

THINK GLOBAL, ACT GREEN

By **Dr. Franziska Blindow-Prettl**
Dec 20, 2019

PLANET POWER FINANCE: THINK GLOBAL, ACT GREEN

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Climate change is the defining challenge of this generation, according to the United Nations, and if you ask NASA it is one of the most complex issues we face today. At the heart of the climate debate is the energy sector. There is now a global consensus that hydrogen is a key cornerstone on the transmission path to a sustainable energy future and to phase out from burning fossil fuels.

Hydrogen has entered mainstream discussions. The Tokyo Olympics shine a light on hydrogen, the G20 summit in Japan had a strong focus on hydrogen and the International Energy Agency launched a report “The future of hydrogen” concluding that the time is right to tap into hydrogen’s potential.

Hydrogen is the only currently available modular and non-fossil fuel option to store large quantities of energy over longer periods of time. It makes the large-scale integration of renewables into the energy system possible, enables energy utilities to store energy from short to long-term as a buffer between supply and demand, and allows to distribute this energy geographically. Hydrogen has the potential to decarbonize key sectors of the economy – power generation, transport, district heating and industrial heat processes.

After economic theorist and futurist Jeremy Rifkin predicted the rise of The Hydrogen Economy in 2002, history failed to cooperate with him. The US, then hooked on foreign oil, developed hydraulic fracking and became a net oil exporter. Fossil fuel use increased globally, driven by demand in Asia. Hydrogen seemingly went into hibernation during the rise of solar panels, wind power, and electric vehicles. Rifkin’s prediction seemed far off target–until recently.

2019 was a formidable year for hydrogen – and thanks to a few key developments over the past few years it seems hydrogen is back for real:

Falling costs of renewable electricity generation:

The last few years have seen a rapid decrease of costs of solar and wind and an increase in the installation base far beyond expert expectations. The share of renewables in electricity generation has increased up to 50% in some regions of the world like Southern Australia. This also revealed the intermittency challenge, which leads to overproduction and significant curtailments during some hours of the day and lack in others. Coal fired baseload utilities, guaranteeing the baseload power, cannot follow these dynamic patterns and have to be kept running even in times of high renewables output, exacerbating the situation. Hydrogen looks like a promising solution to store energy from renewables at low costs over days, weeks or even months.

Availability of improved electrolyzers:

There are two trends emerging: On one hand, Siemens and others are custom-designing larger PEM electrolyzers, that offer better efficiencies. On the other hand, is the mass production of smaller PEM and AEM electrolyzers that can offer a significant cost reduction through economies of scale. The first fully automated electrolyser production lines are currently just about to be implemented. Small, stackable electrolyser units can allow homes and smaller entities to produce individual hydrogen amounts for “personal use”. This can lead to a partial decentralization and autonomy of the hydrogen production, similar to what house roof PV solar panels did for electricity production.

Advancement in new electrolyser as well as non-electrolyser hydrogen generation technologies:

There are a number of new hydrogen generation technologies in research and development that look promising to provide future ways to produce green and cost-efficient hydrogen.

Potential of Star Scientific's, HERO® Technology as a demand side activator:

Besides injecting hydrogen into the gas network, most green hydrogen-related implementation strategies focus on hydrogen solutions for the transport sector as an enabler for the hydrogen economy. However, this requires large upfront investments in a hydrogen refueling infrastructure before demand of fuel cell vehicles and hydrogen will substantially increase and CO₂ emissions in the transport sector will fall simultaneously. A rapid and deep transformation of the energy sector could be much easier to implement. Power generation offers the significant advantage of single points of fuel consumption coupled with relatively constant and high demand. In the bigger picture, demand-side drivers are crucial in stimulating lower prices for green hydrogen; with lower prices of green hydrogen stimulating innovation in hydrogen-related technologies, which in turn fosters higher demand for green hydrogen, helping spur more supply side innovation, bringing hydrogen prices further down.

Governmental support:

Public action and support can attract private investment by reducing the cost of capital of green growth. Particularly in 2019 it became clear that governments shift their focus and accept hydrogen as the missing link in a green energy future. Where in the past only a limited number of pioneering states and industry players have stood somewhat alone, governments all over the world are now recognizing hydrogen as critical to reaching their energy and climate targets and are rolling out long-term hydrogen strategies to accelerate its deployment. From Germany to Australia to Korea, in 2019 according to a study by the Financial Times there are more than 50 strategies and targets now set in place to support hydrogen development.

Hydrogen Council:

Hydrogen has united a coalition of businesses that, absent the Paris Agreement and climate discussions, would have remained married to fossil fuels. Instead, chief executives of the world's major energy, transport and industrial companies formed the Hydrogen Council at the World Economic Forum in Davos, Switzerland in 2017. The hydrogen council has a united vision and long-term ambition for hydrogen. Star Scientific has joined the Australian chapter in November 2019.

