



MIW

"Think Circular, Less is More"™

MATERIALS IN WORKS (MIW)

Giving Label Packaging Waste A Second Life



www.materialsinworks.com



(+60) 127 16 8338 @John



enquiry@materialsinworks.com



**“Labels are everywhere,
decorating and identifying
products. The unsung heroes,
Paper Liners safeguard the labels
before applied.”**

THE PROBLEM

But Paper Liners are not recyclable, often ending up in landfill.

16.45t/day

of paper liners been ending up in landfill. Contributing substantially to the need for more landfill sites.

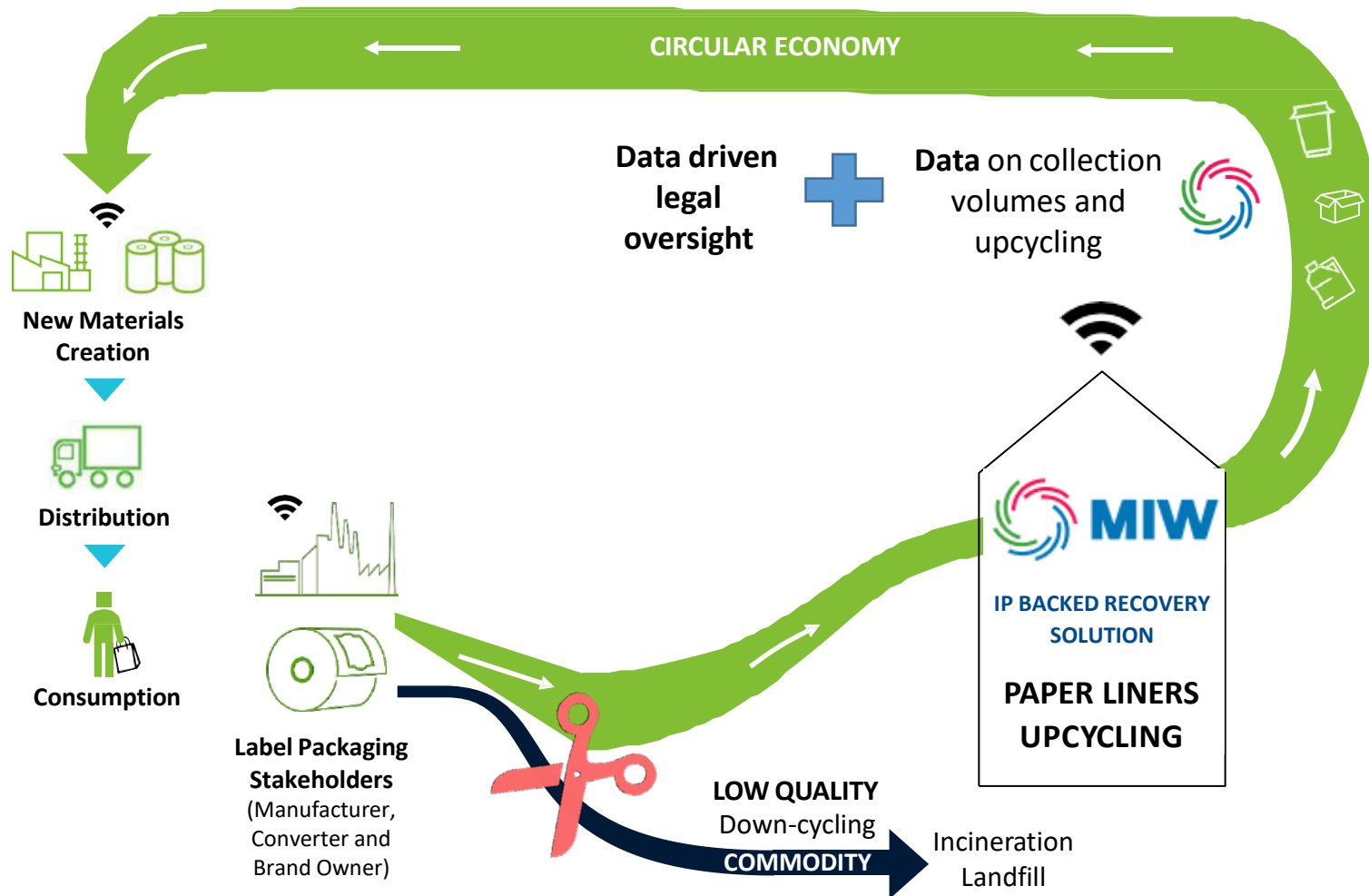
28.1%

in recycling rate, Malaysia is still far behind from the target which is more than 40% by 2025.

