

PLANET & PROFIT

UBQ MATERIALS LTD. 2021

One of the greatest critical challenges we face as a global community is how to best approach the growing volume of municipal solid waste (MSW). The decisions we make are of enormous importance to society at large and the planet in general. Greater urbanization, increased mass production and consumption, and the rise of disposability makes MSW <u>an extremely</u> <u>complex issue</u>. Collected and uncollected waste are becoming a globally pervasive situation that poses serious environmental health threats.

The World Bank predicts global <u>waste will grow by 70 percent</u> by 2050 unless people, organizations, and governments take urgent action to mitigate its harmful effects. Waste—and what we do with it—has often been an overlooked issue as it relates to a sustainable and healthy world. Renewable, circular economic practices that focus on redirecting the flow of waste away from landfills and repurposing it into products are key to creating a safer, healthier, and more economically viable planet for everyone.

UBQ[™] Material is a novel, climate positive approach that uses a revolutionary process to convert organic household waste into sustainable bio-based material. Clean, recyclable, and cost-effective, it can be used as a substitute for plastics, concrete and wood in the manufacturing of thousands of products. Innovation and sustainability in MSW management have never been more exciting.

PLANET, PEOPLE & PROFIT: MAKING A POSITIVE IMPACT

The environmental and financial costs of global waste are affecting world-wide economic growth. Sustainable waste and production practices integrated into global development planning and implementation are a way for organizations to produce goods more efficiently and costeffectively while lowering risks to people and the planet. **The term "waste regime" is used to describe the economic, political, and material dynamics through which waste is produced, conceptualized, and politicized.It addresses such questions as:**

- What technologies are used in MSW management?
- Why are they prioritized?

• Who is involved in the production, circulation, and transformation of MSW? The interrelated nature of waste regimes helps us understand why transporting waste out of sight—and into landfills—is not enough.

Today, the "triple bottom line" or 3Ps concept of planet, people, and profit is increasingly seen as just as important as traditional financial performance. Here's a brief summary of what this concept entails:

- **People:** includes individuals, families, employees, communities, and any other persons who influence or are affected by, for the purposes of this paper, MSW management.
- **Planet:** refers to the positive and negative impact waste production and management has on the natural environment. It can include topics like carbon footprint, toxic materials, and the usage of natural resources. It also relates to the active removal of waste and rehabilitation of harm done.
- **Profit:** is the positive and negative impact the handling of MSW has on a local, national, and global economy. It includes employment creation, innovation promotion, and other economic impacts.

Every business pursues financial profitability. But those who embrace a people, planet, and profit ideal see profits as one part of their overall business plan. They also recognize that profit isn't diametrically opposite to people or planet. With this very philosophy, <u>B Corporation</u> has risen with the vision of a global economy that uses business as a force for good. Certified B Corporations are businesses that meet the highest standards of verified social and environmental performance, public transparency, and legal accountability to balance profit and purpose.

In 2016, Swedish household goods giant IKEA reported sales of nearly \$38 billion. That same year, the company used recycling waste to produce some of its best-selling products and, lo and behold, turned a profit. And while the company is invested in sustainability, they use the approach because it's cost effective. This would come as no surprise to the people at MIT Sloan Management Review who, back in 2013, found that "sustainability-driven innovators" <u>saw</u> increased profitability when they "included sustainability as a permanent fixture in their management agenda.

Developed by <u>John Elkington</u>, a world authority on corporate responsibility and sustainable development, the 3Ps have never been more relevant than they are today. Major organizations have announced ambitious plans to reduce emissions and go carbon neutral.

- In January 2020, Microsoft declared it would be carbon negative by 2030 and would by 2050 remove from the environment all the carbon the company had since 1975 directly or by electrical consumption emitted into the atmosphere. In July, the company posted a progress report on its grand goal. Daimler, who's currently testing UBQ's thermoplastic material in the
- production of automotive parts, has announced that starting in 2022, all German Mercedes-Benz plans would <u>operate CO2 neutral</u>. The company has also stated a goal of having all its cars carbonneutral by 2039, the most ambitious target of any major automaker. Reflecting their commitment to becoming a circular business by 2030, IKEA plans to <u>expand its</u>
- <u>sustainability efforts</u> to include having all their products able to be reused, refurbished, or recycled.