Today, it is not the question of IF but HOW we can transition to a hydrogen economy, which brings enormous potentials for entrepreneurs and investors. The demand side seems to confirm this potential with its own trends of increasing volumes of green bonds and other sustainable and impact investing focus:

Divest/Invest movement:

Investors with \$45tn of assets under management have made public commitments to climate and responsible investment. A lot of money divested from fossil fuels is seeking a purpose. The DivestInvest initiative has now a committed USD 8.8 trillion to divest from fossil fuel companies within 3-5 years after the pledge. The European Investment Bank EIB will end its financing of oil, gas, and coal projects after 2021, a policy that will make the EU's lending arm the first multilateral lender to rule out financing for projects that contribute to the climate crisis. The decision to prioritize renewable and efficient energy follows a policy promise by the incoming European commission president, Ursula von der Leyen, to turn the EIB into a "climate bank", unlocking a potential €1tn in funds to help move Europe's economy toward cleaner energy.

This could lead to significant and interesting disruptions on financial markets. A Citigroup report outlines the huge financial risks now facing the oil, coal and natural gas industries. The fossil fuel industry represents stranded assets of more than \$100 trillion in pipelines, ports, power plants, and ocean drilling platforms, all soon to be made obsolete.

Investing for purpose:

Many wealthy and ultra-wealthy families are currently seeking to invest with a purpose, either sustainable or with impact. Their family offices invest on average 19% of the portfolio dedicated to sustainable and impact investing, with 34% of all family offices investing in impact. About 50'000 families globally account for total assets of USD 5 trillion. If 34% of these families move 19% of their assets to impact investing, this will equal funds of USD 323 bn.

Strong demand for green bonds:

Green bonds have started to take off in 2019 with global green bond issuance at US\$167 billion bringing the total outstanding debt in green bonds to USD 500bn. Green bonds can be a very effective vehicle for the USD 45 trillion of assets that made public comments to invest into climate and responsible investments to help them achieve their pledges in fixed income. Demand in green bonds surpasses supply: In 2019 most of the green bond issues were oversubscribed.

For an investor, the technical and geopolitical developments of hydrogen on one side and the shifting demands on the other side, present **massive opportunities**. Dedicated financial institutions will have a chance to capitalize on these developments when combined with thorough research and robust portfolio construction.

Planet Power Finance is such a dedicated financial institution. We specialize in identifying hydrogen technologies and invest in promising companies and projects. Planet Power Finance will prioritize technologies that are synergistic to Star Scientific's, HERO® and may help speeding up the roll-out of Star Scientific's, HERO® technology.

We will scan potential investment cases on a global scale to identify best candidates taking into account hydrogen logistics, subsidies, CO2 emission trading schemes and other programs.

We are investing our passion, knowledge and capital into unique people, projects and businesses. We create exclusive investment opportunities by **“connecting the dots”**, linking stakeholders in policy, technology and finance sectors at each stage of the project development's or firm's value-chain.

Through global cooperation we already see large-scale hydrogen projects, and they are inspiring further action and collaboration. To realize the hydrogen economy and its foundations for a new energy era, we need **smart investments and innovative financing to scale up and mass deploy hydrogen technologies**. Not only is there a compelling environmental case for action, but the economic case is also healthy. In 2017, the Hydrogen Council study “Hydrogen Scaling Up” showed that a \$2.5 trillion market is there to be captured by 2050. This timeframe and market estimate however is without an accelerated demand & supply cycle for green hydrogen that Star Scientific's, HERO® and other demand-side technologies can trigger.

No one country or company alone has the financing, technology or policies to start a global energy revolution. However, there is a very clear and urgent need to unlock the investments required to power the global energy transition – today.

We need to have the vision and insight to seize the opportunities for a clean, secure and affordable energy future. By connecting the right dots, Planet Power Finance can **help accelerate** the arrival of the hydrogen economy: Technologies that have the potential to implement a value chain from green hydrogen sources to greenhouse-gas-free heating, electricity or transportation – at reasonable costs – are there now. By supporting and combining the right players to “lighthouse projects”, we can greatly accelerate the scale-up of both green hydrogen production and consumption. Aiming big and acting together is necessary to achieve environmental sustainability. To fuel Earth with sustainable energy in the near future is seen as today’s Moonshot. It’s achievable.

Original article:

<https://www.h2-view.com/story/plant-power-finance-think-global-act-green/>

About the Author

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Franziska spent over 25 years in Private Equity, Hedge Funds and financial engineering.

Prior to *Planet Power Finance*, Franziska was a Partner at LGT Capital Partners and Head of LGT Family Office. LGT Group is a \$ 250 bn family-held asset and wealth management firm owned by the Princely Family of Liechtenstein.

Before LGT, Franziska was with EIM, one of the world's first fund of hedge funds founded by the industry's pioneer Arpad Busson. At EIM, she was the Global Head of New Product Development.

Franziska started her career with her family's international automotive supplier business, which was founded by her father in 1953 and that today is among the largest automotive suppliers in Germany with over 10'000 employees.

Franziska has also been active for the family's impact investing projects and founder of PRETTTL Impact Investing, currently advising several portfolio companies.

Franziska holds a PhD from the University of St. Gallen (Dr. oec. HSG) with a dissertation on the valuation of high-tech start-ups and an MBA in finance and accounting from the same institution.



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