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From Molecules to Markets…
The Next Decade of Industrial Gases

sbh4 GmbH, Stephen B. Harrison

gasworld Global Summit 2026

Budapest, 3rd December

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The journey ahead

We have always made molecules. As we enter the 2030's, energy, carbon, chips and resilience will decide who wins.

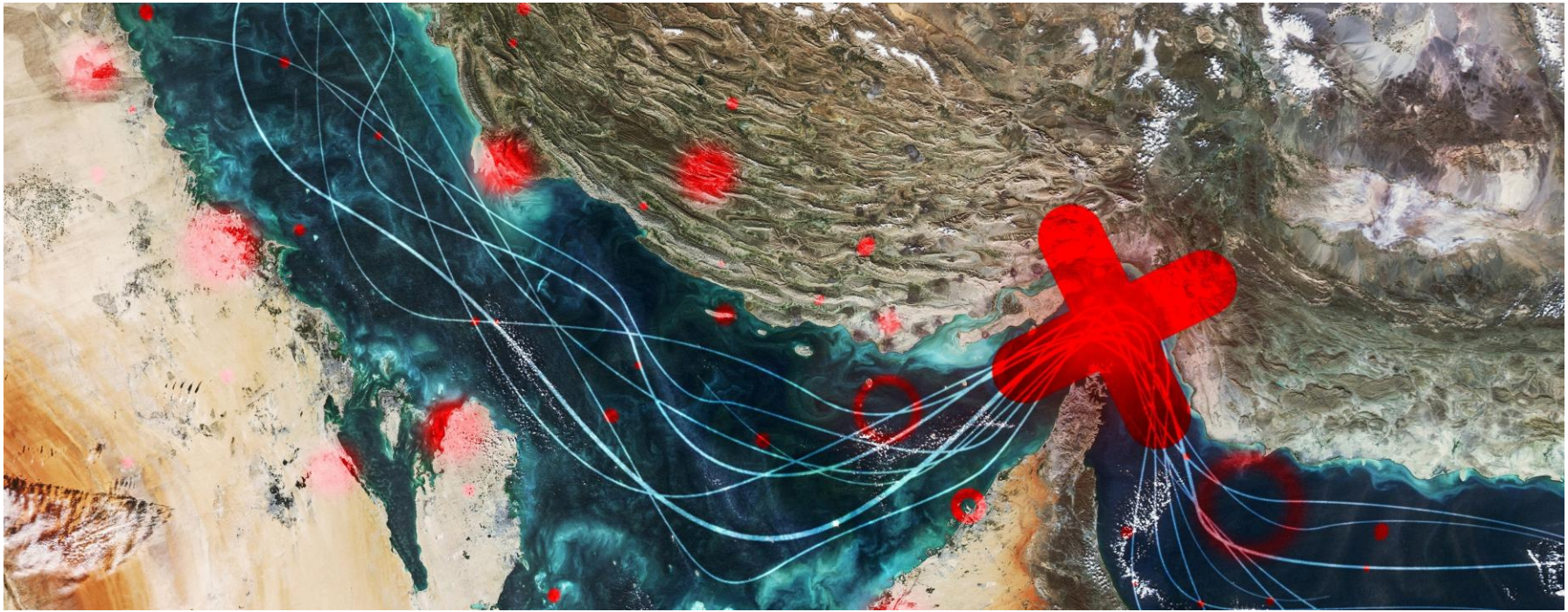
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- **Molecules are the product**
- **Resilience and sovereignty and safety are the service**
- **Surviving and exploiting volatile energy markets**
- **Certification for chip-grade purity and carbon markets**
- **Competing for power with our customers**

