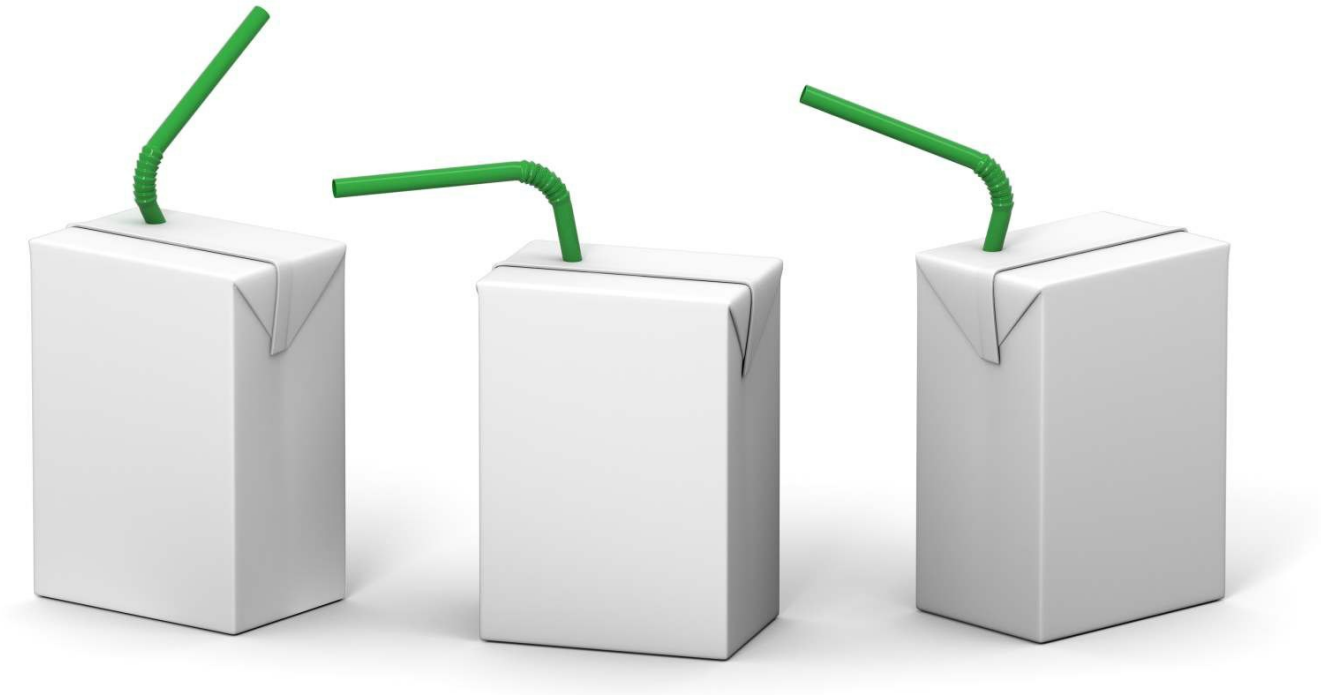
Enval Offers Breakthrough Recycling

University of Cambridge



The University of Cambridge, with Enval Ltd., hopes it has a technology that can do something useful with the aluminum from juice cartons, much of which ends up in landfills around the world.

In Western Europe, more than 30,000 tons of aluminum are used annually in the lining of drink cartons. The statistics are similar for North America.

Enval Ltd. hopes its technology can recover the aluminum, much of which ends up in landfills.

Using technology developed at the University of Cambridge in the United Kingdom, Enval uses the process of pyrolysis — applying heat to create a chemical change in a substance, in the absence of oxygen — to separate the aluminum from plastic that also is a by-product from the partial paper recycling of cartons. That aluminum then can be sold for reuse.

Enval also hopes to add energy efficiency to the process by manufacturing a portable pyrolysis machine, rather than having to haul the aluminum and plastic to a central processing location.

