

Ahead of Earth Day on April 22,
we spotlight Earth-conscious individuals
who make it their business to save the planet

👁 TAY SUAN CHIANG

THE ECO-PRENEURS

01

MINIWIZ

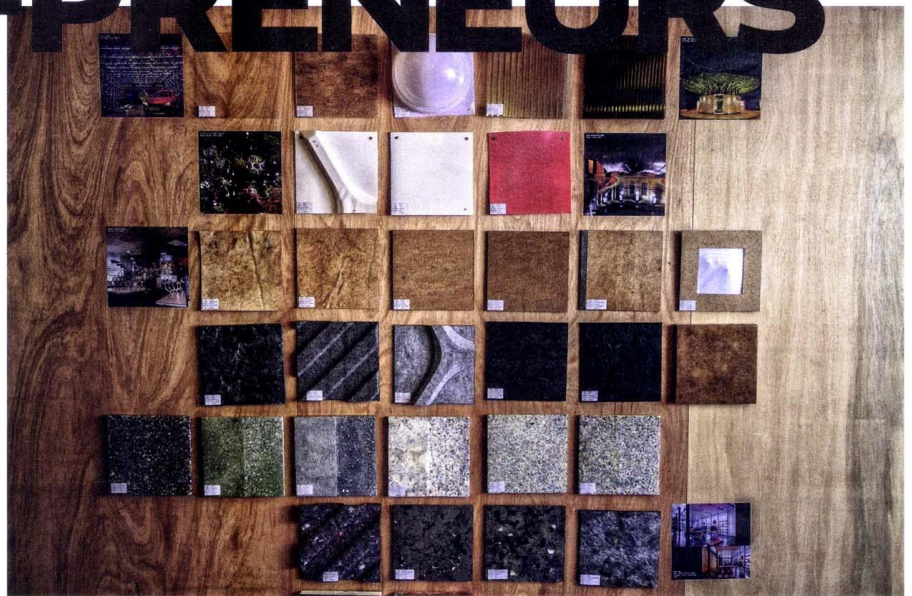
Arthur Huang is a magician, but not the type to pull a rabbit out of a hat. What he does is take discarded footwear and apparel and turns them into a recycled material composite to fit out store interiors, which was what he did for several NikeLab stores.

There is no hocus pocus involved - just 14 years of dogged experimentation and research. Mr Huang is the founder of Miniwiz, a firm dedicated to upcycling and consumer trash and industrial waste reuse innovation. He even dresses in clothes and shoes made from trash.

The structural engineer and architect used to lecture on life-cycle analysis, a technique to assess the environmental impact made at every stage of a product's life from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling.

"But I couldn't just keep talking about it, and not do anything," says Mr Huang, 41, a Taiwan native who has a degree in architecture from Cornell University and a masters in the same field from Harvard University.

It was in the US that he saw how the West was spending its resources and it was impossible to think that all that buying and fast fashion could have no consequences on the environment.



1

2



3



(1) A wall of different materials created from trash. (2) Arthur Huang. (3) NikeLab store in NYC, made from recycled materials.



4



5



6



7

Mr Huang was named a Technology Pioneer by the World Economic Forum in 2015, and a National Geographic Emerging Explorer in 2016.

Nestled in its Taipei headquarters, is a lab where the magic happens. Each month, the team invents 20 new materials using trash.

For example, there is Natrilon™, a yarn made from recycled PET bottles and enhanced with silica dioxide from rice husks. Natrilon™ fibres have a merino-wool like texture with a satin finish and can be used for interiors, furniture and apparel. Another material is PlyFix™, also made from PET drink bottles, which is good for sound insulation, packaging and furniture. Layers of fibrous materials are compressed into a single solid sheet whilst retaining a soft, tactile surface avoiding the traditional plastic feel.

Miniwiz works with most kinds of trash, even small cigarette butts found in the oceans. The paper and tobacco are turned into compost, while the plastic-like cellulose acetate fibres used to make cigarette filters are processed and turned into buttons and sunglasses. The firm doesn't deal with nuclear and PVC wastes and materials such as steel and copper, because of their high toxicity levels.

"WE LIVE TO SUPPORT THE MASS ADOPTION OF A CIRCULAR SYSTEM WHEREBY ALL THE MATERIALS WE USE ARE REUSED, AGAIN AND AGAIN, AND AGAIN WITH ZERO WASTE. TRASH SHOULD BE THE NEW CURRENCY."

ARTHUR HUANG



8



9

Miniwiz's projects range from furniture, interiors, consumer products such as sunglasses, boats and even buildings. In Taipei, the EcoArk Pavilion has been hailed as a benchmark for the future of green buildings. The nine-storey tall pavilion built for the 2010 Taipei International Flora Exposition is largely made from 1.5 million recycled plastic bottles. Now a public museum, it weighs 50 per cent less than a conventional building and yet is strong enough to withstand the forces of nature, including fire.