THE 3PS AND IMPACT INVESTMENTS

Companies aren't limiting their sustainable decisions to people, planet, and profit. Impact investments—the unleashing of capital for good—are being used to generate positive, measurable environmental and social impacts as well as favorable financial returns.

- In June of this year, Amazon announced its \$2 billion <u>Climate Pledge Fund</u> to invest in sustainable technologies and services designed to help the company reach its net-zero carbon commitment by 2040. Earlier in the year, the company's CEO, Jeff Bezos, pledged \$10 billion to fund and support scientists, nonprofits, activists, and other groups in their fight to counter the effects of climate change.
- In April 2020, the world's largest investor, Blackrock, launched its new <u>Global Impact</u> <u>Fund</u>. The fund enables investors to direct monies towards companies who support the <u>United Nations' Sustainable Development Goals</u>. A few months prior, Blackrock announced it would put sustainability at the heart of its investment decisions by divesting from thermal coal and no longer investing in endeavors harmful to the environment.



Founded in 1992, TPG, is a leading private investment firm managing in excess of \$111 billion in assets. In 2018, along with co-founders Bono and Jeff Skoll, it launched <u>The Rise Fund</u> as a vehicle for investing in organizations who are changing the world and supporting visionaries and entrepreneurs who demonstrate the ability to drive measurable social and environmental change alongside business performance and strong returns.

UBQ MATERIALS: A CASE OF TRASH TO TREASURE

UBQ believes there doesn't have to be a choice between sustainability and profit. Our globally-patented, climate-positive process and material is cost-competitive with other thermoplastics, does not require significant investment in new equipment, and seamlessly integrates into existing plastic manufacturing infrastructure. In fact, we believe UBQ is the ideal case study for what's possible in a circular economy where growth is redefined and positive society-wide benefits flourish:

- A patented, advanced conversion technology transforms household waste everything from yogurt containers to chicken bones and cardboard – into an eco-friendly thermoplastic composite.
- The climate-positive material can be used to produce a range of everyday goods and has already been used in the manufacturing of pipes, shopping carts, bricks, pallets, panels, automotive parts, and trash cans.
- The bio-based materials used in place of conventional plastics are 100 percent recyclable.

UBQ Material is a plug-and-play solution that drives sustainability goals without compromising profits.

TOWARDS A CIRCULAR ECONOMY

We currently live in a primarily linear economy. The goods we use are manufactured, sold and used, and then tossed away as waste. In 2010, when the Ellen MacArthur Foundation <u>report on the Economics of a Circular Economy</u> was released, it asked readers to imagine an economy where the goods we use today are eventually turned into tomorrow's resources. Sustainable development requires deep and disruptive changes in the way businesses and societies are organized. A circular economy model offers new avenues of innovation and integration between the 3Ps and MSW management. Sustainable actions that move away from wastefulness and towards an economy that redesigns, reuses, and remanufactures materials may disrupt businesses, but they're also better for people, the planet, and profits. Many global industries are already taking steps to advance a circular economy by developing innovative technologies, products, and services that are designed to responsibly manage MSW. One way to look at it is to see a circular business model as one where we use, not consume or own.

The four key components of a circular economy are that products are:

- **1** Designed for durability and recovery
- 2) End of use recovery
- 3 Sustainable, safe inputs
- 4) Process recovery and reuse

There are wide-ranging benefits to closing the loop and adopting a circular economy model. Though it's often mistaken for recycling, a circular economy eliminates one step that linear and reuse economies share: non-recyclable waste. And where in a linear economy value is created by producing and selling as many products as possible, in a circular economy long term, multiple life cycles are emphasized.

GARBAGE AS A COMMODITY

It would be a nice feature, but trash doesn't disappear. It has to go somewhere. Traditionally that somewhere has primarily been landfills. In a circular economy, garbage like banana peels, milk containers, and plastic straws could be a valuable commodity.