65-70%

surge in raw material price, Malaysia is a net importer of raw material, Pulp.

OUR SOLUTION



**Business case for
Paper Liners**

**New Value
Creation**

RM 1,672_{per ton}
Recovered
Cellulose Pulp
(RCP)



Hard-to-Recycle
Item (No Value)

OUR PRODUCT



Recovered Cellulose Pulp (RCP)

A lignin free, **wet-formed chemical pulp**, comprising Nordic Hardwood and Softwood fibers with a **cellulose content exceeding 90%**. Its low kappa number enables the **making of A4 copier paper, tissues, and food packaging.**

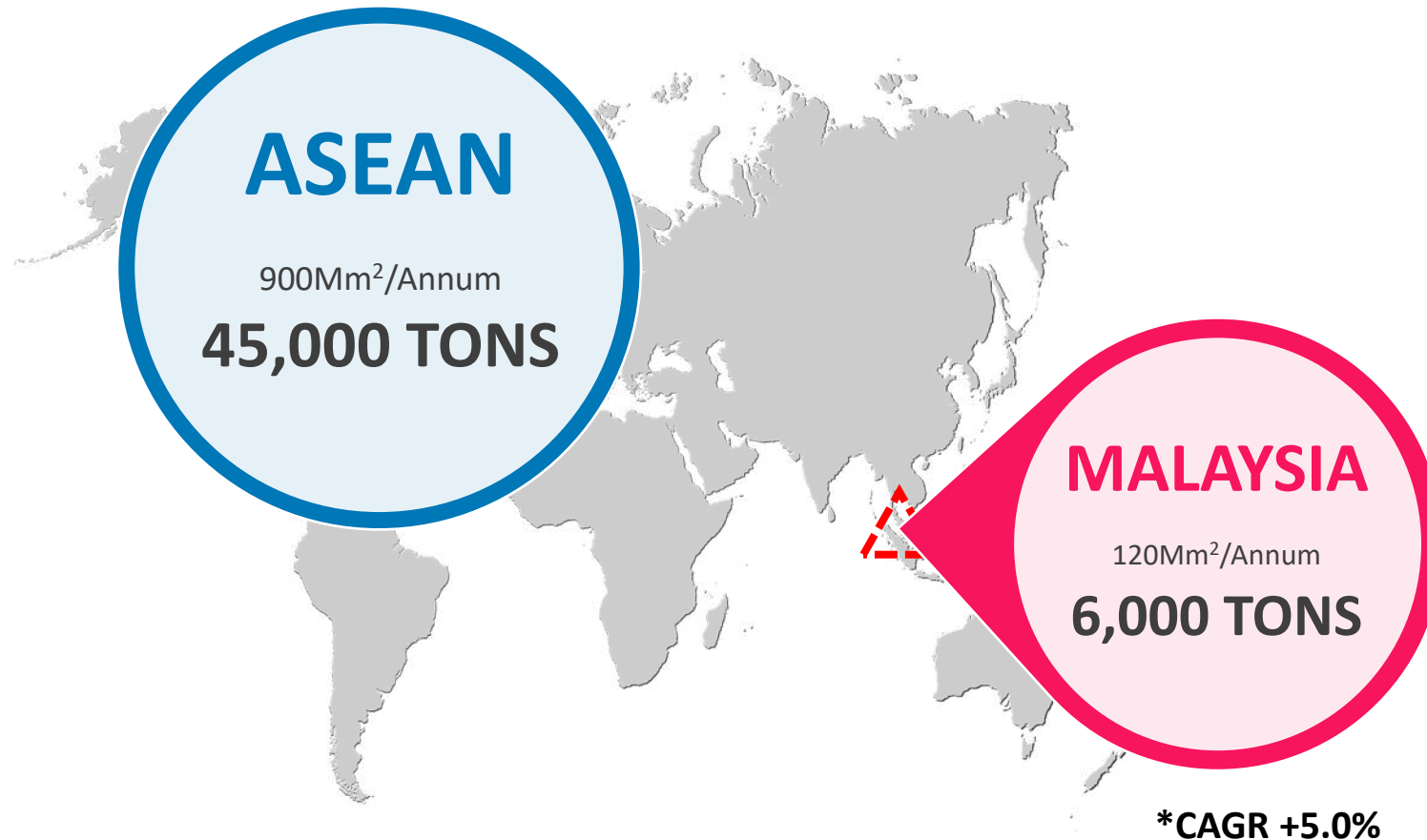
Partnered with leading research institutions:



