CHALLENGE PRESENTED BY

NESCAFÉ Dolce Gusto

VISIONARY PARTNER

HUAWEI

LEADER PARTNERS

DOW

Reino de los Países Bajos

COOLHUNTERMX

GRUPO EXPANSIÓN

WDCD MÉXICO FOUNDING PARTNER

WHAT DESIGN CAN DO MEXICO

GNP SEGUROS

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Escuela de Arquitectura, Arte y Diseño

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WASTE IN MEXICO CITY

INTRODUCTION

A METROPOLIS IN CRISIS

Every day, 13 thousand tonnes of garbage is dumped in Mexico City. This means that on average, every citizen produces one kilo of solid waste every day. Since the start of the COVID-19 pandemic, this number has started to rise. The city is expected to generate **3 thousand tonnes more garbage** than usual as citizens quarantine at home. This means that one of the biggest problems facing the country is that of the **excessive generation of waste.**

Mexico City, an enormous sprawling city, has struggled with waste for many years. It now ranks as the second biggest producer of waste among the world's megacities (behind New York City), with waste management systems that cannot keep up with the problem. For most households in the capital, the biggest culprit is **kitchen waste**, including vegetable, fruit, tortilla and bread waste. In second place we find **plastics,** often in the form of single-use products, like plastic bottles and disposable plastic bags and packaging. The use of these products have increased during the pandemic as sanitation and convenience is prioritized. Lastly, even though **e-waste** only represents less than 1% of the total amount of waste produced in Mexico, this number is expanding rapidly.

Studies show that 53.1 million tonnes of waste is produced in all of Mexico annually. With 14.9 million tonnes that could be reused, the **lack of infrastructure and regulations** in the country have made it difficult to implement new initiatives. Current programmes mostly focus on the country's city centres, which have better recycling infrastructure, while some outskirt areas still do not have a proper waste management system.

Image credits:

LOCAL INSIGHT

INFORMAL LABOUR

MEXICO CITY

Despite the fact that the government is in charge of local waste management systems, most of the cleaning workers in Mexico City are volunteers, who are not afforded any work benefits. In Mexico City, some 10,000 waste-pickers, known as *pepenadores*, make a living from picking through the waste in the city. The city's recycling plants also depend on informal labour to succeed, since this workforce is responsible for more than 60% of all material recovery.

It's also worth noting that the COVID-19 pandemic increases the risk for people working in the informal waste sector, as household garbage is a likely source of infection.

A BRIEF SUMMARY OF MEXICO CITY'S WASTE SITUATION

A THROW-AWAY SOCIETY

Before the pandemic, Mexico City generated **more than 13 thousand tonnes of waste every day.** This is partly due to the material culture of Mexico, which drives overconsumption. The problem is intensified by a crippling lack of infrastructure — the city simply cannot manage the amounts of waste that is being produced. Based on conversations with experts and challenge partners, we have chosen to focus this brief on the three main types of waste produced in the city:

1. Organic waste: Mexico (over) produces large amounts of food, and as much as 34% of it is thrown away. There is also a lack of waste separation knowledge and culture in Mexico, which means that organic waste in urban areas is usually mixed in with other residues.

2. Plastic waste: 123 tonnes of plastic waste is produced every day in Mexico City, and only 6% of it is recycled. Meanwhile, 48% of the plastic made is intended for single-use plastic products.

3. Electronic waste: Mexico generates roughly 1,032 million metric tonnes of electronic waste annually, ranking among the largest e-waste generators in Latin America. **Mexico City alone generates around 312 tonnes per day, making it the fastest growing type of waste in the city.**

NOTE: Of course, creatives already working on solutions that tackle other waste streams such as textiles, building materials and consumer goods are very welcome to submit proposals.

Image credits: Jezael Melgoza via Unsplash

LOCAL INSIGHTS

ORGANIC WASTE

MEXICO CITY

According to official data, urban solid waste in Mexico City is composed of mostly organic matter from the kitchen and the garden. Most of it is disposed of along with other waste in landfills or incinerators, and never reach a composting plant.
Meanwhile, more than one-third of the food produced in Mexico is wasted as a result of overproduction and inefficient distribution. 18% of the food loss takes place during the processing and production stage. Some products like milk and fish can reach up to 50% loss at this stage.

In Mexico City there are only five composting plants, of which only one has a significant volume, but the compost generated is not sold and carries high costs.

There is a lot of misinformation on how to handle and separate organic waste, which means very little of it is treated and composted. As a result, a lot of poorly sorted waste, underutilised waste, and most detrimentally, excessive waste remains.

