

CIRCULAR ECONOMY WARRIORS



CONTENTS

- 4 Getting started on the circular economy
- 12 Making a big splash
- 14 Seeding the circular economy
- 15 Kind to people and planet
- 16 Cradle-to-cradle homes with kenaf
- 18 When less is definitely more
- 19 Leanne Ooi leading the way on remanufacturing
- 20 Young duo out to change the world
- 21 Vinesh Sinha, an unconventional leader
- 22 Sabahan turns recycled plastic into lumber products
- 23 How 5 sectors can increase circularity globally



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FOREWORD

Are you aware that 70% to 80% (and many believe this is a conservative estimate) of the products and materials that we use daily are headed for the landfill or incinerator?

This is the biggest problem with the linear economic model. The take-make-waste model, which has been the economic model since time immemorial, is taking a toll on the global environment. Even today, as efforts to reduce waste for the betterment of the environment gain traction, waste is still a major problem.

In recent years, we have seen the emergence of the term circular economy. In a perfect circular economy, nothing goes to waste; products and materials are used, recycled and reused. In essence, it is a regenerative economy.

The World Economic Forum estimates that today, only 8.6% of the global economy is circular. It believes that continued efforts to push the transition to a circular economy can help bring about US\$4.5 trillion (RM18.6 trillion) in benefits.

The good news is that advancements in technology are expected to bring about a faster transition, and this is where young people are among the leaders

of change. In fact, a notable trend in the transition globally is that the charge is often led by millennials and Gen Z. This is perhaps because they were born in a digital economy, are more aware of the need to protect the environment or do not have the mindset of the previous generation of entrepreneurs, the majority of whom put profit above all else.

In Malaysia, baby steps are being taken to make the transition. However, most of these businesses, which are mainly social enterprises, cannot claim to have the close loop of a circular economy. Many of them practise part of the circular economy loop. Nonetheless, these efforts, however small, can bring about great change over time.

In this pullout on the circular economy, our writers sought out several of these entrepreneurs, some young and some not so young, who in their own way are leading the charge to push the economy from a linear to a circular one.

We hope their stories in the following pages will inspire, educate and, more importantly, help create greater awareness on the need to eliminate waste and pollution to ensure a healthier Mother Earth.

— Anna Taing

Sustainability and technology go hand in hand



Industrial Revolution 4.0 (IR 4.0) may not often be associated with climate change mitigation, but its use of technologies such as the Internet of Things (IoT), big data, artificial intelligence (AI) and cloud computing can actually play a pivotal role.

Smart factories equipped with IR 4.0 capabilities can be more efficient and effective than ever before, ensuring that no energy or materials are wasted, observes Datuk Mohd Abdul Karim Abdullah, CEO of Serba Dinamik Holdings Bhd.

Clean energy can also be integrated with IR 4.0 to power various processes and the transport of goods to the final consumer.

“Investing in research and development to bring more awareness of how technology can encourage reuse, reduce, recycle and replace principles so that there is effective use of raw materials and energy is important,” he says.

IR 4.0 creates more efficiency and improves the way businesses are run. For instance, a combination of IoT and 5G allows for real-time collection and distribution of data through the right channels.

“Big data powered by AI allows for predictive and prescriptive analytics. To enable swift action and data-driven decision-making, this information has to be accessible at any time and anywhere, which is where reliable cloud computing platforms come to play, as these can store, process and visualise the data,” says Abdul Karim.

In turn, this allows companies to better analyse how their processes impact the environment. Predictive and prescriptive analytics also encourage the optimal use of resources, materials and energy.

“That is because production is only done on demand and at the right quantity. Waste is recycled or converted into materials. What is left is only what cannot be put to another use,” he says.

Linking IR 4.0 and sustainability together is crucial. There is a misconception

that sustainability practices are separate from the usual activities of a company. But that is not the case, Abdul Karim emphasises. The right approach is to include sustainability into common practices.

“This is where technology can be used to make sustainability more viable and attractive for businesses. Technology should be able to highlight how sustainability principles are achievable and can work both ways for the environment and the business,” he says.

Any business that integrates sustainability into its operations can achieve longevity and save costs while benefiting the environment, says Abdul Karim. “Ultimately, technology should be able to normalise sustainable business practices and allow the industrial sector to lead by example.”

Working towards IR 4.0, which is often described as the path forward for the industrial sector, without practising sustainability would limit the benefits of the technology.

Businesses need to understand that energy, environment and climate change have significant influence on business processes and outcomes, says Abdul Karim. “Therefore, the industry has to start implementing sustainable business processes, such as utilising green energy in their operations, shifting away from the ‘take, make, waste’ model and maximising lean practices in their operations.”

Creating long-term value

Combining sustainability and technology is an area that Serba Dinamik is passionate about. For the past 30 years, the company

has been providing integrated engineering solutions to the energy sector. It is also involved in IT, global trading and training and education.

“The foundation of our success is creating long-term value, which is exactly what sustainability is all about. Over the years, the company has embarked on sustainable business practices and is actively working towards quantifying business value through digital transformation solutions,” says Abdul Karim.

“The company also holds on to the value of giving back to the community in the most meaningful way, which is to ensure the industrial sector can lead the way in combating climate change.”

For instance, Serba Dinamik digitalised its business operations and shifted away from paper-based operations using SMART digital platforms developed by Serba Dinamik IT Solutions (SDIT).

SDIT has also developed AI and data-driven enterprise resource planning (ERP) platforms to produce SMART procurement and SMART inventory solutions. Its SMART maintenance solution offers enablers for lean practices, such as AI-driven predictive analytics, real-time remote monitoring and digitalisation of knowledge and experience.

Predictive analytics can allow for early prevention of unplanned downtime, while remote monitoring enables immediate tech support on-site by experts.

Digitalisation of knowledge and experience involves training through XR technology (a combination of augment-

ed reality, virtual reality and mixed reality). This cuts down on the waste generated when running conventional training sessions and encourages better knowledge retention, says Abdul Karim.

“Using these systems, we are able to track the source of our inventory and materials, minimise waste in our inventory backlog and utilise an AI engine to predict inventory usage, lifecycle and warranty, among others. Ultimately, these systems allow Serba Dinamik to make precise decisions, minimise waste of resources or materials and enable us to identify the vendors or partners that embrace sustainability in their products and services.”

Now, SDIT is expanding into five key areas of advanced technology — cloud computing, AI, frontier technology, cybersecurity and fintech.

Meanwhile, Serba Dinamik has actively invested in renewable energy assets in line with its mission to be a sustainable and environmentally responsible company. It has invested in companies involved in hydropower generation and biogas power generation.

“We have also developed several objectives and operating procedures to ensure that we minimise our resource consumption by at least 5%, as well as minimise any form of waste generated. Apart from that, the company has imposed resource consumption and waste management measures in our policies to minimise waste production and ensure a prudent use of resources,” says Abdul Karim.

The company also ensured that its latest facility is certified by the Green Building Index in Malaysia. As a result, its total produced waste did not exceed 6,000 tonnes last year.

Additionally, the company has been working with communities to increase their awareness of sustainability. For instance, it collaborated with Bintulu Development Authority to teach students from Universiti Teknologi Petronas, Perak, and families from Kampung Jepak, Bintulu, about composting methods.

Serba Dinamik Indonesia has collaborated with Ecubes Arcola to challenge 90 students from Surabaya to build, design and race hydrogen-powered model cars. Moving forward, the two parties will work together with the British Embassy in Indonesia and the Surabaya city government to develop the first zero-emission bus using hydrogen fuel cells.

SDIT is already working with industrial partners such as Microsoft and Huawei to build SMART city solutions so that technology can make sustainability more viable.

“We are building power management systems, smart residences, waste management systems, traffic control management systems, smart grid systems and public infrastructure monitoring systems. The end goal of SMART city solutions is to realise Malaysia’s smart nation aspirations and turn it into the regional and global leader of sustainable practices,” says Abdul Karim.



“Big data powered by AI allows for predictive and prescriptive analytics. To enable swift action and data-driven decision-making, this information has to be accessible at any time and anywhere, which is where reliable cloud computing platforms come to play, as these can store, process and visualise the data.”

- Datuk Dr Ir Mohd Abdul Karim Abdullah
Group managing director and CEO
of Serba Dinamik Holdings Bhd

Getting started on the CIRCULAR ECONOMY

BY TAN ZHAI YUN

Going from the traditional 'take-make-waste' linear economic model to a circular economy can sound like a daunting task.

For one thing, the circular economy demands that materials be kept in use as long as possible. This would probably require a change in business models to introduce product-as-a-service, for instance, or for companies to implement a take-back system after consumers use their products.

A circular model also calls for designing waste out of processes. This could involve changes in the supply chain to ensure that everything is reused, recycled or remanufactured. In addition, capital is needed to invest in sustainable raw materials or renewable resources.

In short, the circular economy demands systemic change and involves many stakeholders, but it need not be complex.

Companies are already taking the lead to implement circular practices in their processes, even if, for now, they are taking only baby steps. While some are making the changes to adhere to regulations in foreign markets, others are doing it because they see the advantages of a circular model.

The circular economy is also not something accessible to only multinational companies or start-ups. In Malaysia, one can find family businesses in traditional sectors taking steps towards circularity. The younger generation helming these legacy businesses are observing what the trends are.

Many are proceeding cautiously, but it is worthwhile understanding why they are heading in this direction and what other stakeholders can do to help make these practices mainstream.

Let no coconut go to waste

In 2007, Joe Ling left his accounting job in Australia and returned to Malaysia to help his father grow Linaco Group, one of the biggest suppliers of coconut-related products in the country.

It was not an easy decision. But because the company was on the brink of forming strategic partnerships and business continuity was crucial for that to occur, Ling decided to give it a shot.

Since then, the 29-year-old company has grown by leaps and bounds and now exports to more than 40 countries. It has also expanded its product line to Chinese herbal recipes, pre-mixed species and other food items.

The presence of Ling and his brother, Jimmy, as the executive director and managing director of Linaco Group respectively has added new dimension to the company.

One area that the brothers have pushed for is sustainability. They invested in processes to ensure that every part of the coconut is used. This is not a new idea, says Ling. But it has been made commercially viable now because of how the company has grown. "It came to a point where our main products — the coconut cream and milk — crossed a certain volume [sold] that allowed us to invest in processing the by-products in a feasible way," says Ling.

Coconut cream and milk are made from coconut meat. The market for coconut water grew in the 2010s, enabling the company to invest in processes to extract and package it.

What is left is the coconut skin, or testa, which used to be thrown into the landfill or passed on to collectors. These collectors will dry the testa in their backyard, extract the oil and sell it as crude oil to refineries. The residue is sold to animal feed or fertiliser mixing companies.

Linaco has begun to do the drying process itself by investing in a drying, crushing and pressing machine.

“We don't do the refining process ourselves because that requires a bigger volume than we currently have. But we could do that one day.” — Ling

It then sells the crude oil to refineries to turn into cooking oil. "We don't do the refining process ourselves because that requires a bigger volume than we currently have. But we could do that one day," says Ling.

Meanwhile, the coconut shell is used to generate steam to power Linaco's manufacturing processes.

When the volume of coconut shells grew, the company began to turn the excess shells into charcoal. These can be turned into activated carbon, which is an important material in filtration systems and air conditioners. "At this point, we are only turning it into charcoal [before selling it to others]. When our volume grows bigger, we can invest in the process to make activated carbon ourselves," says Ling.

It has to be cost effective to be sustainable

These steps have been achieved in stages over the years. As Ling describes it, manufacturing is a game in which you need enough numbers before you can move to the next step.



“Efforts need to be made to reduce the improper disposal of plastic. Whatever can be recycled should be recycled.” – Ang

The big plastic conundrum

As more companies and consumers demand environmentally friendly products, plastic packaging producers have had to change their product lines. That included offering biodegradable plastic options and products that have recycled plastic components.

Thong Guan Industries Bhd, which was founded in 1942, has been following the trend. Alvin Ang, its executive director, shares that it was his uncle who spearheaded the “Live Green” initiatives under the family business earlier this year.

“I just want to grow the company. This trend is consistent with developments in the plastic industry,” says Ang.

Under the Live Green initiatives, Thong Guan began offering a compostable bag range, implementing a repurposing programme for post-industrial and post-consumer waste, and introducing plastic made of renewable feedstock, among others.

“The industry is moving towards using recycled products in its packaging. The advancement of technology has enabled us to blend superior resins with recycled plastic so it can maintain the mechanical properties of plastic,” says Ang.

He joined the company in 1993, after his father told him to take the place of an accountant who had resigned. Ang has remained there till today.

Over the years, he observed that the plastic industry had a bad image. “When I tell people that my background is in plastics, they look at me differently,” he says. He wants to change that view.

It is undeniable that plastic litter is a serious issue, but Ang argues that it is not the only culprit causing pollution, and that the act of littering is a bigger problem.

“People need to realise that plastic can be recycled. Efforts need to be made to reduce the improper disposal of plastic. Whatever can be recycled should be recycled,” says Ang, who is the chairman of the northern branch of the Malaysian Plastic Manufacturers Association (MPMA).

Many plastic items can be recycled, but they often do not end up in a recycling centre because of littering. Then, contaminated plastic becomes a problem, since it may not make economic sense for recyclers to take it in, Ang says.

Those that do end up in the recycling centre can be turned into various products. Thong Guan has recycling machines in all its plants to recycle excess plastic into garbage bags and other items, says Ang. Some industry players turn recycled bottles into polyester clothing.

