

‘A good way to  
market technologies  
for better batteries.’

**Christian Rood**

*Co-founder and Director  
LeydenJar Technologies BV*



# LeydenJar to take ECN technology for better batteries to the market

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**An ECN invention that was unsuitable for the production of thin-film solar cells twelve years ago has proven a perfect solution for increasing the storage capacity of lithium-ion batteries by 50 percent. In order to market the new technology and attract investors, entrepreneurs Christian Rood and Gabriel de Scheemaker founded the spin-out company LeydenJar Technologies BV, named after the famous Leyden Jar of 1746, the precursor of the battery.**

## **The problem**

‘All around the world, researchers are trying to improve the capacity of lithium-ion batteries. Silicon is seen as a promising material for this. By replacing the traditional graphite anode with silicon, this component will have ten times as much storage capacity, and the capacity of the battery as a whole will increase by 50 percent. However, the problem with silicon is that it expands to three times its original

size when the battery is recharged, which can loosen the silicon layers and cause the battery to fall apart.’

## **The solution**

‘LeydenJar applies tiny vertical rows of silicon onto copper foil using nano-technology, creating enough space for expansion so that the battery remains stable. The layer ultimately needs to be ten microns thick for commercial application; that’s ten times thinner than a sheet of paper. What makes ECN’s invention so promising is that the technology brings mass production within reach due to its similarity to an existing production process for solar cells. We believe this is a unique advantage.’

## **The impact**

‘The new technology will increase the capacity of rechargeable batteries by 50 percent. With the application of this technology, the range of electric cars can

be increased, batteries in smartphones, laptops and other electronic devices will last longer, and the costs of sustainable energy storage will decrease. The goal is to supply the technology to large battery manufacturers, with whom we are already in talks. We have sufficient funding for the first year and want to start up a pilot plant in 2018 where we can show our first customers that this technology is sufficiently competitive for large-scale production. In other words, we want to demonstrate that a better battery can be produced for the same amount of money.'

## The collaboration

'I have known ECN since 2010, and I have been involved in various licensing projects. There is much mutual trust between us, which is always important

when establishing a spin-out venture. In 2015 we went looking for promising technologies, and this one came out on top. Gabriel de Scheemaker (my business partner) and I were first given three months by ECN to discover whether there was a real business opportunity here. This was a very successful process; we talked to a wide range of experts and customers in a type of pressure-cooker process to assess the feasibility and quality of the invention. During this time, we gathered together a professional team, drew up a road map and strategy, and determined how we were going to obtain funding. We then took another three months to make our plans concrete and draw up contracts. As businessmen, we found this a very confidence-inspiring way to start a spin-off company. For ECN, LeydenJar Technologies is the ideal partner to bring this technology to market and establish contacts with the battery industry and venture capitalists.'

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