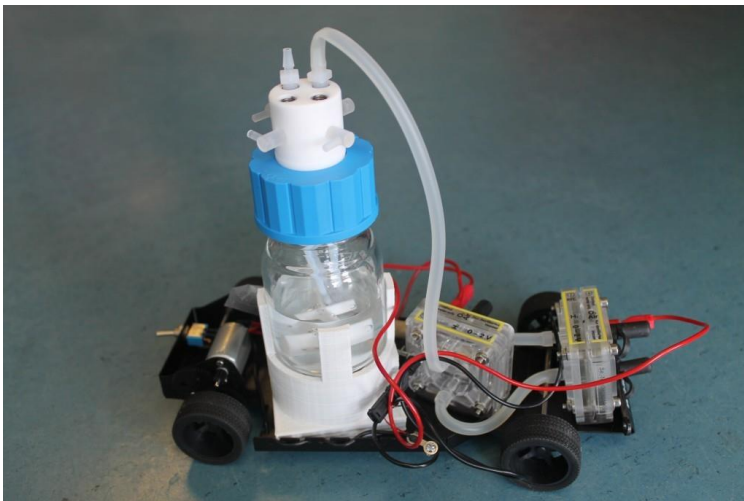


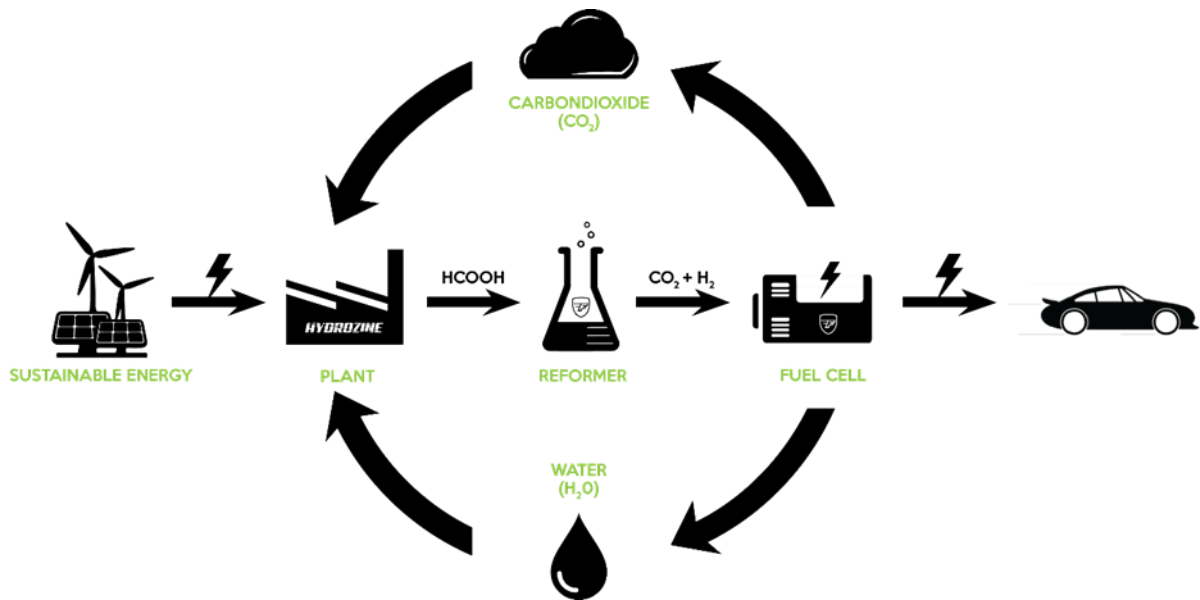


Team FAST is a student team from the Eindhoven University of Technology working on developing an innovative energy system. This system is innovative in the sense that it is powered by formic acid, a hydrogen carrier. The history of Team FAST starts in 2015 when a group of honors students were looking for a project in the energy sector. During the search, one of the students found a catalyst, a substance which allowed for the fast conversion of formic acid into hydrogen, in a scientific paper. By combining this catalyst with a hydrogen fuel cell, which converts hydrogen into electricity, it was possible to create a vehicle on formic acid. So this is exactly what the students did and Pico was born. To be able to drive, Pico still needed external heat from a hairdryer, but it did spark the interest into researching the possibilities of using formic acid as an energy carrier.