2026: predictably chaotic

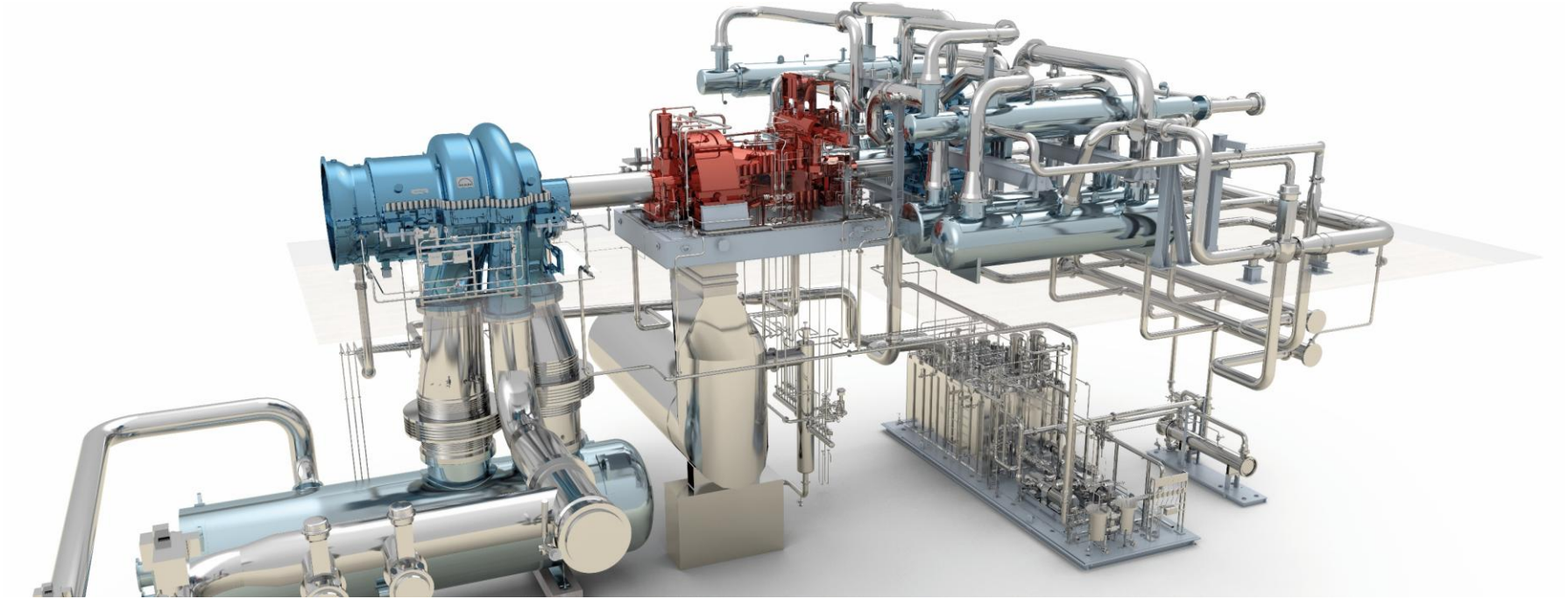
Hormuz restricted since February. Gulf LNG disrupted. European natural gas topped €100/MWh in October.

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It matters! We are an energy business in disguise

Energy can be up to 80–90% of an ASU's production cost.



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Or, we are simply an energy business

Energy can be up to 80–90% of an ASU's production cost.

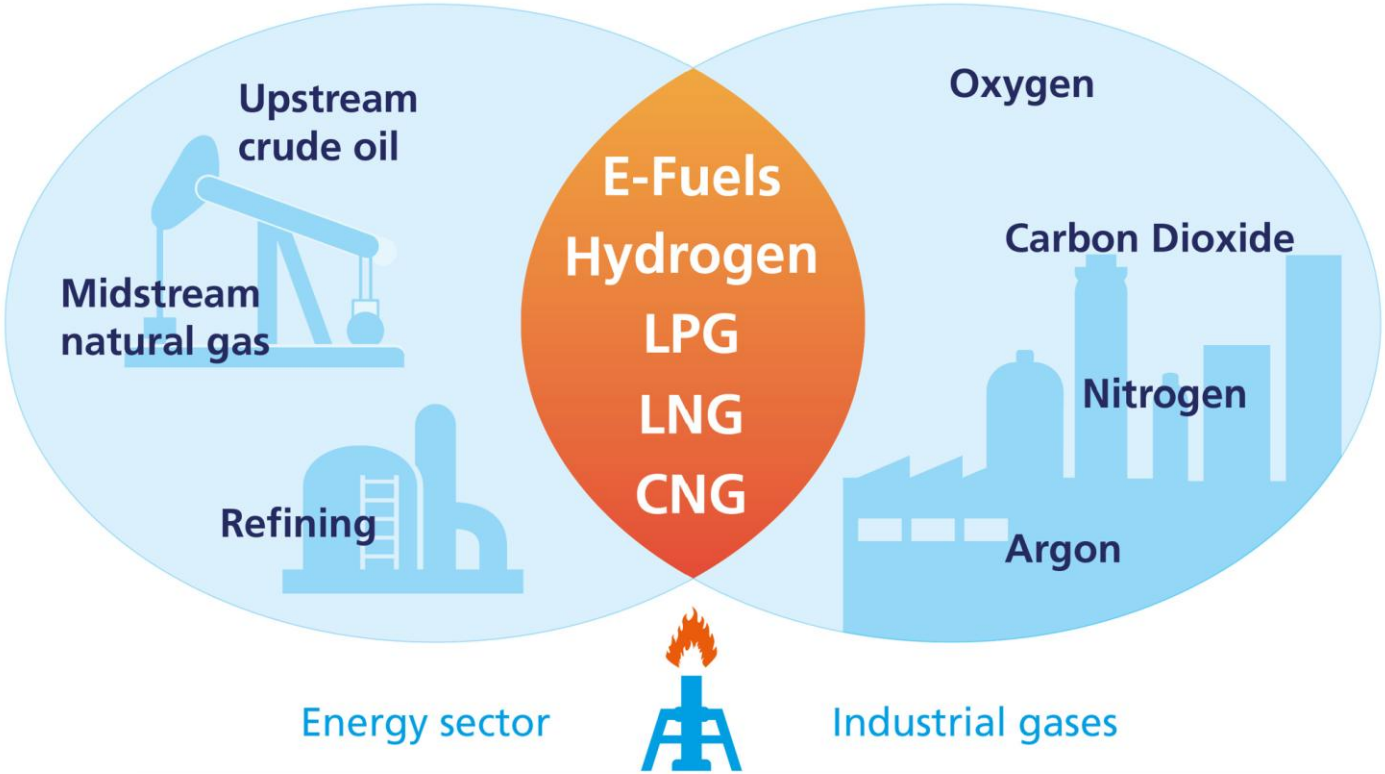
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The synergy is obvious

