

Industrial partners perspective



An interview with **Martin Krebs** (VARTA)

Ph.D, Manager Innovative Projects and Patents

Martin Krebs – He studied Physics and Electrochemistry at the TU Clausthal. Then he joined VARTA building up an electrochemical research lab. Since 2001 he manages collaborative projects, which were funded by the EU Commission and the BMBF.

In the A3Ple project VARTA investigated the different technologies for making the current collectors on the substrate. They tested the PVD technologies, also printed and hot-embossed current collector

(interviewed by Diana Gaspar– UNL)

What was VARTA's motivation for joining the A3Ple project?

The A3Ple project was a successor project for the GREENBAT project, where they developed printed Lithium-Ion-Batteries LIB. The results of GREENBAT were encouraging to pursue the work. Furthermore the charm of A3Ple is that it covers all steps for making Smart Objects, including very nice applications which can be successful for the use.

What are the objectives of VARTA when joining EU funded collaborative projects? Do you believe these are adequate instruments for large companies?

VARTA typically joins funded projects because the funding makes them possible. Without funding the risk for the company would be much higher and the management would never allow such projects.

Also the involvement of a consortium, which covers all important tasks necessary for the work, is very much appreciated. So in a fruitful cooperation the problems can be solved. So VARTA is aware what is going on in the community for the respective project topic. Especially the cooperation with LabelTech can be helpful for the future.

What are the most challenging aspects of A3Ple project from VARTA's point of view? What do you consider to be a big success for the consortium?

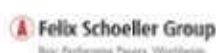
The most challenging aspect of A3Ple is to develop all components of the Smart Object. If one important component is missing the concept cannot be successful. Nevertheless the work on printed lithium ion batteries together with CEA can also be used for other OLAE objects.

The investigations on substrates and current collector useful for lithium ion batteries can also be used for other battery systems. The results are important in any case.

Which is the impact you expect this project will have for VARTA? Can the outputs be used within your company in the future?

The work being performed can be used for all other printed batteries, e.g. Zinc/Carbon, Nickel/Metal hydride and others. In a further project application under H2020 a consortium intends to develop printed Zinc/Air Secondary cells for all applications up to solar energy storage in household, grid support and peak-shaving. These applications are important in context with the CO₂-reduction.

This project has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 262782 (APPLE).



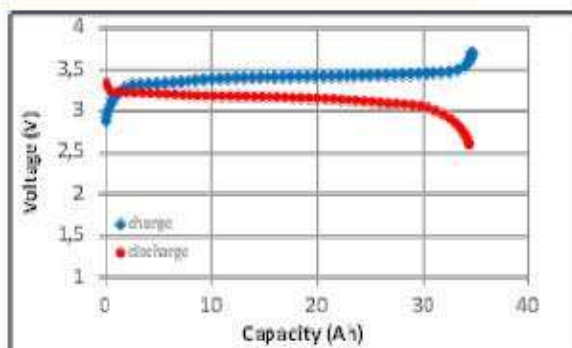
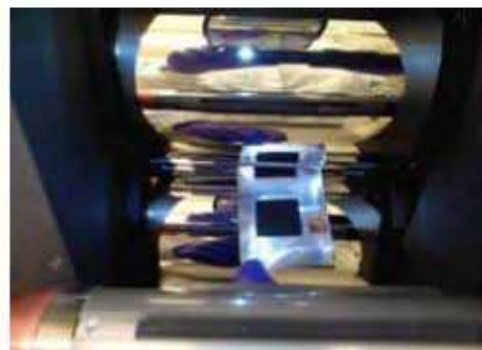
Do you think that the application in paper electronic devices can boost batteries' industry and increase the incomings?

These developments cover a completely new range of products and it will not jeopardize the existing battery business. So a fully new market will be opened for a lot of companies, like battery manufacturers, label makers, packaging companies, etc. So it will create a lot of jobs in Europe.

In your opinion, which industry sectors are likely to gain from the development of new concepts of paper/board based products with new functionalities?

I clearly see benefits for the following sectors:

- Packaging (especially food)
- Logistics, like RFID
- Sensors for temperature, humidity, gases
- Medical sensors for heartbeat, breath, skin temperature, blood sugar, etc.
- Advertisement and gaming.



Flexible batteries being developed in A3Ple.

Collaboration between CEA and VARTA.
54 x 66 mm²
Cgr/LFP secondary
Initial capacity of about 36mAh for a nominal voltage of 3.2V

The Company:

VARTA Microbattery (VMB) is a medium size battery manufacturer at Ellwangen in the southern part of Germany. VMB employs nearly 750 persons in Germany and approx. 2000 worldwide. The entire Research, Engineering and Production of the electrochemical cells are done at Ellwangen.

The product range of VMB contains small batteries for portable devices, like Hearing Aids, Computers, Car Electronics and Heat Calorimeters. In the last years this portfolio was extended to automotive traction batteries in the Joint-venture Volkswagen VARTA Microbattery Forschungsgesellschaft mbH (VWVM) and storage batteries in the order of 5 – 13 kWh in the VARTA Storage GmbH (VS).

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