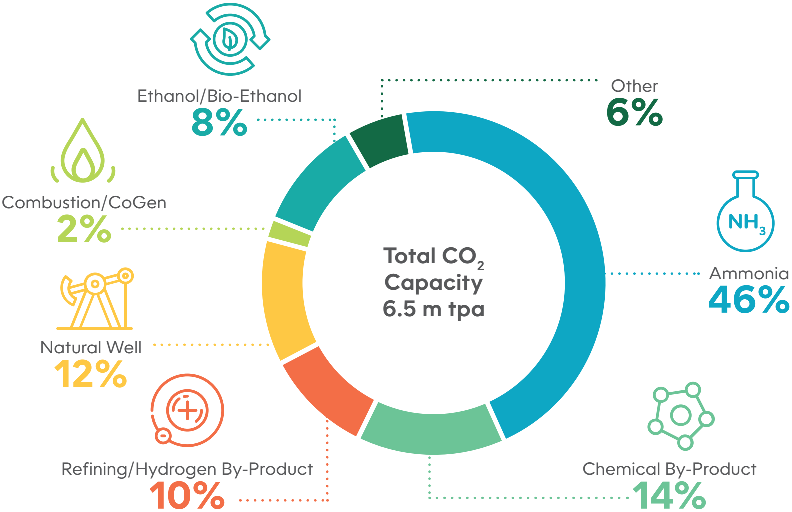


Source: Hydrogen Council McKinsey Report, Insight 2021

SOURCING OF QUALITY CO_2 IS A GROWING ISSUE

There is a demand for over 3.6 million tons of CO_2 in many different applications across the EU. While there is an apparent over-capacity the demand at peak times and reliance on ammonia has resulted in tight supply markets. Share of bio-ethanol as a source has grown in 2022, while ammonia share dropped.

CO_2 Product By Source 2022

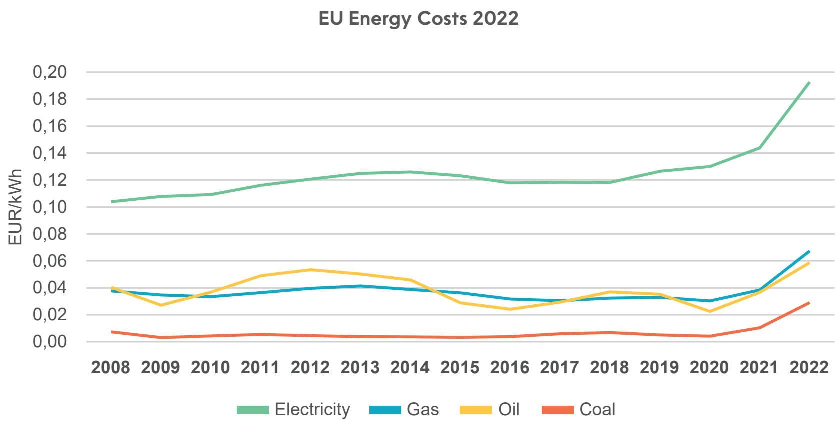


Source: gasworld Business Intelligence

Energy

THE IG INDUSTRY IS ENERGY INTENSIVE

Higher energy costs are impacting on the industrial gases sector within the EU.



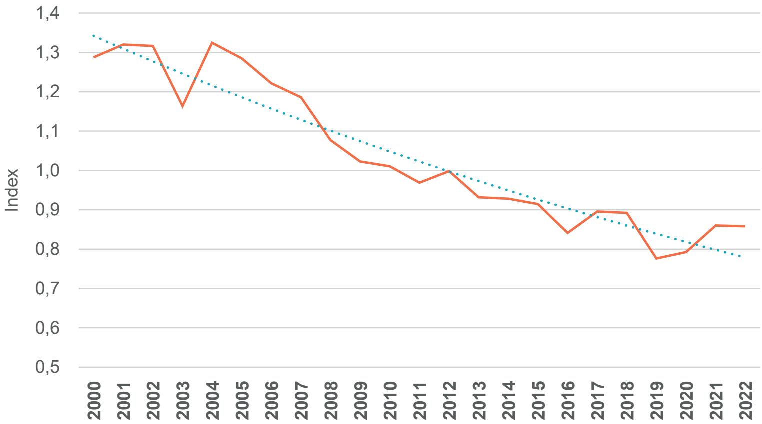
Note: The natural gas and electricity prices are for Europe, but the oil and coal prices are global.