Is the opportunity too good to miss?

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https://pdf.sbh4.de/assets/fuel-gases.pdf

Helium: a third of Qatari supply offline

Amur coming back from an extended outage. Ras Laffan struck in March. Partial restart in June. No quick fix.

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CO2: hostage to ammonia

Half of Europe's merchant CO2 is a by-product of making ammonia. Expensive natural gas shuts down the supply of CO2.

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Every megawatt counts

A 3,000 t/d ASU draws 30–50 MW. Each extra €10/MWh costs around €3.5 million a year.

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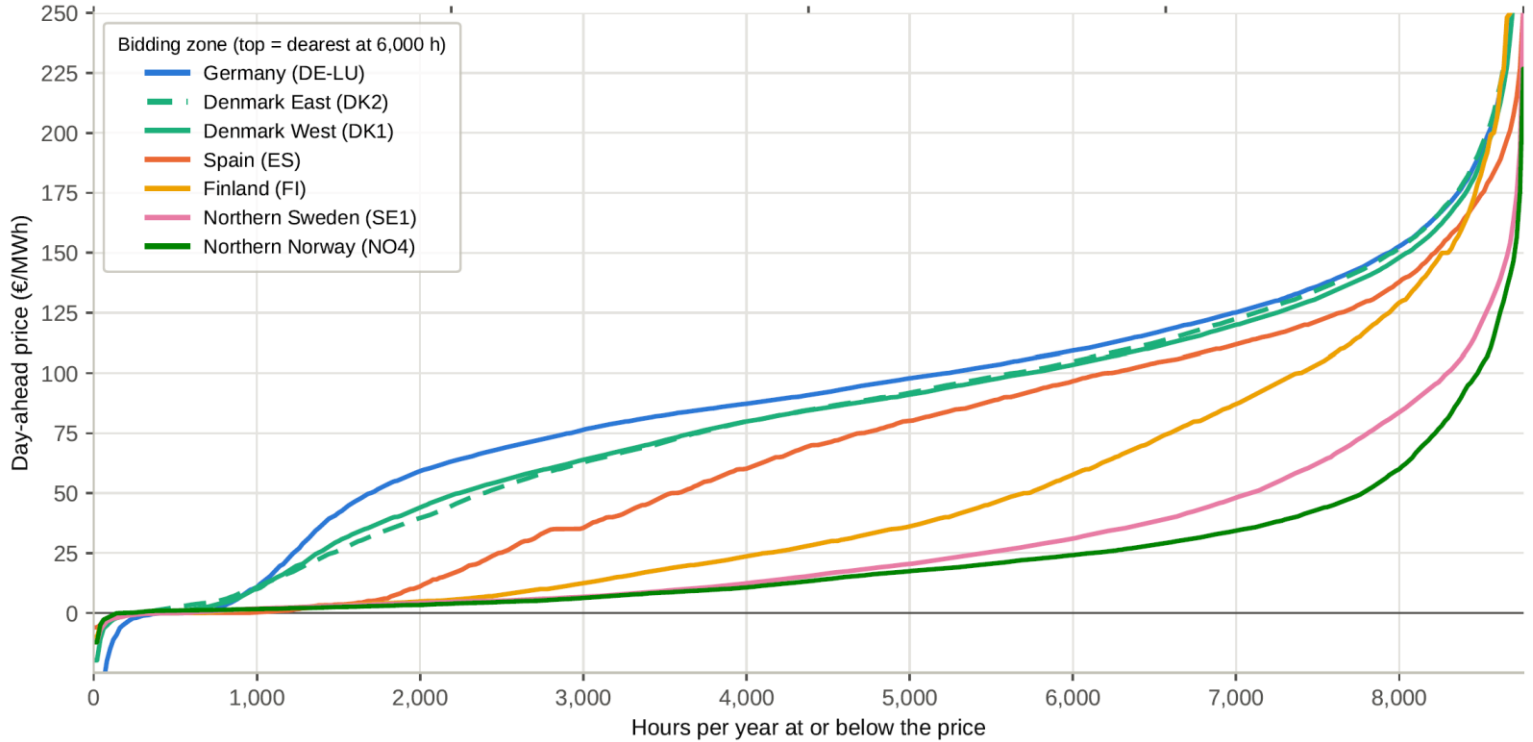