LOCAL INSIGHTS

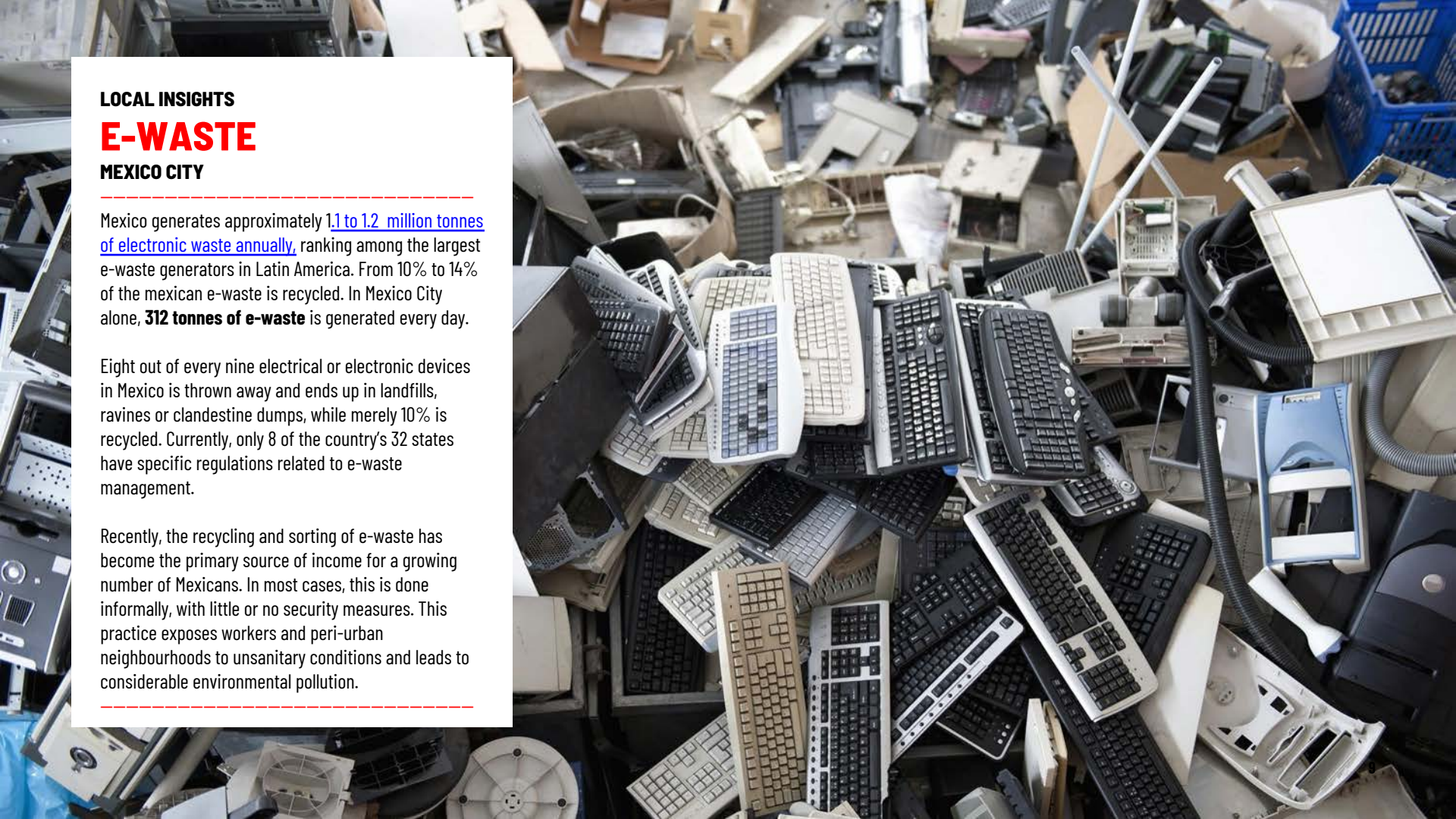
PLASTIC WASTE

MEXICO CITY

Plastic waste accumulation is one of the most well-known issues regarding waste management and waste production in Mexico. More than **7 million tonnes** of plastic is produced in Mexico every year, and less than 10% of this is recycled. **In Mexico City alone, 123 tonnes** of plastic waste is produced every day. Currently, there is not a legal framework that regulates plastic production and disposal in Mexico. Domestic norms serve as guidelines, but are not mandatory.

To try and curb the use of single-use plastics, the Mexico City government has started to implement regulations on plastic bags and disposable products, and to promote biodegradable plastics.

While recycling is one solution, it is met with many challenges. Environmental projects are sometimes not followed through the shifts in government leadership every six years. This makes it hard to implement a long-term governance vision and doesn't give enough time, in one political term, to develop the required infrastructure to recycle all the waste that is being produced. Also, most local governments experience many challenges, as they are usually under considerable financial and political restraint, and struggle to create new programmes to tackle the plastic waste issue. This is despite the incredible effort that the current government in Mexico City has been making in the issues of plastics over the last two years.



LOCAL INSIGHTS

E-WASTE

MEXICO CITY

Mexico generates approximately 1.1 to 1.2 million tonnes of electronic waste annually, ranking among the largest e-waste generators in Latin America. From 10% to 14% of the mexican e-waste is recycled. In Mexico City alone, **312 tonnes of e-waste** is generated every day.

Eight out of every nine electrical or electronic devices in Mexico is thrown away and ends up in landfills, ravines or clandestine dumps, while merely 10% is recycled. Currently, only 8 of the country's 32 states have specific regulations related to e-waste management.

Recently, the recycling and sorting of e-waste has become the primary source of income for a growing number of Mexicans. In most cases, this is done informally, with little or no security measures. This practice exposes workers and peri-urban neighbourhoods to unsanitary conditions and leads to considerable environmental pollution.