The untapped potential of trash has long been a focus of environmentalists who believe the linear economy model of disposable products is no longer sustainable. Instead, they envision a circular economy in which resources are maximized and waste is minimized.

One country that has managed to reduce landfill transfers to less than one percent is Taiwan. Nearly half its MSW is recycled. Plastic waste is turned into cell phone cases. Food scraps become fertilizer. But many of the facilities needed to accomplish these results in other countries have slowed down the adoption of more sustainable technologies and strained municipal budgets.

With just slightly more than a decade left to reduce global warming levels, a zero-waste approach is one of the fastest, cheapest, and most effective ways to reduce emissions and accelerate the transition to a circular economy. UBQ Materials uses unsorted, residual MSW as its primary feedstock, diverting it from landfills while reducing emissions. It is the most climate-positive material available today and no other thermoplastic material offers its substantial environmental benefits.

WHAT IS UBQ MATERIALS? BREAKING THE MOLD OF TRADITIONAL RECYCLING

An Israel-based company UBQ Materials has developed one of the most promising waste conversion technologies. In a patented-closed loop process, UBQ produces its thermoplastic by breaking down waste into its most basic natural components of lignin, cellulose, sugar, and fibers and, using an energy-efficient and patented process that does not rely on water or produce harmful emissions, transforms them into a novel composite thermoplastic.

This composite thermoplastic has been successfully implemented in injection molding, extrusion, compression molding, and 3D printing. It's been tested and proven compatible with conventional polymers such as Polypropylene (PP), Polyethylene (PE), Polyvinyl chlorine (PVC), Polystyrene (PS), and Acrylonitrile butadiene styrene (ABS).

UBQ is not a plastic treatment or recycling process. The solution addresses the MSW crisis as a whole by adopting a truly circular model to its resources, processes, and economics. Unlike traditional recycling, the process uses the entire waste stream, requiring no separation, except for metals and minerals which have high recycling values. The end result is a truly circular model yielding zero waste.

TACKLING THE WASTE EPIDEMIC AND "PLASTIC SOUP"

Of all the threats to the planet and its people's existence, it's likely none is more acute than the problem of MSW.

Oceanographer Jacques Cousteau once said that "water and air, the two fluids on which all life depends, have become global garbage cans. Sadly, nearly 25 years after his death, modern society produces <u>an excess of 2 billion tons of MSW</u> globally every year.

Sadder still, 80 percent of it is dumped into open landfills situated near or next to oceans, rivers, and lakes. Alarmingly, and despite increased awareness of the threat waste poses, the amount produced is expected to more than double, to nearly 5 billion tons by 2050.

The Plastic Soup, also referred to as the Pacific Trash Vortex or Great Pacific Garbage Patch, is just one example of the problem the planet faces when dealing with waste.

The enormous stretch of waste is located about a thousand miles from Hawaii and California and is estimated to be twice the size of the continental U.S. Eighty percent of the waste comes from the land in the form of litter that gets stuck in storm drains, legal and illegal dumping of garbage and appliances, and inadvertent spills by plastic manufacturers.

The toll that this waste is taking on marine life is well-documented. Humans, too, are negatively affected. Most experts agree cleaning up the Plastic Soup isn't feasible as it would entail filtering enormous amounts of water, a process which could cause significant harm to plankton and other marine organisms. A better solution is finding ways of not adding to the existing problem. Recycling is often cited as a promising solution to the MSW crisis. It's a well-intentioned hope, but the fact is that until only recentlynly nine percent of the massive amounts of bottles, packages, and food containers discarded each year was recycled. An additional 12 percent wasburned, and the rest buried in landfills or simply tossed away to end up polluting our waterways.

When in 2018 China reduced by 99 percent the amount of waste the U.S. and EU could import into the country, American municipalities found themselves facing a dire new reality. Either pay much higher rates for recycling or throw it all away. Cities across the country now either burn a large percentage of the trash they collect, and many are no longer recycling cansglass, and paper, sending them all to a landfill instead. It's safe to assume the nine percent estimate for how much trash is recycled is now likely significantly lower.