Image courtesy of APCI

Negative prices, positive opportunity

German power hit minus €499/MWh on 1 May 2026. Flexible loads get paid.

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Day-ahead power price duration curves, Oct 2023 – Sep 2026 (3-year average)

The cryogenic battery

Make liquids when power is cheap. Ride the peaks from storage. Operate electrolysers only with cheap power.

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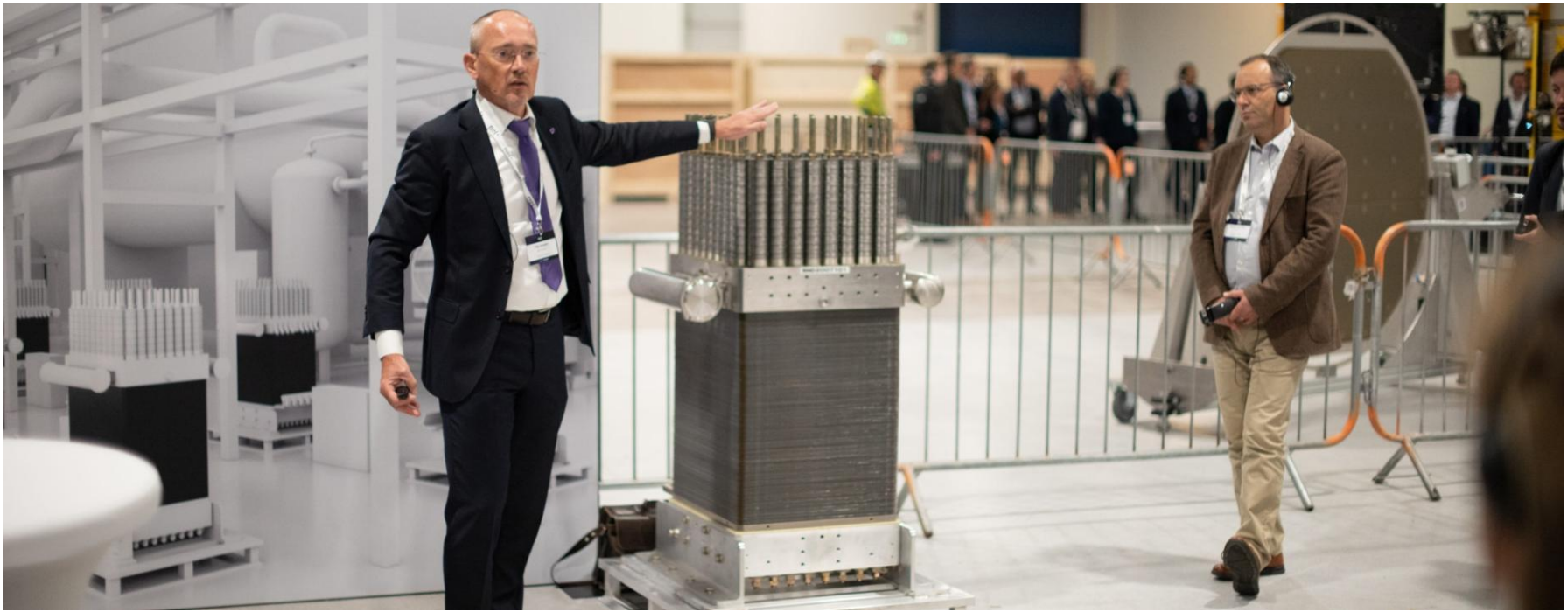


Copyright Linde AB

The hydrogen power play

Make hay when the sun shines, and hydrogen too. Storage and time shifting are embedded in industrial gases operations with ASUs and vaporisers.