WHERE DESIGN CAN MAKE A DIFFERENCE IN MEXICO CITY

OPPORTUNITIES FOR DESIGN

HELICOPTER VIEW

1. AWARENESS & BEHAVIOURAL CHANGE [TAKE LESS, HANDLE SMARTER]

There is a lack of reliable information on how to handle and separate waste. As a result, citizens and companies hardly separate their waste, reducing the possibilities to turn waste into a resource. This applies to all waste streams: organic / food waste, which can't be composted, e-waste from which valuable materials cannot be extracted and plastics that cannot be recycled. **How can we design educational programmes and campaigns to make communities aware of the impact of their waste, and to incentivise sorting and recycling efforts?**

2. COMMUNITY-BASED INNOVATION [HANDLE SMARTER]

Waste management in Mexico City largely depends on the informal sector. There's much to learn from the practices of informal waste pickers. The city could benefit even more from this workforce by improving infrastructure and working conditions. **How can we design (small-scale) facilities, services and programmes to enhance the separation and processing of different waste streams?** And by doing so, better support the jobs in this sector. Consider focusing on specific categories such as: **plastics, organic waste and e-waste.**

3. DESIGN TO RECYCLE [MAKE BETTER]

Most products are not designed with recycling (and its dependence on the informal sector) in mind, which makes it hard or even impossible to extract materials that can be used to manufacture new products. This applies to electronic devices, plastics, textiles, furniture and many other consumer goods. At the same time, recycled materials are seen as inferior to new materials. Therefore the challenge is twofold. **How can we design products so that they are easily disassembled and recycled? And: how can we encourage companies to consider recycled materials as a resource for production?**

OPPORTUNITIES FOR DESIGN

HELICOPTER VIEW

4. DESIGN TO REPAIR [TAKE LESS, MAKE BETTER]

What applies to recycling also applies to reparation: modern products, and especially electronic devices are not made to be repaired. They are either too complex or too closed, which makes them hard to disassemble and replace parts. As a result, the sector specialised in repairing domestic appliances is disappearing. **How can we design products that are simpler and easier to repair? Consider programmes that entice consumers and small businesses to take pride in repairing and maintaining products.**

5. DESIGN TO LAST [TAKE LESS, MAKE BETTER]

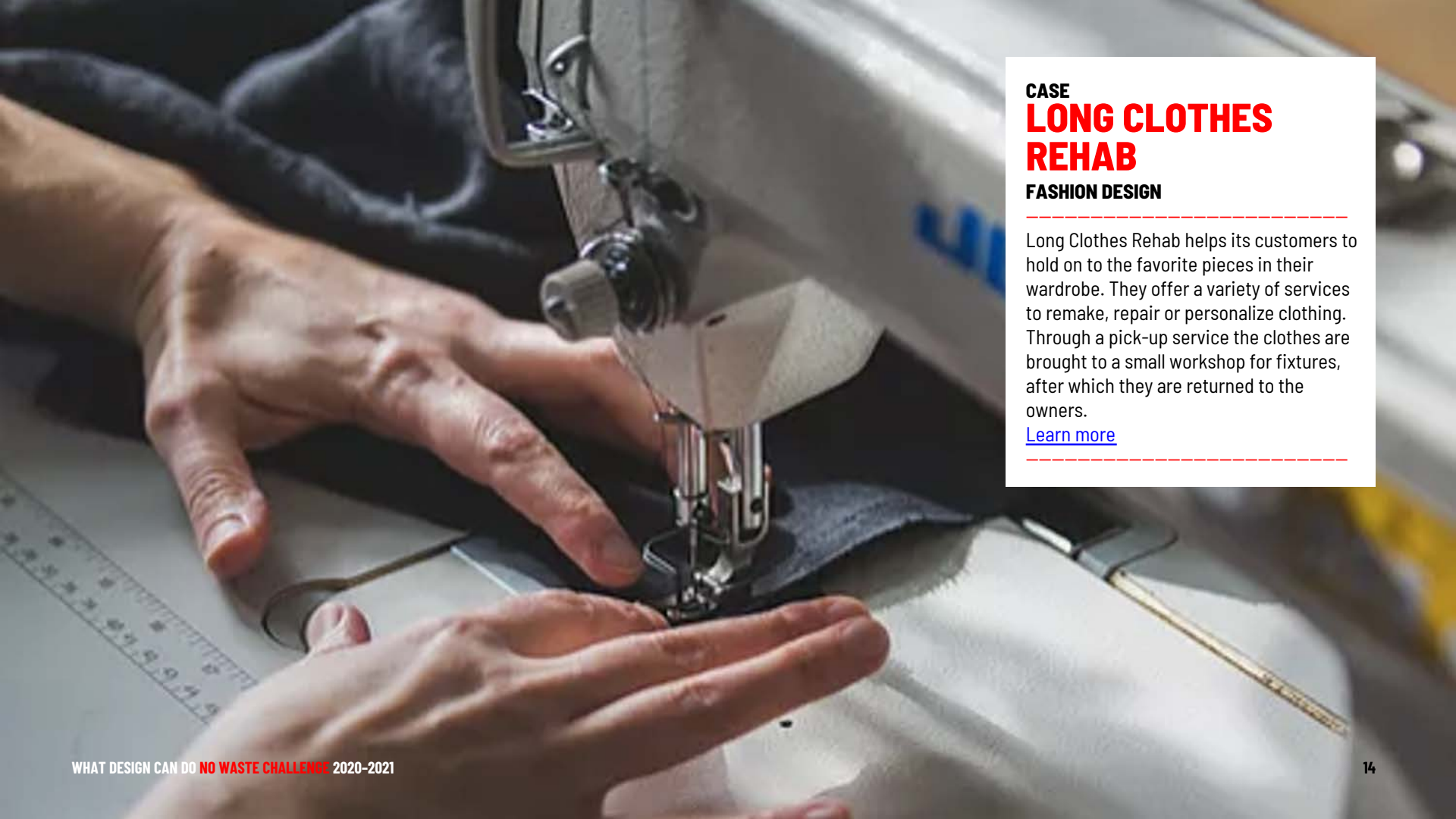
Most marketing strategies are focused on encouraging consumerism in a global economy, thereby increasing material extraction for products that will be quickly disposed of. Mexican consumers are very susceptible to these strategies. The government's environmental and sustainability regulations are more a set of recommendations than mandatory measures, letting the market continue with business as usual. **How can we change the mindset of Mexican consumers to favour more durable products? And how can we empower consumers to demand more sustainable products from industries and stricter regulations from the government?**

CASE

ECOLANA

SYSTEM DESIGN

Ecolana is a digital platform and consulting firm that connects consumers, brands, and informal collection and recycling centers to help reduce waste. They are the ultimate app and a digital guide for recycling in México City. Ecolana was one of the winning projects of the WDCD Clean Energy Challenge 2018-2019.



