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Conversations
FOR TOMORROW

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Conversations FOR TOMORROW

From the Desk of

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TOWARDS A PLASTIC-NEUTRAL SOCIETY

Kian Seah is the founder and CEO of Heng Hiap Industries (HHI). Based in Malaysia, HHI is the world's first end-to-end integrated plastic-recycling company. HHI works with 28,000 independent plastic recyclers to create high-performance, niche plastic material that is exported to 38 countries and is the first company anywhere in the world to receive the Ocean Bound Plastic (OBP) certification.

The oceans are getting dirtier

In the first decade of the new millennium, the volume of plastic waste generated by humanity rose more than it had in the previous 40 years as a whole. Less than 10 percent of the seven billion tons of plastic waste generated globally has been recycled[1] and this is now impacting humans directly, with recent research from the Netherlands finding microplastics in the human body.[2] Plastic pollution has four different aspects: mismanaged landfills, leakage into rivers, leakage into oceans, and pollution from open fires. Of the four, ocean plastic has the greatest harmful impact, because it reduces marine diversity. Plastic waste entering aquatic ecosystems is currently projected to grow to 23–37 million tons per year by 2040.[3] The financial damage due to the plastic pollution in the marine ecosystems is nearly $13 billion.[4]

To abort this damaging process, we must amend plastic-consumption patterns to become circular, rather than linear, with reuse and recycling predominating, and the plastic waste channeled back into the industrialization cycle. Below, we lay out the key recommendations for an innovation-led approach to becoming a plastic-neutral world.

> **"Less than 10 percent of the seven billion tons of plastic waste generated globally has been recycled"**

1. UNEP,"Our planet is choking on plastic"
2. The Guardian, "Microplastics found in human blood for first time," March 2022
3. UNEP,"Our planet is choking on plastic"
4. Heng Hiap website, accessed on 16th June 2022

Circular economy: A way out of the mess we have created

Linear design looks at how the product is manufactured, branded, and consumed by the customer; however, the design function does not address what happens once the product has been consumed and discarded. In a linear consumption pattern, the carbon footprint is very large. An estimated 63% of consumers are aware of the enormity of the global plastic waste problem,[5] and consumer behavior is shifting from a linear consumption pattern. Around half of consumers claim to be interested in purchasing zero-waste products, and 48% say they already reuse plastic bottles.[6] Each time the plastic is recycled, the carbon footprint is halved, meaning that, if circularity can be implemented on a global scale, plastic has the potential to become one of the resources with the lowest carbon footprint.

Traceability: The key to the recycling process

Firms have always competed to make their products prettier, smarter, cooler, better, and faster. However, especially among the younger demographic, another consideration is now driving consumer demand: sustainability. At Dutch multinational Philips, green products and solutions contributed 71% of total revenue in 2020, with 15% coming from circular-economy products and solutions.[7] Consumers are willing to pay more for sustainable products, and 61% of consumers will be less willing to buy products if they found they performed poorly on environmental practices.[8]

5. Our World in Data, "Plastic Pollution"; Capgemini Research Institute, circular economy survey, August–September 2021, N=7,819 consumers
6. Capgemini Research Institute, circular economy survey, August–September 2021, N=7,819 consumers.
7. Philips, 2020 annual results, https://www.results.philips.com/#livesimproved, accessed April 15, 2021.
8. WARC," Consumers will drop environmentally unfriendly brands", February 2020.

Consumers nowadays demand extensive product information, including the product source, compliance certification, and evidence of sustainable production methods. The brand that provides customers with the fullest evidence of sustainability will win their business. For instance, while one organization may state opaquely that they use 25% of recycled content, a competitor could specify the use of 25% ocean-bound recycled plastic, and provide a fully traceable history. Organizations should begin putting in place the technology to achieve a high degree of traceability; blockchain application will be very important in achieving this.

