

Green Hydrogen 101

The Future of Clean Energy for Industrial Decarbonization



**What It Is, Why It Matters,
and How to Get Started**



Why Green Hydrogen?

Green hydrogen is at the forefront of industrial decarbonization, offering a sustainable, cost-effective alternative to fossil fuels. This guide will help you understand what green hydrogen is, why it matters, and how your industry can take advantage of it.

Global push for decarbonization

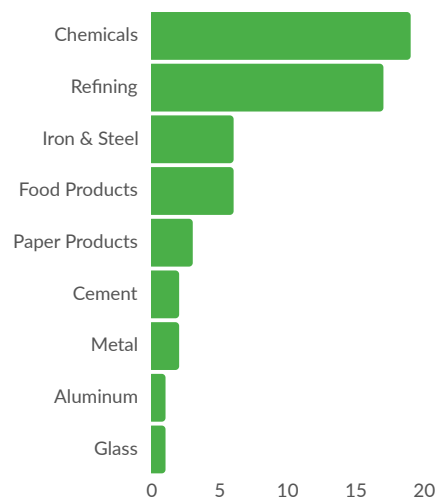
Industries globally are under pressure to reduce carbon emissions and shift to cleaner energy sources. Regulations, market demands, and corporate sustainability goals are accelerating the shift from fossil fuels.

Industry needs low-carbon alternatives

Sectors like ammonia, steel, chemicals, and others contribute about **30% of total US emissions** through carbon-intensive processes. Green hydrogen offers a scalable, sustainable solution to decarbonize.

Share of Industrial Emissions in the US

This chart breaks down total US industrial emissions by sector.



Source: [Annual Energy Outlook](#)



What's in this guide?

This guide is designed for decision-makers in heavy industry who want to understand:

- What green hydrogen is + how it works
- Its benefits and industrial applications
- Challenges and how to overcome them
- Steps to transition and choose the right partner

What is Green Hydrogen?

Green hydrogen is produced using renewable energy, making it a zero-emission fuel that can replace grey hydrogen and fossil fuels in industrial applications. It enables long-term emissions reductions while ensuring energy security and cost stability.

Types of hydrogen

Not all hydrogen is the same. The key types include:



Green Hydrogen: Produced via electrolysis powered by renewable energy for zero emissions



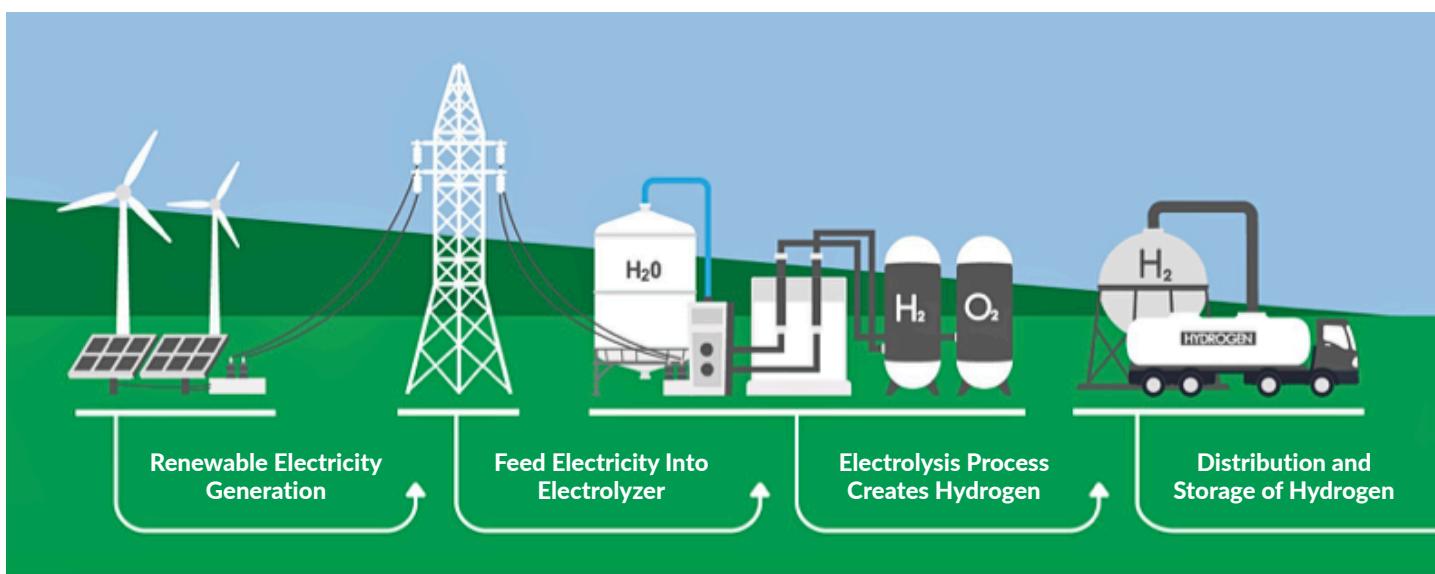
Grey Hydrogen: Produced from natural gas via steam reforming, emitting excessive CO₂



