INNOVATORS: DR GUNTER PAULI

Dr Gunter Pauli generates genuine innovation everywhere he goes and is determined to keep getting projects off the ground and keep generating jobs, including in textiles.

Blue future

Dr Gunter Pauli's inventiveness became evident as soon as his university days were over and he started work. His first big breakthrough was Ecover, now a global brand with a wide range of 'green' detergents. But green thinking has never really been enough for Dr Pauli and in 1994 he set up Zero Emissions Research and Initiatives (ZERI), a diverse group of thinkers, but also of doers. ZERI is a network of researchers finding what the founder calls "very pragmatic solutions to things that we know can be solved now".

Wake-up call

By the 1990s, he says he had become the biggest buyer of fatty acids from Indonesian palm oil, using them to make his phosphate-free detergents. But only then did he realise the effects on the rainforest of the palm oil industry. "I wanted to have biodegradable products, but I was destroying the habitat of the orangutan," he says. "It was not sustainable. What a wake-up call." It taught him an important lesson: there is often "discontinuity" in great ideas and, if you are a genuine innovator, as soon as you identify this lack of continuity, you know it's time to change again. "There are always other great ideas," he says.

In time, he came to put many of his ideas into a book entitled 'The Blue Economy', highlighting 100 innovations that he believed could generate 100 million jobs in ten years. He calls it blue because it goes beyond green.



Dr Gunter Pauli delivering a keynote speech at the fourth bluesign conference in St Gallen in July 2015.

bluesign technologies

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In December 1997, following the third United Nations Climate Change Conference (COP3), Gunter Pauli was given the task of drawing up a business model that would be in keeping with the Kyoto Protocol, the treaty that came out of COP3 committing governments to reducing greenhouse gas emissions. "When I made my presentation, there were four people in the room, me included," he says. "No one was interested in changing the business model. You can change technologies and processes, but what is really required is a change in the business model. We're brainwashing all these MBAs to think in exactly the same way: core business with core competence, lower marginal costs, high productivity, low labour costs, just in time and economies of scale and, of course, great supply chain management. That's what we've all been doing for 30 or 40 years and the result is that we have massive youth unemployment, communities that are dying because everything is globalised."

What now?

In the next 20 years, there are just ten countries that will generate net jobs, Dr Pauli estimates. He says: "That means the other countries in the world will be losing jobs. Welcome to the world of globalisation." He says again that what is required is not a different way of conducting business in the same old way, but a new logic. Companies have not just to come up with ideas, but to do things, to add value, so much value that they will "outcompete everyone", but not on cost. His book 'The New Blue Economy', a revised version of the original, with the aim of highlighting 200 blue economy projects that have already been implemented, that attracted $4 billion in investment and generated four million jobs. He insists this is only scratching the surface.

The value of thistles

Examples of the projects he is involved in at the moment include Novamont. This company, of which Gunter Pauli is chairman, based in Novara in northern Italy, has set itself the mission of developing materials and biochemicals through the integration of chemistry and agriculture, by starting up state-of-the-art biorefineries in agricultural communities. It wants farmers to be able to make the most efficient use possible of all their resources throughout the entire lifecycle, generating social, economic and environmental benefits.

Novamont refers to its biorefineries as "third generation", which means they are dedicated to the generation of high-added-value products from biomass; Novamont has bioplastics firmly in its sights. One of these facilities is already in place at Porto Torres in the north of Sardinia. It's on the site of a former petrochemical plant that was processing two million tonnes of petroleum per year to produce 700,000 tonnes of chemicals. "That's not resource-efficient," the Novamont chairman says. "Instead, we decided to use thistles. There are 360,000 tonnes of thistles in Sardinia alone because the European Union has been paying farmers there not to farm and what you get when you don't farm is weeds, including thistles. The thistle is the cheapest raw material in the world: you don't have to plant it, you don't have to use pesticides; the only thing you have to do is harvest it. Shale gas will never compete with us. Petroleum is a joke for us."



Thistles: the cheapest raw material in the world, with textile potential.

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Novamont's thistles are yielding lubricants, natural herbicides that have a commercial value, but also polymers, and Dr Pauli says that, "of course" these polymers can be used in textiles. Waste from the thistle-refining operations is 20% of volume, but, unlike the waste output from most chemical factories, it is all going into animal feed. The company has now taken over six former petrochemical plants in different parts of Italy; it's raising the investment it needs to transform them all into third-generation biorefineries that bring benefits to all, while employing people at unionised European chemicals industry rates. Its costs are a tenth of those of other industrial biotechnology companies.

Rock, paper, value

Another venture is stone-paper, which, as the name suggests, is paper made from stone: it's 80% stone and 20% polymers that Dr Pauli is working to make from thistles. A factory in China ("Europe wasn't prepared to play along") will make one million tonnes of stone-paper there. He wants this figure to reach 25 million tonnes a year. The process uses no trees, no water and

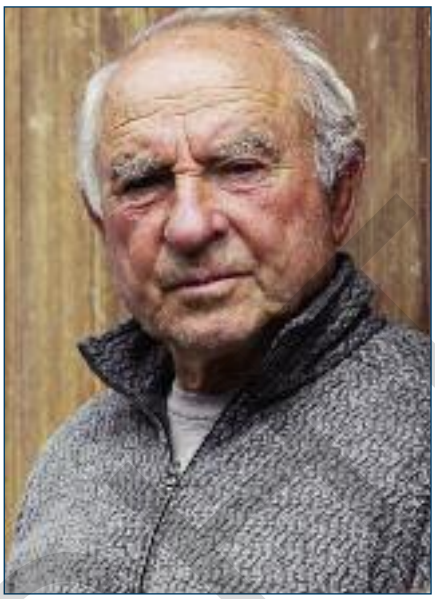
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the paper is recyclable for ever. "People say this is fantasy," the innovator explains. "They simply don't believe it's possible: that's how stuck we are in the business models of today."

