

# Lieven Standaert

Lieven Standaert is an artist and inventor from Belgium. He is currently building a zero emission airship all by himself, and has already successfully completed a scale model, nine meters in length. A full capacity vessel of 90 meters will be ready to take off in quite a few years time.

We're sitting on a pile of dirt, when Lieven is telling me about how hydrogen power actually works, and what it takes to cruise an airship just like a sailing boat.

We have this technology where we use hydrogen as a clean fuel. It's a very old technology. We've known about hydrogen for over a hundred years. And we're using it today in cars. We make cars where we use hydrogen as a clean fuel and they burn the hydrogen and what comes out as exhaust is simple, clean water. Fantastic, beautiful technology. We can't use the cars, because we don't have refueling stations for the hydrogen. But that's not the real issue, I think. I think, the real issue is, they messed up the story about the hydrogen technology.

If you have a car and you fill it up with hydrogen, you're basically saying: The hydrogen is a clean fuel, it's a replacement for gasoline. And it isn't. Because the gasoline you get from the ground, the hydrogen you have to make it yourself, it doesn't come around in nature. And you make it with a very old process, which is called electrolysis. Which is basically, you put two pieces of metal in a bucket of water, you put current through it and you convert the water (H<sub>2</sub>O) into hydrogen and oxygen - H<sub>2</sub> and O<sub>2</sub>. O<sub>2</sub> is what we breathe, but H<sub>2</sub> is a lightweight gas, which when you burn it, when you use it as a fuel, it turns back into water.

So you have this closed cycle, which is very elegant, very beautiful. This chemical process that starts with water, you put electricity in it, you turn it into a gas that, if you burn it, it turns back into water. So you have this closed cycle that you can keep repeating, you have this battery that you can charge up and use. But that's what it is - it's a battery, it's not a replacement for gasoline, it's a replacement for a battery. It's a super clean battery that never wears out.

It's not an energy source, it's an energy carrier. So, the place where the cars mess up the story is that they only tell half of the process. What you need to tell is the story where you make the hydrogen. Because if you make the hydrogen for those cars with electricity from a coal firing plant, you're still going absolutely nowhere. You need to make the hydrogen with green energy. So what you need are cars with solar panels, are cars with windmills on top, or a very big airship with two very large propellers on it that it can use to create electricity from wind power.

The project I'm working on is a zero emission airship. The idea is to design an airship with two large propellers on it. It can fly with those in a normal way. But when it runs out of power, it doesn't land. Instead you park it at an anchoring cable. And it stays up there, it stays a hundred meters high like a kite. When it's anchored and up there, it turns its propellers around to use them as wind generators. The wind generators produce electricity, electricity and water give you hydrogen, hydrogen is lighter than air. So you can use it to keep the airship afloat, but it's also a clean fuel, so you can use it for your propellers to fly on later.

It can travel all over the world without needing harbours, without needing refueling facilities, without needing airports.

And at the same time, you have a project that tells a story about a more responsible way to deal with energy, because what you build is a machine, 90 meters long, that deals with energy the same way as a living being. In that, if it runs out of power, you can't just refuel it, it needs to go to sleep.