

GREEN HYDROGEN

The energy transition has become a necessity both for the planet and for human beings.

Today, it is impossible to do without fossil fuel resources to meet current energy needs, despite the availability of various renewable energy technologies (solar, wind, geothermal, water).

The aim of our project is to bring to life 40 years of research into the applications of the most widespread elemental gas on the planet and one with enormous potential: GREEN HYDROGEN.

Last year SNAM ITALIA, which owns almost the entire Italian gas network, experimented with introducing hydrogen mixed with the classic methane or LPG gas that arrives in our homes. The result was a 10% reduction in CO₂ emissions into the atmosphere in just one week. The CEO himself, Dr. Marco Alvera' (SNAM ITALIA), confirms that, thanks to current technology and those we are studying at various centres around the world that deal with renewable energy, we can replace the current methane or LPG with 100% hydrogen, without any problems and without any changes to the structure of the methane pipelines, as these are perfectly capable of transporting hydrogen. And we are only talking about civil/home use.

Producing and transporting green hydrogen is certainly much cheaper and safer than producing methane and LPG, or extracting hard coal. We have estimated that producing green hydrogen using second-generation solar energy would cost less than transporting a load of any other fuel from Sicily to Germany. If the same amount of green hydrogen were produced in Germany, it would cost much more due to climatic factors, which are certainly much more favourable in southern Italy and northern Africa. Let's not forget that all European and non-European pipelines are interconnected.

Staying on the topic of Germany, it will have a huge need to import hydrogen by 2030 as it will also have to cast off nuclear power plants, not just the classic coal/gas/oil-fired ones. Germany is one of the European countries (along with Sweden and Italy) that are making a real commitment to the ecological transition.

Green hydrogen could be used not only for domestic consumption but also for large fossil fuel-intensive companies, such as steelworks and microchip manufacturers, which consume a huge amount of fossil fuel. In producing steel (for example) by injecting green hydrogen instead of coal into the blast furnaces we will be able to produce the famous steel 2.0, a zero-emission steel.

The hydrogen will not only provide the energy needed for the smelting process, but will also be used in the Steel 2.0 production process to separate the oxygen from the iron as it is naturally composed (saving at least 30% in production costs, not to mention that the amount of scrap would be greatly reduced).

The German government has earmarked EUR 7 billion for this type of research in 2020. It has been discovered that injecting simple hydrogen instead of coal into the blast furnaces would reduce emissions of benzo(a)pyrene (a highly carcinogenic and cancer-causing substance) into the atmosphere.

Negotiations are under way with the Italian government to carry out the same process at our steel plants across the country. The first experiment was carried out in Dalmine in the province of Bergamo (IT), where we tried to inject green hydrogen into an industrial combustor. We have calculated that this small injection of green hydrogen (only 30% mixed with methane) reduces emissions from the industrial burner by about 40% and, crucially, there is no need to change the asset.

Companies will not be forced to modernise their equipment because green hydrogen is 100% compatible with the current fuels (in this case methane) that are currently used. This would not only reduce the demand for fossil fuels, but it would increase the demand for hydrogen and we could cut harmful emissions into the atmosphere.

Generally, drinking water is used, from which hydrogen is broken down through the process of electrolysis. Drinking water is a precious commodity for our planet and it seemed rather silly to use such an important resource to produce another, equally important one.

So in 2020 we decided to look for other technologies that would allow us to create the same result, but with less environmental impact. We flew to Germany, to Berlin in the Adlershof district, where we discovered one of the most important innovations we are focusing on. Creating green hydrogen not from drinking water but from wastewater. Here we discovered a new type of hydrolyser that can split hydrogen from water with a third of the energy required by a conventional hydrolyser. This is thanks to the discovery that by focusing energy on the ammonium particles, the chains of atoms to be broken are much less energy intensive, to the point of reducing the cost of producing green hydrogen by about half.