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The great hydrogen project reset

Air Products shelves blue in Louisiana and green Arizona, yet sells out of Gulf-Coast grey. NEOM ammonia to be marketed by Yara.

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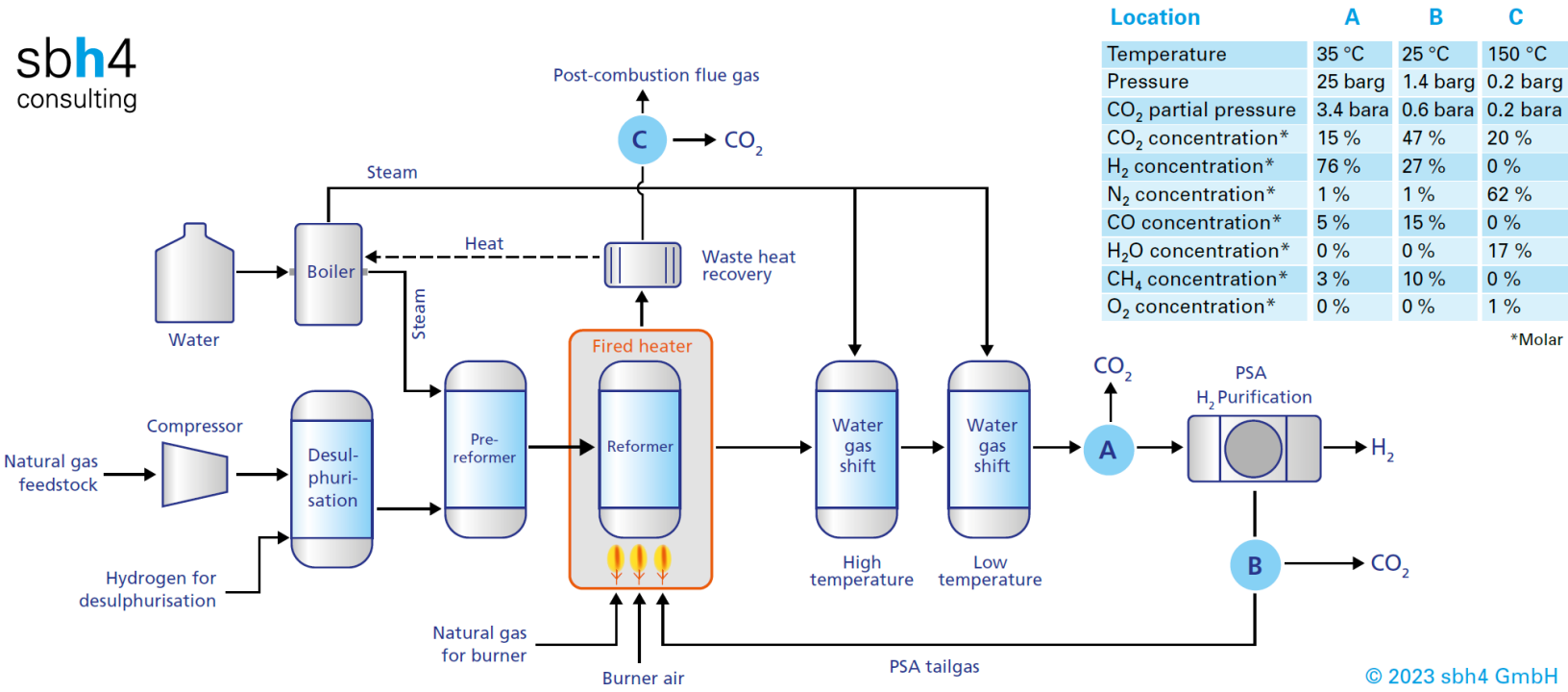


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Hydrogen: hype to hard hats

Low-emissions hydrogen: almost 1 Mt in 2025, heading past 1% of global output in 2026.

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Location	A	B	C
Temperature	35 °C	25 °C	150 °C
Pressure	25 barg	1.4 barg	0.2 barg
CO_2 partial pressure	3.4 bara	0.6 bara	0.2 bara
CO_2 concentration*	15 %	47 %	20 %
H_2 concentration*	76 %	27 %	0 %
N_2 concentration*	1 %	1 %	62 %
CO concentration*	5 %	15 %	0 %
H_2O concentration*	0 %	0 %	17 %
CH_4 concentration*	3 %	10 %	0 %
O_2 concentration*	0 %	0 %	1 %

*Molar

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Warnings for ASUs, AI and green steel

Green hydrogen has been held back by the high cost of electricity, the lack of grid connections and long lead-times for power management equipment.

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Carbon is now priced at the border

EU CBAM live since January 2026: importing green ammonia for crackers just got more expensive.