USM UNIVERSITI
SAINS
MALAYSIA



MARKET FOR PAPER LINERS UPCYCLING OFFERINGS



MALAYSIA

120Mm²/Annum

6,000 TONS

*CAGR +5.0%

Source from: AWA Release Liner Annual 2019

PRIME BEACHHEAD MARKET

Paper Liners Upcycling
offerings in peninsular
Malaysia

2 multinational **label manufacturers** and label material **converters** operate, aligning with **brand owners** committed to driving **positive change** in sustainability and the **circular economy**.

CLIMATE IMPACT



With 60% of the Beachhead Market,
we save **54,600 Trees**
from cutting down which equivalent to
offsetting 10,920 t
of CO₂-emissions each year.

Landfill Disposal:

29,400 t of CO₂-emissions each year

WITH MIW UPCYCLING SOLUTION:

6,300 t

← -23,100 t CO₂-emissions each year

79% Reduction

59,778 t
of CO₂

Cumulative CO₂ Saving within 5 Years time
≈ **of taking 13,000 cars off the road for 1 year**

COMPETITIVE LANDSCAPE

Exclusive waste firms in ASEAN upcycle paper liners into valuable pulp.



MIW

"Think Circular, Less is More"™



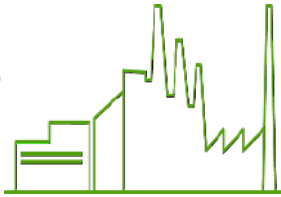
More Than 1000

conventional waste collectors with no
upcycling capabilities



BUSINESS MODEL

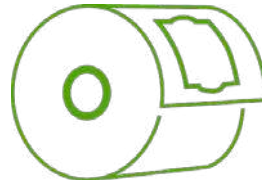
We are earning by charging waste handling fees and via the sale of recovered cellulose pulp