For each project, Miniwiz collects its trash closest to source, to cut down on transportation costs and carbon footprint. "We help to clean up the local pollution and turn it into something of more value," says Mr Huang.

It reaches out to consumers directly, such as getting them to donate their used plastic coffee cup covers, as well as to brands, industrial trash collectors and also NGOs.

Mr Huang hopes to turn consumers into recyclers, and acknowledges that incentives are needed. In the upcoming months, he will be starting a project in Singapore, where people can donate their trash to him. But this has to be trash that is clean and can be further upcycled. In return, consumers get digital points, which they can use to make purchases.

He doesn't think that the demand for material consumption will decrease, so the alternative is to turn trash into solutions and opportunities.

"We live to support the mass adoption of a circular system whereby all the materials we use are reused, again and again, and again with zero waste. Trash should be the new currency," he says.

miniwiz.com

(4) Le Blé d'Or, a restaurant in Taiwan, built from post-consumer waste and waste from beer spent grains. (5) Polli-Brick™ is a revolutionary building material made from 100 recycled polyethylene terephthalate polymer. (6) Located in Milan, the 'House of Trash' is dedicated to the exploration and showcase of technologies and applications using waste. (7) The EcoArk Pavilion located in Taipei, is the world's first fully functional, public structure built using 1.5 million recycled plastic bottles. (8) Re-View™ is a pair of sunglasses made from recycled post-consumer CDs and DVDs, enhanced with carbonized rice husk. (9) Natrilon™ is yarn made from 100 per cent post-consumer recycled PET beverage bottles and rice husks.

02 UGLYFOOD

If the vegetables and fruits in your supermarket could talk, they would be calling out to you to pick them. The lucky ones are those that look most radiant and plump, without a dent or blemish in sight.

But what happens to the rest of the produce? Often, the unsold produce or those which have ripened or are a little blemished are thrown away. Yet, they are still perfectly edible.

Alarmed by this common practice of cosmetic filtering and also having some first hand experience in farming, Yeo Pei Shan began to look at how food waste could be reduced. "There is a lot of hard work and effort to bring food from farm to table. Throwing it into the bin is a waste of food and also the resources used, such as energy and water," says Ms Yeo.

Together with business partner Augustine Tan, they set up UglyFood, to maximise the value of food resources and to offer healthy and delectable food products.

Over the course of one year, they have saved 3,830 apples, 2,050 oranges and 50kg of Romaine lettuce from the bins and counting.

UglyFood gets its supplies from importers, wholesalers, and supermarkets. Rather than ask suppliers for 'ugly' foods, Ms Yeo approaches them with the intention to help them reduce wastage and cut losses.

"It is heartening when some suppliers take the initiative to contact us as they agree with our cause and also want to reduce food waste and provide more accessible food to all," she adds.

UglyFood collects two types of fresh produce - those that are in excess, and those

slightly blemished or overripe.

For blemished and overripe fresh produce, sorting is done immediately to separate the good-to-eat and better-to-avoid ones. "Sorting ensures that the good-to-eat will not be affected by the better-to-avoid ones," explains Ms Yeo.

The fresh produce is sold at a discounted price, through the Treatsure mobile app. UglyFood also sells its produce at pop-up markets, and also works with companies to stock their office pantries.

It also sells cold-pressed juices and ice cream. The duo work with an established cold-pressed juice company to produce juices, such as Starfruit Pear Orange, Apple Carrot Orange, and Apple Beetroot Carrot Lemon. U-Glee!, their dairy-free, fibre-rich and preservative-free banana ice cream is made at a rented kitchen space.

They also hope to get more food manufacturers on board with them to use slightly imperfect fresh produce and to brand them under "UglyFood". "We want to create a community of F&B partners who champion the same cause," says Mr Tan. They currently have an F&B caterer who is keen to use their produce in his buffet offering.

Their appearances at pop-up and corporate events have paid off. "Consumers are more aware that ugly foods are still edible after tasting our products," says Ms Yeo. "We feel that that is the first step to change, which is to be aware."

The next step would be translating the awareness into action and Ms Yeo acknowledges that this step will require more convincing.

"Singaporeans are pragmatic. We want the best out of the deal and ugly foods do not look like a best deal. We hope that more Singaporeans can be slightly less pragmatic and to opt for ugly foods as they will be doing a big part in preventing food from feeding the bins," she says.

uglyfood.com.sg

"THERE IS A LOT OF HARD WORK AND EFFORT TO BRING FOOD FROM FARM TO TABLE. THROWING IT IN THE BIN IS A WASTE OF FOOD AND ALSO THE RESOURCES USED, SUCH AS ENERGY AND WATER."