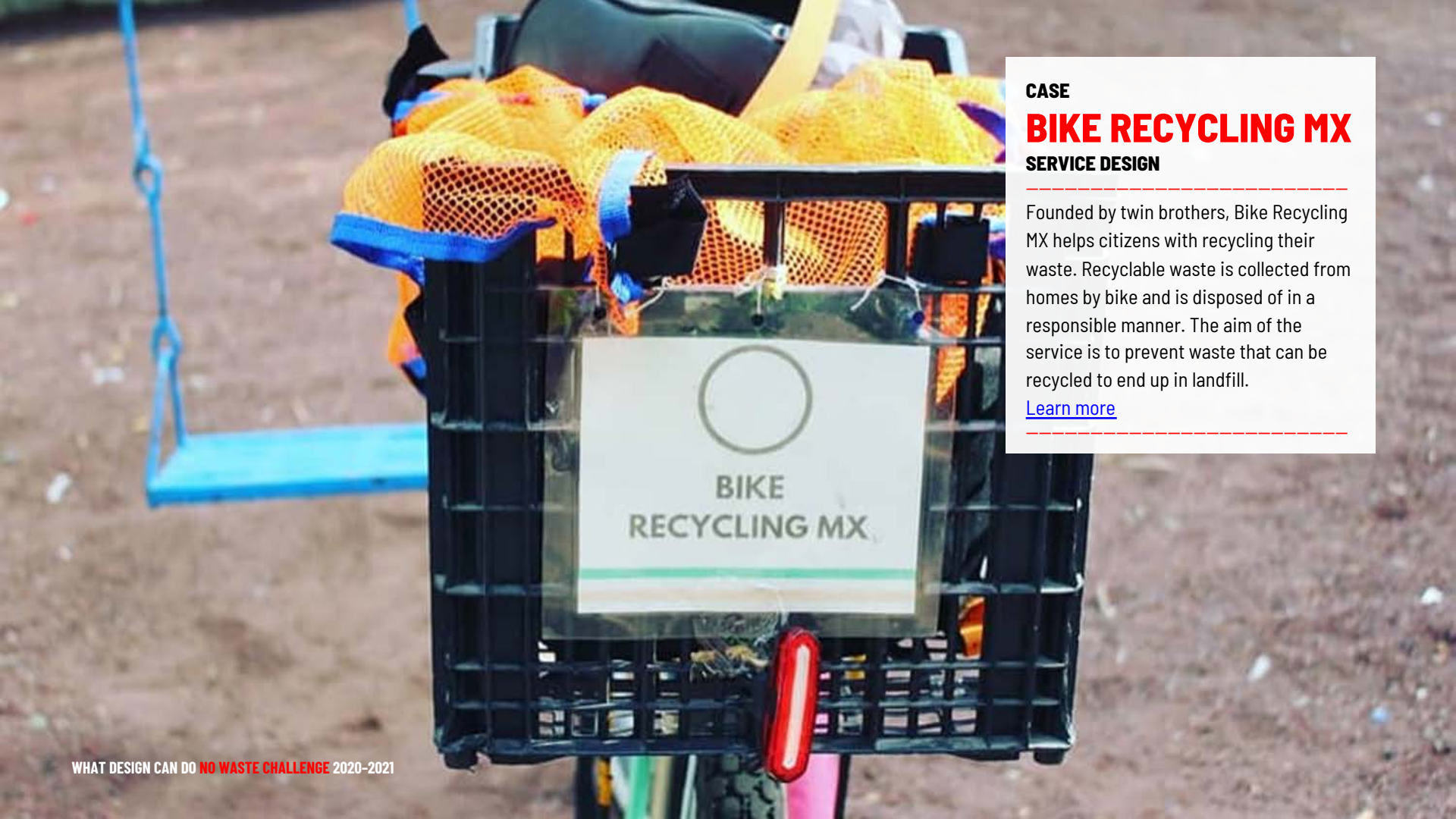
CASE

LONG CLOTHES REHAB

FASHION DESIGN

Long Clothes Rehab helps its customers to hold on to the favorite pieces in their wardrobe. They offer a variety of services to remake, repair or personalize clothing. Through a pick-up service the clothes are brought to a small workshop for fixtures, after which they are returned to the owners.

Learn more



CASE

BIKE RECYCLING MX

SERVICE DESIGN

Founded by twin brothers, Bike Recycling MX helps citizens with recycling their waste. Recyclable waste is collected from homes by bike and is disposed of in a responsible manner. The aim of the service is to prevent waste that can be recycled to end up in landfill.

Learn more

OPPORTUNITIES FOR DESIGN

ORGANIC WASTE

SHORTEN THE CHAIN FROM FARM TO FORK

Mexico produces large amounts of food and 34% of it is wasted, which is the result of overproduction and inefficient distribution. **How can we design products, services and programmes that lead to less food waste?** Take into account every step of the chain from harvesting and production to the distribution, consumption and disposal of food. **Consider ways to shorten the chain by bringing locally produced food closer to consumers**. Consider programs to **change public perception of what is edible** (in terms of aesthetics or expiration date, for instance).