Coffee is another passion—not drinking it, but using the waste to farm mushrooms. ZERI has helped set up 3,000 farms producing mushrooms in coffee waste. The network's founder says he thinks this is a failure. "We should have 500,000 of these farms," he insists. "Nestlé produces millions of tonnes of waste from its instant coffee production. That would make millions of tonnes of mushrooms and that would mean millions of tonnes of feed for chickens." Nestlé could generate 600,000 jobs from this, he continues.

Naturally blue

During a keynote speech at the fourth bluesign conference in St Gallen in July this year, Dr Pauli said he felt it appropriate to show a picture of Switzerland's unofficial national flower, the edelweiss. "It has the capacity to tolerate UV at an altitude of 2,000 metres and never blisters and never burns," he said of the flower. "Does it use zinc oxide or titanium oxide to block the UV? Of course not. The flowers are smarter than we are. They are able to feel the UV hit their skin and scatter it so that it never affects any of their cells. That's smart." He pointed out to the textile manufacturers in the audience that they ought to try to take a leaf out of the edelweiss's book. "If you don't block UV you get discolouration in your textiles too quickly and you don't like that, and I know what you're putting in there and I would like you to think instead about the way the edelweiss has solved this."



Gunter Pauli hails Patagonia founder, Yvon Chouinard, as one of his mentors.

Patagonia

Other examples of the way nature works that he likes to bring to the attention of the global textile industry include kelp, a large type of algae. "We don't really know what it is," he says. "We only know it grows twice as fast as bamboo and that it gets to 50 metres without roots. The chemistry of algae is fascinating for the textile industry in particular. We can make textiles and dyes out of algae. [German research organisation] Fraunhofer is already studying 'algaemy'. Lots of people in the textile industry know Fraunhofer, so why don't you go and talk to them about this?"

From base to valued

He points out that ZERI's own research institution has 50 PhDs looking into the same topic, 'algaemy', the ability to transform a base material such as seaweed into valuable products such as clothes and food. ZERI research in this area is not just for textiles. It has arranged for a small algae farm to grow on the roof of the Novotel in Bangkok,



turning the carbon emissions from the hotel into Spirulina, a source of protein. "It normally costs $16,000 per tonne wholesale, but we are producing so much we can give it away for free," he says. "It's the greatest nutrition on earth [each spoonful contains four grammes of protein and important amino acids] and we can give it away for free."

Back in Indonesia "which used to have a great textile industry but it's now collapsing", ZERI is working with the government to restore mangrove plantations, not least because these offer natural protection from tsunamis and their disappearance exacerbated the effects across the whole Indian Ocean region of the devastating 2004 tsunami. Its first project, on Java, has already generated shrimp farms, with the shrimp feeding at zero cost on some of the algae that grows among the mangrove trees. The world's first biorefinery for seaweed is also part of the project and is producing fibres and colour pigments for textiles as well as biofuel and calcium for pharmaceuticals. "It's now our biggest cashflow," Dr Pauli says.

Coffee waste can create jobs

Linked to his own ambitions for using coffee waste for good, he is also an admirer of Singtex, the Taiwanese technical textiles manufacturer that launched S-Café in 2009, a yarn that includes recycled coffee grounds, which the company says imbues textiles spun from the yarn with odour-control, quick-drying and UV protection functionality. ZERI projects that S-Café has inspired include coffee-enhanced nylon 6 for carpets to make rooms odour-free because the coffee absorbs bad odours. It's also going into polyurethane in refrigerators to make refrigerators that absorb odours and into paint to make paint that scatters UV the way the edelweiss does. "Our view is that the coffee industry, through projects like these, can generate more jobs in the next ten years than the whole of the textile industry supports at the moment," he claims.

Dr Pauli's innovative thinking first came to the attention of the outdoor industry in an unusual way. In his early Ecover days, he spent a lot of time thinking about sustainable production, reasoning long before most company leaders, that this had to include what his employees wore and the environment in which they worked. To this day, Ecover is proud of the factory Dr Pauli built. It operates entirely on renewable energy and was designed from the outset to follow the movement of the sun from east to west so that the people inside can work under the maximum amount of natural daylight.

Mentoring process

"When Patagonia brought out its Capilene baselayer garments, I bought some for all our workers and everyone wore them because that saved me about four degrees on the thermostat," he recalls, "and everyone was very happy". When he placed the order, Patagonia called him from California to find out more about what it suspected must be a mass expedition to the Himalayas. On learning that Dr Pauli wanted his workers to wear the baselayer products "just to save energy", he was invited to, and attended, "a very enjoyable meeting" with Patagonia founder, Yvon Chouinard, whom he now describes as a mentor for his business ideas and innovations.

Solving problems now instead of waiting five years to see how approval processes and feasibility studies pan out is "the kind of urgency business has lost", Gunter Pauli believes. He wonders if entrepreneurs really are entrepreneurs these days.

