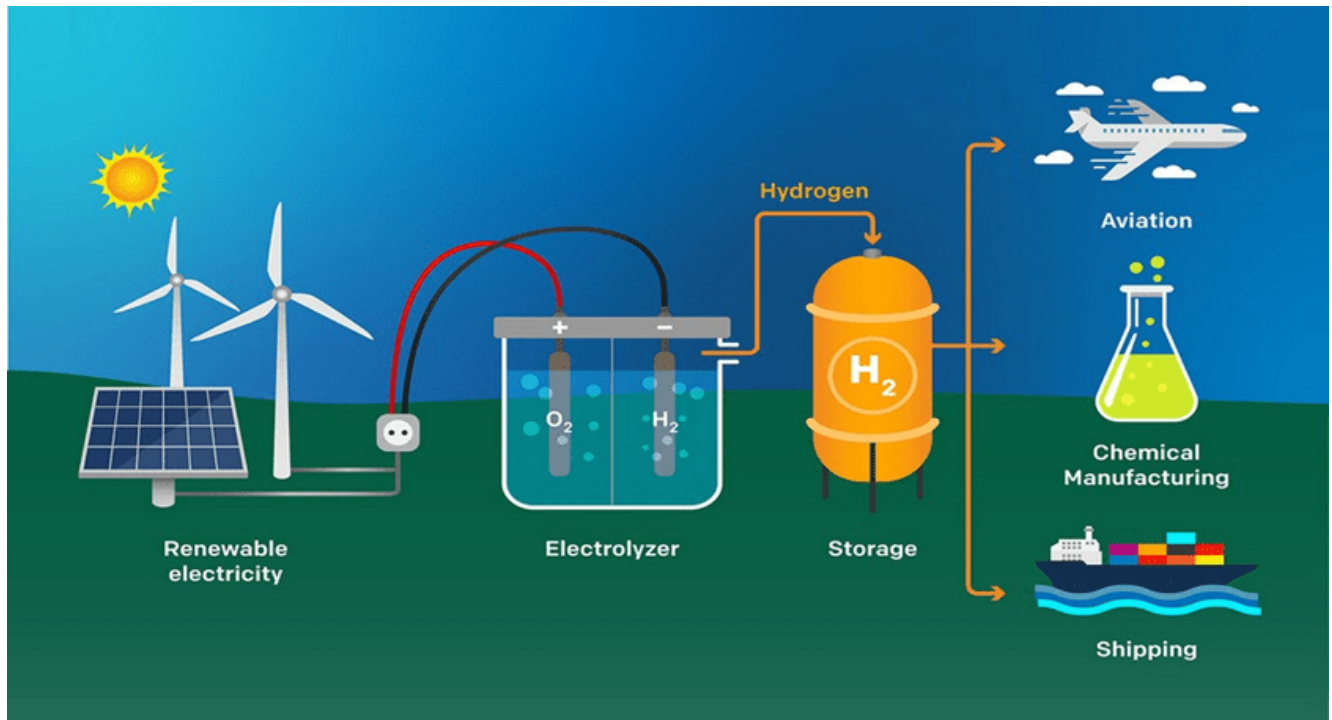


Australia & Green Hydrogen: A Clean Energy Solution for the Future

Imagine a world where water and sunlight produce the fuel that powers our homes and energises our industries. In this world electricity generation would produce no [pollution](#) and leave no [carbon footprint](#). The truth is this world may not be as far off as you think. Enter [green hydrogen](#), an emerging technology that could help reshape energy production on a global scale. In fact, green hydrogen is seen as a clean energy solution for the future. The International Energy Agency (IEA) reports that [20% of all globally announced hydrogen projects](#) are in Australia. This percentage is larger than that of any other single country and represents almost half of all export-orientated projects worldwide. Australia will play a significant role in the emerging hydrogen market. The country will also be responsible for ensuring its hydrogen production is sustainable.

What is Green Hydrogen

Hydrogen is the most abundant element in the [entire universe](#). On Earth, we find hydrogen mostly in water (H₂O) rather than in its gaseous form. This gaseous form of hydrogen is more abundant in other parts of the universe. So, to harness hydrogen's potential as a fuel source on Earth it must first be extracted from water. The ['colour' of hydrogen](#) is determined by the method which is used to extract it. Not all colours of hydrogen are equal, with some often derived from natural gas or coal. However, the method used to extract green hydrogen generates no [greenhouse gas](#) emissions. This ensures its production is sustainable and environmentally friendly. If you'd like to learn more background information about green hydrogen you can check out [one of THRIVE's past articles on the topic](#).



Producers typically create green hydrogen through electrolysis. A process that uses electricity to split water into hydrogen and oxygen.

Image source: [Future Fuels](#).