YEY PEI SHAN



(1) U-Glee!, a dairy-free banana ice cream. (2) Fresh produce can be purchased on the Treatsure app. (3) Co-founder Yeo Pei Shan. (4 & 5) Cold-pressed juices from UglyFood.

03

UGLYGOOD

Did you know that the fruit juicing industry is believed to be one of the most wasteful, resource-inefficient industries? "Only 40 per cent of the fruit is extracted for its juice and the remaining fruit pulp and peels are thrown away," says Jeremy Lee, a Singapore Management University graduate with a passion for entrepreneurship, sustainability and technology.

Each year, Singapore generates about 20,000 tonnes of fruit waste which are incinerated. However, due to its high-water content, the process is highly inefficient and pollutive for the environment. On the other hand, the waste stream represents a potentially valuable resource which can be processed and extracted to create high value products.

While still an undergraduate, Mr Lee, together with fellow SMU student, Clewyn Puah, explored circular economy solutions and sustainable business models.

"We believe that the waste management industry is ripe for disruption and transition towards a more resource-efficient future," says Mr Puah.

Their research led them to start UglyGood, which collects fruit waste and turns them into



usable resources, such as cleaning products and animal feed.

UglyGood collects fruit and vegetable pulp and fruit peels from local centralised juice kitchens and large fruit juice manufacturers. In the UglyGood lab, the fruit peels ferment in beer brewing barrels, and are processed to create natural bio-based cleaning products including a floor cleaner and a multi-purpose solution.

Meanwhile, the fruit and vegetable pulp are processed into animal feed for herbivorous and omnivorous animals such as the tree



(1) Natural multipurpose cleaner made from orange peel waste.
 (2) Founders Clewyn Puah and Jeremy Lee.

kangaroo, elephants and baboons, at the Singapore Zoo, Night Safari and River Safari. "The pulp serves as a healthy and nutritious supplementary food for the wildlife," says Mr Lee.

Food manufacturers are happy to work with UglyGood as they save on disposal fees since they are not charged a recycling fee. While they currently only collect fruit waste, UglyGood has been asked by other manufacturers to collect their byproduct waste, such as coffee spent grains, sugarcane bagasses, and beer spent grains.

UglyGood also plans to partner Ijooz, a local orange juice vending machine operator, to recycle up to 60 tons of orange peels daily.

Other plans include creating the first citrus waste processing plant in Singapore and expanding into Southeast Asia to build recycling partnerships and introduce new products from citrus peel waste.

"Waste is a resource that should be harvested and leveraged upon. Through our processes and business model we hope to incentivise businesses to play a more active role in a sustainable future," says Mr Lee.

uglygood.com.sg

04

REVOLV

Every morning, thousands of office workers grab a takeaway coffee from their favourite cafe. After downing their coffee, the cup ends up in the bin. The process gets repeated again the next day. It is the same at festivals, where drinks are served in plastic cups that are discarded at the end of the night. Imagine the number of plastic cups that get thrown in a year, usually just after one use.

Revolv wants to reduce that single use of plastics. Starting in Bali, it operates a network of reusable cups, bottles, and containers for the to-go economy.

"We want to make it weird to use something once and throw it away. By growing a community around reusing instead of single-use, we can all normalize keeping waste out of our natural systems and urban environments," says Antonia Zimmermann, Revolv's head of public relations and partnerships.

Here's how it works: customers order a takeaway drink that comes in a glass cup with a silicone lid and sleeve. He pays a



(1) (from left) Velina Veleva, sales lead in Bali, Antonia Zimmermann head of PR and partnerships, and Hady Hubaydillah, operational lead in Bali. (2) Revolv's tech enabled coffee cup. (3) Stainless steel tumbler. Stainless steel tumbler from Revolv.

deposit for the cup and enjoys his drink. He returns the cup to the cafe and gets back his deposit. The cups are washed and then put back into circulation. They also come with a tag, so that Revolv can track their locations.

Currently, the system is available in 10 cafes in Bali, with plans to introduce it in Singapore and Hong Kong.

Revolv also has a range of double-walled stainless tumblers which it rents out to festival organisers.

The company believes that their system is a win-win for all, and not just the environment.

"We provide a solution for businesses to provide convenience to their customers alongside a conscious solution. They also save money by not buying single-use containers," says Ms Zimmermann.

And as for customers, she says, "they are making a sustainable conscious choice every time they opt into the system. Not only do they eliminate single-use waste but they also get discounts from our partners."

revolv.io