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Copyright AM Green

AI chips: the new growth engine

Q3 2026: Linde electronics +15%. Air Liquide electronics +12%, advanced materials +27%.

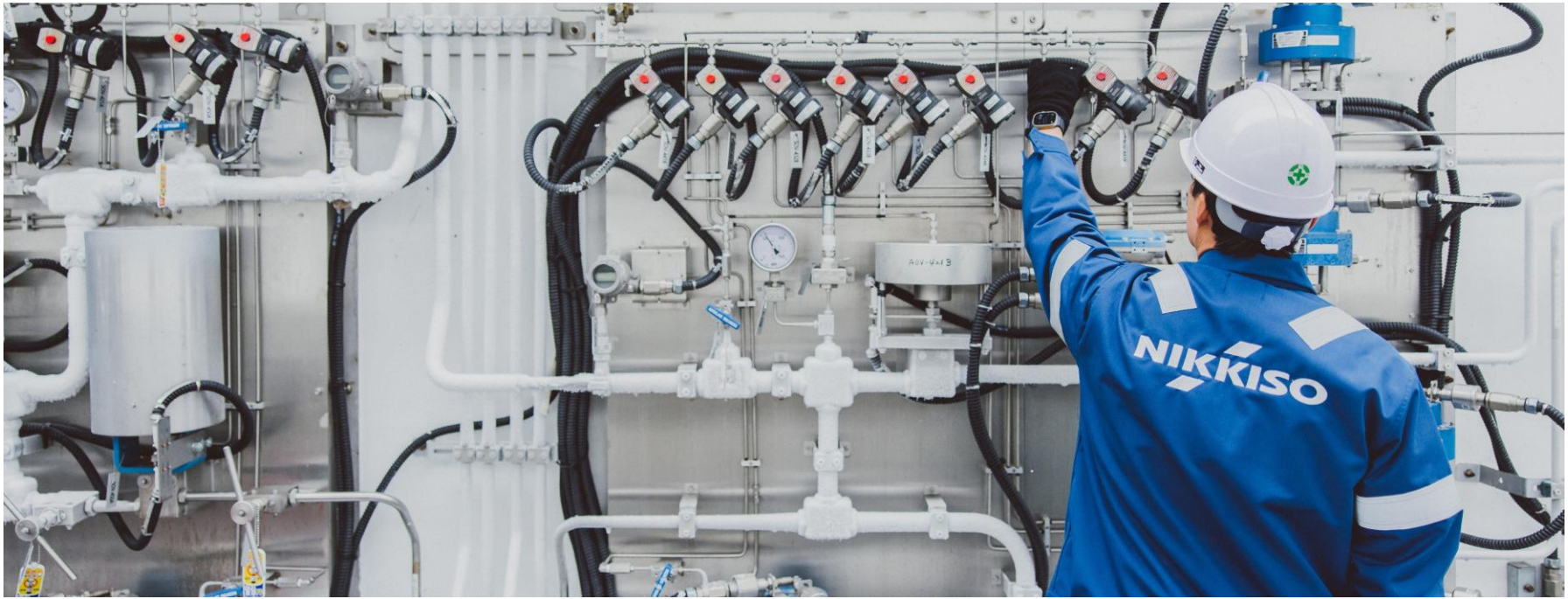
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Molecules made next door

Fabs want power-hungry cryogenic plants and over-the-fence pipelines: long contracts, baseload demand, ultrapure supply. Our shareholders love it!