What happens after the garbage bag or polyester clothing is used? “It can be recycled again but it does not make economic sense. Maybe when oil prices hit RM200 per barrel, it will make sense,” says Ang. High oil prices translate into higher costs in making plastic, which makes recycling plastic more attractive.

“[Otherwise,] consumers should reuse plastic bags until they cannot be used anymore before throwing them away. Then, they will end up in the landfill. In countries like Japan or Switzerland, they go to an incinerator.”

Ang says it is technically possible to recycle soft plastics such as stretch films, although recyclers may not find it economical to collect it, since it is very light and difficult to store.

In general, maintaining a circular plastic supply chain would require consumers to responsibly dispose of all their plastic products, and for recyclers or collectors to take all the plastic products and channel them to industry players that can turn them into something new. This results in fewer natural resources being extracted to create new plastic.

But this does not always make economic sense, so materials such as straws and shrink wrap tend to escape the supply chain. Downcycled and hard-to-recycle plastic products will eventually reach their end of life and find themselves in landfills or incinerators.

Even the alternative of compostable or biodegradable plastic can be problematic, as it often requires specific conditions to decompose. Therefore, industry players and observers continue to search for relevant solutions to tackle the plastic problem.

Meanwhile, Thong Guan and MPMA are trying to raise public awareness of the potential of recycling, says Ang. “We have a mobile truck that can crush plastic bottles into flakes and turn them into resins that can be put through an injection moulding machine to produce plastic products.”

He hopes the authorities will improve plastic waste collection efforts. Meanwhile, the company is in the process of being certified as a recycling centre for post-consumer waste.

“We have a washing plant to clean the plastic, and turn it into resin to be used for secondary packaging such as garbage bags, shrink films and plastic bags,” says Ang. **E**

Thong Guan introduced its Live Green initiatives earlier this year, which include a compostable bag range and repurposing programme for post-industrial and post-consumer plastic waste

At the same time, there must be demand for the product. Previously, coconut shells and testa were sold to third parties, which generally run informal factories. These days, however, buyers of products such as crude oil demand more in terms of quality.

“Now, they look at whether your iodine level in the crude oil is high. Fifteen years ago, no one cared whether your crude oil had been processed in the right way. They didn’t test for microorganisms and other hazards as much as they do today,” says Ling.

This development presents an opportunity for companies such as Linaco that can undertake the processes professionally. It also helps to spread the cost, as one coconut can now generate more revenue streams than before.

Why aren’t all coconut manufacturers doing this? “We need a good network to sell the by-products. There are also smaller factories that have not crossed the threshold that makes sense for them to invest in machines to convert shells into charcoal, for instance,” says Ling.

He has other goals as well, including owning coconut plantations and using the waste products as fertilisers. “But it needs to come to a certain volume, otherwise it will not be sustainable,” he says. In March, Linaco signed a memorandum of understanding with the Sabah state government to invest in coconut plantations in the state.

Packaging sustainability is also part of his road map. Currently, Linaco’s coconut water is packaged in Tetra Pak cartons, which are recyclable. Some products are still in plastic or aluminium foil packaging to ensure the freshness of the food.

Linaco opts for recyclable packaging as much as possible, says Ling. He hopes technological advancements will allow food to be transported and sold in the freshest conditions, thus eliminating the need for additional primary and secondary packaging.

“We definitely want our food products to be as healthy and safe as possible. But we have to balance it against the cost of production and packaging. We have a target. How to get there is the big challenge and journey for us,” says Ling. **E**

TOWARDS A GREEN ECONOMY

Gamuda Bhd group managing director Datuk Lin Yun Ling talks about the group's journey towards zero-carbon, and why the transition has to be a collective effort on the part of all stakeholders

In recent years, countries around the world, led by the US, the European Union (EU) and China, have accelerated their transition to the green economy to tackle the devastating effects of climate change. As these countries rev up their commitments to transforming to low-carbon, resource-efficient and socially inclusive economies, it will be only a matter of time before it becomes imperative for other countries and economic sectors to follow suit, particularly if it is a prerequisite to doing business.

Transitioning to a green economy, whether for a country or an organisation, requires a multi-pronged approach. In the case of Gamuda Bhd, it's the Gamuda Green Plan that is anchored on four key pillars: sustainable planning and design, and circular construction; community and business; environmental and biodiversity conservation; and enhancing sustainability via digitalisation. But it is through the first pillar — sustainable planning and design, and circular construction — that the development and infrastructure player hopes to make the biggest dent.

Responsible for more than 30% of global carbon emissions and nearly a third of all wastes, the building and construction industry can help achieve climate goals and curb global warming by shifting to a circular economy model. Here, the focus is on more efficient use of resources and greater commitment to the environment by minimising (or even eliminating) waste and pollution, and by improving efficiency. The circular construction approach encompasses everything from the design phase to construction, operations and maintenance, and eventually, deconstruction.

In Gamuda's path towards a green economy, group managing director Datuk Lin Yun Ling emphasises the need to adopt a strategic approach. "We have to ask ourselves where we can make the most impact. No one group or country can do everything. It's a collective effort. For us, being in the infrastructure business, we see that we can make the most impact in terms of concept planning and design."

In an interview, Lin shares his thoughts on the move towards a green economy by countries around the world, why it is imperative for such a transition and Gamuda's experience in seeding the next generation to care, take action and arrive at a zero-carbon economy.

Why is the circular economy important to Gamuda?

Datuk Lin Yun Ling: I think firstly, we'll need to look at the bigger picture. There have been developments over the past year that have been very heartening, not only in the EU — which has been a leader when it comes to the green economy — but also even in the US and China. If there is one thing these three biggest powers in the world agree on, it is that climate change is a threat to humanity. We have this habit of thinking that there is a fine line between an imminent threat and an existential crisis, but the pandemic has shown that there is no fine line: An imminent threat is an existential crisis.

These economies have given their pledges to the world — essentially most have committed to decarbonisation and zero-carbon targets. In the steps these economies have taken, whether in their respective economic development plans or stimulus plans to get them out of pandemic, they are investing and creating new jobs in the green economy. We need to think about what these pledges and the transformation of these economies with green investments mean for us. What will they mean for the other countries in the world? I can see that none of these countries will allow the others "to get away with it". The EU may impose a levy on imports from places with poor ESG (environmental, social and corporate governance) so everyone will have to play their part. We will all be pulled into it whether we like it or not.

“WE HAVE TO ASK OURSELVES WHERE WE CAN MAKE THE MOST IMPACT. NO ONE GROUP OR COUNTRY CAN DO EVERYTHING. IT'S A COLLECTIVE EFFORT.” — DATUK LIN

When did Gamuda's sustainability journey begin?

I'd like to think we started many years back, though it was not done in a very concerted or coordinated way. I remember 25 years ago when we started our township development in Kota Kemuning, we had 30 building contractors under us, and we insisted that all the foreign workers were properly housed in our centralised labour quarters, modelled after European youth hostels, with strong showers, clean beds and good ventilation, as well as a *dobi* and mini-mart. This is what we call enlightened self-interest — you take care of the worker, he's happy, rests well and becomes more productive.

So, when did it shift from sustainability to circular economy?

The circular economy is only one part of the whole ESG effort, and no doubt most directly related to carbon reduction. Our approach has to be strategic — we have to ask ourselves where we can make the most impact. Being in the infrastructure business, we can clearly see that we can make the most impact in terms of concept planning and design. So, with the MRT, that takes a lot of cars off the roads. And now our Penang South Islands (PSI) project, we have master-planned it to be a very low-carbon, smart city. Our target is a 50% reduction in carbon emissions by 2030 compared to a conventional design.

At the strategic level, we opened our first IBS (industrialised building system) factory. This is not a precast factory. It is the digital manufacturing of our construction products. The design of the house or apartment building is done online and is paperless; the data is on the cloud and then sent directly to the robots, and the panels are made based on the online drawings. The panels are then assembled on-site like Lego blocks. We are also digitalising all our management work systems. Two years ago, we put our procurement on a digital platform, so it's very transparent. All



our management employees have access to how the tender and auctions are called; who was awarded. All this information is shared online through a live-stream process.

In the coming years, you will see our green economy initiatives — in how we master-plan our townships and how we bring Gamuda Parks into play with a lot more urban forests, a lot more planting. In the coming years, all the buildings in our developments will be designed to green and very energy-efficient standards.

What guides your approach towards the circular economy model?

Our Green Plan has been finalised. Beyond that, it's important to understand that a company's greenhouse gas emissions are classified into three scopes of emissions. Scope 1 emissions are direct emissions related to our activities. Scope 2 emissions are indirect emissions, basically from electricity generated and distributed by TNB (Tenaga Nasional Bhd). Scope 3 emissions are all indirect emissions related to the value chain.

The Gamuda Green Plan

● Pillar 1: Sustainable planning and design, and circular construction

Achieve 50% reduction in carbon emissions via sustainable master-planning, shared facilities, climate-responsive design and green features, integrated transport planning, super-low-energy buildings with smart features and RE installations, reduction in landfill waste and freshwater demand.

● Pillar 2: Our community and our business

Scale-up community investment efforts via Yayasan Gamuda, including the Enabling Academy, and build capacity and capability in new sustainability and climate science areas through our Gamuda Scholarship programme. Elevate health and safety performance through robust risk assessments and controls and adoption of best practices — prioritising the well-being of the workforce.

● Pillar 3: Environmental and biodiversity conservation

Nurture and plant one million trees and saplings by 2023. Intensify Gamuda Parks' agenda by establishing wetlands arboretum, develop in-house specialists and partnerships with the indigenous community, and conduct biodiversity audits at developments.

● Pillar 4: Enhancing sustainability via digitalisation

Transform into a data-driven organisation by digitally integrating our processes — digital engineering, enterprise resource planning, data warehouse platforms and Building Information Modelling. The focus is on upskilling data literacy and digital skills as key enablers for sustainable growth.

If we look at the bigger picture, and if you've read Bill Gates' latest book *How to Avoid a Climate Disaster*, it tells you that green electricity is the key to the whole world moving towards net-zero. If we can't get carbon-free electricity, then it's going to be very difficult to achieve a zero-carbon economy. Electricity is central to everything.

So, Scope 2 is the biggest elephant in the room: If the electricity is generated by coal-fired plants, what chance do we have to move to a circular economy model?

The government or the Energy Commission has to come up with strategies and a roadmap to zero-carbon and with clear timelines. So far, they have said they want 30% of the electricity generated to be from renewable sources by 2025. There are many issues they have to contend with: Our coal-fired power plants still form the bulk of the power generated. In many other countries, solar energy is increasingly cost-competitive but it is a different form of energy because of the intermittency issue and the need for innovations to enable storage. But at some point, you have to reduce the green premium or additional costs to move or migrate to renewable energy (RE). You have to come up with the right incentive structure. In Europe, as far back as more than 10 years ago, they had already set up an emissions trading system to force that shift.

I feel that if we can green our entire power system, we have a very good chance to meet the Paris Agreement targets. It's not easy because it's a question of how to bring in all these incentives, how to retire the coal plants, reduce the reserve margin and yet keep tariffs affordable. You have to juggle these different priorities to get it right.

Do you think that the absence of a clear roadmap to generate electricity from renewable sources has been a major obstacle to adopting the circular economy model?

Yes and no. In the first place, let's be clear — what we see now are the bits and pieces, like 30% RE by 2025. But we are talking about a roadmap to zero-carbon. When rating agencies look at us and determine our ESG performance, they can understand that we have very little control over scope 2. They would want to see what we are doing regarding scope 1. In our design and planning, we come up with a low-carbon master-plan. Our design puts bicycles ahead of cars. We harvest rainwater and use it just as we do other wastes like food waste. These we address.

What are the challenges in this journey towards sustainability?

It's not unlike elsewhere in the world. By that, I mean it's really down to conviction. The leaders in the group have to own it; they have to have conviction and walk the talk with employees.

What's the recipe to get people to walk the talk and advocate to others?

That build-up of conviction quite often comes from knowledge. When you know the subject matter, the buy-in is better, and from there you hopefully get to a virtuous cycle, where the better you are at it, the more time you will spend on it, and when you spend more time on it, your conviction strengthens. When our people see that the digitalisation of processes and operations makes us more competitive and how we can be successful in the future, they love it. The buy-in is there when they see that.



Building Information Modelling (BIM) is used in projects across the group, including the MRT Putrajaya Line



Gamuda boasts the country's first digital Industrialised Building System (IBS) facility

What buoys your optimism about the sustainability of Gamuda's efforts so far?

As an engineer, I enjoy reading about issues and innovations. But it's like a sort of tailwind when I see all the younger employees being more enthusiastic. Their knowledge is good. Their digital skills are good. That's very encouraging. It's not like we have to force it down our people's throat. We are fortunate that we are not in that kind of situation.

What do you hope to achieve at the end of the day?

It's easier to answer by asking, what if we don't do it? If we don't address climate change, what kind of legacy are we leaving our children and grandchildren? There's no alternative. It's not just issues that are directly pertaining to climate change but a lot has to do with how we treat our foreign workers, how we upskill our workforce and how we approach nature and biodiversity in the right way.

Do you see yourself as a circular economy warrior?

I don't believe in these words because what's the alternative? We can't keep doing things as we have done in the last 50 years. The science is clear — it's not just Greta Thunberg telling us. It's not about being a hero. There's just no alternative.



The Green Tech Park in Penang South Islands will be powered by renewable energy and will feature super-low energy buildings, says Lin

“It's such a waste to throw [demolition debris] away. They could be reused, upcycled or recycled as a last resort.” — Yap

Senviron salvages materials (right) from demolition sites and reuses them in construction projects such as the Concubine KL bar (left)

FROM PAGE 5

Tackling construction waste

Andy Yap first realised the potential of construction waste when he witnessed the demolition of a building. He had just joined his family's demolition business after several years of working in advertising in New York.

