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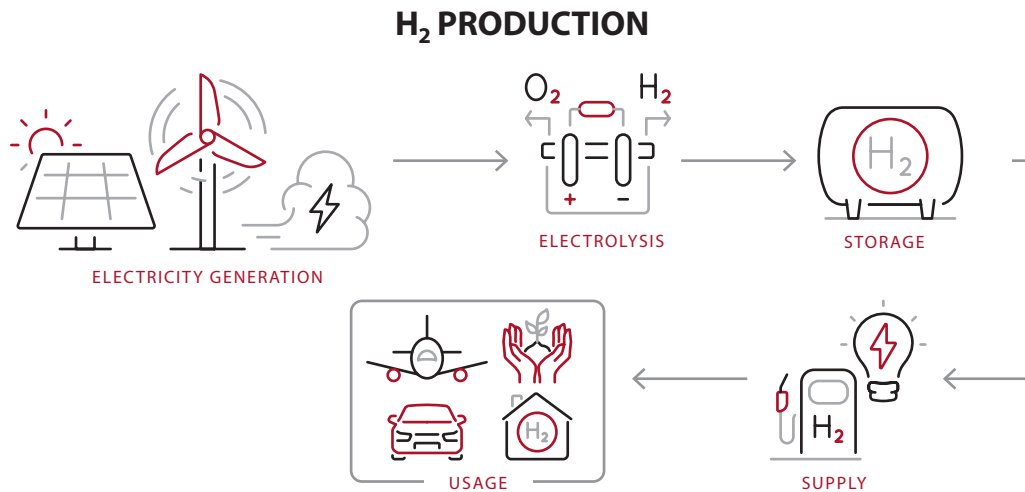
# DE-RISK AND FUTURE-PROOF YOUR HYDROGEN OPERATIONS

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The low-carbon hydrogen economy is on its way.  
Are your people and workplaces ready—and safe?

**blacklinesafety**

# HYDROGEN A KEY ENABLER OF CLIMATE COMMITMENTS



The demand for hydrogen is poised to skyrocket due to its pivotal role in achieving global net-zero carbon emissions. That's because hydrogen:

- Has the capacity to be carbon neutral in its production
- Integrates easily with renewable fuels, and
- Is a better option for electrification in hard-to-abate sectors like aviation, shipping and long-haul transport.

Driving the surge are significant policy shifts and supportive regulations around the world, especially in Europe, aimed at boosting hydrogen production.

Additionally, major investments from governments and new infrastructure projects are laying the groundwork for a hydrogen-powered future.

But are your operations ready for the rewards—and risks—of hydrogen production?



The global hydrogen market is poised to reach \$410B USD by 2030 (CAGR 7.8%).

## STAY A STEP AHEAD OF AN EVOLVING RISK

While hydrogen performs well as a fuel, forward-thinking companies need to consider and adapt to the evolving risk landscape posed by hydrogen's integration into various aspects of their business. That's because hydrogen is:

- The smallest molecule in the universe, making it challenging to contain and prone to leaks.
- A much greater explosion hazard than other liquid and gas fuels.

Even if hydrogen is not currently part of your business, it likely will be soon. For example, if hydrogen is used to power homes, utility companies will need to check for hydrogen leaks in their pipelines. Similarly, if used to power cars, car manufacturing facilities and their workers will need hydrogen detection equipment.

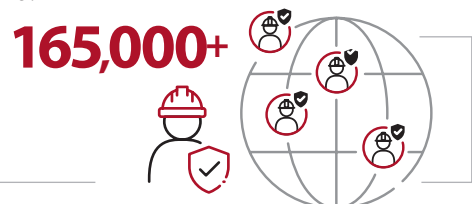


Blackline Safety is uniquely equipped to address the challenges of hydrogen production, transmission and usage thanks to our:

- State-of-the-art sensor technology
- Scalable solutions
- Unparalleled connectivity for rapid incident response.

Our game-changing solutions ensure that hydrogen leaks are quickly detected and managed, providing essential protection in an increasingly hydrogen-dependent world.

Blackline Safety protects over **165,000** workers at more than **2,200** different companies across a dozen industries globally.



# COMMON HEALTH AND SAFETY RISKS WITH HYDROGEN PRODUCTION

## EXPLOSIONS

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Working with hydrogen poses significant explosion hazards, as it is much more explosive than conventional fuels.



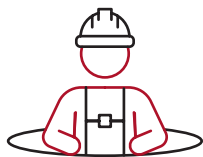
- Small molecular size makes it prone to leaks.
- Flammable in air at concentrations between 4% and 75%. By comparison, methane is flammable in air only in proportion between 4.4% and 17% by volume\*.
- Minimal amount of energy required to ignite a hydrogen-air mixture is much lower than that for other fuels.

These risks create the need for devices that can detect for both Lower Explosive Limits (LEL) and Parts Per Million (PPM). Intrinsically safe devices with mass communication capabilities to facilitate evacuation and ensure worker safety are also required.

## CONFINED SPACE ENTRIES

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Hydrogen operations often involve numerous confined spaces such as storage tanks, utility vaults, process vessels, pipelines, heat exchangers, boilers, and compressor stations.



In these environments, hydrogen can easily accumulate in high spaces due to its lighter-than-air nature.

Gas detection devices equipped with pump *cartridges* for pre-entry checks and continuous monitoring to detect and manage hydrogen concentrations effectively are critical to ensure safe working conditions.



The amount of energy required to ignite a hydrogen/air mixture is much lower than for other fuels.\*\*

\*Source: IEC

\*\*The minimum amount of energy required to ignite a mixture of hydrogen and air is just 0.017 mega joule (mJ). In contrast, the minimum ignition energy for hydrocarbon fuel gases is much higher, at around 0.3 mJ for methane/air or propane/air mixtures.