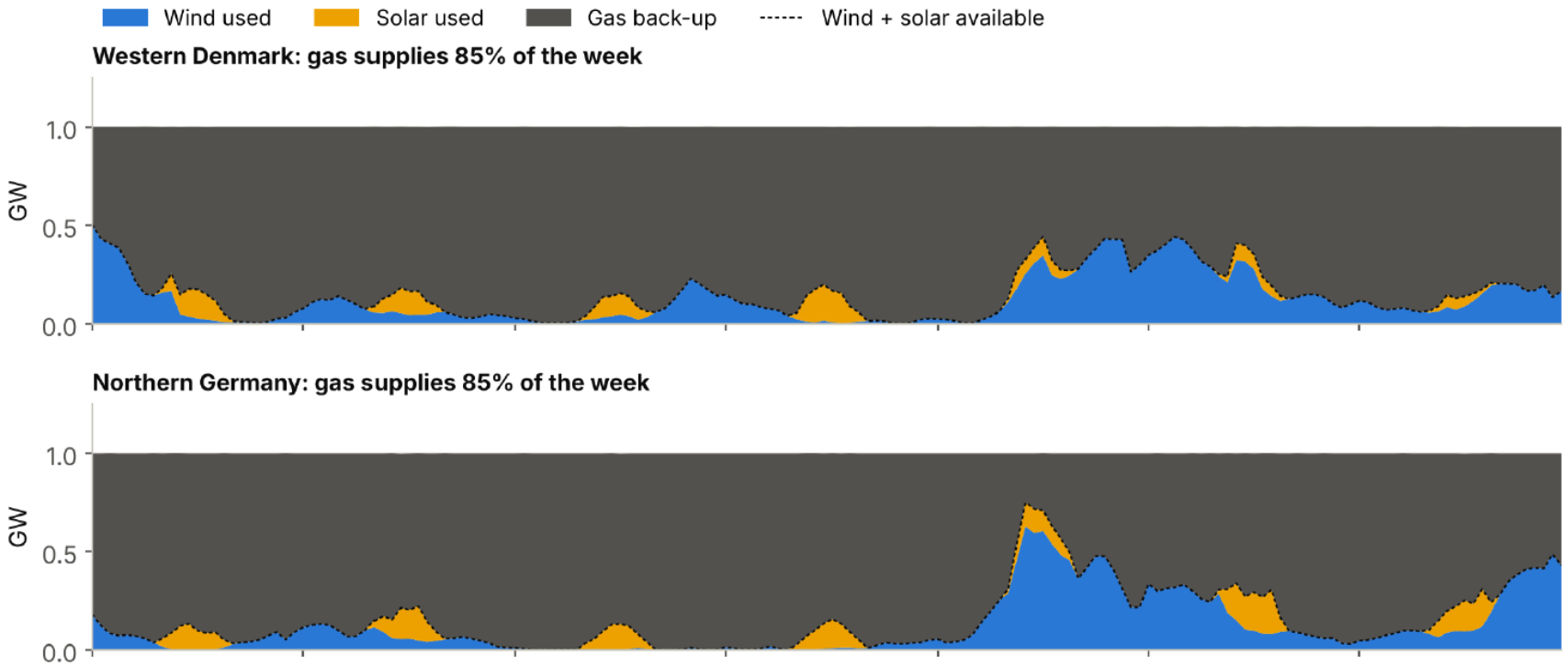
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Chips need gases, AI needs power

AI drives ultrapure gas demand but competes with ASUs and electrolysers for clean electrons and grid connections.

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The customer of 2030

They will demand, and deserve: music, resilience, carbon transparency, purity, explainable prices and digital service.

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Gas is the product, resilience is the service

Dual sourcing, strategic storage, on-site generation, sovereignty, and safety: written into contracts.

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Show me the carbon

A verified carbon footprint with every delivery. Scope 3 and CBAM make certifiable data a daily deliverable.

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Helium and rare gases are scarce resources.

Help customers to re-use, recover, recycle and re-purify. Or innovate to avoid.

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Telstar Helium Recovery Systems



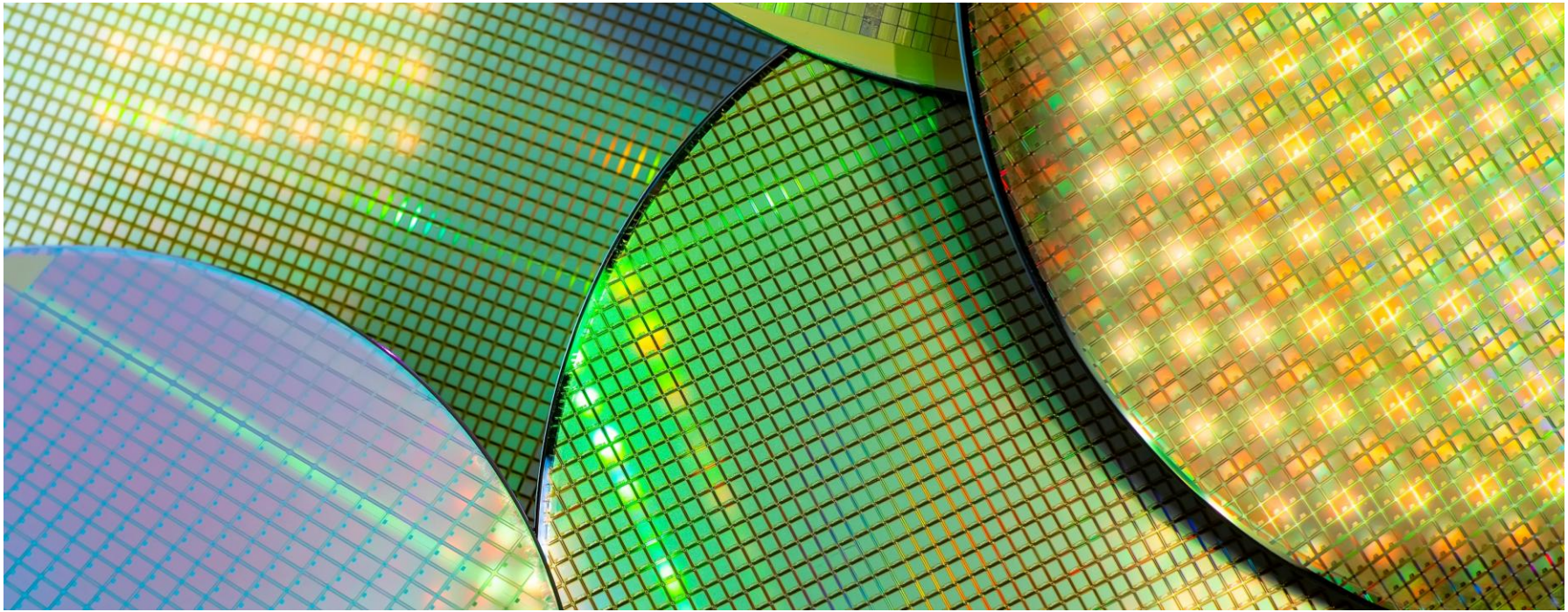
https://www.telstar.com/en/vacuum-equipment/helium-recovery-system/