In his first site visit, he walked into a high-rise commercial building and saw the general workers smashing perfectly good cabinets and tearing down old wooden doors.

“I knew this debris was going into the landfill. But many of these things were still in good condition, and I knew that there were people out there who needed them. It's such a waste to throw it away. They could be reused, upcycled or recycled as a last resort,” says Yap.

So, he began contacting social enterprises and non-governmental organisations such as EPIC Homes, which builds homes for the less fortunate, and Biji-Biji Initiative, which upcycles materials.

“There were cabinets, furniture, lights, basins, bidets, taps and even toilets. I told them to make a list and take photos of everything they wanted, and I would bring it to my dad for approval,” says Yap.

His father, who founded the demolition company CW Yap Demolition Specialist in 1990, was open to the idea. More than 400 wooden doors, 2,000 downlights and 3,000 carpet tiles were donated to these organisations.

This was the beginning of Yap's side project to salvage construction waste, which is parked under Senviron Ventures Sdn Bhd. Before a site is demolished, he salvages good-quality

materials and stores them in his warehouse.

He does not sell the items. Instead, he donates them to charities and social enterprises, and reuses them for his own projects. For instance, Concubine KL, a bar located in Kwai Chai Hong (or Lorong Panggung) in Chinatown, is furnished with many old timber and window fixtures he salvaged. Yap co-founded the bar in 2019.

Running these side projects while working in the family business keeps Yap busy, but his family has been supportive of his activities.

“Asian families don't like to waste. We didn't have a choice back then because there was no takers for the materials. My family wasn't aware that there were social enterprises who wanted these items. They're very supportive of my effort. My dad even helped me figure out how to build Concubine's outdoor structure with the salvaged timber,” says Yap.

This effort also adds value to the family business. When they tender for a demolition job, Yap makes sure to include an environmental proposal that describes how the company salvages materials.

“Our efforts in salvaging the materials can help clients obtain points in the Green Building Index (GBI) rating system,” he says.

Making the demolition sector circular

The problem that Yap is attempting to address is huge. Most illegal dumping sites in Malaysia consist of construction and manufacturing waste, according to the Solid Waste Management and Public Cleansing Corporation (SWCorp).

Demolition activities generate more waste than the construction sector. Concrete is the biggest component of construction and demolition waste. The rest are glass, steel and wood, among other materials.

Fortunately, some materials always have takers. According to Yap, there will be buyers for the steel, aluminium, copper cables and reclaimed timber. Windows, doors and furniture are harder to give away.

“If I tear down a 10-storey building, 2,000 to 3,000 tonnes of waste is generated per day. I estimate that less than 5% of it is recycled or upcycled. The biggest culprit is actually concrete,” says Yap.

Concrete is made of sand, cement and rocks. Producing concrete can be taxing to the environment because cement manufacturing is an energy- and emissions-intensive process. Rocks and limestone, which are used to make cement, are also extracted from the environment.

Concrete cannot be reused as concrete because it lacks the necessary strength, says Yap, but it can be used to build non-loading structures such as concrete barriers, which is what one often sees at highway construction sites.

So far, Yap has only been able to recycle concrete for his personal projects.

“I do not have the time to slowly process the debris into a recycled product. When we tear down a building, we have to remove the debris in a week. I have limited space in my warehouse.

“If I want to recycle up to 95% of the build-

ing, I also need high demand for concrete debris,” he says.

Fortunately, he has managed to find an outlet. Some construction sites are on soft and unstable ground. After a heavy downpour, machinery and vehicles may get stuck, so contractors often buy small rocks from quarries to stabilise the ground.

“Instead, I offer them crushed concrete debris. I extract the metal so it won't puncture tyres. It's a greener and cheaper alternative, and they don't need to extract natural resources,” says Yap.

Making these practices mainstream will require solutions for the logistics problem. Yap hopes to build a central recycling facility in Klang Valley for this purpose, as there are many new construction sites emerging in the area.

“All I need is the land for storage and processing. That's the biggest cost. With a central facility, I can stockpile the waste and figure out who needs it. I can also do research and innovation,” he says.

It is a win-win solution for the whole sector, he believes. Demolition players who want to save on logistics and disposal costs can send the waste to the central facility instead of the landfill; construction players can scout for reusable and upcycled materials from the facility.

“Many developers are trying to adopt green technology, but it has to make commercial sense. If I can get the authorities to collaborate with me on the central facility, the developers would come to us in the natural course of things,” says Yap.

CHANGING THE REAL-ESTATE ECOSYSTEM FOR THE GREATER GOOD



The Elmina Rainforest Knowledge Centre and Elmina Living Collection Nursery

Leading local developer Sime Darby Property has joined the circular economy movement for the benefit of the planet and future generations.

While the nature of property development is antithetical to the principles of a circular economy, Sime Darby Property is not resigning itself to this notion. Instead, the developer has taken up the challenge to disprove it through its sustainability initiatives, which are focused on lowering construction's impact on the environment and regenerating natural systems. The developer has already embarked on efforts to preserve its natural capital — its land — by ensuring a balanced flow of renewable resources and more prudent use or substitution of non-renewables.

The City of Elmina development serves as a shining example of Sime Darby Property's aspiration to adopt circular economy principles in its townships. Boasting a masterplan designed to sustain its existing forests and waterways as well as native flora and fauna, the township offers an idyllic living environment in which people and nature thrive symbiotically.

To further expedite this important endeavour, Sime Darby Property has set up the Elmina Rainforest Knowledge Centre (ERKC) and Elmina Living Collection Nursery (ELCN). Both facilities are designed to enhance biodiversity and help mitigate the impact of climate change. They also act as centres that connect society to nature. Sime Darby Property is also replanting an urban rainforest, which will take up 84 acres in the 300-acre Central Park and is designed to act as a carbon sink.

BOOSTING LOCAL BIODIVERSITY

Both the ERKC and ELCN, which occupy a total of nine acres, provides the public with knowledge about the importance of biodiversity and the need to conserve nature. The on-site biodiversity conservation and educational programmes at ERKC are overseen by the Tropical Rainforest Conservation and Research Centre (TRCRC), which aims to protect Malaysia's rare, threatened and endangered plant species.

At the ELCN, endangered tree species are grown in the nursery. The threatened flora species replanted here have been identified by the International Union for Conservation of Nature (IUCN) as being at different threat levels, from "at risk" to "critically endangered". Some of these local species are also found in the adjacent Bukit Subang Forest Reserve (Bukit Chera).

A unique operating model was developed where these rare, threatened, and endangered

plant species are sold to Sime Darby Property, which helps to sustain the operations of the ERKC. Furthermore, by having its own nursery, the developer has created a sustainable supply of flora, which it can use for its expansive landscape plans, which not only benefit society but also provide space for nature.

The developer's aim is to plant up to 50,000 IUCN Red List trees across all its townships with an ultimate target to plant a total of 160,000 trees by 2030. The trees will sequester up to 30,000 tonnes of carbon dioxide, on top of acting as high-value carbon sinks.

EMBRACING THE REUSE-RECYCLE CONCEPT

Recycling is a necessary component of a circular economy, as the model focuses on minimising waste. Ultimately, it is about introducing effective solutions to waste management while maximising value by providing end-of-life solutions to reduce, reuse and recycle products and materials. Sime Darby Property has always been a proponent of this concept, and it has showcased the capability to expand its participation beyond its current capacity.

In 2019, the company embarked on a sustainability assessment of its business to determine the most impactful contributions it could make in delivering a greater purpose tied to the United

Nations' Sustainable Development Goals (UN SDGs) 2030.

In March 2020, Sime Darby Property introduced its 2030 Sustainability Goals, consisting of 18 goals that support the SDGs 2030 with measurable targets that are beneficial to all stakeholders. Both the ERKC and ELCN are already providing tangible delivery of at least 11 out of 17 UN SDGs and six out of 18 of the developer's 2030 Sustainability Goals.

This initiative includes establishing a more holistic circular green supply chain, in which the developer has introduced more recycled materials in its developments while extending the life cycle of products used. The ERKC structure itself is a prime example of this sustainable approach, as it features sustainable and tropical designs inspired by the 1930s Guthrie estate buildings.

The ERKC building was constructed using recycled components from Sime Darby Property's Idea House (SDIH), previously located in Denai Alam, demonstrating the viability of reusability and recyclability of building materials in construction. The SDIH was built in 2010 and dismantled in May 2018. About 45% of the SDIH was recycled into the ERKC.

It is common knowledge that existing commercial buildings are not designed for easy deconstruction. In the case of SDIH, however, Sime Darby Property showed how the construction of the ERKC can leverage circular design

principles to extend the life cycle of a building as well as its materials.

The building materials used for the ERKC were selected because of their Green Label certification. The building also boasts an eco-friendly design, which promotes natural cooling through effective shading and enhanced cross-ventilation. It is also equipped with a rainwater harvesting solution and a photovoltaic solar roof, providing average power savings for about 50% of the building's energy requirements.

REGENERATIVE APPROACH TO BUSINESS

Sime Darby Property's application of circular economy principles expands beyond structures. Operational eco-efficiency stands as a core pillar, covering the company's carbon, water and waste footprints. In 2010, it initiated the Carbon Footprint Project, designed to lead the company to become operationally carbon negative by 2030.

In 2016, the developer also launched its Water Footprint Project to reduce its water intensity by 30% within 15 years. Just last year, it implemented best practices of sustainable use of non-potable water, which eliminates adverse environmental impact.

The developer has also been actively involved in lowering its operational waste generation. Launched in 2016, the Waste Footprint Project incorporates the recycling of construction waste from sites, further reducing construction waste by applying the Industrial Building System (IBS) in construction.

Sime Darby Property also launched a community Solid Waste Recycling programme in 2016, beginning with a structured programme in Bandar Bukit Raja before introducing it in other townships. So far, the developer has facilitated 185 tonnes of household domestic waste recycling (equivalent to almost 180 tonnes of carbon dioxide offset), which has also provided funds to the communities. This marks a major green initiative by the company involving collaboration with communities, councils and recycling companies.

By embracing innovation and change and adopting a resource-efficient and sustainable approach to business, Sime Darby Property is not only leading the charge towards a zero-carbon, circular future, but also helping to create a sustainable and environmentally friendly future for its business and clients. Ultimately, by applying circular economy principles to its business, Sime Darby Property is creating a positive and long-lasting impact on the environment as well as the industry.



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*Group Chief Executive Officer
DPO International*

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Koong Wai Seng

*Chief Executive Officer
SkyWorld Development Group*

“HSBC Malaysia has played an instrumental role in our transition journey into sustainability, supporting the group in our first sustainable financing. HSBC's expertise in sustainability and deep understanding of our business enabled our swift transition and maiden venture into the manufacturing of liquefied carbon dioxide from raw gas, effectively reducing harmful gasses being released directly into the environment as waste.”

Raymond Gan

*Chief Executive Officer
Kelington Group Bhd*

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Making the circular economy model work requires not just business initiative but also government action, says Business Council for Sustainable Development Malaysia (BCSD Malaysia) executive director Roberto Benetello.

The circular economy calls for systemic changes to the current economic model. It involves new business models such as resource sharing and product life extension, so materials can be kept in use as long as possible. It also demands that waste be turned into valuable raw materials, so natural resources no longer need to be extracted from the earth.

In Benetello's view, for circular practices to be mainstream, a clear and supportive regulatory framework is needed. Otherwise, initiatives by companies will encounter numerous roadblocks.

He cites a project that he is working on as an example. "We are trying to recycle the single-use plastics utilised by patients who do dialysis at home. To do that, the plastic has to be classified as normal waste instead of clinical waste. And we need the Ministry of Health and Department of Environment to agree on that. This plastic is not contaminated and can be recycled."

There are many other examples, he adds. "The recyclers are worried that they'll get fined for recycling certain scrap products. You can imagine that this is a big deterrent for entrepreneurs who want to start something in this sector."

BCSD Malaysia is a CEO-led collaboration and

BCSD Malaysia's focus areas



Circular Economy



Cities & Mobility



Climate & Energy



Food & Nature



People



Redefining Value

Making a big splash

The circular economy demands that systemic changes be made to the current linear economic model. Achieving this will require collaboration among all stakeholders, be it government, businesses or consumers.

advocacy platform that focuses on integrating sustainability into business strategies. It is part of a global network encompassing around 5,000 companies worldwide.

As one of its focus areas, BCSD helps companies incorporate circular and sustainable strategies in their processes.

"Many of our colleagues in other countries have already done the projects that we want to do. We bring their experience into the projects in Malaysia and avoid wasting time reinventing the wheel," says Benetello.

New regulations on waste categories need to be adopted, taking into consideration the latest technologies to manage these materials, he adds. Extended Producer Responsibility (EPR) schemes, which require manufacturers or importers of products to take responsibility for the impact of their products, are also helpful.

That is not to say no steps have been taken. As part of the Roadmap Towards Zero Single-use Plastics, a Circular Economy Roadmap for Plastics in Malaysia was supposed to have been introduced last year. An EPR scheme was proposed in the 12th Malaysia Plan.

"An association formed by the biggest food and beverage companies in Malaysia has also got together to explore an EPR programme for plastic. It's a good thing, but the government needs to also take the lead and set some important parameters," says Benetello.

He advocates big, transformational changes in the system because they are needed to mitigate climate change. "We don't have time. We don't know whether we are able to limit temperature increase to 1.5°C at this point. We have to move fast," he says.

