

ByFusion Turns All Types of Ocean Plastic into Eco-Friendly Construction Blocks

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A new startup called ByFusion created an eco-friendly way to repurpose collected ocean plastic permanently, in the form of construction blocks called RePlast.

[Tom Idle](#)

“It’s all about timing,” says **Gregor Gomory**, CEO of [ByFusion](#), a startup he believes is about to take advantage of a “perfect storm” brewing as the world wakes up to the enormous problem of plastic waste filling up our oceans.

By now, we’ve all heard the statistics: By 2050, there will be [more plastic in our oceans than fish](#), according to the **Ellen MacArthur Foundation**. The 4-12 million tonnes of plastic that is spewed into our waters every year is a problem that can no longer be ignored.

In the throes of developing a process for creating construction blocks out of straw bales – and filled with TV news images of his beautiful country’s ocean-waste mountain – New Zealand-based inventor and engineer **Peter Lewis** had a light-bulb moment: What if all of this plastic waste could somehow be put to good use? He played around with some ideas and soon realised that plastic boasted similar thermal properties to straw bales and, if presented in the right way, could be used in construction, too. A prototype technology was created, but for a “variety of reasons” the idea stalled due to fundraising issues.

Fast-forward several years and Gomory and his team have well and truly revived the concept and, buoyed by a landscape of renewed interest in environmentalism – the “perfect storm” he describes – are finally realising Lewis’ original vision.

“We purchased the IP and developed a platform to bring the concept to the US and to do things at a much larger scale; our timing was much better,” Gomory says, pointing to a waste management sector still reeling from plummeting oil prices and finding it more expensive to sell recycled plastic than it is for manufacturers to make it.

So now, ByFusion takes plastic waste in any shape or form, feeds it into its machine (kind of like a giant washing machine) and creates blocks, known as [RePlast](#). These are the same size and shape as the conventional concrete blocks most commonly used in US construction projects.

And while they are not able to carry out the same job as concrete (after all, they are still made out of plastic and will compress under heavy weight), it is their thermal properties that are most exciting.

“RePlast blocks have incredible thermal characteristics in terms of sound and heat transfer,” Gomory says. “We envisage using them with normal building frames as fill. Our initial testing shows that they blow traditional cement blocks out of the water.”

RePlast can also be used in road works or in community projects. In fact, that’s where Gomory sees the most potential: “In theory, we’re looking at an absolute definition of a circular economy, whereby plastic waste washing up in local communities gets processed and used in local community centres or on roadways.”

The blocks require no glues or adhesives, they can contribute to LEED certification for construction and they possess a 95 percent lower greenhouse gas emission footprint when compared to concrete blocks.

So, how does ByFusion actually get hold of its feedstock? Well, the original idea was to partner up with the waste management sector. But what Gomory refers to as the “myth of kerbside recycling” – where, in a city like New York, just 7.5 percent of plastic that households put out for recycling actually gets processed, the rest heading for landfill – made him think again.

With his heart in marine conservation it was an easy decision to partner up with an alliance of [non-profits already handling ocean waste](#) on beaches around the world. Initially, the focus will be in Hawaii, working with [Sustainable Coastlines Hawaii](#), a project will accumulate and process plastic to help protect the Hawaiian Archipelago, home to more than 7,000 marine species and extensive coral reefs. The ByFusion technology will arrive in a shipping container and then a team will get to work, shoveling plastic waste into one end of the machine and receiving lovely Lego-like bricks out of the other end.

Of course, there is a bottomless pit of feedstock for ByFusion. The challenge for Gomory right now is finding ways to make use of RePlast and to keep the organisation appropriately funded. He wants to “open source it” and invite architects, developers, builders and those within local authorities to consider how they might use RePlast.

“We don’t want to say this is RePlast – this is how you should use it and you can’t change it,” he said. “We want to see RePlast used in a modular way in low-income housing, for example. There are much smarter people out there than us that will have ideas.”

The uphill struggle of controlling the global plastic waste issue continues to get steeper. But Gomory, who has spent the last 20 years leading startup teams and developing marketing strategies in the sustainable business arena, remains hopeful.

“If something seems overwhelming, it is built into the human condition to stick your head in the sand and say, ‘I’m not going to deal with it’,” he said. “But you have to take baby steps and change people’s mindsets. I pick up a RePlast block and I can visualise a 100-ton pile of plastic sitting on a runway in the North West islands of Hawaii. And I can see that broken down into smaller pieces and that pile not being there any more.

“If I can continually visualise steps in that way, I’m hopeful about the future.”