RM3.08M

Sale of Recovered
Cellulose at
RM 1,672/ton

3,600 ton (60%) of the
Beachhead Market Share and
Singapore Market



RM10.86M

Waste Collection /
Processing Fees at
RM 308/ton

3,600 ton (60%) of the
Beachhead Market Share and
Singapore Market



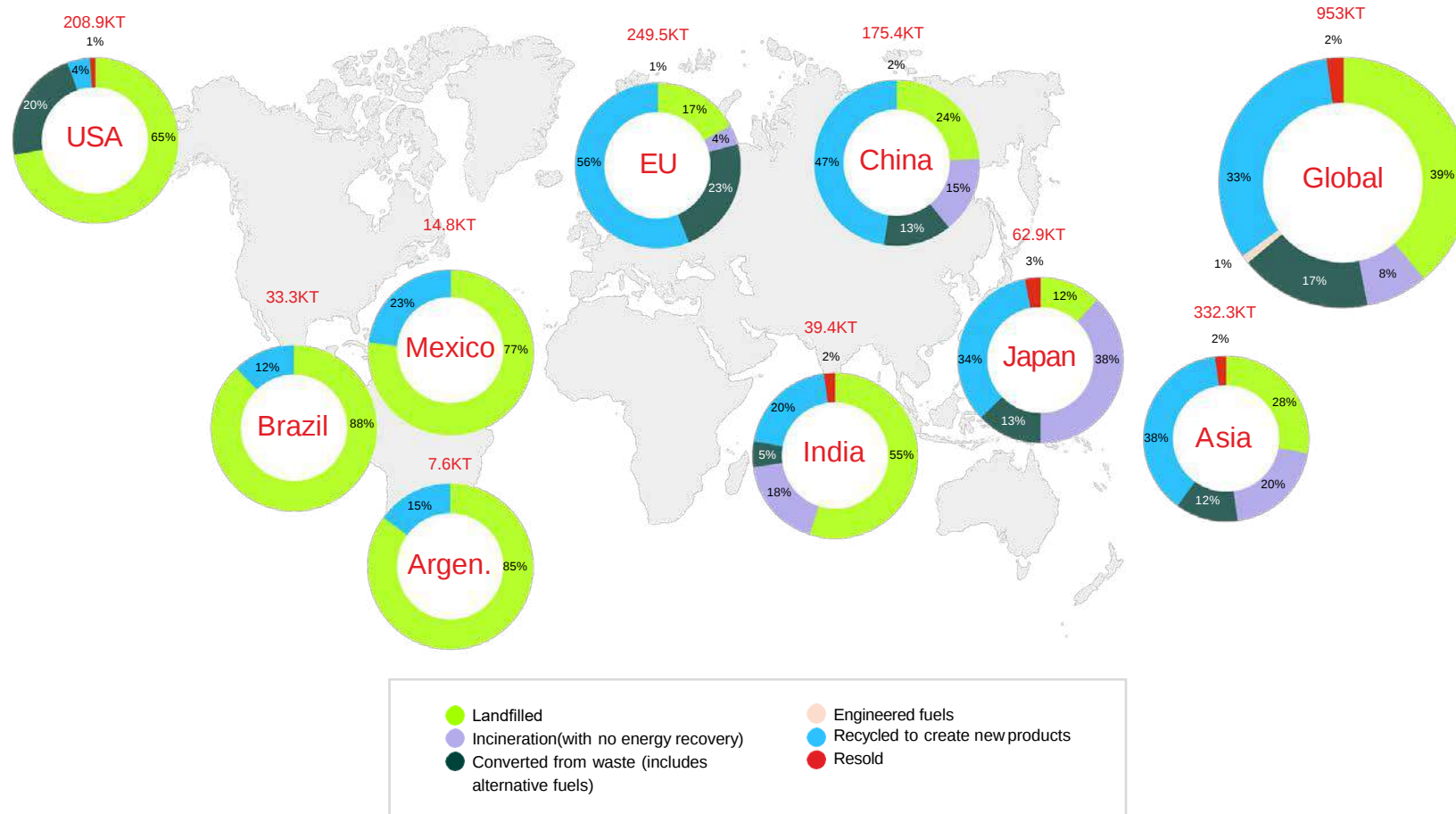
RM13.94M

Sales Revenue

Projected by 2030 after
acquiring 60% of the Beachhead
Market Share and Singapore
Market

GO-TO-MARKET

Launching in most populated cities, going from country to country, region to region