"In many countries, companies are told by the government to be circular. If you are a small company and you are part of the global value chain, those rules will force you to comply with circular economy and sustainability requirements."

— Benetello



What's in it for companies?

There are many reasons for companies to go circular. For one, they could find new clients in other parts of the world where sustainability regulations are stricter, says Benetello.

"In many countries, companies are told by the government to be circular. If you are a small company and you are part of the global value chain, those rules will force you to comply with circular economy and sustainability requirements."

In addition, adopting circular practices can increase the reputation of companies, especially among younger consumers who emphasise sustainability.

"Another big driver is efficiency and cost control. When your processes are more efficient, you can achieve savings," says Benetello.

Technology advancement in the fields of artificial intelligence and the Internet of Things can help companies become more efficient. "It can give you new dimensions on how to classify and track your waste. Traceability of waste is very important," says Benetello.

What are some low-hanging fruits in this area that companies can embrace to begin with? They can innovate and look for new revenue streams, he says. "For instance, some companies are using recycled materials to make furniture. Some are using scrap material to create art.

"They can also optimise their resource consumption, reduce waste, reduce energy consumption and achieve some savings there."

A huge area of potential in Malaysia is oil palm biomass, which is the by-product of palm oil milling and harvesting. "You can use the pulp and make paper or cardboard," he says.

The construction industry could rely on apps to match the demand and supply for scrap products. Meanwhile, the fashion industry can expand the second-hand market. It should also come together and discuss how to make products more recyclable. Clothes with a mixture of cotton and polyester, for instance, cannot be recycled.

An emerging opportunity, Benetello adds, is in the recycling of lithium-ion batteries.

"The transition into electric vehicles is creating a lot of these batteries. At the end of its life, it has to be dumped somewhere. This market is estimated to grow to US\$18 billion by 2030. We cannot keep mining lithium, cobalt and nickel forever. Some of these elements need to be recycled, and it's a huge opportunity that can change the economy of a country," he says. — By Tan Zhai Yun



PICKLES AUCTIONS BRINGS TRANSPARENCY AND INTEGRITY FOR ASSET DISPOSAL

With the post-COVID economy now becoming more certain, organizations are acting on their recovery plans. This means restructuring, reorganization, or even dissolving entire business units. What remains is a significant problem of reclaiming the sunk capital that is now trapped in idle, underutilized, or obsolete equipment and machinery. The need for exchanging equipment and machinery has grown with the pandemic, but the conduct and sale process remains murky with significant risk for graft and side deals taking place. Fast moving organizations are turning to international auction houses who bring large databases of buyers and advanced competitive bidding tools and technologies to maximize the return on every asset put to sale.

The Emergence of Industrial Auctions

Savvy managers have discovered how to dispose of their assets quickly in thriving competitive marketplaces. International auction companies like Pickles Auctions, who have been operating in Malaysia since 2017, bring large databases of local and international buyers along with comprehensive digital marketing teams and secure high speed bidding technology. These auction houses typically provide a step-by-step solution, which include finance, valuations, asset preparation, and an international buyer base. The process is structured to maximize the return since the commission is set by the sale price.



“By their nature, auctions are transparent and auditable,” says Joey Caisse, General Manager of Pickles Asia, headquartered in Malaysia. “We leverage our database of over 15,000 buyers in Malaysia and over 150,000 buyers internationally to make the bidding comprehensive and competitive. Companies that use our service know that the last hand in the air is the highest price on the day.”

The Pickles team brought integrity and transparency to our tender process. It made the disposal decisions very easy for our board as they were confident with the international approach to the bidding process. The Pickles team are experts and the results speak for themselves.

Ang Han Sin - Finance Manager, Q-Team

“We were selling direct for many years. We were introduced to Pickles and they made the disposal process much easier. Their team took care of the inspections, valuations, marketing, and the entire sale process and all payments were on time as promised. They were able to fetch a good price even considering the current market conditions.”

Kenneth Liew, Director of Fook Lift Sdn Bhd



Founded in Australia in 1956, Pickles is the largest auction company in the region with over 1,000 employees and RM7.8 billion in sales last financial year. They have six Malaysian facilities located in Selangor, Penang, Johor, Pahang, Sabah, and Sarawak and service Malaysia's largest publicly listed companies including: AmGeneral Insurance, Allianz, AXA, Maybank, Affin Bank, Sunway Construction, POS Logistics, Proton, Sime Darby, and among many others.

Auction results are a boon for companies like Sunway Construction, where Pickles recently sold two end-of-project Light Rail Transit Launching Girders for over RM1,000,000. Sunway struggled to find buyers for a unique asset built for one purpose. Selling to their usual suppliers didn't work, so they turned to Pickles for a solution. “Pickles provided a full-service asset disposal platform including valuations, marketing, sale, and payments made on time. We selected Pickles because their process is transparent and auditable. Their professional team and large buyer database produced great results and we are looking forward to a long-term relationship. I would recommend Pickles to anyone seeking transparency and integrity in their asset disposal process,” said Derrick Tang Beng Khuan, Senior Manager at Sunway Construction.

The Hong Seng Group, respected for their rebuilt truck business, recently encountered a storage yard cleaning challenge. William Teoh, Assistant M.D. of the

Hong Seng Group started selling by auction and said, “Pickles made the disposal of our end-of-life assets easier. They were able to find buyers for our hard to sell assets. The team at Pickles are quite innovative in their approach as well. The entire process is transparent, and they take the integrity seriously. We are happy with the service provided.”

Making a Positive Contribution to the Circular Economy

By auctioning industrial assets, businesses are positively contributing to local economies, the environment, and their balance sheets. Pickles understands the value in guiding their partners into a regenerative-focused business model. Therefore, entering the circular economy, through buying or selling, is a simple and seamless process. Unlocking this precious cash flow can then be reinvested into the new economy. Smaller businesses enjoy the open and transparent bidding, which has been historically hidden or only offered to a select few.

With delays in international production and delivery, many are turning to locally owned industrial equipment for sale. Buying at auction also gives business owners an opportunity to secure assets at a transparently arrived price. There are no losers in a negotiation. The highest acceptable offer secures the item and after payment they can take possession. It is fast and easy for all involved.

Pickles plays this critical role in the Circular Economy by bringing a community of traders together into an efficient marketplace. Buying or selling by public auction is the best way to take advantage of a thriving market. With a continual commitment to making this community successful, there are plenty of reasons to engage the Pickles sales services:

- Trusted by more listed financial institutions than any other auction company in Malaysia
- Transparent and auditable processes, locally lead and internationally trained
- Largest database of industrial buyers and sellers in the region.

WHO IS PICKLES?

Pickles Australia is proudly recognized as the #1 auction and valuation specialist in Australia with over 1,000 staff and an annual turnover exceeding AUD\$2.4 billion dollars. In 2017, Pickles Asia was established in Malaysia as the first overseas office bringing Pickles services to the thriving Asia-Pacific market. Pickles works with major clients including insurance companies, banks, governments, local councils, fleet and lease companies, car manufacturers, and not-for-profit corporations. Pickles Australia now provides invaluable resources and advice to assist in the thriving used goods industry in Malaysia.

BY SREEREMA BANOO

For Juliana Adam, the most gratifying aspect of the work she does in the sustainability and circular economy space is the resulting impact on people and communities. “The environment angle is also a plus,” says the 35-year-old, who is the CEO of Biji-biji Initiative, a social enterprise set up in 2013 to share progressive ideas on sustainability and waste issues. “I am more interested in the changes and impact of our projects on people, for example the communities we work with. To see the smiles on their faces whenever we teach them how to make plastics into art, and to give them the ability to improve their livelihoods with their own skills and ability, that’s the push for me,” she says.

One of Biji-biji Initiative’s founding partners, Juliana spearheads the social enterprise’s flagship circular economy campaign, Beyond Bins. The campaign approaches the circular economy by giving waste a newfound value while at the same time providing underprivileged communities with alternative sources of income. Beyond Bins strives for a circular economy by connecting corporate players, the underserved communities and the social enterprise’s partners.

“The essence of Beyond Bins is to promote sustainable living to the communities in need and to



Our forte within the circular economy loop is being on the ground and connecting with people and communities to slowly change their mindset towards sustainability. And that’s my motivation – to bring change to people and communities.” – Juliana

Seeding the circular economy

Biji-biji Initiative CEO Juliana Adam on the importance of engagement, communication and collaboration to further sustainability goals

the larger public. We do this by providing a small-scale plastic recycling machine, which is inspired by and built based on the open-source blueprint of the Precious Plastic project by Dave Hakkens,” she says, adding that the machine is placed at identified communities that have been given a period of training.

The campaign is currently engaging with two communities — an Orang Asli village in Batu 12, Gombak, and a community in Kampung Selayang Baru — in collaboration with PSPK (Pertubuhan Perkhidmatan Sosial dan Pembangunan Komuniti Daerah Gombak, Selangor).

“We teach these communities about sustainability, how to use the machine and how they can make money from the machine by making new products from recycled plastic. Normally, these communities would just sell the plastic waste to a recycler, but by using the machine, they can get a higher value for it because it’s shredded and also separated. So, that’s one part. At the same time, we’re showing them ways they can get more income by creating new products from the recycled plastic such as cups and coasters that they can then sell,” says Juliana.

The campaign also lends a helping hand by connecting the communities with corporations that are keen to advance their corporate social responsibility (CSR) initiatives by buying these products as part of their marketing campaigns, she says, adding that the social enterprise receives a commission on the products sold.

“Given Biji-biji Initiative’s reputation as environmental warriors, corporates already tend to gravitate to us when they are planning their CSR and outreach campaigns,” Juliana says, stressing that the social enterprise is careful about who it engages with. “We don’t do greenwashing and we emphasise that the companies too need to undertake certain steps if they want to engage with us. For example, if they want to show that they are a green company and that certain products are green, then we ask them for more details about the production of these items, how they are planning for the end of life for these products and if they don’t have a recycler, we introduce trusted recyclers to them so that the loop can be closed.”

With the Beyond Bins campaign, Biji-biji Initiative works with the corporates to come up with the desired products. Collaborating with freelance industrial designers and engineers, a mould and a prototype for the product are created, which are then used by the communities to produce items from recycled plastic. Some of the clients include Nestlé, Adidas and a few beauty brands, says Juliana.

Besides the positive response from corporates, one of the most satisfying outcomes of the campaign has been the response from the communities. “Mary, one of the women from PSPK, for example, has been recycling for a long time but now she’s influencing her family to be more conscious about plastic waste and the ways waste can be upcycled. So, it’s these ripples that we’re creating,” she continues.

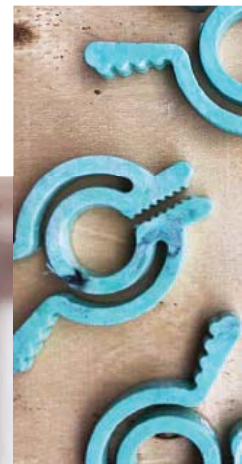
But the campaign is not without its challenges. “It’s a slow game with the Orang Asli who tend to treat plastic as if it’s a natural resource like leaves. So, they’ll burn or bury it. It’s a steep learning curve because we need to raise their awareness about sustainability and help them see the potential of recycling the plastic rather than destroying it.”

Juliana concedes that while generally more people seem to be aware of the importance of shifting to a circular economy model of production and consumption, it is still not widespread.

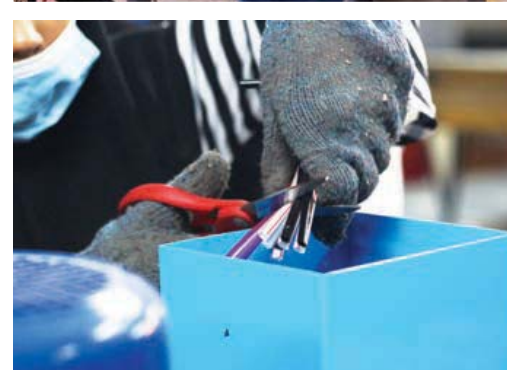
“It’s challenging to get people into the circular economy ... even with single-use plastic, for example, it’s very difficult to get people to say no to it. There’s also not much support for those who want to recycle — you have to drive to drop off your recyclables,” she says, pointing out that this is where the local authorities can play a bigger part in providing a more standard collection for waste and recyclables. “People also need to have the trust that the items will actually be recycled.”

Work in progress

Despite her work in raising awareness of recycling and the circular economy, Juliana does not consider herself a green warrior. “I feel I’m not that gung-ho. Although my friends do get annoyed when I bring up the use of single-use plastics like straws,



Underprivileged communities like the Orang Asli are taught to use the plastic recycling machine to make new products from recycled plastic





Some of the products made from recycled plastic include coasters and cups

when I did an audit on myself last year (during the Movement Control Order), I was surprised by how much single-use plastics I too use.

“So, working in this realm, I feel that there is no such thing as an expert in sustainability. There’s something new to learn every day. For example, even if I know how to recycle a particular type of plastic, there are still other types of plastics. The learning never stops; it’s always a work in progress,” she adds.

Having spent a decade working in the sustainability realm, including co-founding Taboo Enterprise — an events-based company focusing on sustainable event management — and Me.reka, an alternative education space nurturing creativity and sustainability in STEM-centric education, Juliana believes that the biggest lesson is that one cannot go at it alone.

“We need to work with other players and to get other stakeholders involved because if not, we’ll only be working in silos,” she says. Although there are many other non-governmental organisations doing similar work on sustainability, they are not working collaboratively, she notes. “This is challenging because even those working in this space fear competition.”