BIOMATERIALS

Biomaterials made of organic waste can be a good alternative for single use products and packaging. Yet, there's a lack of infrastructure to digest and process food and garden residues. Also there's little recognition for the potential of biomaterials. **How can design help accelerate the development of biomaterials to a commercially viable practice? Consider small-scale, community-run bio waste digestion systems, and types of biomaterials that can inspire consumers and entrepreneurs to become active in the collection and processing of organic waste.**

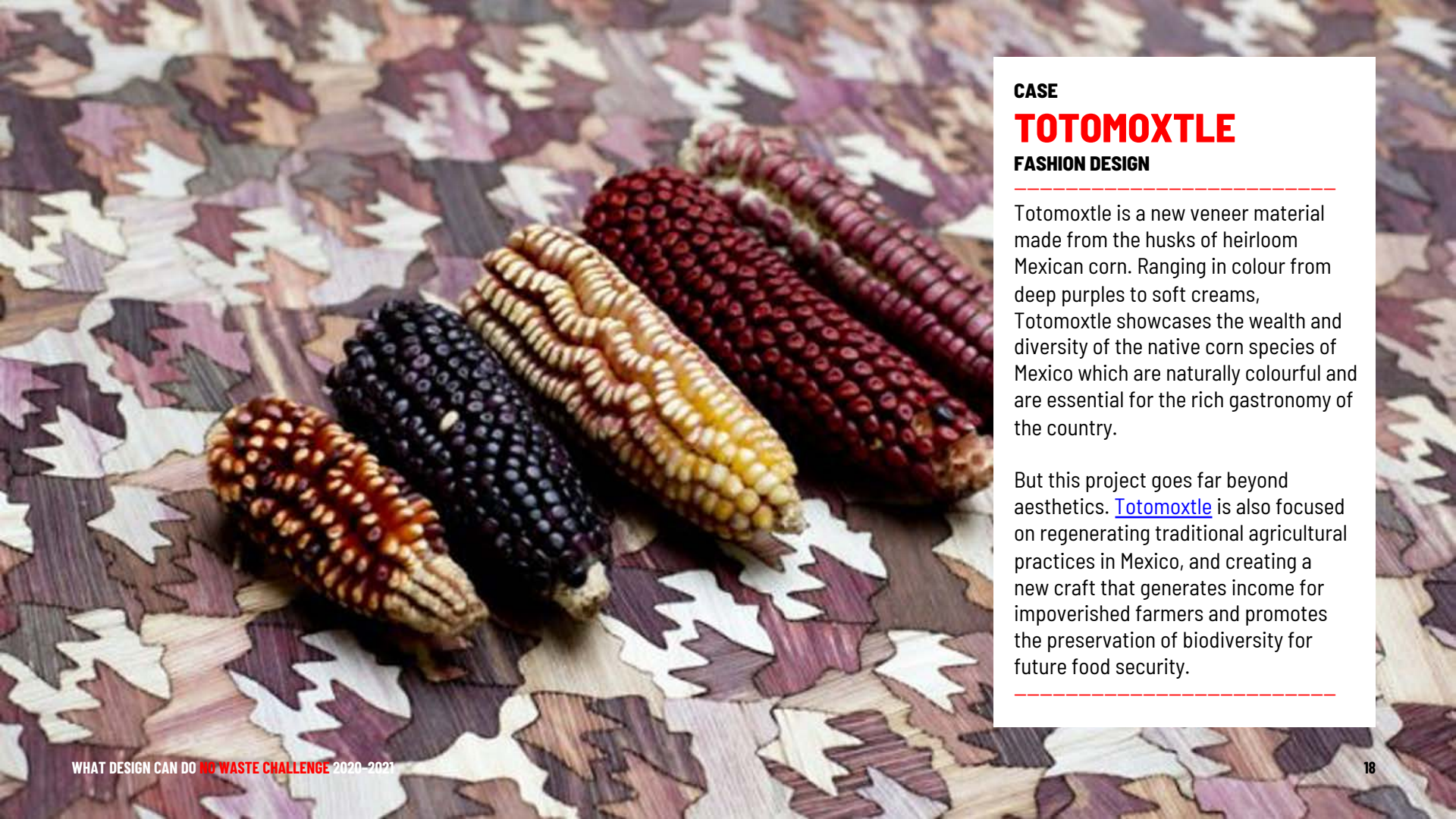
CASE

SAVEFRUIT

FOOD DESIGN

A post-harvesting technology designed to extend the life of fruits, SAVEFRUIT provides a product capable of delaying the fruit ripening process, maintaining its texture, firmness, color, odor, flavor and nutritional properties for a time period, enabling producers to reduce fruit waste and create an abundance of food on the planet.

