MISSION FOR AMERICA · CHAPTER 05 · THE PLAN

Clean Hydrogen

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Introduction

This document provides a blueprint for the National Mission for Hydrogen, outlining the key policies, programs, and actions needed to build an American green hydrogen industry. This blueprint focuses on the actionable framework for success. The full report details industry context, challenges, and implementation.

These mission blueprints are intended for industry experts, policymakers, and other readers who need a clear, accessible way to absorb the key elements of each plan. They do not include the background information, industry context, or in-depth analysis found in the full-length national mission chapters. While we encourage all readers — especially policymakers — to explore the complete reports for a deeper understanding of the industries and solutions involved, we recognize that many professionals may not have the time to do so. These summaries are designed to offer a more digestible version of each mission's core goals and strategies.

Each blueprint begins with three brief overview sections introducing the Mission for America, the role of the president, and the Reconstruction Finance Corporation. These topics are explored in much greater detail in the Mission for America introduction. Readers who have already reviewed that material — either in the introduction or in another mission summary — may wish to skip directly to the section titled The National Mission for Hydrogen.

The National Mission for Hydrogen

In his 1874 novel Mysterious Island, Jules Verne foresaw a bright future for hydrogen made from water, writing: "I believe that water will one day be used as a fuel, that hydrogen and oxygen, which constitute it, used singly or together, will furnish an inexhaustible source of heat and light." Hydrogen enthusiasts have touted the promise of hydrogen ever since. This national mission contains a plan to build the world Verne envisioned — a world where hydrogen plays a key role in powering the economy.

In the 150 years since the publication of "Mysterious Island," the promise of hydrogen has remained unfulfilled. Many industries have flirted with the idea of using hydrogen to reduce emissions or pioneer new technologies but to little success. In the early 2000s, transportation enthusiasts hailed hydrogen vehicles as the future of transportation. Fast forward 20 years and hydrogen vehicles are still a niche market. In 2022, President Biden signed generous hydrogen subsidies into law and kick-started a new wave of enthusiasm around hydrogen. The Treasury Department took nearly three years to finalize the rules for claiming the credits — and by the time it did, the political ground had shifted entirely. The Trump administration canceled two of the seven federally funded hydrogen hubs, abolished the Office of Clean Energy Demonstrations that managed them, and signed legislation shortening the deadline for claiming the hydrogen production tax credit from 2033 to 2028, leaving the industry scrambling to break ground before the window closes. Roughly 60 major hydrogen projects were canceled in 2025 alone. One could be forgiven for returning to the old joke that hydrogen is the fuel of the future — and always will be.

In spite of the hydrogen industry's rocky past, the case for hydrogen in hard-to-abate industries has only grown stronger. The recent past has separated viable use cases from hype: hydrogen-powered passenger cars and home heating have collapsed, while steel, shipping, chemicals, and seasonal energy storage have gained real traction. The open question is whether the United States will build that industry or cede it to China. Governments around the world have launched major national efforts to build their own hydrogen industries. China, the European Union, South Korea, Saudi Arabia, and others have invested tens of billions of dollars into developing hydrogen infrastructure. But the global picture has darkened: green hydrogen still accounts for less than one quarter of one percent of global production. The opportunity is real, but the window is closing.

The emerging hydrogen economy is quickly becoming the next frontier of global energy and industrial competition — and China is winning. China now holds 60% of global electrolyzer manufacturing capacity and produces them at two to five times lower cost than Western manufacturers. In 2025 alone, China commissioned the world's largest electrolyzer at 500 megawatts. The United States built the solar industry and then lost it to Chinese manufacturing. Hydrogen is the next chapter of that story — and the window to write a different ending is closing fast.

Before the U.S. joins the hydrogen race, it is important to identify where hydrogen can meaningfully reduce emissions, and where it may be a false solution. In some applications, hydrogen is technically viable but inefficient, impractical, or even unsafe compared to alternatives. Policymakers must clearly understand hydrogen's most effective uses to make smart investments and policy choices.

Steel

How Hydrogen is Used: Hydrogen is used to produce low-carbon primary steel — new steel made from raw iron ore — through hydrogen direct reduced iron (DRI). In this process, hydrogen acts as the reducing agent, converting iron ore into sponge iron. The sponge iron is then melted in an electric arc furnace and refined into finished steel.

Outlook for Future Adoption: Hydrogen DRI is the leading pathway to decarbonizing primary steel production. Leading-edge projects are advancing: Stegra's 2.5 million-ton-per-year green steel plant in Sweden is over 60% built with production targeted for 2026, and SSAB aims to offer commercial fossil-free steel across all product groups the same year. But the economics remain brutal outside Nordic countries with cheap clean power — ArcelorMittal canceled its EUR 2.5 billion German conversion in 2025 despite EUR 1.3 billion in committed government subsidies. Hydrogen DRI is the right technology, and it will need the kind of patient, public-backed financing this mission proposes to scale.

Shipping

How Hydrogen is Used: Hydrogen can be used in many ways to reduce emissions from shipping. Hydrogen can be used directly as a fuel in modified ship engines or fuel cells, but most proposals focus on using hydrogen as a feedstock to make other fuels. The leading options are ammonia or methanol made from green hydrogen, which can then be used to power ship engines or fuel cells.

Outlook for Future Adoption: Hydrogen-derived fuels are gaining real traction in decarbonizing shipping. The International Maritime Organization finalized interim guidelines for hydrogen and ammonia as ship fuel in September 2025, entering force in July 2028. Ammonia engines are now commercially available from WinGD and Wartsila, and 2025 saw six ammonia-fueled and 13 hydrogen-capable vessel orders. Ammonia produced from green hydrogen is the leading candidate and has moved well beyond the demonstration stage. Methanol is also being explored, though it requires additional carbon inputs that must come from sustainable sources to deliver true emissions reductions.

Agriculture

How Hydrogen is Used: Hydrogen is the essential feedstock for producing ammonia, the backbone of synthetic fertilizers. In the Haber-Bosch process, hydrogen reacts with atmospheric nitrogen to produce ammonia (NH_3), which is then used to manufacture nitrogen fertilizers that support the majority of global food production. Today, virtually all of this hydrogen comes from natural gas. Green hydrogen replaces that fossil fuel input, producing green ammonia — and, by extension, clean fertilizer — without the associated greenhouse gas emissions.