https://www.efcgases.com/news/efc-launches-cymer-qualified-neon-gas-recycling-system-a-game-changer-for-excimer-lasers/

Purity without compromise

Advanced chip nodes need ultrapure gases, full traceability and zero-defect logistics.

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Digital by default

Telemetry, predictive replenishment and self-service portals. AI as co-pilot, not autopilot.

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https://www.ambrasistemi.it/products/

Prices with understandable win-sharing

Transparent energy indexation, plus a fair share of the cost savings from flexible operation. We did it with argon credits, they will want it again.

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From molecules to markets…

Takeaways for the journey into the 2030's

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- **Understand energy, and you understand our business.**
- **AI drives growth in opportunities, and threats.**
- **Hydrogen is selective, and a power play.**
- **Resilience, recovery, recycling and sovereignty sell.**
- **Carbon counts, and customers decide.**
- **And, as always – safety as standard.**

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Introduction to Stephen B. Harrison and sbh4 consulting

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Stephen B. Harrison is the founder and managing director at sbh4 GmbH in Germany. His work focuses on decarbonisation and GHG emissions reduction. E-fuels, bio-fuels, hydrogen, ammonia, LDES and CCU/S are fundamental pillars of his consulting.

Stephen has extensive investment due diligence advisory experience in the energy and clean-tech sectors. Private Equity firms, investment fund managers and green-tech start-ups are regular clients. He also supports operating companies in their mission to decarbonise their scope 1, 2 and 3 GHG emissions. Startups also benefit from Stephen's strategic advisory services to ensure their successful scale up through development plans which are aligned to market needs.

In 2023, Stephen evaluated seven CCTUS, hydrogen and e-fuels submissions to the European Commission's Third Innovation Fund. In 2025, Stephen assessed assessing seven Innovation Fund applications related to e- and bio-methanol production. Again, in 2026, he assessed 6 large-scale Bio-SAF and e-SAF projects for the Innovation Fund. In each year, the fund allocated more than €2 billion to large-scale decarbonisation projects in Europe.

In 2024, 2025 and 2026 he supported the European Commission with venture capital investment due diligence and assessed 15 Horizon grant applications and more than 30 Marie Curie Post Doctoral Network and Doctoral Fellowship applications.

Stephen has served as the international expert and team leader for three ADB projects related to CCU/S and renewable hydrogen deployment in Pakistan, Palau and Viet Nam. He has also supported the IFC and world bank on e-fuels and green hydrogen strategy development projects in Namibia and Pakistan and project evaluations in Paraguay and India.

With a background in industrial and specialty gases, including 27 years at BOC Gases, The BOC Group and Linde Gas, Stephen has intimate knowledge of e-fuels, hydrogen, ammonia and carbon dioxide from commercial, technical and operational perspectives. For 14 years, he was a global business leader in these FTSE100 and DAX30 companies.

As a member of the H2 View (2020-26) and **gas**world (2018 to present) editorial advisory boards, Stephen has advised the direction for the leading hydrogen-focused international publications for more than 6 years. Through H2 VIEW, World Hydrogen Leaders and Sustainable Aviation Futures, he has led Masterclasses covering hydrogen, SAF and hydrogen derivatives themes in virtual and live sessions.