SAVEFRUIT® allows you to get the time needed to store, distribute and sell fruit; provides extra protection against diseases that may appear in fruit; helps to delay color development and allows to preserve the color of the peel; acts in a natural and specific way and is non-toxic for humans/environment; and prevents accelerated maturation of fruits due to temperature changes during logistics.
https://www.savefruitcorp.com/



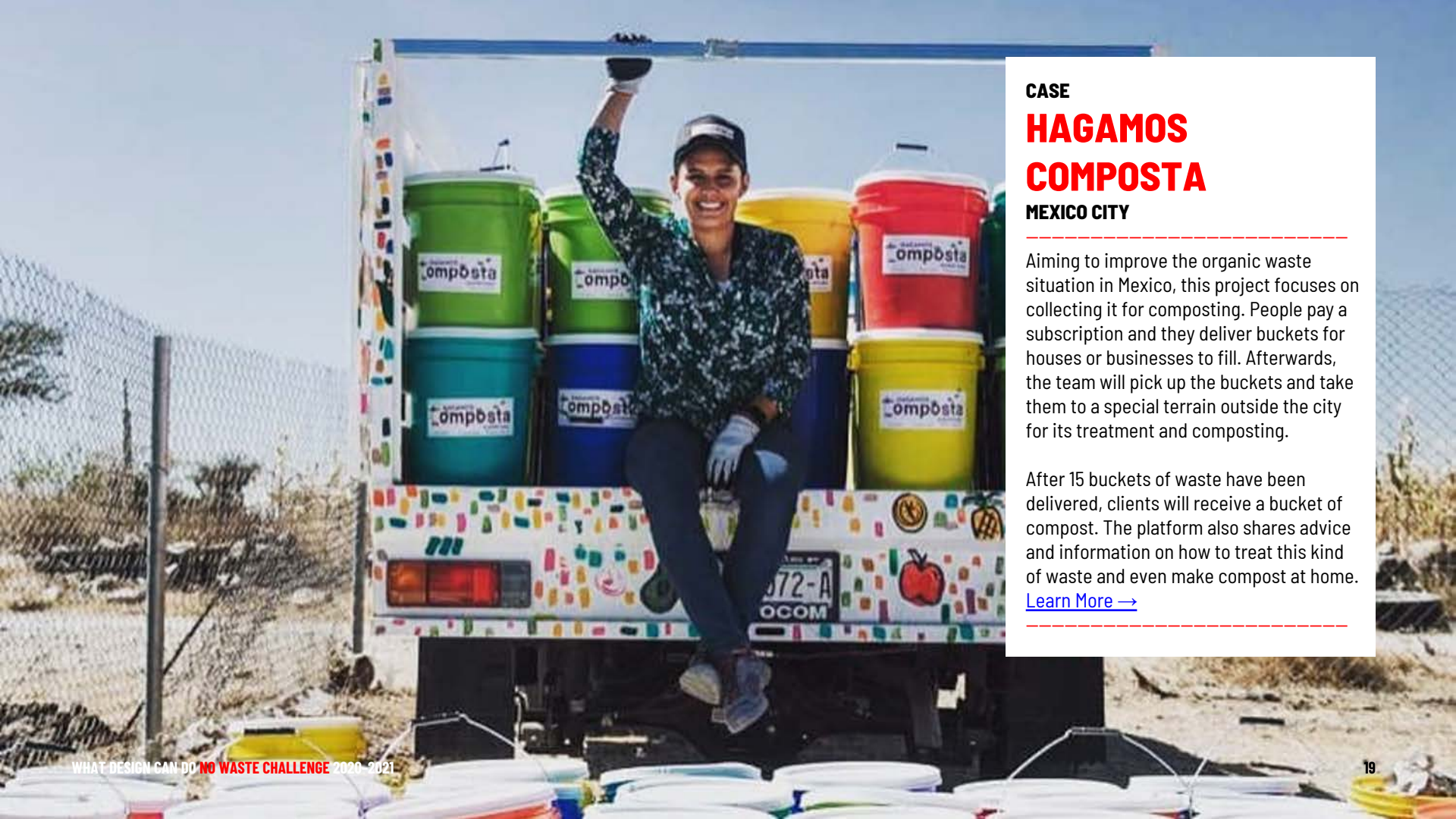
CASE

TOTOMOXTLE

FASHION DESIGN

Totomoxtle is a new veneer material made from the husks of heirloom Mexican corn. Ranging in colour from deep purples to soft creams, Totomoxtle showcases the wealth and diversity of the native corn species of Mexico which are naturally colourful and are essential for the rich gastronomy of the country.

But this project goes far beyond aesthetics. Totomoxtle is also focused on regenerating traditional agricultural practices in Mexico, and creating a new craft that generates income for impoverished farmers and promotes the preservation of biodiversity for future food security.



CASE

HAGAMOS COMPOSTA

MEXICO CITY

Aiming to improve the organic waste situation in Mexico, this project focuses on collecting it for composting. People pay a subscription and they deliver buckets for houses or businesses to fill. Afterwards, the team will pick up the buckets and take them to a special terrain outside the city for its treatment and composting.

After 15 buckets of waste have been delivered, clients will receive a bucket of compost. The platform also shares advice and information on how to treat this kind of waste and even make compost at home.
Learn More →

OPPORTUNITIES FOR DESIGN

PLASTIC WASTE

TAKE ON SINGLE-USE PLASTICS

Half of all the plastic produced worldwide is only used once. Starting in 2021, Mexico City's government has prohibited the use of single-use plastic products including plastic bags, forks, straws and cups. But without the imposing fines, a complete end to single-use plastics seems unlikely. To be effective, the measure requires the support of citizens to transform consumption habits and strive towards more sustainable lifestyles. **How can we design programmes and campaigns to change mindsets towards disposable products? And what sustainable, biodegradable alternatives for single-use plastics can we design?**

TAKE ON PLASTIC PACKAGING

Plastic packaging is also single-use, but is harder to ban as it's interwoven with nearly everything we buy. How can we reduce the use of plastic packaging? Consider **programmes and campaigns to make consumers more aware of the impact of plastic packaging;** and addressing **brands to take responsibility for their packaging** that ends up in our streets, rivers and oceans. Last but not least: **how can we design more sustainable packaging systems to replace the current polluting ones?**

MOVEMENT TO COLLECT & RECYCLE

A whopping 91 percent of plastics isn't recycled at all. Instead it ends up in landfills or in the environment. **How can we design programmes, services and facilities to encourage communities to collect, separate and process plastic waste?** Plus: **how can we promote the use of recycled plastic in new products** and by doing so reduce the fabrication of virgin plastics?