Outlook for Future Adoption: Agriculture is one of the strongest near-term use cases for green hydrogen, because no alternative decarbonization pathway competes with it. Fertilizer production has no practical substitute for hydrogen — the transition simply swaps a fossil fuel input for a green one, with the same end product. The American agricultural sector consumes roughly 18 million metric tons of ammonia annually, almost entirely derived from dirty hydrogen, making it one of the largest and most concentrated sources of hydrogen demand in the country. The economics are more favorable than in most sectors: fertilizer plants are large, centralized, and long-lived — well-suited to RFC-backed offtake agreements and transition financing. The primary barrier is cost, but that gap narrows significantly with the full 45V credit and cheap clean power. Decarbonizing fertilizer also reduces exposure to natural gas price volatility, a recurring source of instability for both farmers and consumers.

Aviation

How Hydrogen is Used: Hydrogen can power large, low-emission aircraft in two main ways. It can be stored onboard and converted to electricity in fuel cells, which drive electric motors, or it can be burned directly in modified jet engines to produce thrust. Both approaches require storing hydrogen either as a compressed gas or as a cryogenic liquid in specially designed tanks.

Outlook for Future Adoption: Hydrogen retains strong long-term potential for decarbonizing large aircraft, even though the private market has stalled. In 2025, Airbus delayed its ZEROe hydrogen aircraft program by five to 10 years — pushing commercial service into the 2040s — and cut the program's budget by 25%. The challenges of hydrogen's low volumetric energy density, cryogenic storage, and wholesale aircraft redesign have proven far harder than anticipated. Sustainable aviation fuel will carry most long-haul flights for the next two decades. But the incumbents walking away is exactly the gap the Mission for Aviation is built to fill: a public moonshot that charters competing public corporations to build the world's first zero-emission long-haul aircraft, with hydrogen as the primary path and commercial service

targeted for the 2040s. This Mission supplies the hydrogen side of that effort, standing up green hydrogen production at the airports and hubs the fleet will need as it matures.

Rail

How Hydrogen is Used: Hydrogen trains use fuel cells to generate electricity, which either powers the train's motors directly or charges onboard batteries that provide extra power during acceleration.

Outlook for Future Adoption: Hydrogen will likely play a complementary role in reducing emissions from rail transportation. Most passenger and freight rail will be electrified, but hydrogen offers a practical alternative for routes where electrification is too expensive or logistically challenging. The first hydrogen-powered passenger train in the United States — the ZEMU, on the Arrow Line between San Bernardino and Redlands, California — entered revenue service in September 2025. In Europe, Germany's Alstom Coradia iLint has been operating commercially since 2022. These deployments show the technology is viable and applicable for niche scenarios.

Freight

How Hydrogen is Used: Hydrogen-powered semi-trucks use fuel cells to generate electricity, which drives the truck's electric motors. Hydrogen is stored onboard in pressurized tanks and refueled at dedicated hydrogen stations.

Outlook for Future Adoption: Hydrogen may help reduce emissions from long-distance trucking, but the VC-backed hype cycle has crashed. Nikola filed for bankruptcy in February 2025 and had one employee by year-end. Hyzon dissolved between December 2024 and February 2025. The startup collapse validates caution — but established OEMs are still in the game. Hyundai's XCIENT fuel cell truck now offers 450-mile range, and Daimler plans small-series production of its NextGenH2 truck from end of 2026. Hydrogen's higher energy density by weight and faster refueling time make it better suited to time-sensitive, long-distance freight operations, but future breakthroughs in battery technology could narrow — or even eliminate — that advantage.

Light-Duty Vehicles

How Hydrogen is Used: Light-duty hydrogen vehicles use hydrogen fuel cells to generate electricity, powering the vehicle's electric motor.

Outlook for Future Adoption: Hydrogen is very unlikely to play a major role in decarbonizing passenger cars. Battery electric vehicles (EVs) are already far more popular, efficient, and cost-effective, with a rapidly expanding charging network. The hydrogen fueling network is actively contracting: Shell closed all seven of its California light-duty stations in February 2024, True Zero shuttered 10 stations in late 2023, and only about 50 retail hydrogen stations remain in the state. Toyota sold just 210 units of its Mirai hydrogen sedan in the United States in 2025. Fuel-cell passenger vehicles are a dead end.

Heating

How Hydrogen is Used: Hydrogen home heating uses hydrogen as a fuel in specially designed boilers. When burned, hydrogen reacts with oxygen to produce heat and water vapor.

Outlook for Future Adoption: Hydrogen is not expected to play a meaningful role in decarbonizing home heating. Direct electric heating solutions such as heat pumps are far more efficient — delivering three to four times more heat per unit of electricity — require no on-site combustion, and are safer for households and communities. The United Kingdom canceled its hydrogen village trials at Whitby and Redcar in 2023, effectively ending the most prominent government-backed attempt to make hydrogen heating work. Using hydrogen for home heating would waste clean electricity and introduce unnecessary safety risks.

Green Hydrogen Production

The 2025 rationalization confirmed the right use cases for hydrogen: steel, shipping, chemicals, and seasonal energy storage. Other technologies may eventually compete — leaps in battery technology could enable large ships to run on electricity, and alternative steelmaking methods such as molten oxide electrolysis may become cost-competitive. But hydrogen is the best pathway available today for these hard-to-abate sectors. This national mission may be updated as technology evolves.

Although hydrogen will play a key role in lowering emissions across many industries, the extent of those reductions depends on how the hydrogen is produced. Hydrogen is produced using a range of technologies and energy sources. The hydrogen industry uses a color coding system to differentiate between types of hydrogen production.

This national mission aims to build a domestic hydrogen sector that exclusively produces and uses green hydrogen. Green hydrogen is the only form of hydrogen production that does not contribute to the climate crisis and is compatible with the Mission for America's goal of reaching net-zero emissions. Throughout this chapter, we will frequently group non-green forms of hydrogen under the banner of "dirty hydrogen." Policymakers should view all forms of dirty hydrogen with skepticism.