CLOSING THE LOOP – A MODEL OF CIRCULARITY

In a circular economy model, a material must be fully recyclable and able to be looped back into its original material value, to be utilized over and again.

UBQ is such a material and, unlike existing oil-based resins, can be recycled many more times without losing its physical properties.

Together with systems change company <u>SystemIQ</u>, UBQ worked to define eight criteria for qualifying a solution as a "target technology" in a circular solution. Ranked from most to least critical, they include:

- 1) Safe technology with no associated health hazards
- 2 Doesn't take away feedstock that could be upcycled more efficiently3.
- **3** Loopability
- 4) A low or negative carbon footprint
- 5 Designed to mitigate landfill use
- **6** Does not require fossil-based resources
- 7) Compatible with other streams of similar materials
- 8) Does not increasingly incorporate contaminants that can lead

to health issues or downcycling

UBQ Material is designed to be positioned at the end of the material life cycle. This ensures wasted resources are not burned or dumped directly into waterways, or ending up in landfills. Our conversion solution processes all waste, not just plastic, into a singular and homogenous upcycled material. The ability to actively divert MSW from an unsustainable disposal method makes UBQ capable of closing the loop, bridging the gap for material demand with sustainable bio-based materials, while at the same time reducing carbon emissions and waste pollution.

UBQ CLIMATE IMPACT OPPORTUNITY

UBQ is designed to convert a seemingly unrelated stream of materials into a homogenous and valuable bio-based composite material with ZERO impact: zero water, zero waste, zero effluents, zero combustion, and zero emissions.

Accredited sustainability and LCA auditor <u>Quantis International</u> has designated UBQ as "The Most Climate Positive Thermoplastic Material on the Market," citing the reduction of 11.7 tons of carbon dioxide for every ton of UBQ material produced.

The climate impact equivalency for UBQ is exceptional. Producing 1 ton of UBQ amounts to the following measures:

- Annual carbon sequestration of 540 trees that are 10 years or older
- 376 square feet of annual arctic sea ice that melts and is lost
- Annual emissions of seven average new medium-sized cars
- Annual carbon emissions from 1.5 from average U.S. household for a full year.

To further illustrate how enormous the impact can be, UBQ is currently in the processing of expanding operations into the U.S. The facility there is expected to have an annual throughput capacity of 90,000 tons. That equates to taking 630,000 cars "off the street" for a full year.

UPSTREAM AND DOWNSTREAM MARKET & DEMAND POTENTIAL

Could UBQ eventually become a victim of its own success? Won't the model eventually run out of MWS to utilize in its process?

SystemIQ found that while UBQ's process has a role to play in reducing MSW, it is only one of many actions and targeted technologies needed to achieve landfill reductions through 2050.

Plastic is light, versatile, and ingrained into our everyday lives. It's also here to stay and will remain crucial for a long time to come. It is estimated that the production of plastics will quadruple from 311 million tons to 1.124 billion tons by 2050.

Bio-based or thermoplastics that can bridge the gap of material demand growth while closing the loop between waste to renewable resources offer great opportunities. By using waste that's already destined for landfills, UBQ helps advance a more circular economy.

UBQ'S ROLE IN A SUSTAINABLE WORLD

The name UBQ stands for ubiquitous. The problem of MSW is ubiquitous and we believe the solutions must be as well. This is the true beauty behind UBQ: our material is applicable in so many different industries and within so many different product sectors.

Large brands and corporations have already integrated UBQ into their efforts. Over the last year we've signed deals with:

- Daimler AG, manufacturer of Mercedes-Benz, to explore the use of the material in auto parts.
- Arcos Dorados, the world's largest McDonald's franchisee, to integrate the material into in-restaurant items.
- The State of Virginia in the U.S. to use UBQ in the manufacturing of municipal recycling bins.

UBQ strives to be a model and inspiration for how the relationships between sustainability and the health of our people, planet, and economy can be reimagined. One does not have to rule out the other: we can develop economically viable solutions that advance global sustainability goals.

To learn more, visit **www.ubqmaterials.com**