Green Hydrogen as A Clean Energy Solution in Australia

Australia has a [pipeline of around 100 hydrogen projects](#) that have been announced since 2019. Most projects in this pipeline have a strong focus on renewable hydrogen production. This is owing to Australia's abundant solar and wind resources. Estimates reveal that the country's low-emission hydrogen production, using methods like [water electrolysis](#), could reach approximately [6 Million tonnes \(Mt\) by 2030](#). Following these production targets, Australian green hydrogen could help to prevent between 93 to 186 Mt of CO₂ per year by 2050. Alongside this capacity, new policies, such as the [Hydrogen Production Tax Incentive](#) and the expanded [Hydrogen Headstart program](#), firmly establish Australia as a leading destination for green hydrogen production globally. With all of this in place, Australia's green hydrogen industry could provide a clean energy solution for the future.

The Western Green Energy Hub: A Future Clean

Energy Solution

The Western Green Energy Hub (WGEH) in Australia stands as the nation's largest proposed green hydrogen project. In fact, the WGEH is among the largest green hydrogen projects in the world. Once operational, the WGEH will reach a capacity of 50 GW of renewable energy by 2030 which will be dedicated solely to green hydrogen production. To generate this huge amount of energy the WGEH will utilise approximately [25 million solar panels and 3000 wind turbines](#)!

An important [ESG](#) consideration for the WGEH will not only be its environmental focus, but also its ability to show respect to Indigenous culture and involve the region's Traditional Owners in the planning, development, and ongoing management of the project. WGEH shows promise in this respect, recognising the [Mirning People](#) who are the Traditional Owners of the lands in the Southeast region of Western Australia. The WGEH includes a partnership with the Mirning Green Energy group. This group has secured [a permanent seat on the WGEH board](#) and holds a 10% free carried interest stake in the project. The project's [corporate charter](#) also states that WGEH will not take any action on Mirning lands without prior approval from the Mirning People.

Alongside the WGEH, Australia has several other proposed green hydrogen energy projects (e.g., the [Australian Renewable Energy Hub](#)). These projects will help to facilitate both domestic use and export of this clean fuel. Given the scale of these green hydrogen projects, it will be vital to consider all environmental and social factors during their development. Ensuring sustainability and respecting Indigenous rights are key to achieving clean energy goals while fostering positive outcomes for local communities.



Large solar farms, such as this one, will be essential energy sources for electrolysis – an essential process for green hydrogen production in Australia.

Image source: [EnergyMagazine](#).

Australia's Future Clean Energy Solution with Green Hydrogen

Australia is uniquely positioned to become a global leader in green hydrogen production, providing a clean energy solution for the future. This is primarily thanks to its vast renewable energy resources and its strategic geographic location. As the world transitions to a low-carbon economy, Australia is pouring resources into green hydrogen to not only decarbonize its own industries but also to become a major exporter of clean energy.

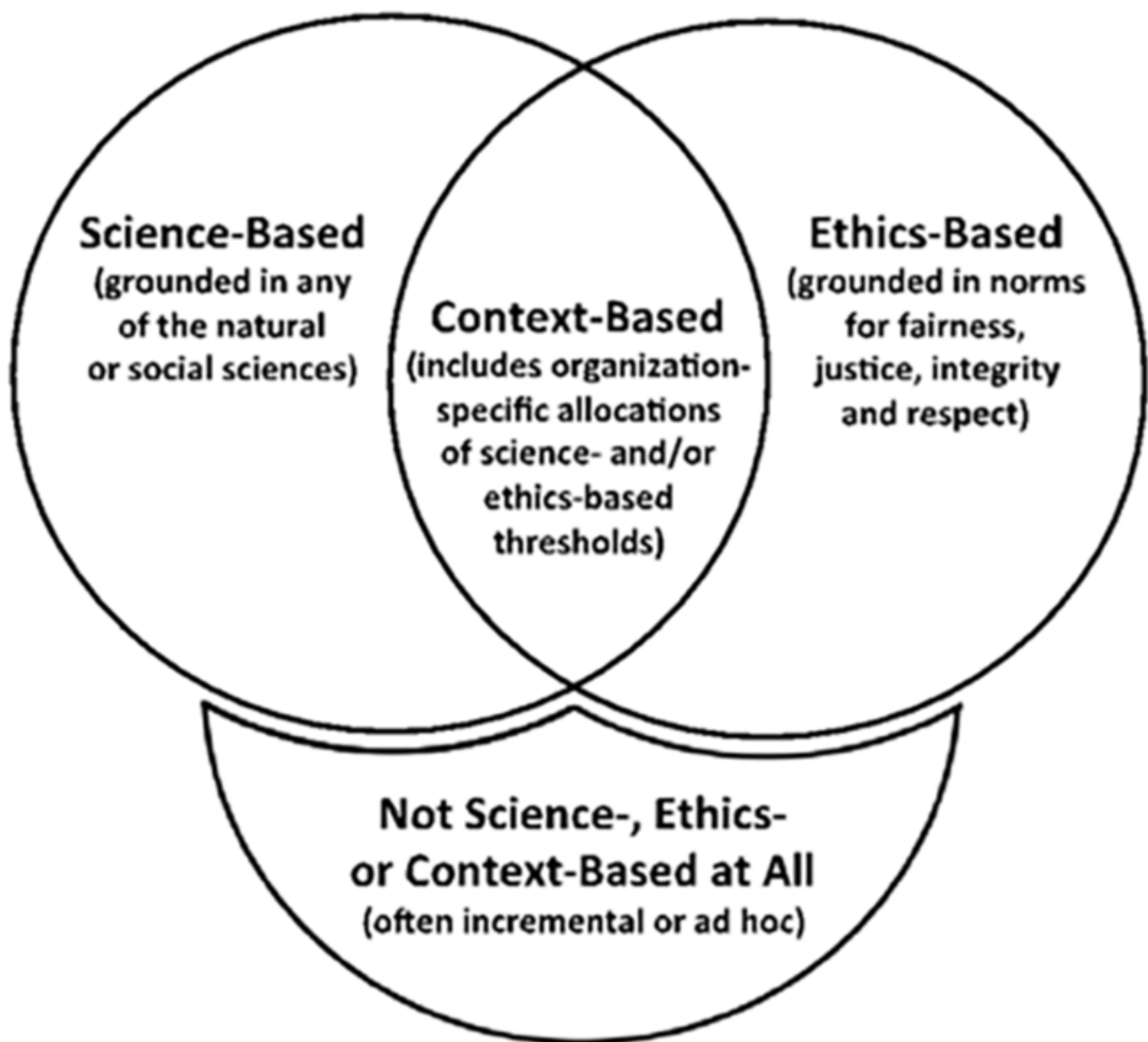
The Australian government has ambitious plans for green hydrogen, apparent through its [National Hydrogen Strategy](#). This strategy aims to turn Australia into one of the top global hydrogen producers by 2030. This will include a significant investment in research and development. The nation's [Hydrogen Hub](#) initiative will also channel significant funding into infrastructure. This initiative will involve establishing hubs in regional areas that house strong renewable energy