Through her work at Biji-biji Initiative and the Beyond Bins campaign, Juliana often engages with various stakeholders, for instance, fast-moving consumer goods (FMCG) companies and the Malaysian Plastics Manufacturers Association. On the latter, she says that though plastics manufacturers tend to be viewed less favourably by the environmentally conscious, they too have a role to play in the sustainability story. “They tend to get a bad rep but we collaborate with them because they too are looking for ways to make their processes and products more sustainable. So, even though we’re fighting to tackle plastic waste, we also work with manufacturers to prolong plastic life.”

As for the FMCG companies, she reckons that as the larger players move towards closing the loop and shifting to a circular economy model of production, others will follow suit. Other stakeholders including retailers also have a role to play by having platforms where consumers can send their recyclables. “These are the players that can give a bigger push towards sustainability, for example by having refilling stations or offering buyback services.

“Our forte within the circular economy loop is being on the ground and connecting with people and communities to slowly change their mindset towards sustainability. And that’s my motivation — to bring change to people and communities.”

Juliana’s recent experience as an Acumen Malaysia Fellow has also boosted her sustainability journey. “There is a tendency for people to have this imposter syndrome, where those who are doing good feel that they are not doing good enough. I’ve had that feeling too but through this fellowship programme, I have learnt that although we each may be making small dents, together we could make a huge dent.

“So, when you think about it, although we may feel that we are small fries and what we’ve done is not enough, it is actually enough. That’s because there are many fighters like us and when we get together, that’s when the actual change happens.” **E**

Kind to people and planet

Fashion designer Estee Chan is taking baby steps into the world of circular fashion with her eco-friendly streetwear brand, STUF

“

The pandemic has pushed me to want to do more to help the environment and address pollution.” — Chan



Estee Chan’s foray into the fashion industry was an eye-opening experience; it got her thinking about the industry’s impact on the environment and the well-being of those who wore her clothes.

The 26-year-old fashion design graduate of Hong Kong’s Raffles Design Institute started a womenswear brand, Eveiller, not long after her return to Malaysia. “About a year later, I asked myself whether all I wanted was to run an ordinary fashion brand. I felt that I could do something more,” she says, adding that this sense of discontent and restlessness was exacerbated by the realisation that the industry was behind a significant amount of fabric waste.

“My factory was in Kuala Lumpur and I would visit regularly for quality control inspections. Each time I was there, I saw fabric cuttings and leftover pieces on the floor. I was very disturbed by this, and even during my studies, when we would produce really complicated designs, there was so much fabric waste.”

It was around this time that Chan stumbled upon Tencel, an Austrian brand of wood-based fibre called lyocell. Although she was aware of the fibre during her studies, she had not encountered it until she found that a local bedsheet brand used it extensively in its collections.

One could say it was love at first touch. Impressed by the quality and texture of the fabric made from this fibre, Chan carried out further research on the material.

“I found that there are so many advantages to Tencel for both for the wearer’s skin and the environment. This material is bio-based without any synthetic fibres, so there are no plastic or toxic chemicals; making it biodegradable and compostable.

“It’s soft to the touch and comfortable on the skin. I could see its potential and this sparked my interest to start an eco-friendly clothing brand focusing on streetwear, which I found that no one had done before in Malaysia. I wanted to be the first to introduce Tencel in clothing in Malaysia,” she says.

She launched STUF in October 2019. The name, which stands for Save The Uncertain Future and Solve The

Unpleasant Feeling, represents the two priorities for the business: the environment; and the comfort and well-being of those who wear her products.

Chan’s foray into sustainable fashion is on the heels of many in the global fashion industry that are seeking solutions to address the significant waste that the industry generates.

The Ellen MacArthur Foundation, a charity that works with business and education to accelerate the transition to a circular economy, reports that more than US\$500 billion (RM2.06 trillion) of value is lost every year, owing to clothing underutilisation and the lack of recycling.

Furthermore, this take-make-dispose model has numerous negative environmental and societal impacts. For instance, total greenhouse gas emissions from textile production, at 1.2 billion tonnes annually, are more than those of all international flights and maritime shipping combined. Hazardous substances affect the health of both textile workers and wearers of clothes, and they escape into the environment.

Global brands such as H&M have already made inroads into more sustainable fashion, setting targets to use only recycled or other sustainably sourced materials by 2030.

At international Dutch retail clothing store chain C&A, meanwhile, more than half its collections are made from bio cotton, recycled and recyclable materials, or Cradle to Cradle Certified™ fabric. The latter refers to the fact that they were designed and manufactured in a way that is benign to the environment and human health, and whose materials can be recirculated safely into industrial materials or composted into the soil.

Although Chan has been taking baby steps into the world of sustainable fashion since starting STUF, her awareness of how the circular economy model can change the fashion industry for the better has heightened.

The linear model, particularly with its emphasis on synthetics, troubles her. It is not just the fact that these fabrics that end up in the landfills are not biodegrad-

CONTINUES ON PAGE 17

Cradle-to-cradle homes with kenaf

Tim Tan, a self-described “IT guy gone wrong”, has spent the better part of his professional life developing new products and, from there, new businesses. So, when he stumbled on kenaf a few years ago, the 58-year-old did not just find the answer he was looking for in his quest for an affordable and eco-friendly building material; having spent some three decades in the building materials industry, Tan saw in kenaf the chance to close the loop on building materials.

Kenaf is a major crop in Africa and Asia, and the use of kenaf fibre has, over the years, diversified from its historical role as a cordage crop (to produce string, rope, twine and sackcloth) to thermal insulation and soundproofing solutions in construction and in the manufacturing of medium-density fibreboard for the furniture industry. The automobile industry has also been using kenaf fibres to replace synthetics in car interiors such as door panels, dashboard coverings, seat backs and cushions, to name a few.

The kenaf plant is a cousin to okra, cotton and the hibiscus, and every part of it can be used. “The best use of the leaves and shoots is for animal feed. It is highly nutritious, with about 30% crude protein. Waste components of the plant can be upcycled as plant-based animal feed, and any other waste can be turned into compost to replace chemical fertilisers,” Tan says.

It was the fibres of the plant, however, that most intrigued Tan. In a kenaf stalk, there are two fibres — the inner and the outer, or the core and bast respectively. From his initial research on the plant, Tan found that, like hemp, which is a widely used biomass building material, the kenaf core could be used to make fibre-based bricks, or kenafcrete, which is ideal for building affordable houses.

Tan built a business anchored on the circular economy model — where all resources are reused or upcycled into more valuable products and nothing is wasted. Affordable Abodes, which he started with a partner in 2015, sought to reduce the carbon footprint of the production and transportation of building materials while creating more jobs locally.

The idea was to encourage paddy farmers, affected by climate change, to farm kenaf, thus increasing their income, as well as employ local youths in the manufacture of kenaf fibre building materials. “Apart from offering the chance to put a roof over the heads of the poor, we saw this as a way to train people and lift them out of poverty and bad social situations,” says Tan.

Tim Tan, who started Affordable Abodes to build affordable homes for the underprivileged, is furthering his research into expanding the use of kenaf as a building material. The day may come, he believes, when entire houses can be constructed from this plant.

Everything was done from scratch. Following research and testing in the backyard of his partner’s house in Muar, Tan came up with a brick-like material that is 90% composed of kenaf core. To bind the fibres, Tan used an industrial waste lime product — upcycling it to produce a binder, thus replacing cement. “We then went to a kenaf farm in Pahang to set up a small factory to produce the raw materials and then brought them to Muar to cast into kenafcrete blocks.” With these, they built a small 700 sq ft house.

“I saw this as a fantastic solution for rural developments,” he says, adding that the next couple of years were spent on further testing and securing approval and accreditation from SIRIM. Its products also have the Construction Industry Development Board’s Industrialised Building System certification.

“In terms of sustainability and the circular econo-

my, I have not come across anything as close [to these concepts] as what we do with kenaf. Throughout my career in the cement industry, we looked at environmentally sustainable cement, one that was not heavily dependent on burning limestone,” he says, pointing out that cement, concrete and steel produce about 30% of global greenhouse gas emissions.

“Kenaf fits in well with our goal to find a good-quality building material that lasts and is safe for the occupants because it’s not just a matter of putting together a shelter for the poor. In the end, if we don’t use the right materials, they end up spending more money repairing the house. Income is wasted, so we’d rather do something once and make sure it’s right from the beginning. Although they are poor, they deserve everything that we deserve,” he says, adding that a house made from kenaf can be delivered on a RM65,000 budget.

Tan has spent the past year developing new kenaf bast fibre technology for more building applications



In terms of sustainability and the circular economy, I have not come across anything as close [to these concepts] as what we do with kenaf.” — Tan





Further innovation in kenaf building materials

In 2018, the enterprise made a foray into prefabricated kenaf panels instead of blocks. Each of the 3m by 0.6m panels is load bearing — able to bear a load of five tonnes. “So, it’s technically possible to build a 2½-storey low-rise development with kenaf core panels,” he says, adding that, so far, Affordable Abodes has supplied kenaf products for 14 dwellings.

In the run-up to 2020, the company was all set to roll out its products when the Covid-19 pandemic hit, putting the brakes on new projects. “The pandemic set us back quite harshly because nothing is really moving in the low-cost sector,” says Tan.

What’s more, with national borders closed, Tan, a Singapore national, has also been unable to return to Malaysia. But he has not been idle this past year. “We are currently developing new kenaf bast fibre technology for more building applications. So, it’s not just the kenaf core that we’re using to develop building materials.

“With the kenaf bast, we can also make fibre composites that can replace fibreglass. I had already known this was possible, but a couple of years ago, we did not have all the resources to carry out the research to develop this. I had in mind that once we had more funding and investment and were able to scale up, we could explore this. Now that I am locked down in Singapore, that’s what I am doing: focusing on the research.

“Now, we have the building solutions for the walls, but in future, I want to make roofing out of kenaf fibre composites, as well as make the doors, windows, frames and even furniture,” he says, adding that such solutions would replace timber and put a halt to deforestation.

“There are still many things that can be looked at. The floor slab, for example, is made of concrete and roofing is made of steel or clay tiles, which are also not very good for the environment and also uncomfortable. So, we’re trying to make kenaf fibre composite roofing, which is insulated, so the houses will be cooler,” he says, pointing out that the walls are already insulated, as kenaf fibre panels comprise more than 90% fibre.

Tan envisions that the day will come when 100% of a house can be built from kenaf. He concedes that glass windows cannot be replaced but, pointing to old kampung houses, he says louvered windows and shutters are more sustainable options in the long run. “They made more sense to keep the heat out. As it is, we consume too much energy because of glass. By having a well-insulated house against the heat, you won’t require as much energy to cool the house down,” he says, adding that building a sustainable house boils down to a combination of using the right materials and good design.

“From our research, a kenaf house can absorb the equivalent CO2 emission of one to two cars per year — that’s about three to four tonnes of CO2. The houses are also fully recyclable. Typically, brick houses last 30 to 40 years and we expect the kenaf houses to last at least 50 years. And at the end of the life of the house, the panels can be repaired or, if not, they can be dismantled and recycled. We can use the same raw materials to manufacture kenafcrete again,” he says, not discounting the possibility of eventually building cradle-to-cradle houses.

Moving beyond proof of concept

Although things have been slow because of the pandemic, Tan says the company is close to securing a deal to build a 100-bed nursing home in a mixed-use development in Juru, Penang. Although details of its participation in the development, which also includes low-cost housing blocks and a school for the underprivileged, have not been finalised, he reckons that it could be a combination of elements.

“We could provide the walls for low-rise structures because these will not need much structural reinforcement. In any case, our panels are structural grade, so that will save money and time. The building will be cooler as well because the panels are insulated and can absorb sound, which is important in a nursing home,” he says, adding that hopes are running high for the project to commence by the end of June or July.

Given the visibility of the project, Tan hopes that it will be the catalyst for more jobs in the future. He is grateful for partners, associates and prospective clients who appreciate what Affordable Abodes is doing.

The research he has undertaken and amassed over the years has also made Tan a staunch advocate of kenaf. Although the kenaf industry in Malaysia was established some 15 years ago, with the National Kenaf and Tobacco Board of Malaysia having allocated 2,000ha for smallholders to cultivate kenaf, it has not yielded the desired finished products.

“The initial intent of the industry was to supply to Proton and the automotive industry, but they’ve not come up with the right technology; I don’t know why that is. Instead, kenaf is used for mattress stuffing much like coconut fibre. But coconut fibre is really a waste product and here you’re growing a plant for fibre and using it like a waste product ... So, it’s a missed opportunity,” he laments.

So, how can kenaf potentially impact the building materials industry? “In a hectare, we can plant the crop 2½ times a year (four-month planting cycle). So, for that, we can produce enough biomass to build about 15 small (700 sq ft) houses. If Malaysia planted 1,200ha of kenaf, that’s a lot of biomass, which can build several thousand houses.”

Affordable Abodes’ goal, he adds, is to build 10,000 houses a year. “To do that, we need to build four factories. Our existing factory can produce only 800 to 1,000 houses a year,” he says, adding that he hopes to roll out the kenaf fibre building material technology across Malaysia and the region.

Gratified by the response and impact of the enterprise so far, Tan holds close to his heart the ethos that one does not do business with just one’s mind. “We have to put our hearts first to solve these problems and, with the help of God, we work together to accomplish those goals. That’s how we see this business in the long term.” —By Sreerema Banoo

Back to basics

FROM PAGE15

able but that every wash leads to microfibrils polluting our rivers and seas. “They end up in the ocean and our food chain, so it’s important to raise awareness that what we wear can be harmful to us,” she says.