Our goals are many. First and foremost, we want to set up small green hydrogen production centres exactly where they are needed, in order to cut transport costs.

Another goal is to make particularly energy-intensive factories more environmentally friendly and, with the right design, help those factories that could never make such a green transition on their own.

To this end, we are testing smart grids so that we can direct electricity intelligently: when companies are producing little, we store the electricity in state-of-the-art batteries and send it to those who need it most at that moment.

Intelligent electricity management through smart grids is obviously the future to overcome those energy management problems that every company or private individual has to deal with at the end of the month.

The Italian Institute of Technology (IIT) is working on the green hydrogen project.

The ECB (European Central Bank) has between 60 and 70 billion to finance these projects.

The whole Core Team is working on this project day and night. And we can guarantee that this project will become a reality because we have the technologies scattered around the world but we are the first to put them all together.

One of the big goals is to create a large HUB for the distribution of green hydrogen in Sicily, a land of sun and wind connected with its methane pipelines to almost all of Eurasia and Africa. Within 6/7 years we expect to build one of the largest centres for the production of green hydrogen using second-generation solar energy (molten salts), which require much less maintenance than current solar panels as the technology is completely different.

Hydrogen by nature really has infinite functions: from the metallurgical industry, to the medical industry, to the pharmaceutical industry, not to mention private use. The HUB to be built in Sicily will not only produce hydrogen and oxygen, but also clean electricity thanks to the new hydrogen fuel cells.

The plan also includes two other key points: producing hydrogen from seawater, which we will be able to do thanks to an Italian company that has invented the first seawater electrolyser. Without wasting the precious drinking water, we will also be able to produce electricity in large quantities thanks to the new hydrogen fuel cells. The waste result of which is simply H₂O, i.e. pure water, can be used for a wide variety of purposes, from distributing water to the population in times of drought to irrigating fields.

We are also in contact with the region of Sicily to be able, in the event of excessive production, to introduce the water directly into the region's aqueduct. Fortunately, technology is advancing and will help us achieve this goal as well.

Thanks to our collaboration with the SNAM ITALIA network, we are aiming not only to achieve our goals, but also to repair the leaks in the circuit.

How do you monitor everything? With our blockchain. As we all know, a blockchain is inviolable and immutable over time, so we are testing our blockchain (on a small scale) for power plant management, the proper functioning of distribution, and most importantly the functioning of the smart grid itself.

We are developing an AI that can be coupled to our smart grid, which will be able to manage all smart grids in the best possible way, thanks to a few experts in the field who will take care of it. Smart grids are now a reality in many countries around the world, from Europe to the US, and they will continue to expand.

Hence our Coin, the Green Hydrogen (GH₂) currency that will be used for payment and collection of credits and debts. Once the true smart grid is created, all connected users will be able to choose to pay or be paid in fiat currency or GH₂. Thanks to Plus Ultra, a technology patented in Italy, the system will be able to manage which renewable energy to use at that moment for the necessary need.

We plan to bring the transformation of classic non-electrified trains from diesel to hydrogen. These preliminary agreements are already in place with all Italian regions that suffer from the lack of electrification of the rail network.

We want to trigger change, we want to leave a cleaner world.

Technologies are now very advanced, fuel cells are not what they used to be, we are becoming a case study for the EU and this fills us with pride.

Last but not least, we are looking for and creating small communities (10-15 thousand inhabitants initially) and making them completely autonomous thanks to hydrogen, second-generation solar energy

and mini-hydroelectric turbines to be built (respecting environmental constraints) in strategic points that can supply electricity and make these small communities totally independent. Obviously, we are starting with small communities, but we expect to reach very important cities.

GH2 is the coin of the future, a coin that will grow over time. We're in the early stages, our projects are real, we really want to change small parts of the world until we become one huge community, not just an energy community. Follow us on our social networks. There you will find all the news in real time –

Green Hydrogen 2 Core Team

THANKS FOR READING!