The primary goal of this mission is to produce roughly 6–10 million tons of green hydrogen a year within 10 years, on the way to roughly 50 million tons a year by mid-century and higher as the economy fully converts. The decade builds the foundation: greening the dirty hydrogen worth converting and standing up the first new demand in steel, shipping, and fertilizer. Most of the later growth is aviation, the biggest eventual consumer, converting through the 2040s and 2050s. It is a deliberate moon-shot: global green hydrogen production today is only about 0.15 million tons, less than a quarter of one percent of all hydrogen output, and the IEA projects just 10 million tons of low-emissions hydrogen worldwide by 2030.

This mission focuses on building hydrogen supply and the infrastructure to support widespread future use. Policies to drive hydrogen adoption in specific industries are addressed in the sector-specific missions. This mission's job is to scale production and lay the foundation for a national hydrogen economy.

In milestones, the build looks like this:

Milestone	Green hydrogen/yr	Electrolyzers	Clean electricity/yr	Freshwater/yr	Lead drivers
Year 5	~3.3 million tons	~35 GW	~175 TWh	~33 Mm^3	Greening fertilizer and ammonia; electrolyzer stand-up

Year 10	~6–10 million tons	~65–105 GW	~315–525 TWh	~60–100 Mm^3	Existing dirty hydrogen greened; first steel and shipping demand
2050 (mid-century)	~40–58 million tons	~425–605 GW	~2,100–3,050 TWh	~400–580 Mm^3	Aviation scaling; seasonal storage; shipping
~2060 (full build-out)	~75–110 million tons	~790–1,155 GW	~3,900–5,800 TWh	~750–1,100 Mm^3	Fleet fully converting; aviation the largest consumer

These are illustrative planning levels, and the back half tracks how fast aviation converts. Electrolyzer capacity assumes roughly 10.5 gigawatts per million tons (about a 55% capacity factor). The electricity column is the new clean generation this mission asks of the Mission for Clean Power, from a few percent of today's US output in the first decade to approaching, and at the high end exceeding, the scale of today's entire grid at full build-out, most of it for aviation. The freshwater column (Mm^3 is millions of cubic meters) is the electrolysis water that must be clean and fresh, about 10 liters per kilogram of hydrogen; even full build-out stays well under one percent of US freshwater, and the larger cooling requirement can draw on seawater or be avoided with dry cooling. Water will shape where to build.

The specific goals of this national mission are to:

Lower the cost of green hydrogen to $1 per kilogram.

Transition existing gray and blue hydrogen to green, as refinery hydrogen demand fades with falling oil use.

Establish new regulations for the safe production, transportation, and utilization of hydrogen.

Ensure that the hydrogen industry's large new electricity demand is met with new, additional clean generation, so it expands the clean grid. It will not draw clean power away from other sectors or lean on fossil generation.

Grow the domestic electrolyzer manufacturing sector to support 6–10 million tons of green hydrogen production within 10 years, on the way to 50 million tons by mid-century, and to begin exporting electrolyzers to other countries.

Utilize salt-cavern hydrogen storage as a seasonal energy storage strategy to help enable a smooth, affordable transition to 100% clean energy.

Build hydrogen-safe pipelines to support short-distance hydrogen transportation.

Train workers, including many ex-fossil fuel workers, for hydrogen-industry jobs.

Build hydrogen infrastructure near seaports to support future use.

Build domestic electrolyzer manufacturing capacity independent of Chinese imports, preventing a repeat of the solar panel dynamic where America invented an industry and then lost it.

This national mission is one of the most ambitious in the Mission for America. The American hydrogen industry produces only 10 million metric tons of hydrogen a year, essentially all of which is gray hydrogen

that will need to be phased out. The industry produces a negligible amount of green hydrogen and the technologies needed to expand production — such as clean energy and electrolyzers — are in short supply. The cost of green hydrogen remains high — though with the full 45V tax credit, costs approaching $1 per kilogram are achievable in the best US locations — and demand remains low. The fundamental challenge of this national mission is constructing a green hydrogen economy functionally from the ground up.

Water, often raised as an objection to green hydrogen, is not a binding constraint. Splitting water is the reaction itself, but it takes only about 10 liters of fresh water per kilogram of hydrogen, so even a fully built-out hydrogen economy would use well under one percent of the nation's fresh water. The larger cooling requirement can run on seawater or be removed with dry cooling. The real question is where to site production, and the answer favors the coasts and water-rich regions.

Despite these challenges, the goals of this mission are achievable within the comprehensive framework of the Mission for America. The national mission for clean energy will create an abundant supply of affordable clean energy generation that can be used to produce cheap green hydrogen. The national missions for steel, aviation, shipping, trucking, and farming will all help increase the demand for hydrogen by creating subsidies for green hydrogen-derived products and green hydrogen-powered vehicles. Additionally, coordinated investments in infrastructure, workforce training, and advanced manufacturing will create the industrial ecosystem needed to support large-scale hydrogen production.

Building a hydrogen industry will lower emissions, and it is also a strategic imperative. The United States invented the solar industry and watched Chinese manufacturing take it over. Hydrogen is the next industrial competition, and the stakes are higher: the countries that manufacture electrolyzers and produce cheap green hydrogen will dominate the steel, shipping, and chemical industries that depend on it. This mission will drive job growth, increase national wealth, and ensure America does not lose another critical industry. Hundreds of thousands of Americans will move into high-paying jobs producing hydrogen, developing supporting technologies, and constructing the next generation of steel plants, farms, and ships powered by hydrogen. These industries will produce high-value goods for both domestic consumption and export. If America is the first among its economic competitors to build a green hydrogen industry, it will establish itself as the global leader in hydrogen production.

Solutions Overview

The National Mission for Hydrogen addresses key challenges in building a green hydrogen economy with comprehensive, interconnected solutions. Each of the five solutions outlined here target a critical aspect of the mission — transitioning dirty hydrogen production to green hydrogen, creating new regulations for the industry, expanding electrolyzer manufacturing, deploying hydrogen energy storage, and building the infrastructure to transport and use hydrogen. Together, these solutions form a comprehensive strategy to build a 100% green hydrogen economy, create millions of jobs, and enable emission reductions in many other industries. The wave of roughly 60 project cancellations in 2025 — by BP, Fortescue, Shell, ArcelorMittal, and others — proved that private capital alone cannot build this industry. The RFC-

led approach is the only viable path. This section summarizes each solution section's goals and overall strategy.