A report titled “A New Textiles Economy: Redesigning Fashion’s Future” by the Ellen MacArthur Foundation and Circular Fibres Initiative found that, during textile use, trillions of plastic microfibrils are released through washing. Most of these ultimately end up in the ocean, contributing to ocean pollution. In recent years, plastic microfibrils from the washing of plastic-based textiles such as polyester, nylon and acrylic have been identified as a major contributor to this issue.

The report found that, annually, around half a million tonnes of plastic microfibrils — equivalent to more than 50 billion plastic bottles — resulting from the washing of textiles are estimated to be released into the ocean.

A balancing act

Chan sources Tencel from Austrian-based company Lenzing, which produces the lyocell fibres from sustainably farmed eucalyptus trees. “For every tree that is chopped is down, more trees are replanted to replace them. But the most interesting part of the production process, and what makes the material so sustainable, is that less water and energy and non-toxic chemicals are used to produce the fibres. A closed loop process is also used to produce the fibre,” she explains.

Working closely with Lenzing and the fabric mill in China, Chan is focused on ensuring that her products are sustainable. What’s more, she has also opted for digital printing instead of dyeing to reduce pollution and the impact on the environment.

“With STUF, it’s been a very different realm. With the womenswear brand, it was all about designing, keeping dead stock and there was so much fabric waste during the production process, especially with complicated design, whereas for STUF, there’s very minimal leftover fabric.

“As a fashion designer, you’re always thinking about creating complicated and cutting-edge designs but, at the same time, there is all that fabric waste. So, it’s a question of balancing the two.

“The Covid-19 pandemic has transformed my mindset. The focus is now on going back to basics; it’s not so much about fashion anymore but comfort and simplicity, and basic items like the T-shirt can be used in a variety of occasions. The pandemic made me realise that the world is changing, and what’s important is taking care of ourselves, protecting our skin and being comfortable.

“It’s all about our well-being, and the pandemic experience also pushed me to want to do more to help the environment and address pollution. Our T-shirts, made from a combination of Tencel and cotton, are biodegradable and compostable under home soil, industrial and marine conditions. “So, even in the worst case scenario, if it ends up in the landfill, it can be reverted back to nature in a few months.”

She does not discount the possibility of putting the material into a home compost bin. “It comes from trees, so it will return to nature,” she says of the cradle-to-cradle attribute of her products.

Raising awareness

From the outset, Chan chose to focus on streetwear because she wanted to influence and raise awareness among the younger generation about issues relating to sustainability and climate change.

“I felt that by getting together, we can do something positive for the environment, and such a mindset should be adopted from a young age. Although there are so many streetwear brands in Malaysia, this is something that is not seen in Malaysia. It’s new and I felt that the younger generation, especially, would get the hype.”

STUF’s T-shirts, available in two colours and two designs, are touted as the country’s first to adjust to the body’s temperature, thanks to Tencel. Other advantages include the fact that they are moisture-absorbent, highly breathable, highly durable with minimal static charge and ideal for those with sensitive skin.

They are marketed and sold online and at pop-up bazaars, and Chan says the feedback from customers has been positive. Most of the customers, she adds, are won over by the feel and comfort aspect of the material.

The pandemic, which put the brakes on the pop-up bazaars, has made marketing a challenge for Chan. “Most assume that it’s just an ordinary T-shirt, so it’s at these bazaars that I have the opportunity to explain about the material and the differences between Tencel and synthetic fabrics as well as other natural materials. So, although there are promotional materials on the website, what works best is when customers are able to use all their five senses to gauge the product,” she says.

As part of her sustainability ethos and eschewing of fast fashion, Chan, who runs the company solo and is its sole employee, plans to take it slow in growing the brand. “My focus is to go slow, unlike fast fashion, where there is a new product every month.”

Eventually, she plans to transform STUF into a lifestyle brand, offering bottoms, shirts and loungewear. “The T-shirt will always be the main focus of the brand. It is easy to match and it’s the most basic item in the wardrobe. It’s also suitable for many occasions, especially for staying in, which the pandemic has forced us to do.”

She plans to continue using Tencel for all her future products. “Even when I expand my product range with fabric blending, I’d still insist on using natural fibres.” —By Sreerema Banoo

BY ELAINE BOEY

A tireless advocate of sustainable waste management and the circular economy (CE), Chelsea Chee, co-founder and CEO of Mentari Alam EKO (M) Sdn Bhd (Maeko), has carved out a place for herself as a respectable changemaker and innovator.

Whether she is representing the company at global events such as the Circulars Accelerator Cohort 2021 (a programme led by Accenture in collaboration with the World Economic Forum that supports trailblazing innovators across the globe in overcoming their barriers to scale), coming up with business strategies to make composting machines more accessible to businesses on a budget or encouraging other businesses to implement CE principles, Chee is actively shaping the future of the environment for the better.

“If you think about it, life on earth started and thrived in a circular environment for thousands of years. The waste generated by one species is food for another species. There were no landfills. Everything changed when mankind transformed villages into megacities. Now, cities consume 75% of the world’s natural resources and produce 50% of global waste,” she says.

“In Malaysia, about 77% of the population live in cities. Waste that we generate is sent to landfills outside these cities. You could say, our rubbish goes to villages and, in return, we, the city folks, take the food that they grow. If you look closely, you will find that food waste accounts for nearly half of all the domestic waste that goes to landfills. These figures are really scary. There real-



When less is definitely more

Maeko CEO Chelsea Chee developed a made-in-Malaysia composting machine a decade ago and has since been actively lobbying for companies to compost their food waste. The problem has burgeoned but, undaunted, she shows no signs of letting up.

ly was no other option. I had to do something about it.”

Coming up with a solution for waste — particularly food waste — has been a driving force in Chee’s life for a decade. She trained as a sound engineer but worked as a building designer assisting developers to obtain green certification for their buildings. It was then she realised that attention was hardly given to the management and disposal of waste.

“Waste disposal is seen as something that takes place behind a building and away from the public eye. A green certified building would have energy-efficient lighting and walls designed to maximise air circulation, but there was nothing sustainable or environmentally friendly in the way the waste, generated by inhabitants, is managed and disposed of.

“After seeing this over and over again, my business partners and I were compelled to start providing waste management solutions. We established Maeko in 2011,” says Chee.

At the beginning, she thought Maeko could distribute imported industrial composting machines. But the three machines she brought into the country and placed at pilot sites broke down within weeks.

Food waste in Malaysia, she says, is generally greasy and rich and thus unable to be processed by machines designed for different cuisine.

“A composting machine made in Japan to compost Japanese food cannot handle our curries and sambals. It will break down and the smell from the food rotting inside is just terrible. All our imported composters broke down quickly and it was then that my partners and I realised that we had to develop our own machine,” she explains.

Although she claims not to be bookish, Chee is a meticulous researcher with a natural flair for product design. She managed the design and oversaw fabrication of Maeko composters while another co-founder, Mae Ooi, formulated its microbial blend.

After four years of self-funded research and development, they came up with an industrial machine that crushes and agitates waste to speed up the production of compost. By leveraging an anaerobic environment, Maeko composters turn food waste into bio-organic compost that is ready to use within a day.

But Chee found that the market was not ready to acquire composters, as it is cheaper to bin food waste. To come up with a solution, she turned to the basic principles of a CE business and decided to lease out Maeko’s composting machines to clients.

“Items or materials in a CE are recycled, refurbished, cleaned and made good. Based on this premise, Maeko should provide a service, not a product. Our leasing model allows clients to pay a monthly fee for our composters instead of coming up with an upfront investment. We support our clients, cover the maintenance of our machines and, at the end of an agreed period, take our machines back and do what is needed to make them good for the market again.”

This leasing structure, which Chee says is the first of its kind for composting machines in the country, is based on the CE’s closed loop system. “Although the CE has been around in other countries for a long time, it is a fledgling economy in Malaysia. This means my partners and I come up with our own solutions that are aligned with our beliefs and principles and able to generate value for our clients,” she says.

“Building and leasing composters is not an easy business. It is certainly easier, and probably more profitable, for me to operate a business in the linear economy. What drives me is the real possibility for significant change. If all parties collaborate and the government supports and encourages CE initiatives, we can definitely reduce food waste in all stages of the local food supply chain.”

Coming up with these bold business decisions, she says, stems from a change in her mindset. “It comes

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Although the CE has been around in other countries for a long time, it is a fledgling economy in Malaysia. This means my partners and I come up with our own solutions that are aligned with our beliefs and principles and able to generate value for our clients.” — Chee

down to how you and your team, be it your employees or clients, see the world. This needs to change before you can do something different.”

To come up with ideas, Chee spends hours reading publications from CE networks such as Cleantech UK, the United Nations, the World Economic Forum and the Ellen MacArthur Foundation. To change the mindset of Maeko’s employees, she takes them dumpster diving across the Klang Valley, where they get to see for themselves the type of waste that ends up in landfills.

“Unfortunately, we have a habit of buying things that we don’t need. For example, we buy the latest handphone model and dispose of our old but workable phone. Or we buy only the best-looking vegetables. This compels the seller to throw away edible produce just because it doesn’t look the way we expect it to look,” she says.

Besides dumpster diving, Chee likes to take Maeko’s compost truck to wholesale vegetable markets to raise awareness on composting among traders and for her employees to see for themselves the amount of edible produce that is thrown away.

“The problem of waste is easily understood. Landfills are ruining the earth because they take up a lot of space and release greenhouse gasses. These gasses are very effective at trapping heat, and this contributes to climate change,” she points out.

“Yet, there are still many people who think that waste, especially food waste, isn’t a problem. These are the people who don’t understand why we need to compost or why we need to reduce our waste. Even now, I am still asked whether a composting machine takes away jobs. It doesn’t. In fact, it creates a new income stream, as the compost can be sold.”

Her next step is to leverage technology and develop smarter as well as smaller composting machines that can be used in homes. The plan is to use artificial intelligence and data analysis so Maeko’s clients obtain a big-picture view on their unnecessary waste.

This information should enable them to maximise the use of their edible produce and reduce the amount that is thrown away.

What is needed now, she says, are partners with the same aspirations and values. “Success in a CE depends on collaborations. We need to work together to tackle big problems. With like-minded partners, we create greater value for their clients and do so much more for the environment.”

SAM FONG/THE EDGE

Leanne Ooi leading the way on remanufacturing

Rentwise's CEO brings societal and environmental purpose to life in her company's daily operations

Leanne Ooi's employees describe her as a person with "crazy high" levels of energy. "I suppose I need that kind of vigour to have grown Rentwise over the years. It is a capital-intensive, highly technical, detailed operation that requires a lot of training. What we do benefits the environment but is not widely understood by the local market. Nevertheless, this is something that I am really passionate about," says Ooi, CEO of Rentwise Sdn Bhd.

She started the company 20 years ago when she was only 24. Rentwise, which describes itself as a provider of green IT infrastructure, expands the lifespan of business-range electronics such as laptops and computers through a process known as remanufacturing.

Remanufacturing is a fledgling industry in South-east Asia. In Europe, however, it is booming on the back of government directives to reduce electronic and electrical waste. The size of the European remanufacturing industry is expected to hit €90 billion by 2030.

"The mindset here, especially among the large entities, is to recycle their old electronics and buy new ones. They don't think about extending the life of their computers, although it makes a lot of environmental and financial sense to do so," says Ooi, who hails from Penang.

"Looking back, I think I started this business about 15 years too early. From six employees, Rentwise has grown slowly to about 70 employees now. It has been an uphill battle to get corporates to see the business and environmental benefits of reusing or repurposing their equipment.

"But those that do have stayed with us for many years. This is not an easy business to be in and that is probably why there aren't many companies offering this service. I believe Rentwise is the biggest IT remanufacturer in the country."

Ooi has memorised relevant environmental pollution figures after citing them over and over again to build the case for remanufacturing. "A newly manufactured laptop and desktop emits 350kg and 800kg of carbon dioxide respectively. Which means 15 laptops generate as much carbon dioxide as a mid-size car. Carbon dioxide is a greenhouse gas that is said to cause global warming.

"Then there is electronic waste (e-waste). In 2019, more than 2.34 million PCs were shipped to Malaysia while more than one million tonnes of e-waste were recorded. We need to do something about this before it becomes an irreversible trend."

What drives her has evolved over the years and become more meaningful since the start of the Covid-19 pandemic. "When I was young, I was in the right place at the right time when presented with the opportunity to start this company. I figured, why not? Remanufacturing benefits the environment and there weren't many competitors, so I decided to give it a go."

Ooi, who focuses on the commercial operations, has a technical team of 40 employees.

"An increasing number of businesses has been asking for our services, especially after the outbreak of Covid-19 last year. This is probably because they can generate a bigger return on capital by extending the life of their old computers.

"Greater awareness of remanufacturing and its benefits is a promising trend. But what really motivates me now is our ability to help children from disadvantaged communities by providing donated computers. Rentwise's corporate social responsibility (CSR) programme takes old computers and makes them look and function as good as new for these children to use.

"It is so important that school-going children from low-income households and schools that teach a large

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What really motivates me now is our ability to help children from disadvantaged communities by providing donated computers. Rentwise's CSR programme takes old computers and makes them look and function as good as new for these children to use." – Ooi



Ooi focuses on the commercial operations and has a technical team of 40 employees

number of this population have access to computers, since learning is done online across Movement Control Orders. I have seen pictures of children trying to study with paper printouts of computer screens. It is impossible for them to keep up with their studies and this really motivates me to do more," says Ooi, who has three young daughters.