(First design: Pico)

After doing more thorough research into the possibilities of formic acid the students found that it could be created using water, CO<sub>2</sub> and electricity. These same products are also emitted as final product and this means the fuel can be used sustainably. The interest in the technology and the possible use of it to promote a sustainable future led Team FAST to create a better version of Pico as “proof-of-concept” to show that the technology could also work without using a hairdryer. This ambition was realized with Junior.



(Working of the technology)

( "Proof-of-concept" : Junior)



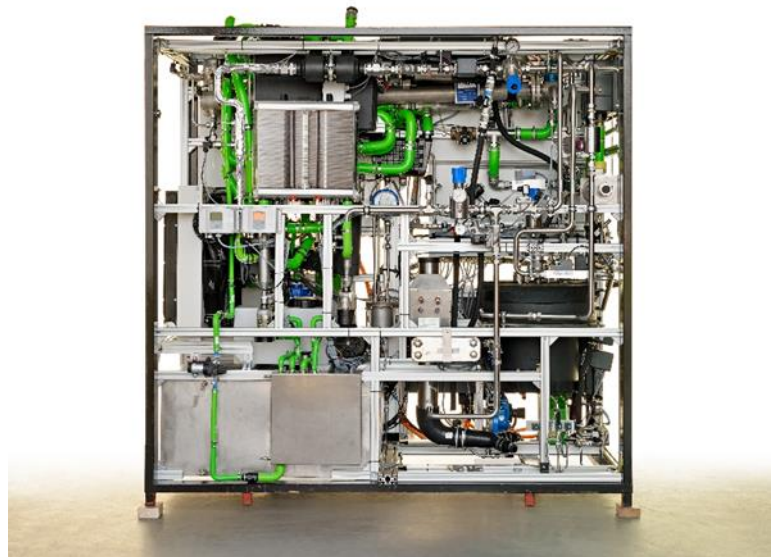
After the reveal of Junior there was a lot of media attention for the idea of using formic acid as an energy carrier. People started seeing it as a viable alternative to current ways of transporting energy. There were of course still a lot of steps to be made until a large scale vehicle could be powered by formic acid. Such a system would have to create at least a 1000 times more energy than the system in Junior. A system of this size did not exist anywhere in the world and building it would thus be a very big challenge. The students however, were determined to accept the challenge. By creating a big prototype everyone could see that formic acid technology was a good option to help enable a sustainable future.

First a location to build the prototype had to be found. Luckily, the Automotive Campus in Helmond just started expanding and were able to offer the team a place to stay. After fully remodelling the workshop and creating a safe work environment, the designing of the system could begin. Next to creating the design, sponsors had to be found to finance the project and get the supplies needed to build it. All students in Team FAST are volunteers and the help of these sponsors allows us to create our vision.



(Engineer Friso on the job)

(Prototype)



(Workshop at the Automotive Campus)

Within a year sponsors for the most important parts had been found and the process of building the first large prototype system could start. Starting with the main parts. Over the year the system grew and started looking better and better. This process required engineers to work day and night to be able to get a result for the pilot, where the system would have to be functioning. In the summer of 2018, the system was used in a pilot for building a road together with BAM Infra. This is the first pilot where formic acid technology has been used. The pilot taught Team FAST a lot about how to improve the current system and how to make it more efficient. This is just the beginning however, new teams will be creating new applications for formic acid technology pushing the technology to its limits. The ideas vary from moon landers to luxury yachts using formic acid as a fuel. Only time can tell what the next challenge will be!



(Design for the pilot)