Solution 1: Replacing Dirty Hydrogen with Clean Hydrogen

The American hydrogen industry produces around 10 million tons of dirty gray and blue hydrogen every year. The industry's reliance on dirty hydrogen makes it responsible for roughly 2% of the nation's yearly emissions. Any plan for building a sustainable hydrogen industry must begin by addressing the unsustainable course the industry is currently on. This solution section outlines a plan to make all the hydrogen the country still produces green within 10 years. Much of today's dirty hydrogen goes to oil refining, and that demand will shrink on its own as oil use falls, so the real task is greening the hydrogen with a lasting future, chiefly fertilizer and chemicals. The primary strategies of this solution include:

Creating a clean hydrogen standard that requires hydrogen consumers to use 100% green hydrogen in 10 years.

Providing hydrogen producers with generous RFC financing and investment to transition to green hydrogen production.

Stimulating demand for green hydrogen-derived products, such as green ammonia, by coordinating purchase agreements and offering loans to help offset higher costs for early adopters. The demand gap is the central bottleneck — the 2025 cancellation wave was driven by producers' inability to find buyers willing to pay a green premium.

Codifying the existing Treasury rules that limit the Hydrogen Production Tax Credit to green hydrogen projects, giving projects a decade from the mission's launch to begin construction, and increasing the payout rate.

Excluding hydrogen projects from the Carbon Sequestration Tax Credit (45Q), which was strengthened under OBBBA and now provides blue hydrogen producers an $85-per-ton backdoor subsidy.

Using the presidential bully pulpit to maintain pressure on hydrogen consumers and producers as they transition to green hydrogen.

Solution 2: Establishing New Hydrogen Regulations

History offers countless examples of how failing to regulate an industry in its early stages leads to entrenched pollution, safety failures, and costly corrections. An under-regulated hydrogen industry presents real risks to workers, neighboring communities, the power grid, and the climate. Strong regulation also ensures that public investment goes only toward green hydrogen. Blue hydrogen projects that collect the strengthened 45Q credit will not qualify. This solution section introduces a regulatory framework for the growing hydrogen industry to ensure that we get it right from the beginning. The primary strategies of this solution include:

Rebuilding and consolidating hydrogen regulatory authority within the Department of Energy — whose Office of Clean Energy Demonstrations was abolished in November 2025 — and empowering the agency with the staff and funding necessary to rigorously enforce regulations.

Codifying in statute the Treasury Department's "Three Pillars" rules — additionality, temporal matching, and geographic deliverability — which were finalized in January 2025 but exist only as regulation and could be weakened by a future administration. These rules require that hydrogen producers source electricity from newly built clean energy generation, that the clean energy be generated in the same time window the hydrogen is produced, and that the clean energy come from the same geographic region as the hydrogen facility.

Ensuring the safe transportation of hydrogen by banning hydrogen transport by rail and long-distance pipelines.

Requiring hydrogen producers and consumers to monitor their hydrogen leakage and identify parts of the value chain prone to leaks.

Solution 3: Building a Competitive American Electrolyzer Industry

The electrolyzer industry faces a challenge that goes beyond the classic chicken-and-egg problem. Chinese manufacturers have broken the supply-side constraint — China now holds 60% of global electrolyzer manufacturing capacity at two to five times lower cost than Western producers. The question now is whether America will manufacture its own electrolyzers or depend on Chinese imports. This solution proposes an industrial policy strategy to build competitive domestic manufacturing before Chinese dominance locks in — a direct parallel to the solar panel dynamic. While Solution 3 builds the domestic manufacturing base for electrolyzers, Solution 5 creates the demand for them — investing in green hydrogen production and infrastructure so that both sides of the market grow in tandem. The primary strategies of this solution include:

Creating new federal subsidies for electrolyzer manufacturing, such as a new production tax credit and expanding the Advanced Energy Project Tax Credit to include electrolyzer factories.

Directing the RFC to provide capital and, if necessary, build Government-Owned-Contractor-Operated (GOCO) factories if private manufacturers cannot meet demand.

Expanding the number of companies manufacturing electrolyzers by investing in start-ups and recruiting allied-nation manufacturers — from Europe, Japan, and India — to build capacity in the United States. Chinese firms should be barred from subsidy eligibility, consistent with FEOC restrictions applied to other clean energy credits.

Strengthening the electrolyzer supply chain by identifying and resolving component shortages through targeted investments in companies producing parts like electrolyzer cells and water tanks.

Building a mostly alkaline electrolyzer fleet, since alkaline runs on abundant nickel and avoids the iridium bottleneck that caps the membrane-based PEM design, while reserving PEM and high-temperature solid-oxide units for the sites that need them.

Solution 4: Deploying Hydrogen Long Duration Energy Storage

The transition to clean energy requires high-capacity storage systems that can provide power over long durations of time. Batteries dominate for anything under 24 hours — at roughly $219 per kilowatt-hour in the United States, costs are falling fast — but they cannot provide the weeks or months of storage a

clean grid requires during seasonal lulls or extended weather events. Hydrogen salt caverns fill that gap: they can store massive volumes of hydrogen for months at a time and convert it back into electricity when needed. The concept is already moving into practice. The ACES Delta project in Utah — with all 40 electrolyzers installed and tested at full load, two salt caverns providing over 300 gigawatt-hours of storage capacity, and a $504 million DOE loan guarantee — is nearing commercial operation. This solution introduces policies to deploy hydrogen salt cavern storage systems to support the clean energy transition. The primary strategies of this solution include:

Creating a Strategic Hydrogen Reserve made up of hundreds of hydrogen-storing salt caverns to provide electricity to the grid during emergencies.

Expanding federal subsidies for energy storage to support investment in hydrogen salt cavern storage projects.

Introducing a new long-term capacity tax credit that encourages storage operators to invest in seasonal energy storage projects.

Financing the deployment of salt-cavern energy storage projects through the RFC.

Solution 5: Building Green Hydrogen Infrastructure

Large amounts of infrastructure will need to be built to support the widespread production and use of hydrogen. Workers must be trained to safely handle hydrogen, pipelines and storage tanks need to be built to move and store hydrogen, and refueling infrastructure must be built at seaports — where IMO regulations create near-term demand starting in 2028. This solution establishes a coordinated industrial policy to accelerate infrastructure deployment, ensuring the hydrogen economy can grow efficiently and reliably. The primary strategies of this solution include:

Developing a national hydrogen infrastructure plan that maps and prioritizes infrastructure deployment, beginning with the Gulf Coast industrial corridor where existing hydrogen demand is concentrated.