Besides being certified as a remanufacturer by the Ministry of International Trade and Industry (MITI), Rentwise is a registered social enterprise with the Malaysian Global Innovation & Creativity Centre (MaGIC). This was done to raise the company's profile, says Ooi, so more entities would be aware of its CSR programme and, thus, willing to donate a portion of their old computers to be refurbished by Rentwise's team of repair volunteers.

"I get requests for computers from children or parents every day. Rentwise is in a position to address this need, but we need like-minded partners — that is, cor-

porates or government entities — that share our vision. There are many companies with old computers sitting idle in their storeroom. Why not engage us to extend the life of 80% of these unused old computers for the respective company to reuse and donate the remaining 20% to our CSR programme?

"Our partners tell us which school they want to support and we get the computers ready. By collaborating, we can play a very important role in bridging the digital divide faced by many children in this country," says Ooi.

Rentwise has donated thousands of computers to children and schools across the country since its CSR programme began about 13 years ago. Ooi gives Rentwise's employees the opportunity to present the donation of these computers to schools in their communities or that their children attend.

"I have a great team of employees and they can represent Rentwise at these events. It makes them feel good to be able to contribute to their children's schools or community.

"Furthermore, these children learn to appreciate old computers that have been made good. This exposure can change the buy-and-dispose consumer behaviour, which is a key driver behind the increasing amount of waste," she says.

Ooi hopes the government will step in and encourage the reduction of electrical and electronic waste. Like many other business leaders in the circular economy (CE), she believes government support is needed for a CE to develop.

"Right now, there is still a lot of scepticism about what we do. Some agencies don't understand how our service benefits the environment. It is just a lack of awareness that the lifespan of electronic and electrical equipment can be prolonged before it is recycled. With the right support and initiatives, this industry can grow quickly," says Ooi.

"Meanwhile, within Rentwise, I am looking to develop more middle managers so that the company can grow. As a leader, I rely on my employees to get things done and they are a great team. I try to live a balanced lifestyle. I work hard at the office during the week and, on the weekends, I spend time with my children. This approach has allowed me to sustain my work for the past 20 years and, hopefully, into the future." — By Elaine Boey

After counting over 30 plastic containers used to pack a hotpot dinner during the first Movement Control Order (MCO) early last year, Adrian Tung and Wong Wei Qi decided to enter the circular economy (CE) system by providing a sustainable packaging solution.

"We looked at all the containers needed for just one dinner and that's when the magnitude of the plastic pollution problem really hit home. The trend of takeaways and food deliveries isn't going away anytime soon. Clearly, the growing use of plastic is not sustainable. We did some research on business opportunities in the CE that can address this problem and came up with Circlepac," says Tung, 25.

Circlepac is a social enterprise and accredited by the Malaysian Global Innovation and Creativity Centre. It provides eco-friendly food packaging solutions. Its products, made from bamboo, sugar cane or birch wood, are biodegradable and compostable but the duo acknowledges that it is not the best way to address the staggering amounts of plastic used every day.

Products made from bamboo and sugar cane are sturdier but require an industrial composter to be processed into compost. As the general public does not have easy access to industrial composters, the CE "closed-loop system" — where waste is reused for new products and/or services — is far from achievable at this point.

"To close the loop, we need to collaborate with all parties on the value chain. Our food packaging solu-



Young duo out to change the world

Adrian Tung and Wong Wei Qi, founders of Circlepac, are setting the trend for sustainable packing solutions

tion is a cog in the system. For the end-to-end system, where our products are used by F&B restaurants and then turned into compost, we need to work with partners. This is the vision that drives us," says Wong, 23, an intern with a global business consultancy.

Wong and Tung were exposed to social entrepreneurship programmes while studying and embraced the idea of making profits with a purpose. Both currently hold corporate jobs and run Circlepac on the side, although they hope to eventually spend more time on building their social enterprise.

"I am really grateful to [have been] able to explore different interests during boot camps, competitions and networking events during my university days. I was immediately drawn to making profits with a purpose and have since wanted to establish a company that gives back to society," Wong says.

"Growing up, my family was very conscious about food waste. My mum carefully planned purchases and never bought surplus food, so our fridge was always almost empty by the end of the week. I learnt from her how to minimise waste.

"Then, I was encouraged to enter the corporate world and didn't envision myself as a social entrepreneur. Now, I am really glad to be able to put my family's practices and the skills that I've learnt while studying into a CE venture, which I believe will shape the future of society."

Tung, meanwhile, also learnt environmental habits as a child and has always been interested in running a company that makes a social impact. He says: "My parents and brother have their own businesses, so entrepreneurship is close to my heart. Growing up in this environment, I believed my own company would offer a platform for me to unleash my creativity and fulfil my interest in improving the livelihood of communities.

"Back then, I didn't understand why my mother insisted that we use our own containers to 'ta pau' [pack] food, use our own tote bags for groceries or

limit the amount of liquid body wash used when having a bath. As I grew older, I saw the importance of all these practices. Some may think the waste generated by menial daily activities is insignificant but one person, doing all these things, can make a difference."

The duo is still learning about sustainable solutions and the ropes of a CE business from environmental advocates and local stewards of this industry. "None of our university friends are involved in CE. But we have met many people when we started Circlepac and have since joined a loose coalition of CE businesses.

"We find that the young are very passionate about climate change solutions and protecting the environment. For example, we are learning from a 15-year-old girl who uses Instagram to teach environmentally friendly practices such as the proper way to prepare items for recycling," says Wong.

Circlepac stands apart from its competitors with its emphasis on awareness-building and education. Wong and Tung are often asked to speak to young adults on sustainable options for the use of plastic. They find the younger generation to be more receptive to their products.

"The older generation prioritises cost. That is often the first question posed to us. The younger generation, those in their 20s, will consider other factors. They welcome alternative products to plastic, even if they cost a little more, and are happy that such solutions are available," Tung observes.

Wong believes that awareness and education are needed because "greenwashing" is rampant and consumers looking for environmentally friendly products may fall for exaggerated or false claims. Greenwashing, where companies falsify their environmental credentials, is a global problem.

Last year, the European Commission and national consumer protection authorities in Europe found this problem to be rife, with online traders failing to offer enough information to consumers to assess

“We really want to see the CE's closed-loop system in practice. But this needs collaboration and businesses are rarely compelled to change from their current linear practices of using and throwing.”
— Wong (left, with Tung)

their green claims and/or using vague terms without substantiating them.

Wong says: "We tell people to look for established credentials when buying sustainable products. At this point, this is the only way to ascertain whether the product or service is environmentally friendly. Look for the MyHijau mark, which is Malaysia's official green recognition scheme, the Forest Stewardship Council certification for wood and other forest products or the US Biodegradable Products Institute's certification to verify product composability claims. Ask whether sellers of their products have these certifications if they make green claims."

The next phase for Circlepac is to collaborate with other parties and close the loop for its products. Tung and Wong are looking for businesses that can support their venture by using their products, which are composted after use. They also hope to eventually manufacture their products locally and are looking for a partner that can provide the technical capabilities.

"We really want to see the CE's closed-loop system in practice. But this needs collaboration and businesses are rarely compelled to change from their current linear practices of using and throwing. We are talking to a few shopping malls and developers, but progress is not as fast as it can be," says Wong.

Tung adds that government support and encouragement will definitely bring development of the local CE industry to the next level. "You see this taking place in other countries. Once the government starts offering incentives and initiatives, its domestic CE will progress as businesses are compelled to change their existing practices.

"Right now, there is interest in this economy but we [CE businesses owners] are largely working in silos. The CE needs collaborations to successfully close the loop. I really believe this economy can pave the way for a more sustainable future. Post-pandemic, let's push the reset button and do things differently," he says. — By Elaine Boey

Vinesh Sinha, an unconventional leader

The founder of FatHopes Energy defies social norms to claim his role as a business visionary and change maker

Vinesh Sinha, founder and CEO of FatHopes Energy, is proving that taking the road less travelled can pay off — for him and the rest of the world. Much like some of the world's most innovative and influential business leaders such as Bill Gates, Steve Jobs, Richard Branson and Mark Zuckerberg, Vinesh dropped out of university at a young age to pursue his passion and start a company.

"FatHopes Energy's vision is to bring sustainable waste-based biofuels to everyday applications to benefit the economy, society and the environment," says Vinesh.

Biofuels emits 70% less carbon emissions than conventional diesel.

Vinesh experimented with the process of transforming used fats into usable energy in his kitchen. Then a young cost-conscious and precocious teen, he wanted a cheaper alternative to diesel for a vehicle that his father had given him.

"When I moved to the UK to further my studies, I was surprised to find biofuel tanks at petrol stations. Biofuels was already established and used widely there although it was hardly known here. I was really interested in building this industry in Malaysia and felt that I could achieve more outside the education system," he says.

"Like most Asian parents, mine were not happy about my decision to drop out of university at 18. I am the eldest of three boys and they felt that my action would influence my younger brothers. Even so, my dad told me to pursue my ambition," Vinesh recalls.

Being young meant he lacked experience in the business world but it gave him the courage to spearhead a start-up in a nascent industry. "I felt that if I failed at this, I could always go back to university or find a job. Since I was young and free, I really didn't have anything to lose."

FatHopes Energy was established in 2010. Its name is a tongue-in-cheek nod to critics and naysayers that claimed his vision to be merely "fat hopes". At the start, it was a cottage industry that grew organically with Vinesh overseeing every aspect of its operations. "I didn't even think of myself as a CEO. I was going around and saying, 'Hey, I am the owner of this business. Can I have your used cooking oil?' I didn't pay for it but slowly, more and more businesses started approaching me to take their oil."

When the price of crude oil started trending down in 2013, Vinesh had to expand into new markets (lower crude oil prices discourages the use of alternative fuel such as biofuel). To meet the minimum amount required to export biofuel, he started to collect used oil from bigger companies such as McDonald's. Soon after, he invested in cutting-edge technology to increase the efficiency and transparency of the waste oil collection process.

The company grew quickly. Currently, it has a presence across Southeast Asia, 11 refineries, a customer base consisting of local oil and gas companies. It also offers an entrepreneurship programme for those looking to start a business transporting used cooking oil and fats.

"Business scaled up tremendously between 2013 and 2016. Being a workaholic, I was too involved in everything. This took a toll and I suffered a heart attack in November 2016. I was only 27, probably among the youngest heart patients in the country," says Vinesh.

"I realised that such a possessive leadership style meant that FatHopes Energy could not survive if I died. I also saw that other aspects of life such as exercising, eating well and my relationships had been neglected. When I got out of hospital, I proposed to my girlfriend, now my wife, and did all the things that I hadn't been doing. I was away from work for a month and a half, my

“

To do extraordinary things, we must move away from complacency. Go against the norm. This is how you create real value for yourself, society and the environment."

— Vinesh



longest break since starting the company," says Vinesh.

The team at FatHopes Energy ran the company well when Vinesh was away and this encouraged him to loosen the reins and hire executive-level managers. "I spoke to Datuk Eddy Leong, who was then the CEO of Big Digital Sdn Bhd (which manages AirAsia's BIG Loyalty programme), and convinced him that he could add great value to FatHopes Energy. He looked at the business and at what I did for a year before deciding to join as our chief operating officer."

"A number of highly-paid technical workers from the oil and gas industry also approached me. They were willing to take a pay cut to join the company. The team at FatHopes is really the wild card that I never expected or planned for," says Vinesh.

"I don't always know the best solution. I tell the team to come up with their own ideas and decisions. It may work or it may not. But I am happier if they try and fail rather than to not have tried at all," he says.

Vinesh is currently building an environmentally-friendly house in Kota Damansara. Besides an architectural design that keeps the house cool and the use of solar panels, he is changing the energy consumption habits of his family so they have the option of living off-the-grid.

"When I started FatHopes Energy, the concentration of carbon dioxide (CO₂) in the atmosphere was about 300 parts per million (ppm) and growing. I wanted FatHopes Energy to contribute towards bringing this level down.

Used cooking oil must pass through a chemical process that eliminates impurities to become useful biofuel



But, CO₂ levels have continued to soar and are now beyond 400 ppm. This hit me with the realisation that I am a mere speck in the grand scheme of things."

"But I can still do something about it. This green home will be energy neutral, which means we produce the energy that we use. My two small children can learn energy-saving habits, which are invaluable lessons. I also believe in the multiplier effect. This house may inspire others to do something similar. Which means that more people are acting instead of waiting for someone to fix the problem," he says.

Fixing problems seems to be Vinesh's forte. When food and beverage outlets (F&B) struggled to survive during the series of movement control orders implemented last year, he established COOX, a cloud kitchen, along with former youth and sports minister, Syed Saddiq, and other entrepreneurs.

COOX offers more than a purpose-built space for the F&B industry. It lowers the barriers to entry for new players so they can grow their business despite the challenges brought about by the pandemic.

"Be bold and take the first step. In my experience with FatHopes Energy and COOX, critics are often extremely loud at the start but will quickly change their tune once the venture takes off and offers a solution to a pressing problem."

"What I hope is that more people turn adversity into opportunities. We are blessed with great weather and stability in Malaysia but this has made us comfortable and complacent. To do extraordinary things, we must move away from complacency. Go against the norm. This is how you create real value for yourself, society and the environment," says Vinesh. — By Elaine Boey

Sabahan turns recycled plastic into lumber products

Zazila Roslan wants to turn the growing wastelands of disused plastics into a new kind of sustainable building material that is stronger than concrete

BY PATHMA SUBRAMANIAM

It was the sight of a murky stream teeming with grimy plastic bags and other gunk that made Sabahan Zazila Roslan terribly homesick. She had just moved to the city of Keningau to attend boarding school located more than a 100km away from her quaint village in Sapulut, Pensiangan. Unlike home, which was surrounded by lush tropical rainforest, the city was dreary and dull, and offered little comfort.