Blue Hydrogen: Similar to grey hydrogen, but with carbon capture technology to reduce emissions

How green hydrogen is produced

Green hydrogen is created through electrolysis, where electricity from wind or solar splits water molecules into hydrogen and oxygen—a completely clean process.



Benefits of Green Hydrogen

More than just a clean energy source, green hydrogen is a catalyst for industrial transformation. From reducing emissions and stabilizing energy costs to unlocking financial incentives and creating jobs, green hydrogen offers a sustainable and competitive edge in the global economy.

Decarbonization & emissions reduction

Green hydrogen eliminates CO₂ emissions from industrial processes, helping companies meet corporate sustainability goals and global climate commitments.

Energy security & price stability

Green hydrogen costs are declining, making it an attractive long-term energy solution. It provides stable pricing and reduces exposure to natural gas volatility.

Regulatory compliance & incentives

Governments worldwide are offering subsidies, tax credits, and grants to accelerate green hydrogen adoption, lowering the cost barrier for industrial users.

Competitive market positioning

Companies that adopt green hydrogen early gain a first-mover advantage, appealing to investors, customers, and supply chain partners seeking low-carbon products.



Growing jobs & manufacturing

Green hydrogen is fueling job growth and industrial investment across the US.

- **Workforce expansion:** New jobs in engineering, construction, and operations
- **Boosting US manufacturing:** Growing demand for electrolyzers, fuel cells, and storage systems
- **Regional economic growth:** Hydrogen hubs driving investment in local communities

Industrial Applications: How Green Hydrogen Is Used Today

Green hydrogen is transforming industrial operations by replacing fossil fuels with a clean, scalable alternative. Industries are leveraging hydrogen to cut emissions, enhance energy security, and meet sustainability goals. Below are key sectors adopting green hydrogen today.

Industry	Application
Methanol Production	Producing low-carbon methanol for shipping, aviation, and chemical industries
Sustainable Aviation Fuel	Producing low-carbon jet fuel by combining green hydrogen with captured CO ₂
Petrochemical & Refining	Serving as a cleaner hydrogen feedstock to reduce emissions in refining processes
Steel Manufacturing	Powering DRI processes as an alternative to coal, reducing emissions from steelmaking
Ammonia Production	Replacing gray hydrogen in fertilizer production to significantly cut CO ₂ emissions
Chemical Industry	Decarbonizing specialty chemical production and reducing lifecycle emissions
Mobility (Transportation)	Fueling hydrogen-powered trucks, buses, and rail, cutting transportation sector emissions
Other Emerging Applications	Powering hydrogen-based fuels, energy storage, and grid stability solutions

Challenges & Misconceptions About Green Hydrogen

While green hydrogen is a game-changing solution for industrial decarbonization, misconceptions about cost, infrastructure, and scalability remain. In reality, advancements in technology, production, and policy support are making it increasingly accessible and affordable.

Cost & infrastructure concerns

Green hydrogen is already becoming cost-competitive thanks to falling renewable energy prices and government incentives.