Creating a new workforce development program financed by the RFC in coordination with major hydrogen companies.

Brokering deals between hydrogen producers and clean energy providers to provide reliable, clean electricity for hydrogen production.

Financing the construction of short-distance, hydrogen-safe pipelines.

Investing in new merchant hydrogen companies that will produce hydrogen for use at seaports and other transport hubs.

Building scalable hydrogen infrastructure projects — production facilities, pipelines, storage tanks, and refueling stations — at all major seaports and transport hubs.

Solution Summaries

This section summarizes the specific actions proposed in the complete National Mission for Hydrogen. Each solution is organized by the actor responsible for implementation — Congress, the president, the executive branch, and the Reconstruction Finance Corporation (RFC) — though not every solution involves all four actors.

Solution 1: Replacing Dirty Hydrogen with Clean Hydrogen

Congress

Create a Clean Hydrogen Standard (CHS). Congress must mandate that all hydrogen consumers transition to using 100% green hydrogen in 10 years, with refinery demand left to fall away on its own as oil use declines. Hydrogen consumers will be required to meet interim goals for increases in green hydrogen usage over the course of the CHS. The CHS will be phased in slowly over the first few years to allow for green hydrogen production capacity to grow and for consumers to secure procurement contracts. Hydrogen consumers that fail to meet their CHS goals will face escalating fees, and chronic offenders will lose access to federal subsidies or even see their permits revoked. The CHS will be overseen by the Department of Energy (DOE), and the department must be empowered with sufficient resources to enforce compliance and issue penalties.

Extend and strengthen the Hydrogen Production Tax Credit. The Hydrogen Production Tax Credit (also known as 45V), introduced in the Inflation Reduction Act, provides up to $3 per kilogram of clean hydrogen produced. The credit survived OBBBA, but Congress shortened the construction deadline from 2033 to 2028 — threatening roughly 95% of announced US hydrogen capacity that has not yet broken ground. Congress must extend the construction deadline to 10 years after the launch of this national mission, increase the payout rate, and make the credit direct pay.

Exempt hydrogen projects from the Carbon Sequestration Tax Credit. Congress should amend the Carbon Sequestration Tax Credit (also known as the 45Q tax credit) to exclude hydrogen projects from eligibility. OBBBA made this more urgent. It raised the enhanced oil recovery credit from $60 to $85 per ton, equalizing it with geological storage. Blue hydrogen producers can now claim this strengthened credit as a backdoor subsidy — even if they are excluded from the Hydrogen Production Tax Credit. Congress must close this loophole while preserving 45Q for industries like direct air capture or hard-to-abate sectors where carbon capture is the only viable option.

Rescue and redirect the Regional Clean Hydrogen Hubs Program. The hydrogen hub program is in crisis. The Trump administration canceled two of the seven hubs — PNWH2 and ARCHES — rescinding $2.2 billion in awards. The remaining five are threatened. The Office of Clean Energy Demonstrations, which managed the program, was abolished in November 2025. Only about $170 million of the $7 billion in authorized funding has been disbursed, and no hub has broken ground. Congress must first fight to preserve the program and reinstate canceled hubs, then condition all future funding on hubs committing

to 100% green hydrogen production. Projects focused on blue hydrogen should be replaced by those aligned with the mission's goals.

President

Defend and extend the Hydrogen Production Tax Credit rules. The Treasury Department finalized the 45V rules in January 2025, establishing the Three Pillars framework — additionality, temporal matching, and deliverability — that limits the credit to genuinely clean hydrogen. These rules are the right foundation, but they exist only as regulation and are vulnerable to weakening by industry lobbying or a future administration. The president should sign an executive order on day one directing agencies to: (1) vigorously enforce the existing Three Pillars rules, (2) push for the 45V construction deadline to be extended to 10 years after the mission launches, and (3) enforce the Clean Hydrogen Standard against any attempt to reinterpret the rules in favor of blue hydrogen.

Win commitments from dirty hydrogen producers as soon as they win the election. The president must begin their term with firm commitments from hydrogen industry leaders to invest in new green hydrogen production. After roughly 60 project cancellations in 2025 — and the exit of major players like BP, Shell, and Fortescue — the industry is in partial retreat. Many leaders will doubt whether the Mission for America platform will be fully implemented. The president must begin their engagement with industry leaders immediately after winning the election to break past this hesitancy. By the time the president takes office, they should already have informal commitments from the biggest producers and users of dirty hydrogen to switch to green hydrogen.

Kick off the national mission by convening leaders from the hydrogen industry and winning their support for this national mission. Within their first 100 days, the president should convene hydrogen industry leaders at the White House to formally launch the national mission. The event should include leaders from both hydrogen-producing and consuming industries, as well as producers of electrolyzers and other hydrogen technologies. The president should use this meeting to explain to industry leaders the new federal policies to help them transition to green hydrogen. In particular, the president should emphasize that these policies will only support green hydrogen producers and that no federal money will be spent supporting the continued production of dirty hydrogen.

Maintain personal engagement with industry leaders. The president must maintain consistent engagement with industry leaders throughout this national mission. Although there is symbolic importance to a gathering of industry leaders, the follow-up to the initial meeting will make or break the national mission. American presidents frequently gather industry leaders for symbolic meetings but rarely follow through on those meetings with sustained pressure. The president will need to use the connections they developed at this initial meeting to pressure industry leaders to follow through on any commitments they made.

Use the bully pulpit to keep pressure on dirty hydrogen producers. The president should leverage their public platform and consistently advocate for transitioning to green hydrogen. The president must utilize speeches, press conferences, and social media campaigns to rally public support and create a sense of urgency, making it politically and socially untenable for companies to continue investing in dirty

hydrogen. The president can use these events to spotlight the companies leading the way in adopting green technologies, in an effort to foster a competitive and cooperative atmosphere within the industry.