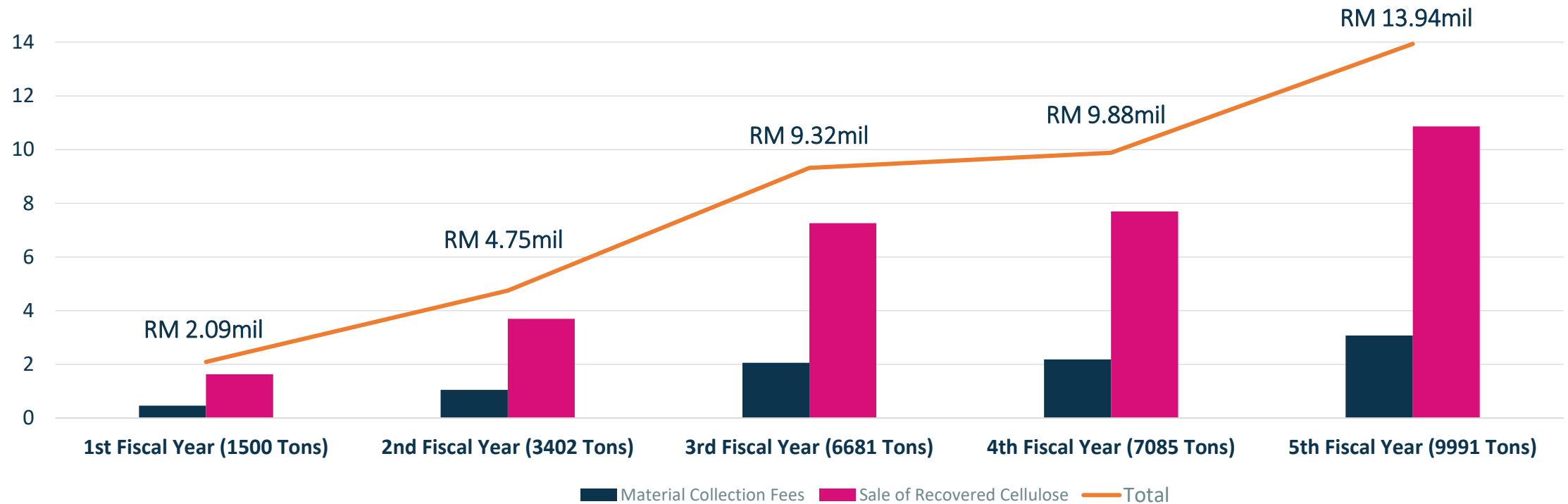


We plan to reduce paper liner waste in landfills and incinerators by launching initiatives in ASEAN countries and expanding globally.

Source from: AWA Release Liner Annual 2019

FINANCIAL FORECAST

Aiming for Malaysia and Singapore, selling 833 Tons of RCP, targeting RM 14mil in 5 years.



OUR PREMISES – SENAI, JOHOR

Proud to be the pioneering company in ASEAN that can transform paper liner waste into recovered cellulose pulp.

360 to 720 Mt of RCP per year

On average, 1 t of Paper Liner Waste diverted from landfills, resulting in a mitigation of 7 tons of CO2 emissions





Proud to be pioneering the upcycling of label matrix and laminates wastes into Processed Engineered Fuel (PEF) in ASEAN.

60,000 to 90,000 Mt of PEF per year

On average, 1 t of PEF from Commercial & Industrial Waste mitigates : 2.0 m³ of landfill space and 0.7 t of CO₂



A TEAM READY TO EXECUTE



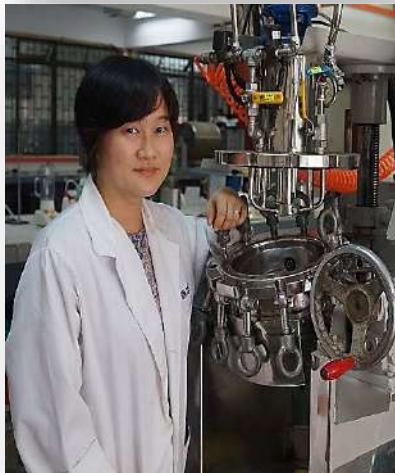
John Ooi

- Technical Director
- UTM graduate with Industrial Chemistry Background
- Sustainable Packaging Industry Veteran



Asri Anuar

- Operation Director
- Strong diverse background in manufacturing industry
- Well equipped with Paper and Coatings manufacturing experience



Assoc. Prof. Dr. Leh

- Technical Advisor from USM
- Assoc. Prof in Bioresource, Paper and Coatings Technology, USM
- Strong background in Bioresource, Paper & Pulp Production Industry



Joel Lau

- Business Director
- Strong sales background in tissue industry
- Well equipped with tissue products and label packaging experience

