
# POWER PLANT(S)

*Plant-e | Marjolein Helder*

"People simply didn't – and often still don't – believe it," Marjolein Helder explains, "and can you blame them? Plants producing electricity seems ridiculous, yet that is exactly what we're doing." The technology was developed and patented in 2007 by Wageningen University in the Netherlands. In 2008 Helder started her PhD and founded Plant-e shortly after in 2009. Since graduating in 2012, she's devoted her time fully to Plant-e, which is now owner of the patent.

"No, that is not how it works!" Helder laughed when asked if Plant-e would allow you to plug your phone charger into some sort of device in the ground, which would then somehow be connected to a plant.

Of course that's not how it works.

**How it does work**

The technology is intricate and overwhelmingly complicated for a layman, but works something like this: through photosynthesis (the process that allows plants and trees to create oxygen) a plant produces organic matter. The plant uses a small part of this organic matter to grow, but most of it is actually excreted into the soil via its roots. Bacteria in the ground then break down the organic matter, releasing electrons in the process. These electrons can be "harvested" through Plant-e's technology and can be used to generate electricity. Plants aren't harmed by the process and keep growing like they normally would, while allowing electricity to be produced.

The process can be used anywhere plants grow and where enough water is available – Plant-e technology needs a fully submerged environment, such as wetlands. "We're not looking to replace solar or wind energy, we want to add another sustainable energy source to the pallet in order to offer different users a solution that best suits their climate." Asia, for example, is a great place for Plant-e's technology, as water is abundantly available in rice paddies and overcast or polluted skies can limit the effects of solar energy. But as long as plants are alive, they will produce energy around the clock.

**It's almost too easy**

"Convincing people that the technology works has by far been the most difficult thing to do," says Helder. "Even though I obviously know it works, cynics

## SUMMARY

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| *Company* | **Plant- e** |
| *Country* | **The Netherlands** |
| *Founder & CEO* | **Marjolein Helder** |
| *Postcode Lottery Green Challenge* | **Runner-up 2011** |
| *What* | **Sustainable green energy** |
| *How* | **Generated from living plants** |
| *Founded in* | **2009** |
| *Employees* | **6** |
| *Founders wisdom* | **"Believe in yourself and your project, if you don't others won't either. If you can substantiate why your project will work, just go and do it. Prove them wrong."** |

can get you down from time to time. Scepticism from the public makes you doubt yourself, your abilities and your project. From that position it is difficult to maintain the drive and energy needed to start and run a business. Of course, being a new entrepreneur brings unprecedented challenges on a daily basis, but as long as you believe in yourself and you surround yourself with people who believe in the technology as well, those challenges are manageable."

It was during this time that Helder sought the advice of a coach who presented her with alternate view: "instead of focusing on what you haven't accomplished, look at how far you've come." Though it is perhaps obvious, it was this change of perspective that allowed Helder and her team to push through the difficult times.

The media exposure, partly facilitated by the Postcode Lottery Green Challenge, has been instrumental for Plant-e. Precisely because of the initial scepticism, having a global platform on which to tell their story allowed them to explain and prove their technology to a wide audience. Being a finalist further validated their business case.

Having a marketable product obviously goes a long way in showing the public that the technology works. At the moment, Plant-e has a planter (of 4 modules of 50x50 cm) for sale, completely fitted with all the required technology to power a led lamp. This product is easy proof that the technology works and is currently being showcased at conferences and expositions, as well as being sold to governments and companies.

### What's ahead

Now it's key to further develop the technology into a product that will be able to power bigger appliances. They're now developing a tube-like battery that can be installed directly into the ground.

"This will ultimately look more like plugging your charger into the ground," Helder illustrates. "The beauty of the technique is that, as time passes and nature develops, the technology will start to work better. The plants grow, creating more organic matter to be broken down, and they'll be better "rooted" into the tube, allowing it to harvest more electrons. There is hardly any maintenance necessary on the tubes; we expect they can have a lifespan of 50 years or more." The tubes can have extra economic benefits for, for example, rice farmers or nature conservation agencies owning large patches of wetland.

In 2015, Plant-e was named Technology Pioneer at the World Economic Forum in Davos, lending further credibility and support to the technique. Every year, this award goes out to "trailblazing companies with the potential to significantly impact business and society through the design, development and implementation of new technologies and innovations." Notable alumni of the award are Airbnb, Google, Kickstarter, SoundCloud and Twitter.