## LONE AND REMOTE WORKERS

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Hazards for lone workers in large industrial and manufacturing facilities are compounded by isolation.

- Workers may be out of sight and sound of others.



### ADDITIONAL RISKS ARISE FOR FIELD-BASED WORKERS

- May work alone when responding to gas leaks or performing inspection and maintenance activities.
- Can operate in remote areas with unreliable cellular network coverage.
- Reliable communication and location technology are vital.

Devices with advanced communication capabilities, including optional satellite connectivity\*, are necessary to ensure lone workers' safety. These devices enable constant contact and rapid response in case of emergencies.



## EXTENSIVE RISK PROTECTION

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When you combine all the potential risks – leaks and explosions, confined space entries and working alone – there's a clear need for a versatile and scalable safety solution to protect your workers.

Layer on the ability to analyze trends from captured data and you can move from reactive to proactive safety management.

Blackline's connected technology addresses all these needs.

\*Not available in all regions.

# COMPREHENSIVE FLEXIBLE SAFETY SOLUTIONS FOR WORKERS AND FACILITIES

With Blackline Safety, you can combat all the risks from hydrogen in a single cloud-connected device that offers gas detection, lone worker protection and an array of communication features for a failsafe way to keep your workforce and workplace safe.

Personal wearable devices:

[G7 Lone Worker](#) • [G7 Single-Gas](#) • [G7 Multi-Gas](#) • [G7 Multi-Gas Pump](#)

Portable area and perimeter monitor:

[EXO](#)



## KEY BENEFITS

### Best Sensor Portfolio

- Broad selection of 20 gas sensors, including MPS – LEL and H2\*.
- Enable monitoring of H2 in PPM (to detect leaks) or percentage LEL (to mitigate explosions).

### Customizable Gas Detection

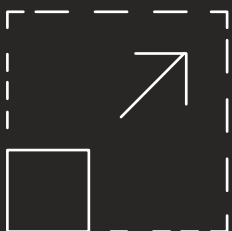
- Devices available in single-gas, multi-gas or multi-gas with pump.
- Choose the right gas sensors and capabilities to address the unique demands of your operating environment.
- Multi-gas with pump option particularly well suited for leak detection and confined space entries.

### Boosted Lone Worker Protection

- Integrated person-down safety features
  - Fall detection.
  - No-motion detection.
  - Missed check-in.
- Emergency SOS.
- Location technology for fast incident response.

### Flexible Two-Way Communication

- Intrinsically safe devices come with an array of communication options
  - Two-way voice.
  - Text messaging.
  - Push-To-Talk (like a walkie-talkie).



### SCALABILITY DRIVES A LOW COST OF OWNERSHIP

All our devices are completely customizable and can be configured to accommodate diverse safety needs. Whether the need is lone worker, single-gas, multi-gas with pump, swappable cartridges and toggled features mean one device can be scaled to have it all, eliminating the need for multiple pieces of equipment. Plus, there's no limit to the number of devices you can have in your network.

\*Not available in all regions.

# REAL-TIME VISIBILITY THROUGH CONNECTIVITY

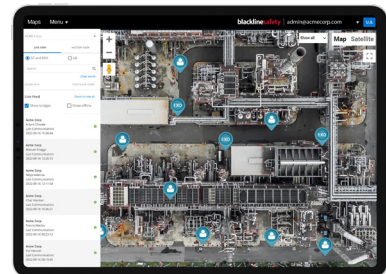
Whether it's a lone worker incident or a gas leak that requires a facility emergency response or evacuation, connectivity will bring your safety program to the next level. All devices have:

- Integrated cellular connectivity.
- Automatically connect to the cloud in minutes.
- No need for Wi-Fi or networks to be set up.

## FULL SITE AND WORKER VISIBILITY

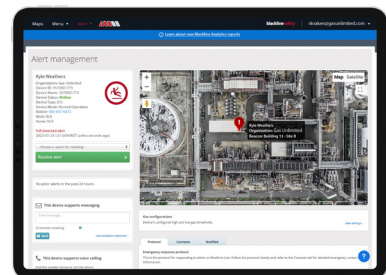
Our web-based safety and productivity software portal, [Blackline Live](#), is the hub of your connected safety ecosystem:

- Contains all the tools you need in one platform.
- Intuitive to use.
- Can configure, view and monitor all your devices in the field including their compliance status.
- Accessible via any internet-connected smartphone, tablet or computer.



## UNMATCHED SITUATIONAL AWARENESS

- GPS-enabled location technology and direct-to-cloud data streaming delivers real-time information and worker visibility at your fingertips.
- Understand everything from normal routines to when an incident occurs.
- Immediately know what happened, when it occurred, who is involved and where they are located.



## DATA TO WORK SMARTER AND SAFER

It's never been easier to dive deep into data to uncover safety insights that help power your business. With our Blackline Analytics reports you can:

- Gain insights into how and where equipment is being used.
- View the compliance status of every device.
- Understand where hazards and leaks are being encountered.
- Unlock trends and patterns to help stay a step ahead of risk.



Our connected safety hardware, software and services can meet you where you are today and scale, providing you with technology that does what you need—now and in the future—without limitation.

Plus, we offer complete, dedicated support—for you and your people—from day one. Our passion and dedication to our customers is why we have a retention rate of 100% and customers who have continued to use our solutions for over a decade.

Join **2,200+** companies who already use Blackline Safety to protect their workers.



**READY TO FUTURE-PROOF YOUR BUSINESS  
FROM HYDROGEN RISK? *LET'S CONNECT!***

**blacklinesafety**

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