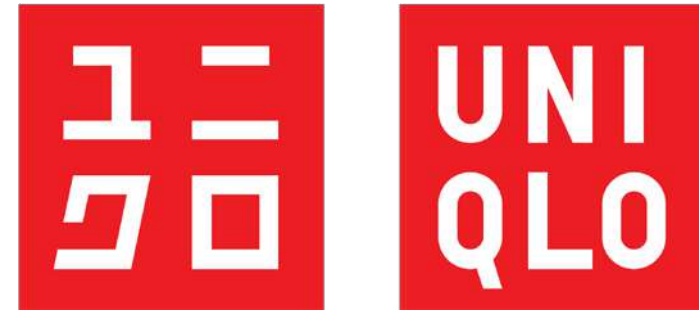
PARTNERS & ACCOLADES



Welcoming Wipro Unza into Liner Recycling Program

Overview: Successfully onboarded **Wipro Unza** into MIW's liner recycling program, marking a major collaboration with a key player in the **home and personal care industry**.

Impact: Wipro Unza's participation strengthens circular economy efforts by ensuring a steady stream of waste material for upcycling.



Welcoming Uniqlo Malaysia into Liner Recycling Program

Overview: Secured **Uniqlo Malaysia** as a partner in MIW's liner recycling initiative, expanding our reach into the **retail and apparel sector**.

Impact: This partnership reinforces Uniqlo's sustainability commitments, transforming paper liner waste into valuable, reusable materials.

PARTNERS & ACCOLADES



Published on AVPN's Deal Share Platform
Access to the Asia's number 1 social investment network



Top 10 in Youth Co: Lab Malaysia Cohort Program
Access to UNDP and others Social Enterprise (SE) networks



Awarded with funding in HSEF 2022
Access to Yayasan Hasanah Partners Program and more!



Top 5 in Environmental NGO Accelerator Perak Programme
Access to Yayasan Hasanah and others Social Enterprise (SE) networks



Top 5 in Cradle MYStartup Pre-accelerator Cohort 1 Programme
Access to Cradle fund Partners Program and more!



National Winner in Shell Livewire Malaysia 2023 Program
Access to Shell's alumni global networks and programs