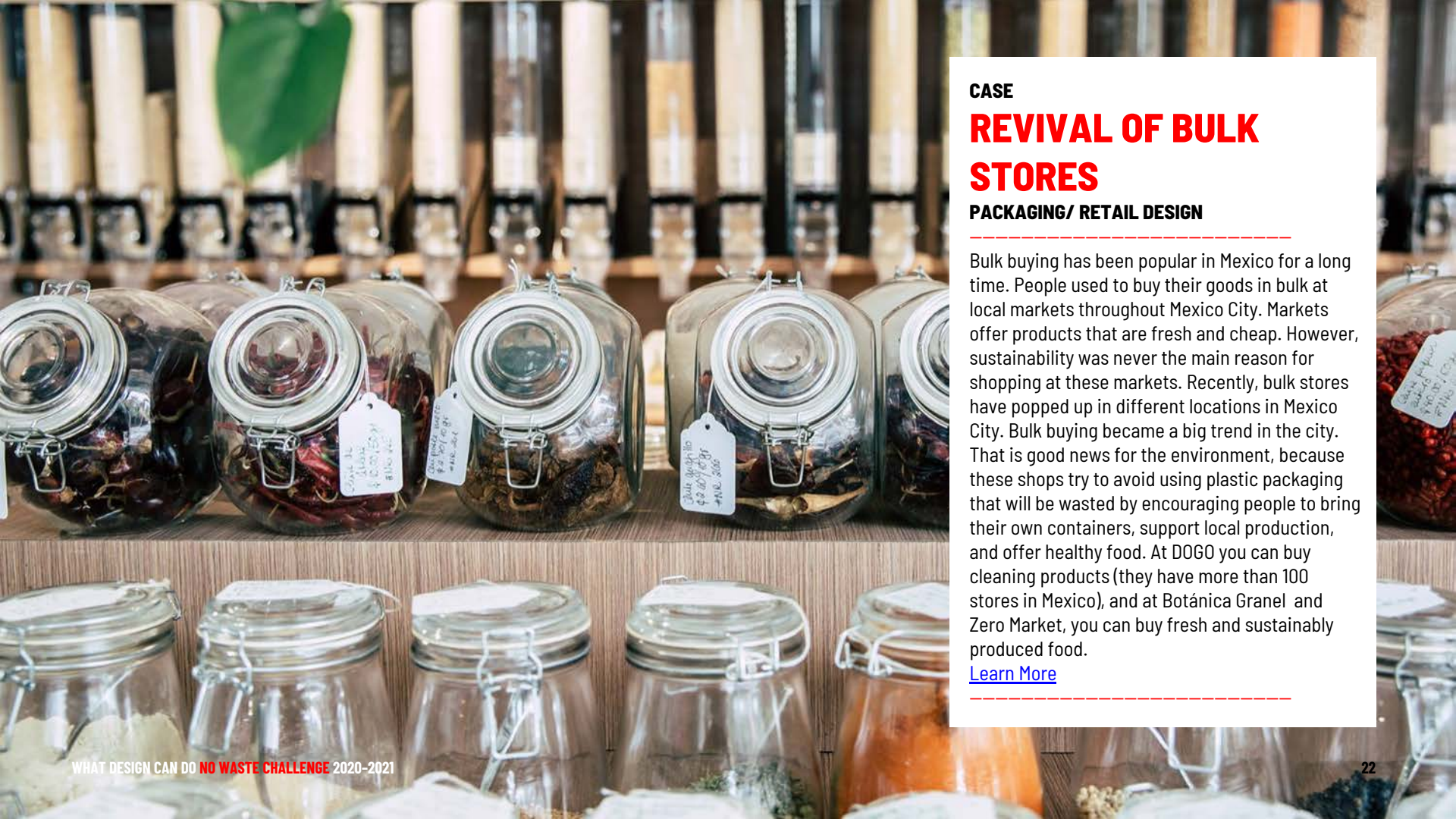
CASE

BIOFASE

PRODUCT DESIGN

Biofase is a company which creates bioplastic and biodegradable products made from avocado seeds. Their disposable products include cutlery and straws, which are completely reintegrated into the environment after 240 days, without leaving any toxic trace behind. Their bioplastic is made from avocado seeds collected from companies that process avocados.