Source: gasworld Business Intelligence

LOWERING OUR CARBON FOOTPRINT

Likewise, our industry is increasing efforts to lower their own carbon footprint – cutting emissions since 2000 with the further with a downward trend.

CO_2 Emission ($MTCO_2Y$)/Gas Output (MTIGY)



Note: Emissions reported for Air Liquide, Air Products, Linde and Nippon Gases.

2022 is estimated.

Source: Company Reports/gasworld Business Intelligence estimates

Our Members

- AIR LIQUIDE
- AIR PRODUCTS
- BARIT MADEN TÜRK A.S.
- BASF SE
- BUSE GAS B.V.
- BUZWAIR INDUSTRIAL GASES FACTORIES
- CARBO KOHLENSÄUREWERK HANNOVER GmbH
- FREYCO KOHLENSÄURE SERVICE GmbH & Co.KG
- GAS TECNICI FOLIGNO SRL
- HABAS Sinai Ve Tibbi Gazlar Ist. End. AS
- IJSFABRIEK STROMBEEK NV
- IRISH OXYGEN COMPANY LTD
- LINDE
- MAXIMA – AIR SEPARATION CENTER Ltd
- MESSER
- NIPPON GASES
- MULTIGAS Ltd.
- OY WOIKOSKI AB
- SHELL GLOBAL SOLUTIONS INTERNATIONAL B.V.
- SIAD
- SN SEIXAL – SIDERURGIA NACIONAL S.A.
- SOL
- STRANDMÖLLEN A/S
- TYCZKA AIR AUSTRIA GMBH
- UAB GASCHEMA
- WESTFALEN AG

- ASIA INDUSTRIAL GASES ASSOCIATION (AIGA)
- AUSTRALIA NEW ZEALAND INDUSTRIAL GAS ASSOCIATION (ANZIGA)
- Austria – ÖIGV
- Belgium – BELGIAN INDUSTRIAL & MEDICAL GASES ASSOCIATION – c/o ESSENSCIA ASBL
- Bulgaria -BULGARIAN INDUSTRIAL GASES ASSOCIATION c/o SIAD BULGARIA EOOD
- COMPRESSED GAS ASSOCIATION, INC. (CGA)
- Czech Rep. – CATP
- Denmark – PCG – c/o STRANDMÖLLEN A/S
- Finland – FINNISH INDUSTRIAL GASES INDUSTRY – c/o OY LINDE GAS AB
- France – AFGC
- Germany – IGV
- Greece – HELLENIC ASSOCIATION OF INDUSTRIAL AND MEDICAL GASES (HAIMG)
- Hungary – MIGSZ (Hungarian Industrial Gases Association)
- INTERNATIONAL OXYGEN MANUFACTURERS ASSOCATION, Inc. (IOMA)
- Italy – ASSOGASTECNICI
- JAPAN INDUSTRIAL AND MEDICAL GASES ASSOCIATION (JIMGA)
- Latvia – LATVIAN INDUSTRIAL GAS ASSOCIATION (LIGA) – Division of LAKIFA (Assoc of Latvian Chemical and Pharmaceutical Industry)
- MIDDLE EAST GASES ASSOCIATION (MEGA)
- Norway – NORSK INDUSTRIGASS FORENING (NIGF) c/o LINDE GAS AS
- Poland – PFGT (Polska Fundacja Gazów Technicznych)
- Portugal – APQUÍMICA – Associação Portuguesa da Química, Petroquímica e Refinação
- Romania – INDUSTRIAL GAS ASSOCIATION OF ROMANIA (IGAR)
- Slovakia – SAVDTP – c/o Messer Tatragas
- Slovenia – GIZ TP c/o MESSER SLOVENIJA d.o.o.
- South Africa – SOUTHERN AFRICA COMPRESSED GASES ASSOCIATION
- Spain – AFGIM – ASOCIACIÓN DE FABRICANTES DE GASES INDUSTRIALES Y MEDICINALES
- Sweden – SVENSKA INDUSTRIGASFÖRENINGEN (SIGA)
- Switzerland – IGS – Industriegaseverband Schweiz
- The Netherlands – VFIG
- United Kingdom – BCGA

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