MEDIA COVERAGE

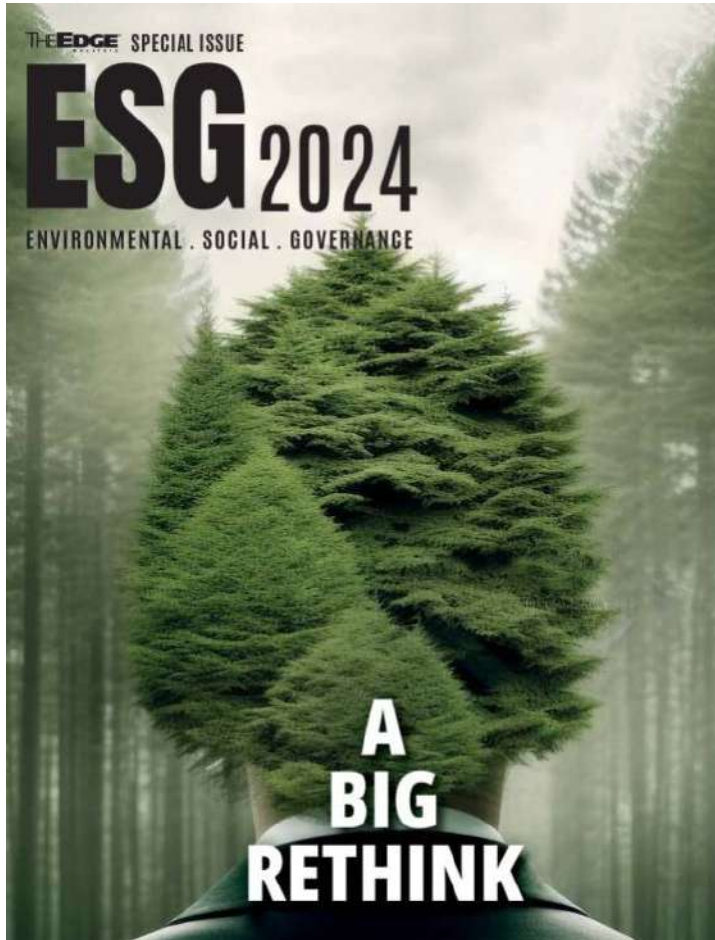


Niaga AWANI: Jiwa SME: Inovasi pembungkusan mampan dari sisa

Usaha untuk memperluas inovasi pengupayaan bahan sukar dikitar semula di peringkat global, banyak cabaran yang perlu dihadapi. Ini termasuk halangan infrastruktur di kawasan membangun, kekurangan kemudahan pengumpulan dan pemprosesan, serta kesedaran masyarakat yang rendah tentang kepentingan pengupayaan. Ini memerlukan langkah strategik untuk mencipta penyelesaian yang berkesan dan lestari untuk memajukan inovasi pengupayaan di seluruh dunia.

02/10/2024 09:40 MYT

MEDIA COVERAGE



and ensuring that all our packaging is recyclable, collected and segregated for recycling. In this sense, it will be important to add capabilities that today are still missing in Malaysia, such as industrial capability for chemical recycling. This would allow the industry to address the components of plastic waste that cannot be processed through the existing mechanical recycling facilities," he says. ■

② Giving label liners a new lease on life

Labelers — one of the most ubiquitous products in the packaging industry — also yield a widely discarded by-product: paper liners or label release liners. Essentially, paper liners — the backing material for the label that stops the labels from sticking together — are conventionally considered a hard-to-recycle item because of their silicon coating, relegating them to the bin and eventually the landfill.

One start-up in Malaysia, however, has come up with an innovative solution to upcycle these liners into recovered cellulose pulp, which then becomes a raw material for premium paper products such as facial tissues.

Established in 2018, Materials In Works (MIW) saw an opportunity to not only address the growing problem of waste in the packaging industry but also play a key role in enabling circularity. "In a day, 16.45 tonnes of paper liners in Malaysia end up in the landfill, which amounts to 500 tonnes a month and 6,000 tonnes a year. In Southeast Asia, 45,000 tonnes of paper liners end up in landfills," says MIW founder and technical director John Ooi.

He saw a rising trend in the European Union, driven by legislation, for industry to embrace circular economy practices, from reducing waste to maximising resource efficiency. Having witnessed paper liner upcycling initiatives in Europe in the decade that he was in the label packaging industry, Ooi teamed up with Dr Leh Cheu Peng, a pioneer in pulp and paper research at Universiti Sains Malaysia, to delve into the possible solutions in Malaysia.

The team spent some five years — including the two years impacted by the Covid-19

lockdowns — on research and development, along the way securing much-needed funding. In December last year, MIW secured about RM2 million through the pitchIN equity crowdfunding to implement its innovative technology and establish the first industrial pilot plant in the region focused on managing paper liner waste.

The pilot plant launched at the end of July is expected to commence operations in September. To date, MIW has successfully added multinational label manufacturers Avery Dennison and PMC, label converters Fastroll Labels and Mega Label, as well as brand owners such as Wipro Unza and Uniqlo Malaysia, to its paper liner upcycling framework.

ONE MAN'S WASTE IS ANOTHER'S TREASURE

The upcycling of paper liners starts with the collection of the liners from brand owners, such as Wipro Unza and Uniqlo. Once the liners are cut and shredded, the small pieces go into a pulper mixer with MIW's proprietary recovery technology to separate the silicon from the liner, yielding some 80% of cellulose pulp that is free of silicon.

The remaining 20% of pulp, which contains fibre and silicon, is used to make lower-end paper products such as egg and coffee trays. To ensure that the cellulose pulp is dry, it then goes into a centrifugal dehydrator.

The recovered cellulose pulp that is produced is a lignin-free wet-formed chemical pulp. Lignin is a natural glue that holds wood fibres together and, if not removed, makes paper made from the wood pulp weaken and discolour rapidly. MIW's recovered cellulose pulp is lignin free and boasts a cellulose content of more than 90%, making it ideal for the manufacture of premium

MIW's pioneering effort offers an opportunity for brand owners and premium paper manufacturers to meet their ESG and circular economy goals.