The UK government introduced a plastic-packaging tax, effective from April 2022, which taxes UK manufacturers and importers on plastic packaging with under 30% recyclable content. This highlights the need for **traceability** of the source of recycled materials.[9]

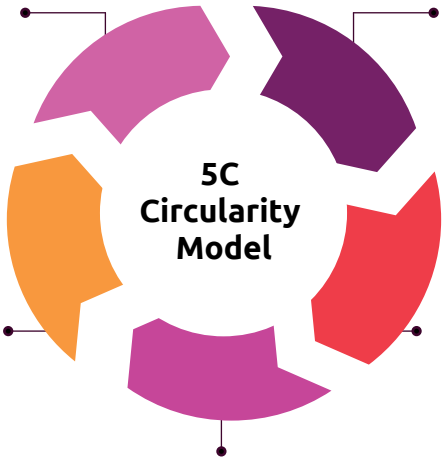
Implement an end-to-end value chain

An integrated recycling value chain reduces labor and logistics costs. The recycling industry is largely informal, with communities of hard-working people sorting through trash and picking out useful materials to recycle. However, this process was manual, complex, and involved pen and paper transactions, and in-person negotiation. The demand for quality recycled plastic is so high that HHI was struggling to keep pace. There are multiple possibilities offered by digital transformation in the waste sector to simplify and digitize this process. HHI developed an app that allowed households to order the collection of their recyclable materials. This removed a lot of inefficiency from existing processes, leading to collection of higher-quality plastics in greater volumes. HHI has collected up to 60,000 tons of plastic waste and aims to recycle over 100,000 tons of plastic by the year 2025.[10]

9. Packaging Gateway, "Will the UK plastic packaging tax force businesses to act sustainably?" May 2022.
10. Heng Hiap website, accessed on 16th June 2022

HHI HAS COLLECTED UP TO 60,000 TONS OF PLASTIC WASTE AND AIMS TO RECYCLE OVER 100,000 TONS OF PLASTIC BY THE YEAR 2025.

HHI has a 5C circularity model:



Communicate this process to the eco-conscious consumer. HHI has devised a way to allow users to trace the source of the material recycled from waste plastic that is found in the vicinity of marine and riverine environments

Collect reusable waste in the largest volumes possible. HHI works with 28,000 plastic recyclers. HHI is also working to digitize the plastic-recycling process through an app that allows the consumer to schedule a pick-up of plastic recyclables from their doorstep.

Champion the circular model in the marketplace, recruiting big-name brands. HHI supplies the recycled plastic to global brands to make home appliances

Convert that waste into a material that can be reused in an industrial grid. HHI creates high-performance, niche plastic material that is exported to 38 countries.

Co-create, in partnership with industrial designers, the lifecycle of the product. HHI customizes different features for each of the eight industries they serve.

Ensure technology and industrial design are pillars of your sustainable innovation

We need to look at all the materials and their chemical properties to give plastic a second life. Recycled plastic must be useable in high-value-added products, such as home appliances, and the quality of plastic must be retained in the recycling process. To achieve this, the plastic waste must be crushed correctly and cut to the right size, with no contamination by other materials. The temperature must not be too high to prevent the oxidization of the raw materials, and the recycling process must observe careful collection and sorting of the waste. It is important that these steps are followed to prevent deterioration and preserve the inherent property of this plastic.

Organizations must ensure that this operation is governed by a clear set of standards – an industrial "playbook," so to speak. It is important to preserve the integrity and inherent properties of the base material throughout the process, using the technologies available to customize and enhance the functionality and performance of the feedstock. This ensures the production of a safe, high-quality material that can be molded into aesthetically pleasing forms and minimizes the production of volatiles.

Many companies are integrating these principles into their manufacturing processes. Renault, for instance, has developed a network of over 330 salvage organizations in France to recycle materials. Renault cars currently sold in Europe contain on average 10–20% recycled plastics.[11]

Innovation for a sustainable future

It is up to us to utilize natural resources responsibly and to best advantage. The magic word is: innovation. Sustainable production design does not seek to take solely for the benefit of an individual organization, but to benefit society and the planet, in terms of both health and wealth. This is innovation at its purest: finding a way to bring good to society and the world while doing no harm.

11 **Automotive recyclers of Canada, "Renault interview: An OEM's perspective on the circular economy and auto recycling," October 2019.**

"Plastic waste must be crushed correctly and cut to the right size, with no contamination by other materials"