“The paper content of cartons has been recycled for quite some time and reused as pulp paper by paper companies, but the residue from the depulping process, containing valuable aluminum, is often sent to a landfill,” says Carlos Ludlow-Palafox, Ph.D., co-founder and chief technical officer of Enval.

“After treatment with the new technology, the metal has a ready market and the oils, generated from the plastic layer, can be used to power the recycling machine. The rubbish sites save money, by avoiding paying landfill taxes. The metal industry saves money and a lot of energy, by purchasing ready-to-use secondary aluminum. And, as consumers, we no longer feel guilty about throwing away yet another drink container that cannot be completely recycled. The planet wins.”

> *Similar processes have been used in Brazil and Finland, and experimented with in other parts of the world. But, Enval has technology that can be portable.*

“It is not energy efficient to haul aluminum liners and plastic to a treatment site,” Ludlow-Palafox says. “It is a relatively light, fluffy material that takes up space, but does not have much weight. So, the portability of our pyrolysis machine has great potential.”

Startup Support

Enval is building a pilot plant pyrolysis machine, thanks in part to startup money from the University of Cambridge and an angel group of investors headed by CREATE Partners. That group has made an initial seed investment of £200,000 with a view to investing further amounts over the next three years.

The investment will allow Enval to build a first-class execution team, to develop a pilot plant for industrial demonstration and to secure initial contracts with industry partners around the world.

Tetra Pak, a leading maker of drink cartons, and others have expressed interest in the technology.

“We are delighted to support a promising technology that, if successful on a large scale, will substantially increase recycling in the UK,” says Richard Hands, environmental manager for Tetra Pak UK & Ireland, in a Nov. 8, 2006, press release.

The process used by Enval started more than eight years ago as Ludlow-Palafox’s Ph.D. project at Cambridge. He worked with Howard Chase, professor of biochemical and environmental engineering and former head of the department of chemical engineering at the University of Cambridge.

“I had been interested in the process of pyrolysis, so we did the scientific research and developed a lab prototype of a device,” Ludlow-Palafox says. “I was looking at it from the viewpoint of a scientist at that time. I could see it had commercial applications potential, but I did not think at that time I would be the one to do it.”

But, in 2003, Ludlow-Palafox found himself getting involved in the business process. Cambridge Enterprise, which works with technology transfer at the university, began working with the researchers, clarifying the route to market the technology, patenting the invention and using a Proof of Concept grant from the Higher Education Innovation fund to build the first continuous prototype of the process. The University Challenge Fund supported market research that identified a number of paper companies interested in the process.

Ludlow-Palafox and Chase, together with Alexander Domin, Ph.D., entered the 2005 Cambridge University Entrepreneurs Business Plan Competition and won. That led to incorporation and the additional funding from CREATE.

Groundbreaking Opportunity

“Enval is a groundbreaking opportunity,” says Boyd Mulvey, chief executive of CREATE, in a Nov. 8, 2006, press release. “The new process offers industry a simple and cost-effective solution to solving a serious environmental

problem. Enval has a robust, patented technology and now, with venture capital and Angel investor backing, the company has the financial resources to deliver that solution.

“CREATE has worked successfully with GEIF Ventures, Cambridge Angels, Cambridge Capital Group and the University of Cambridge Challenge Fund to provide the investment into this compelling business plan.”

Ludlow-Palafox spent much of the latter part of 2006 traveling throughout Europe talking to paper companies and other potential partners for Enval.

“Again, I started at this from the approach of a scientist,” Ludlow-Palafox says. “I now love what I am doing (the combined role of a scientist and entrepreneur). It was difficult going through the period of seeking funding — wondering whether you were going to get any or enough — but now it is rewarding to see the potential in the marketplace.”

Enval initially stood for “Environmental Aluminum.” But, the technology could be used in other recycling possibilities for tires, oil and other waste materials. So, Enval could evolve into “Environmental Value.”

“The research has potential for the marketplace,” says Ludlow-Palafox, who still works with Chase on advising some of the Cambridge researchers. “What better way to bring it to the marketplace than through a company that already is working on it.”

— By Gregg Hoffmann

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