Learn More



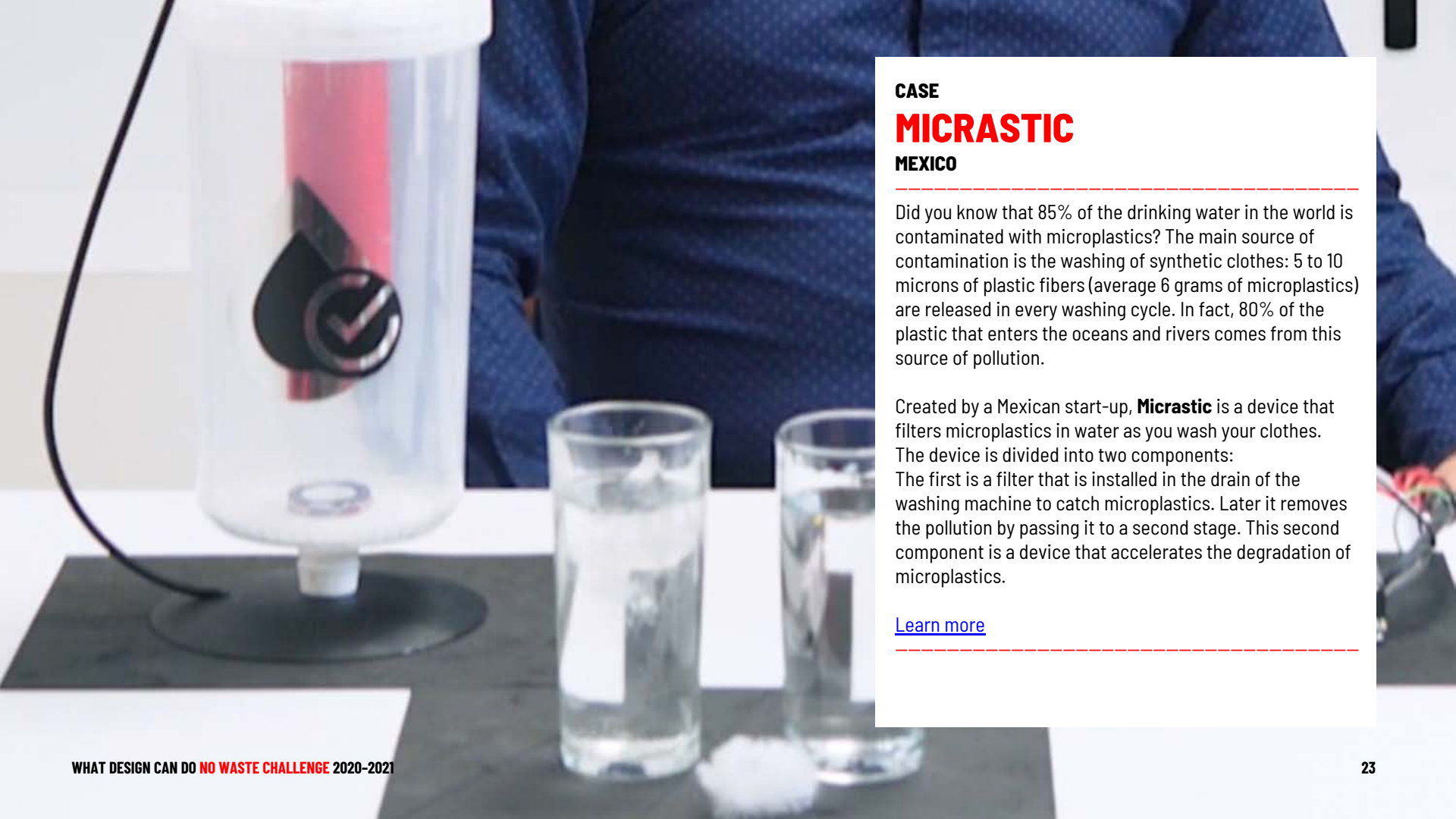
CASE

REVIVAL OF BULK STORES

PACKAGING/ RETAIL DESIGN

Bulk buying has been popular in Mexico for a long time. People used to buy their goods in bulk at local markets throughout Mexico City. Markets offer products that are fresh and cheap. However, sustainability was never the main reason for shopping at these markets. Recently, bulk stores have popped up in different locations in Mexico City. Bulk buying became a big trend in the city. That is good news for the environment, because these shops try to avoid using plastic packaging that will be wasted by encouraging people to bring their own containers, support local production, and offer healthy food. At DOGO you can buy cleaning products (they have more than 100 stores in Mexico), and at Botánica Granel and Zero Market, you can buy fresh and sustainably produced food.

Learn More



CASE

MICRASTIC

MEXICO

Did you know that 85% of the drinking water in the world is contaminated with microplastics? The main source of contamination is the washing of synthetic clothes: 5 to 10 microns of plastic fibers (average 6 grams of microplastics) are released in every washing cycle. In fact, 80% of the plastic that enters the oceans and rivers comes from this source of pollution.

Created by a Mexican start-up, **Micrastic** is a device that filters microplastics in water as you wash your clothes.
The device is divided into two components:
The first is a filter that is installed in the drain of the washing machine to catch microplastics. Later it removes the pollution by passing it to a second stage. This second component is a device that accelerates the degradation of microplastics.

Learn more

OPPORTUNITIES FOR DESIGN

E-WASTE

KEEPING ELECTRONICS IN USE LONGER

In the electronics sector, periods of obsolescence are becoming increasingly shorter. As a result, eight out of nine electrical or electronic devices in Mexico are thrown away. How can we keep these devices in use longer? **How can we design electronic devices in a way that makes them easy to repair? Can we develop a culture of repair and maintenance?** Also consider designing alternative services to owning like sharing, leasing and renting.

GETTING THE BEST FROM E-WASTE

Although many valuable materials can be extracted from e-waste, only 14 percent of discarded electronic devices end up being recycled. The rest find their way to landfills, illegal dumping sites or incinerators. The informal sector active in sorting and recycling of e-waste is growing rapidly in Mexico City, yet largely working in unsafe and unhealthy conditions. **How might we design programmes, services and facilities that improve working conditions and efficiency, so that more valuable materials and parts can be returned to the production chain?**

CASE

RECICLATRÓN

SERVICE DESIGN

Reciclatrón is an activity carried out every year by SEDEMA, which invites citizens to share information and alternatives around how to dispose, treat and recycle electronic waste.
Reciclatrón also offers a service to recover electronic cards, cathode ray tubes, data processing units, monitors, computer equipment, various plastics, electrical appliances, ferrous and non-ferrous metals.

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