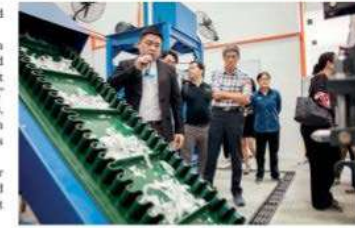
products such as facial tissues and moulded paper products for high-end packaging.

"At the current scale, the pilot plant can tackle one tonne of paper liners an hour. Based on our studies, we can treat and produce about 60 tonnes of recovered cellulose pulp a month," says Ooi. By diverting paper liners from landfills, MIW expects to save thousands of trees from being cut down and reduce carbon emissions substantially.

Ooi describes the pioneering endeavour as a low-hanging fruit for brand owners and premium paper manufacturers seeking to meet ESG and circular economy goals.

Take, for example, a fast-moving consumer goods company or a logistics provider, where labels are an integral part of the packaging. Instead of consigning the paper liners to the bin and eventually to the landfill, taking up MIW's upcycling solution will help companies not only tackle waste but also achieve its carbon neutrality and circular economy goals.

Similarly, for paper product manufacturers, there is now a domestic supply of lignin-free recovered cellulose pulp derived by upcycling what's been considered waste. Ooi discloses that MIW is in talks with tissue and personal care players and expects to seal an offtake agreement soon. What's key, he points out, is securing a steady supply of paper liners to ensure a



log producer: Ooi (left) and Ooi (right) are engaged in the liner upcycling process during the launch of MIW's pilot plant in June.

consistent supply of the recovered cellulose pulp.

With the patent for its technology underway, MIW is confident that once brand owners and paper manufacturers see the potential in upcycling paper liners, the Johor plant can be replicated elsewhere in the country.

He discloses that the company has also approached the Malaysian Industrial Development Authority to present MIW's endeavour as a case study for the Ministry of International Trade and Industry's consideration. This, he says, would argue MIW's case to secure a special permit to import paper liners from Singapore to be upcycled.

He hopes that in the coming years, MIW will be able to expand its presence across the region to countries like Indonesia and Thailand by initiating joint venture initiatives with local partners to tackle the issue of liner waste. ■

③ Integrating sustainability into all aspects of business operations

At the Bosch Mobility Electronics Manufacturing Plant in Penang (BMEMPP), the integration of advanced technologies and Industry 4.0 solutions has been pivotal in achieving its goals in the areas of carbon neutrality, renewable energy and energy efficiency.

As a core pillar of Bosch's corporate strategy, BMEMPP's commercial managing director Dr Jens Reske says sustainability "is a non-negotiable part of doing business. This balance is maintained by integrating sustainability into all aspects of business operations, from the design of products to the sourcing of materials and the implementation of energy-efficient manufacturing processes".

He says by prioritising sustainability, Bosch has enhanced its brand reputation, attracted eco-conscious customers and gained a competitive edge in the market.

"In 2023, BMEMPP became the first Bosch plant in the Asian region to obtain ISO 50001 certification, an internationally recognised standard for effective energy management systems," he says.

As the pilot site for many of these initiatives within Bosch, BMEMPP has developed expertise in energy management.

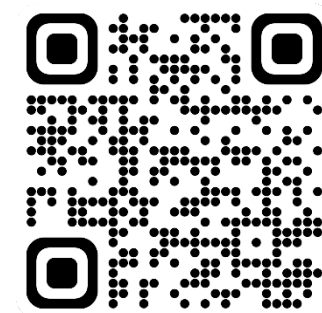
The implementation of an energy management system called Energy Platform, for example, allows for real-time monitoring of the plant's utility consumption, tracking the plant's electricity usage, solar energy generation, water consumption, as well as nitrogen and compressed air usage.

BE PART OF OUR SUSTAINABLE JOURNEY!

Website: www.materialsinworks.com

Email: enquiry@materialsinworks.com

Mobile No.: (+60) 127 16 8338 @John



materialsinworks.com