resources. This will facilitate the construction of infrastructure needed for green hydrogen production, storage, and transportation. These Hubs will be essential in scaling up production and integrating hydrogen into Australia's key industries.

Challenges for Australia's Green Hydrogen Future

Australia's future with green hydrogen will not come without [challenges](#). Building the necessary infrastructure, including electrolyzers, storage facilities, and pipelines, will require significant investment and time. Other concerns include water use as the electrolysis process requires [large quantities of water](#). This can be problematic for Hubs located inland in Australia, away from the coastline where water is easily accessible.

Australia's future with green hydrogen is bright. The country holds the potential to transform not only the domestic energy landscape but also to become a leading player in the global transition to cleaner energy. In the development and production phase of these projects' [context-based sustainability](#) should be a key consideration, taking time to consider Australia's unique geographic position. As technologies improve and investments rise, Australia appears positioned to become a key player in the green hydrogen market.



[Context-Based metrics](#), one of THRIVE's 12 FFFs, are an intersection between ethics-based and science-based metrics.

Image source: [Sustainable Brands](#).

Providing a Clean Energy Future: The Right Way

For future green hydrogen projects in Australia, it will be important to consider ecological impacts during development and operation. For example, green hydrogen Hubs will require significant land use for plants and renewable energy farms. Renewable technologies like [solar panels](#) require large amounts of space to establish. Such land use can present [threats to biodiversity](#) and food security.

Additionally, it is important to consider social impacts. Consultation and collaboration with First Nations People will be crucial. Incorporating Indigenous

perspectives not only ensures that developments respect cultural heritage but also creates opportunities for co-management, allowing Indigenous groups to continue [caring for the Country](#). This inclusive approach can foster stronger community relations and contribute to a more equitable and resilient energy transition for the nation.

While green hydrogen has the potential to play a large role in the world's transition to a cleaner more sustainable future, its environmental benefits are closely tied with how the technology is implemented. Careful consideration of resource use alongside ecological and social impacts will be crucial to ensure that the positives outweigh the negatives.

A Thrivable Future

[The THRIVE Project](#) exists to create a future in which humans will not only survive but also thrive. THRIVE's mission focuses on securing the enduring welfare and 'thrivability' of all species on Earth. The [THRIVE Framework](#) examines issues and evaluates potential solutions – making predictive analyses using topics that support environmental and social sustainability transformations. THRIVE emphasises the possibility of satisfying environmental, ecological, and social needs concurrently, without having to compromise.

This article holds significant ties to the United Nations' [SDG 7](#) (Affordable and Clean Energy). Green hydrogen, as an energy source, can play a key role in achieving SDG 7 by providing access to more affordable, reliable, and sustainable energy within Australia and around the world. By using renewable energy sources like wind and solar, green hydrogen will increase the share of renewables in the global energy market. Investment in green hydrogen will also help foster international collaborations and drive further innovation in clean energy technologies.

If you would like to learn more about thrivability you can visit our [website](#), which is filled with informative resources. There you can check out our other [blog posts](#), read our [published whitepapers](#), and sign up for our [free monthly webinars](#). You can also keep up to date with the latest news from the THRIVE Project on our [LinkedIn page](#).