Scalability & supply of hydrogen

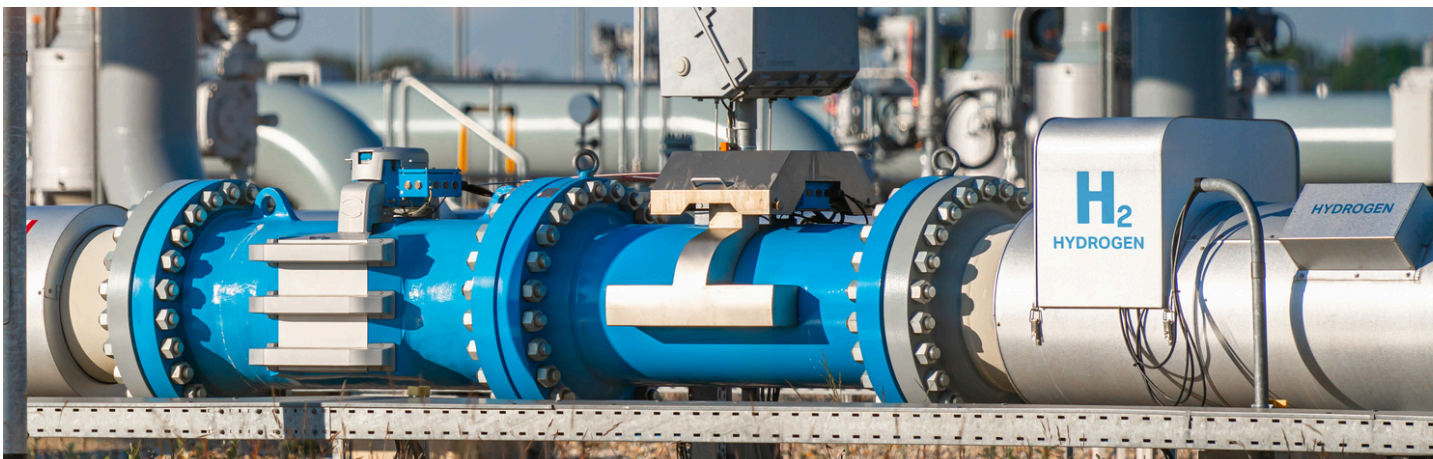
The hydrogen economy is expanding fast, with billions in global investments accelerating production and infrastructure growth.

Hydrogen storage & transport

Investments to expand pipeline infrastructure, hydrogen storage and transport, as well as on-site production are solving large-scale transport needs.

Electrification vs hydrogen debate

Some industries can't fully electrify, so green hydrogen is the only viable pathway for sectors that require high heat or chemical feedstocks.



Transition to Green Hydrogen: What You Need to Know

Adopting green hydrogen requires careful planning, financial strategy, and the right industry partnerships. From assessing feasibility to full-scale deployment, businesses must navigate infrastructure needs, cost modeling, and funding opportunities.

Considerations for adoption

Infrastructure readiness

How green hydrogen fits into existing operations

Hydrogen supply

Ensuring long-term availability and cost stability

Cost modeling

Understanding ROI and total cost of ownership

Incentives & financial support

Government incentives

Tax credits, subsidies, and grants are reducing costs for industrial users

Accelerating adoption

Federal & state programs are accelerating adoption through financial incentives

Implement green hydrogen

Strategic partners

Partner with providers offering turnkey solutions

Secure funding

Funding options to secure cost-effective transition plans

PHASE 1

Project Feasibility & Assessment

PHASE 2

Financial Planning & Incentives

PHASE 3

Project Technology Selection

PHASE 4

Full-Scale Production Deployment

PHASE 5

Project Operations and Management

How to Choose the Right Green Hydrogen Partner

1 Competitive and stable pricing

Look for providers with long-term cost predictability and access to incentives.

3 Access to financing, capital & incentives

A strong partner helps secure tax credits, grants, financing, and access to capital.

2 Supply reliability & infrastructure compatibility

Ensure consistent hydrogen supply that integrates with existing systems.

4 Renewable energy sourcing & long-term contracts

Choose a provider that can secure firm, long-term renewable energy contracts.

Partner with the Ambient Fuels team of experts

We bring decades of experience to your green hydrogen project.



Jacob Susman
CEO



Chris Shugart
Senior Vice President,
Development



Devraj Banerjee
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Erik Anderson
Vice President,
Origination



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Leanne Russell Fate
Director,
Sales & Marketing Ops



Greg Bostick, CPA
Senior Manager,
Finance



Sreya Raju
Manager,
Renewable Supply

Ambient Fuels: Trusted Partner in Industrial Decarbonization

Transitioning to green hydrogen is a high-stakes decision that requires the right expertise, renewable energy supply strategy, and financing partner. As a pure-play green hydrogen developer, our sole focus is delivering cost-effective, scalable hydrogen solutions to power industrial decarbonization.

End-to-end expert project development

- **Optimized financing:** \$250M+ committed to project pipeline and access to tax credits and grants
- **Tech-agnostic design:** Customized solutions to fit existing infrastructure
- **Proven expertise:** Developed 10 GW of renewables, 1 BCF of chemical processing, 200 MW of electrolyzers
- **Renewable supply expertise:** Deep experience in procuring reliable renewable energy supply

Complete project expertise and scope

Offtake & Sales	Technology Selection
Real Estate Acquisition	Procurement
Permits	Construction and Operations
Community Relations	Project Finance
Renewable Supply	Interconnection
Project Design	Regulatory Incentives

Industry-leading experience

Our team of experts has extensive experience at industry-leading companies.



Let's Build a Cleaner Future Together



Book a free strategy call

Talk to an expert about how green hydrogen can work for you.



Visit the Ambient Fuels website

Learn how we can help you transition to a cleaner future.