RFC

Provide financing to dirty hydrogen producers and consumers to transition to green hydrogen. The RFC can provide financing and investment to help existing hydrogen users transition to green hydrogen. Most hydrogen consumers will continue to produce their own hydrogen and thus need to invest in new green hydrogen production capacity. Building this capacity will require companies to make a series of capital-intensive investments. The RFC will provide financing and investment to help make these capital-intensive transitions achievable within the timelines set by the Clean Hydrogen Standard. Some existing hydrogen users may choose to buy hydrogen from merchant hydrogen producers. The RFC should offer these companies generous long-term loans that help alleviate the short-term price difference between dirty hydrogen and green hydrogen. The RFC's financing will be most critical in the early stages of the green hydrogen transition. Once the policies in the national mission take effect, the cost of producing green hydrogen will decline substantially, reducing the need for RFC support over time.

Build demand for green hydrogen by arranging deals with ammonia consumers. The RFC must play a key role in supporting the demand for green hydrogen products by arranging purchase agreements between green hydrogen producers and major hydrogen consumers. The ammonia industry, one of the largest domestic uses of hydrogen, is a good place to begin. To begin this effort, the RFC will organize a summit bringing together major ammonia producers and consumers across various industries. The goal of this summit will be to secure commitments from ammonia consumers for long-term purchase agreements of green ammonia. These purchase agreements will help de-risk investments for producers, ensuring that their new green ammonia production capacity will have guaranteed buyers even before the facilities are built. The RFC can facilitate these deals by offering short-term, low-interest loans to ammonia consumers. These loans will help offset the price difference between green and dirty ammonia, making it easier for companies to absorb the higher costs associated with green ammonia during the early years of the transition.

Solution 2: Establishing New Hydrogen Regulations

Congress

Ban the blending of hydrogen in natural gas pipelines. Congress should implement new regulations that ban the blending of hydrogen in natural gas pipelines. The safety and climate risks of blending hydrogen into natural gas pipelines is too great to allow. Congress should pass strict regulations banning the practice and mandating that hydrogen transportation uses pipelines specifically made for hydrogen. Congress should task the Pipeline and Hazardous Materials Safety Administration (PHMSA) with creating new standards for hydrogen pipelines that guarantee the safe transportation of hydrogen across the country.

Strengthen Department of Energy and Internal Revenue Service enforcement of hydrogen tax credits and regulations. The 45V rules and Three Pillars framework are now on the books — the enforcement gap is immediate. The Department of Energy (DOE) and Internal Revenue Service (IRS) must

be given the resources to enforce these existing rules. This includes imposing fines large enough to deter violations and reclaiming subsidies from companies fraudulently claiming clean hydrogen production.

Require hydrogen producers and consumers to monitor and report their hydrogen leakage as part of the Clean Hydrogen Standard. All hydrogen producers and consumers must monitor and report hydrogen leakage as part of the Clean Hydrogen Standard, with financial penalties for exceeding emissions standards measured as a percentage of total consumption. To ensure the hydrogen economy benefits the climate, the DOE will establish a regulatory framework for tracking and mitigating leakage throughout the value chain, offering clear guidance on monitoring technologies, deployment methods, and reporting procedures. Integrating these regulations into the Clean Hydrogen Standard will simplify the process for both regulators and hydrogen producers by using existing reporting structures.

President

Use presidential power to enforce and defend existing hydrogen regulations. The foundational rules now exist — the Three Pillars framework, the 45V credit structure, and the Clean Hydrogen Standard architecture. The president must issue an executive order directing agencies to: enforce the existing 45V and Three Pillars rules aggressively and protect these rules from industry lobbying to weaken them. The president needs to make it clear to voters and industry insiders that the federal government will defend and enforce these rules as written.

Direct the Office of Information and Regulatory Affairs to prioritize safety. The president holds the ultimate authority over any final regulations via the Office of Information and Regulatory Affairs (OIRA). Both the president and OIRA have the authority to review draft regulations for significant economic impact or larger policy issues. OIRA's review process is the final stage in the regulatory process and involves private meetings between industry and OIRA to finalize regulations. This is often the process where the industry works to remove proposed regulations that might require the industry to invest in safety. Hydrogen regulations will be the target of oil and gas industry lobbyists — particularly efforts to weaken the Three Pillars rules in ways that allow blue hydrogen projects to capture the strengthened 45Q credit, which OBBBA raised to $85 per ton for enhanced oil recovery. The president must ensure OIRA acts quickly and resists industry pressure to weaken critical safety and climate standards.

Solution 3: Building a Competitive American Electrolyzer Industry

Congress

Create a production tax credit for electrolyzer manufacturing with FEOC restrictions. Congress must pass a new production tax credit that provides a sizable credit to electrolyzer manufacturers, with Foreign Entity of Concern restrictions that prevent Chinese components from qualifying and a domestic content requirement that ramps from 40% to 55% over four years, consistent with the 48E structure. At the onset of this credit, the final assembler of the electrolyzer will be the only business eligible to claim the credit. However, as the electrolyzer industry develops there may be a need to expand this credit to other parts of the electrolyzer supply chain, particularly specialized components such as electrolyzer cells, should major supply chain gaps emerge. As with all tax credits in the Mission for America, this credit must be fully refundable and be authorized for 10 years.

Expand the Advanced Energy Project Tax Credit. The Advanced Energy Project Tax Credit, often referred to as the 48C Clean Manufacturing Tax Credit, is an investment tax credit for new manufacturing projects that produce a "qualifying energy project." In the context of the hydrogen industry, manufacturing electrolyzers is considered a "qualifying energy project." Congress should expand the credit to be available to all qualifying projects, make the credit direct pay, and extend it for 10 years from the start of the national mission.

President

Convene industry leaders and convince them of the goals of the mission. The success of the green hydrogen national mission will depend on the president's ability to engage manufacturers to lead it. The best path forward is clearly to work with those already manufacturing electrolyzers. The president will convene the executives of the electrolyzer industry to explain how the government will set aggressive targets for electrolyzer production and give the industry the tools needed to make that happen. But the president should be clear-eyed: major players — BP, Shell, ArcelorMittal, Fortescue — have already walked away from hydrogen. The president will be rebuilding an industry that has partially collapsed. Those who join the mission will receive the support needed to achieve the president's goals. Those who don't will face competition from new companies that will.