"All I wanted to do every time we got a long break was to head back home to my jungle, my playground. I was so used to swimming in the river, fishing and doing carpentry with my father and foraging for food in the jungle that living in the city was agonising," says Zazila, the founder of Ezplast Solution Sdn Bhd.

Ezplast is a social enterprise that turns waste plastic into blocks that can be shaped, painted and used as a substitute for wood. The company also provides income to households that send plastic waste to them.

Her life in Keningau made her realise that she wanted to preserve the connection she had with nature and to build a life around it. Zazila decided that, like her father, she too would become a carpenter upon finishing schooling.

"My father and I used to build furniture together, for the villagers and for our own use. I wanted to continue cultivating that part of me, so I decided to follow in his footsteps," she says.

The villagers felled trees mainly to construct houses and furniture, shore up falling structures and, occasionally, fashion extra material into products to be sold in the nearby town.

"We had to make a living and I loved working with my hands. It connected me somehow to nature in ways no other work did. But I always felt guilty," she says.

The constant broadcasts on excessive and illegal logging in Sabah was affecting her. According to environmental groups, 80% of the rainforests in Malaysian Borneo have been heavily affected by logging.

"I didn't like chopping down the trees and tearing apart the jungle ... It just didn't feel right. All through my childhood and adolescence, I poured out my heart and loneliness underneath the limbs of these trees. They gave me so much comfort and strength."

After a couple of years in the trade, Zazila had moved to Kota Kinabalu and began venturing beyond virgin wood and to work with materials such as repurposed wood and even metals such as aluminium.

When she relocated to the big city, Zazila realised logging was not the only problem plaguing the environment. Being far from the jungle, she found solace in volunteering for beach clean-ups in the coastal city.

The volunteers often collected hundreds of kilograms of plastic waste and tried to salvage the discarded plastic for upcycling or recycling, as the local waste management systems are inadequate in dealing with the amount of plastic waste produced.

It does not help that plastic waste is recycled only when it is cost-effective, she says. Waste from one Malaysian household ranges from 0.85kg to 1.5kg per person per day — higher than developing countries such as Indonesia and the Philippines, with 0.22kg and 0.4kg generated per person per day respectively.

The pliable polymer is typically generated and remoulded until they reach the end of their useful life, at which point a product is disposed of and becomes waste. There are two main routes after this point: (1) landfilling, which results in leakage out of the plastic system; and (2) recovery through incineration and recycling for energy and resources.

Landfill, a form of solid waste management favoured by most countries worldwide, often involves the burial of wastes, whereas waste recovery involves the reuse and recycling of plastic wastes as secondary raw materials.

United Nations Environment Programme statistics estimates that only 21% of plastic waste is recovered, with incineration and recycling constituting 12% and 9% respectively of disposal methods. The remainder is disposed of in landfills.

Efforts to shift from petrochemical plastics to renewable and biodegradable plastics have also proven tricky. The production process can require toxic chemicals and is expensive, and mechanical strength and water stability are often insufficient.

Zazila felt she could use the indestructibility of the pliable polymer to her advantage and solve two problems with a single solution — by producing more durable and sustainable plastic.

"I tried to make handicrafts out of discarded plastic we collected but, then, after a period of time, that too becomes trash. They were not useful, just ornamental.

"That was when I started thinking that if I can make things out of wood, I can turn plastic into wood and make furniture out of it. For that, I needed to figure out a way to shred and compress plastic and make it stronger than wood."

So, in January 2019, Zazila started working on a prototype machine to compress bits of plastic that would turn piles of plastic scrap into formidable blocks, stronger than wood and which could withstand the test of time.

"The best part of learning to work with what you have is learning to be inventive. My father and I managed to get a machine used to compress tyres and modified it to compress plastic. We used a beat-up oven to generate enough heat to mould the waste plastic into a block," she says.

Even then, only certain kinds of plastic — such as polyethylene terephthalate, commonly known

as PET or PETE, and high-density polyethylene (HDPE) — can be meaningfully recycled.

Her first product was a sturdy plastic stool. She then started applying for several seed grants and won RM10,000 from Shell's LiveWIRE programme in Sabah as well as funds from Bumiputera Agenda Steering Unit (Teraju), with which she managed to get herself a manufacturing licence.

The coronavirus pandemic put a dent, however, in her plans to expand her workshop, as shipment of equipment and tools from the peninsula was halted.

Currently, composite timber — a mixture of wood fibre, plastic and a type of binding agent — is already commonly used. Zazila's invention, however, which she has dubbed "plastic wood", is both environmentally sustainable and long lasting, as the product is both rot- and maintenance-free.

"The uses of plastic wood are limitless, really. You have probably already seen it being used commercially in public spaces. The only difference is that polymer is being produced from raw materials extracted from finite resources as opposed to reengineering what we have come to regard as waste.

"I hope this will be the material of choice for those who like do-it-yourself projects as well. Instead of using materials harvested from felling trees, they can just use this to build anything they desire," she says.

Zazila continues to collect waste and work with members of the community to help them earn an income. "When I started this project, I realised early on that it was too hard for me to do the collecting myself."

So, she started visiting areas with a high concentration of low-cost housing and started working with the residents by encouraging them to segregate their waste.

"Just getting lorries or waste collectors to send waste to my workshop wasn't solving the problem. There is no real impact, I feel. Habits need to change, which is why I started going to the housing areas.

"To make it more enticing, I give them vouchers for groceries and essentials in return for 1kg of plastic scrap they segregated for organic waste. I didn't even know I was running a social enterprise at first. I did this simply because it was hard for me to work alone.

"Hopefully, we will be able to give them cash for the plastic scrap someday," she says. Despite her modest efforts, Ezplast collects close to 80kg of plastic waste monthly.

Ultimately, Zazila, like all environmentalists, hopes that waste can be designed out of products and processes right off the bat.

"Ideally, I wish we could avoid the recycling stage at all costs because preventing waste from being created in the first place is the best way to preserve the world we have," she says.

While Zazila is still figuring out the best way to get her invention to market, she continues to work on improving her processes.

"It's foolish to think that we can completely eradicate this plastic epidemic entirely," she says. **E**

“Preventing waste from being created in the first place is the best way to preserve the world we have.”
— Zazila

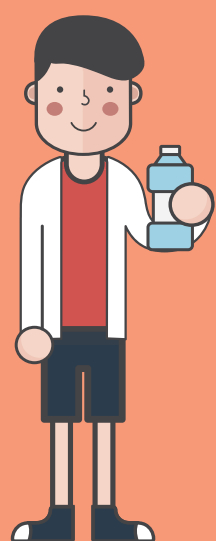
Zazila (left) and co-founder Cassandra Joachim with a stool made entirely of plastic lumber



HOW 5 SECTORS CAN INCREASE CIRCULARITY GLOBALLY

Earlier this year, the Platform for Accelerating the Circular Economy — created by the World Economic Forum in 2018 — released five publications that outlined how five sectors can adopt circular economy principles. The publications highlighted what circularity for each sector would look like and the actions that can accelerate the transition to a circular economy.

Here are some actions and ideas highlighted in the reports:



01. PLASTIC

Only 14% of plastic packaging is collected for recycling currently

a. Incentivise and support product design for reuse and recycling

Stakeholders can score packaging on "recyclability" and "reusability"

b. Agree which plastics can be eliminated and prepare to phase them out

Don't impose an abrupt ban but make sure to scale the supply of substitutes and support the transition



02. ELECTRONICS

Less than 20% of electronics are collected and recycled

a. Enable producers to increase sourcing of recycled content

A platform to share supply and demand forecasts between recyclers and manufacturers

b. Set up effective collection systems

Develop an Extended Producer Responsibility mechanism to finance collection and recycling

05. CAPITAL EQUIPMENT

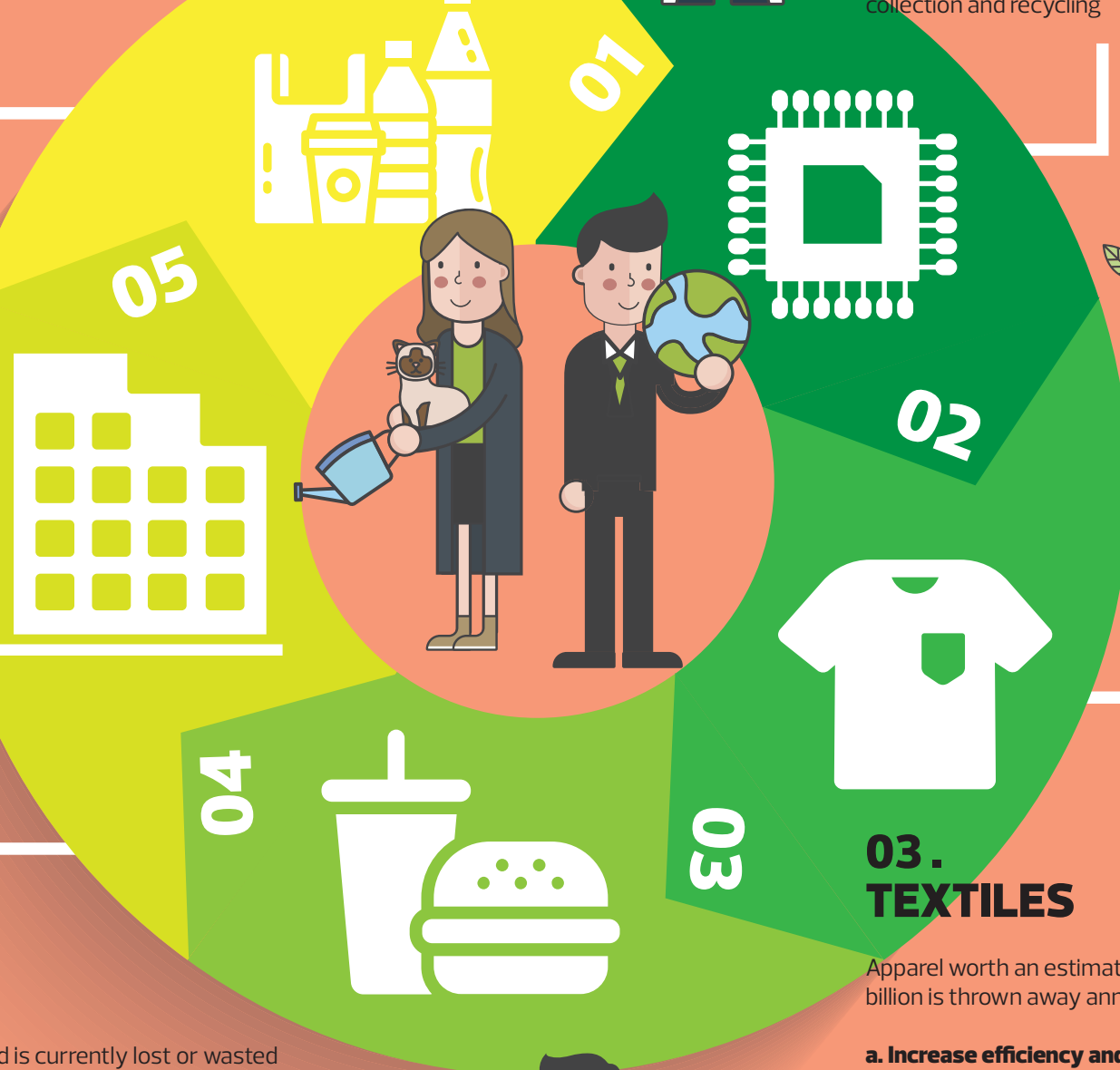
Long-lived buildings, machines and infrastructure consume 7.2 million tonnes of raw materials annually

a. Accelerate product life extension and use rates

Introduce business models like product-as-a-service, components-as-a-service and maintenance or upgrade services

b. Leverage on digital technologies for the circular transition

Utilise a digital twin to understand a specific asset and subsequently optimise its modularity, material use and waste volumes



04. FOOD

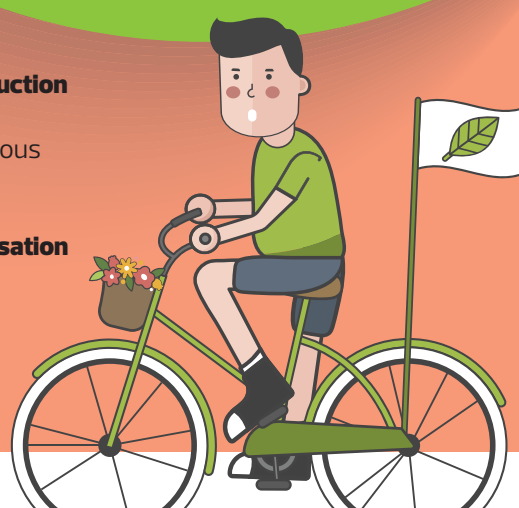
A third of all food is currently lost or wasted

a. Increase investment in food loss and waste reduction

Invest in cold storage, logistics and preservation technologies and capacity training to secure nutritious food supplies

b. Increase information accessibility and data utilisation

Create open-source and diverse data sets with agronomic, climate and market information that can be accessed by innovators



03. TEXTILES

Apparel worth an estimated US\$460 billion is thrown away annually

a. Increase efficiency and quality in textiles sorting for recycling

Develop technologies to digitally share product information and use it for automated, sensor-based sorting

b. Make recycled fibres market-competitive

Accelerate innovation in recycling technology to increase output quality and reduce costs



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