RFC

Invest in existing electrolyzer manufacturers to develop new production capacity. The first step for the RFC is to help existing electrolyzer manufacturers expand their operations. IRA incentives have already catalyzed real progress: Electric Hydrogen's 1.2 gigawatt-per-year gigafactory in Devens, Massachusetts began production in early 2024, Plug Power shipped over 185 megawatts of electrolyzers in 2025 with 203% year-over-year growth. But this is a fraction of what is needed, and roughly 60 hydrogen projects were canceled globally in 2025 because private capital cannot absorb the cost and demand risk alone. Electrolyzer producers tend to fall into two camps. The first camp is made up of small companies still in their growth stages that are not profitable. Companies in this camp tend to focus exclusively on hydrogen or hydrogen-adjacent technologies. These companies have fewer resources but are generally more willing to take risks. The second camp of hydrogen producers are large multinational companies that produce a wide range of products and have a small hydrogen division. These companies tend to be mature, profitable companies that are capable of investing in the hydrogen industry even if they lose money in the short-term. These companies have more resources and capital to invest but may be less willing to take big risks in such an uncertain industry.

Develop new companies. The RFC will need to help grow the number of U.S. electrolyzer manufacturers by supporting early-stage start-ups and launching new ones. The current industry is too small to meet the demands of a robust green hydrogen economy, even with significant production increases. The RFC will rely heavily on equity investments to provide capital to companies without saddling them with debt. This approach aligns with the RFC's role as the nation's venture capital firm. This approach could also drive the RFC's own growth, as early investments may secure the RFC a major stake in a future industry leader.

Help allied-nation electrolyzer manufacturers invest in production capacity in the United States. The RFC can grow the number of electrolyzer companies operating in the United States by recruiting international companies to build productive capacity here. But "international" in 2026 requires precision. The dominant global electrolyzer manufacturers are Chinese, holding 60% of global capacity and 85% of alkaline electrolyzer production. Allied-nation recruitment is the right strategy specifically because Chinese-owned manufacturing capacity cannot be allowed to dominate US production. The RFC should target companies from Germany, Norway, Japan, and India — established manufacturers who can hit the ground running. New companies may be more innovative, but often take years to ramp up effective manufacturing.

Identify and resolve any gaps in the electrolyzer supply chain. The RFC will need to carefully monitor the entire electrolyzer supply chain to ensure that no bottlenecks emerge that could delay the rapid build-out of the industry. Electrolyzer manufacturers assemble the final product but source many components from specialized suppliers. A shortage in an important component such as water tanks, bipolar plates, or electrolysis cells could grind the expansion of the electrolyzer industry to a halt. The RFC must proactively prevent such a crisis by monitoring for potential shortages and working proactively to prevent them.

Build a mostly alkaline electrolyzer fleet, reserving scarce-material designs for where they earn their place. The national build should lean on alkaline electrolyzers, the long-proven design that runs on abundant nickel and uses no scarce platinum-group metals. The main alternative, PEM electrolyzers (the membrane-based type that can switch on and off quickly), depends on iridium, whose entire global supply of roughly 7.5 tonnes a year (mostly a byproduct of South African platinum mining, and not quickly expandable) can support only on the order of 10 gigawatts of new PEM capacity per year. An all-PEM build is therefore physically impossible at national scale. PEM should be reserved for the variable, fast-cycling sites where its quick response is worth the scarce material, and high-efficiency solid-oxide electrolyzers (which split steam at high heat) for steady, heat-rich sites such as those paired with nuclear plants or industrial waste heat. Because China produces roughly 85% of the world's alkaline electrolyzers, standing up domestic alkaline capacity is both the materials-smart choice and the core of the reshoring task.

Solution 4: Deploying Hydrogen Long Duration Energy Storage

Congress

Expand the Clean Electricity Investment Credit for storage. The Clean Electricity Investment Credit, also known as the 48E tax credit, passed in the Inflation Reduction Act, survived OBBBA and is preserved through 2033 — one of the few clean energy credits to retain its full timeline. It provides a payout of 30% of the cost of a large-scale energy storage project, and up to 50% with additional incentives. The credit applies to projects of any size or duration. Congress should expand the credit by making the credit direct pay and create an increased payout rate for seasonal storage facilities.

Create a Long-Term Capacity Tax Credit for seasonal green hydrogen storage facilities. Congress should create a Long-Term Capacity Tax Credit for seasonal green hydrogen storage facilities to

compensate operators for their storage capacity, even during periods of inactivity. The credit would be based on the average annual kilograms of stored hydrogen, multiplied by a rate set by Congress. The credit would apply only to facilities storing green hydrogen. This incentive, alongside existing capacity payments, would encourage large-scale hydrogen storage development, ensuring that clean energy is available when needed.

Create a Strategic Hydrogen Reserve. Congress should create a Strategic Green Hydrogen Reserve (SHR), modeled after the Strategic Petroleum Reserve, to ensure reliable energy supply during national crises or periods of extreme demand. Managed by the Department of Energy, the SHR would use government-owned salt caverns to store green hydrogen, which can be converted to electricity using fuel cells. The ACES Delta project in Utah — with over 300 gigawatt-hours of storage capacity across two salt caverns and nearing commercial operation — proves this concept works at scale.

RFC

Finance new hydrogen energy storage projects. Building new hydrogen storage projects will likely be a capital intensive process, as investors will be required to make a series of costly investments: the land for the salt caverns will need to be purchased, distributed energy resources will likely need to be built on-site or nearby, electrolyzers must be built, and the site will need to be hooked up to the grid. The capital intensive nature of these projects has already driven private investors away — the 2025 cancellation wave showed that private capital cannot absorb the costs and risks of building first-of-a-kind hydrogen infrastructure. Public financing through the RFC is necessary. Three types of organizations will likely build hydrogen salt cavern storage systems: utilities, independent power providers, and hydrogen-using industries. Utilities and independent power providers will use their hydrogen reserves for power generation, whereas industrial-users will use salt caverns to store hydrogen to hedge against supply chain shocks. The RFC will mainly focus on hydrogen producers who intend to use salt cavern storage as a form of energy storage for use on the grid.

Solution 5: Building Green Hydrogen Infrastructure

Congress

Instruct the Department of Energy to conduct a Hydrogen Needs Assessment. Congress must direct the DOE to conduct a new study to analyze the hydrogen requirements of a net-zero economy. The study will review potential hydrogen demand across many different scenarios and attempt to estimate the geographic dispersion of hydrogen demand. Once the national needs assessment is complete it will be necessary to plan for the development of infrastructure and to ensure that the U.S. has the industrial supply chain capacity to provide the materials to build the infrastructure. The plan will estimate the materials required to meet future hydrogen demand — including electrolyzers, clean energy, pipelines, and other key components. The national hydrogen infrastructure plan will be advisory, a framework for the RFC and private industry to work from. The DOE should regularly update the national hydrogen infrastructure plan to stay up to date with industry and technology developments.

RFC

Work with captive hydrogen producers to deploy hydrogen production capacity. Captive hydrogen consumers are companies that produce hydrogen for their own use, typically to manufacture another end product. The RFC will likely rely heavily on loans and loan guarantees that supply companies with the capital to purchase clean energy generation, electrolyzers, hydrogen storage tanks, and all other associated equipment for hydrogen production. The RFC should include these loans as part of a broader investment plan that helps transition these companies to producing low- or zero-emission alternatives to their existing products. Many industries that will be captive hydrogen users, such as steel, are examined in greater detail in their own national missions.

Help launch a new workforce development program for the hydrogen industry. Scaling the hydrogen industry in the short period of time we propose will require creating a new, highly-trained workforce very quickly. Workers must be available before projects break ground. The RFC has a few options for how to help cultivate this workforce. The simplest option would be to provide capital to companies so they can develop their own workforce development programs. In this option, the money for a workforce development program would likely come as part of a broader investment or loan deal made with a hydrogen company. Another option is for the RFC to help launch a new company dedicated to training workers for jobs in the hydrogen sector. In this option, the RFC could provide either a loan or start-up capital in exchange for equity in the new company. Ideally, this new company would be a joint venture between the RFC and major hydrogen companies. The new workforce training company could provide classes and apprenticeship programs in strategic locations for workers who want to join the hydrogen industry. The benefits to this option are that the new company could scale quickly, would not detract resources from hydrogen companies, could easily coordinate with the federal government to identify what the in-demand hydrogen jobs are, and could operate on a long-term outlook that is focused on the good of the entire hydrogen industry. The National Mission for Workforce Development discusses our approach to workforce training in more detail.

Aggressively invest in the development of new merchant hydrogen companies. The RFC will need to invest in the growth of many new merchant hydrogen companies across the United States. As the demand for green hydrogen increases, especially in sectors such as shipping and heavy industry, merchant hydrogen suppliers will be essential for hydrogen users that can't produce their own hydrogen near where it is used. The RFC should cast a wide net and invest in many different companies to create a diverse network of suppliers. Without federal intervention, the risk is that no merchant hydrogen market forms at all. The largest energy companies canceled their hydrogen projects in 2025. The RFC must create the market that private capital has abandoned. By promoting and supporting the growth of new merchant hydrogen companies, the government can help create a competitive and diverse marketplace, driving down costs and accelerating the transition to a green hydrogen economy.

Broker deals between hydrogen producers and next-generation energy providers. The RFC will play an important role in helping hydrogen producers secure clean electricity. Many hydrogen providers will need consistent, round-the-clock clean energy to meet production goals. The RFC can help hydrogen producers meet this need by investing in next-generation clean energy technologies, such as enhanced

geothermal or small modular nuclear reactors, co-located with major hydrogen production sites. The RFC has multiple options for how to pursue this. One option is for the RFC to include financing for building new generation or procuring energy as part of an investment package with a hydrogen producer. Alternatively, the RFC could serve as a "dealmaker" between two companies it has pre-existing relationships with. If the RFC clean power team is struggling to get a new energy project off the ground, they could work with the RFC hydrogen team to identify hydrogen producers that could be suitable customers for the new energy project.

Help finance the production of hydrogen pipelines. Many miles of new hydrogen-safe pipelines must be built to support a national hydrogen industry. In this area, the RFC will probably rely heavily on loans and loan guarantees. Pipelines are predominantly owned and operated by private corporations that range from large, integrated oil and gas companies like ExxonMobil to independent pipeline operators like Kinder Morgan. It is plausible that the hydrogen industry will follow a similar model, with a mix of merchant hydrogen producers and dedicated pipeline companies managing the nation's hydrogen pipelines. Since most pipeline companies are well-established companies, they will have the resources and expertise to begin building new pipelines. All these companies should need to start executing this mission is an injection of cheap capital and leadership committed to the goals of this mission.

Prioritize building small but scalable hydrogen infrastructure projects for seaports. The RFC must lead the development of early hydrogen infrastructure at seaports, including pipelines, electrolyzer facilities, and storage tanks. This state-led approach is essential to overcoming the "chicken-or-egg" dilemma where industries are hesitant to adopt new fuels without existing infrastructure, and infrastructure is slow to develop without guaranteed demand. Private investors are unlikely to take on the high costs and risks of unproven hydrogen systems — especially in complex sectors like shipping. For seaports, the IMO's hydrogen and ammonia fuel guidelines, finalized in September 2025 and entering force in July 2028, create a near-term demand signal that makes infrastructure investment lower-risk. By funding and managing the first wave of projects, the RFC will reduce market uncertainty, accelerate the learning curve for building hydrogen and ammonia infrastructure, and create a foundation for future private investment. These projects will also provide demand assurance for electrolyzer manufacturers, fostering growth in domestic production and reinforcing the broader hydrogen economy. Importantly, the RFC's projects should be designed to be small but scalable, enabling rapid replication and adaptation as the market matures.

If necessary, create a National Green Hydrogen Corporation and find partners to build and operate hydrogen production facilities and infrastructure. In national economic crises, public corporations have often filled a gap in the economy to achieve great tasks that the private sector is either unwilling or unable to take on. In the economic mobilization around World War II, for example, many public corporations were created to fill gaps in supply chains that were too unprofitable, too difficult, or both, for the private sector. To ensure that adequate hydrogen facilities will be built at every port, transport hub, and everywhere else they are needed, it may require creating a National Green Hydrogen Corporation. The NGHC would build and own Government-Owned Contractor-Operated (GOCO) facil-

ities that would then be leased to another company. It will be critical for the RFC to find qualified partners to operate the hydrogen production, transportation, and storage facilities.