

SUSTAINABILITY IN BUSINESS, SUSTAINABILITY AS BUSINESS:

GREEN GROWTH OPPORTUNITIES
FOR SINGAPORE COMPANIES



FOREWORD



Lim Ming Yan
Chairman
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Singapore has embarked on our ambitious vision to transform from a 'Little Red Dot' to a 'Bright Green Spark', by being an inspiration to the world on how Singapore and Singapore's businesses can help the world overcome sustainability-related constraints.

As a low-lying island-state, the climate crisis and resultant rising sea levels pose an existential threat to Singapore. Nevertheless, we have never been defined by our circumstances or geography. Rather, Singapore and Singaporeans are defined by the way we respond, overcome, and forge new opportunities. The local business community is not oblivious to the impact of climate change or the need for a green and sustainable economy. While many multinational corporations and large local enterprises are spearheading sustainability efforts, there remains many companies, especially the SMEs, that are curious yet uncertain about the green transition and their role in the Singapore Green Plan 2030.

How then can we help companies see environmental sustainability as a 'must have' instead of a 'good to have', and to ensure that they do not get left behind by the green bandwagon?

For some, the lack of understanding of environmental sustainability and related concepts has deterred them from taking their first steps towards exploring more sustainable business models. Many industries are therefore encouraged by the recently launched Enterprise Sustainability Programme by Enterprise Singapore, which aims to help businesses develop capabilities for the green transformation.

An equally pertinent challenge is the uneven appreciation across industry eco-systems of green

opportunities and how companies could seize them. Singapore Business Federation (SBF) believes that better clarity on the various revenue-making or cost-saving opportunities would compel companies to incorporate sustainability as an integral component of their business model and new revenue stream, rather than viewing the green agenda as a mere cost centre.

Despite the COVID-19 disruptions, SBF has undertaken extensive industry consultations over the past year in an effort to elucidate green opportunities and the necessary actions required to tap into them. On this note, SBF would like to thank Ernst & Young (EY), Global Compact Network Singapore (GCNS), United Overseas Bank (UOB), our fellow Trade Associations and Chambers (TACs), as well as all the business leaders for contributing your time, insights, and expertise to this policy paper. As a collaborative product of our ground-up, sense-making process, this policy paper is very much an effort by the industry, for the industry.

Businesses play a pivotal role in accelerating the green economy. This policy paper identifies four opportunities and ten recommendations that would support businesses in capitalising on environmental sustainability for growth. SBF is committed to working with like-minded partners across the private and public sectors to take concrete steps towards building a resilient future for ourselves and generations to come.

Together, we can and must do more to transform Singapore into a 'Bright Green Spark' and pass on a better world to future generations.

EXECUTIVE SUMMARY

Sustainability is one of the biggest and yet most untapped business opportunities today. According to the United Nations, investing in Sustainable Development Goals could result in US\$12 trillion of market opportunities, 380 million new jobs, and climate change savings reaching US\$26 trillion by 2030. Through the emerging global consensus to set targets for a green economy, there is scope for the business community to pursue environmental sustainability as a key competitive advantage in the next bound of Singapore's economic growth.

A key step to advancing the green agenda is for local businesses, especially small and medium-sized enterprises (SMEs), to mainstream environmental sustainability and capitalise on emerging opportunities. In particular, SMEs will be critical in the Singapore Green Plan 2030 given their significant roles in supply chains. This policy paper, developed in consultation with a diverse pool of industry stakeholders, aims to articulate the ready green opportunities, as well as to advocate business action and government support needed to expedite the momentum towards environmental sustainability as a viable business proposition.

THE KEY FINDINGS FROM OUR INDUSTRY CONSULTATION AND RESEARCH ARE SUMMARISED BELOW:

OPPORTUNITIES

A

Growing Need for Energy Efficiency Solutions

The adoption of energy efficiency solutions can bring about cost savings for companies. This advantage, along with increasing regulatory pressure to meet low energy targets, is expected to drive up demand for energy efficiency solutions in Singapore.

B

Data-Driven Solutions as a Key Enabler

Data-driven solution providers that are already providing process optimisation solutions can leverage existing expertise and technologies to reposition their offerings to support the sustainability ambitions of their customers.

C

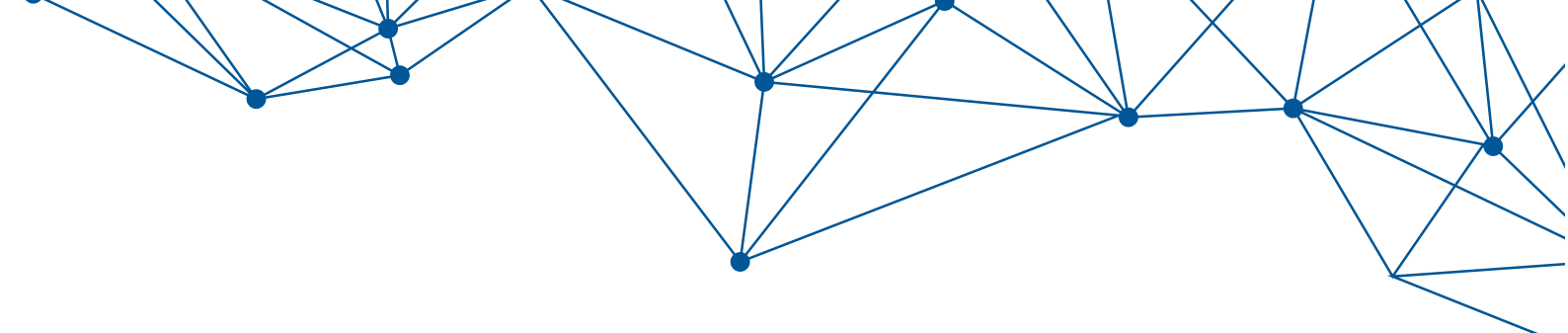
Responding to a Growing Market for Green Materials, Products and Processes

Companies can respond swiftly to the changing demand landscape and proactively transform their product offerings to offer more sustainable products.

D

A Bigger Role for Recycling

Recycling companies have a unique value proposition in the circular economy model as they can create value out of products that would otherwise be incinerated, such as by allowing materials to be reused instead of procuring more raw materials.



RECOMMENDATIONS

1

Going Global with Energy Efficiency Solutions

as local solution providers have the expertise to meet an increasing demand for energy efficiency solutions in the region.

2

Driving Uptake of Energy Efficiency Solutions Among SMEs

where there is untapped potential and a critical need to accelerate adoption.

3

Nurturing Energy Sector Talents

to ensure a pipeline of skilled engineers and technicians who are able to deliver energy efficiency solutions.

4

Aggregating Data for Optimisation and Sustainability

in order to maximise the benefits from data-driven solutions and their applications.

5

Simplifying Wayfinding through Pre-Identified Green Solutions

to help SMEs use and build stronger sustainability capabilities.

6

Incentivising Early Adopters

to drive demand for greener solutions in supply chains.

7

Leveraging Ecosystem Strengths for Growth

by collectively increasing the momentum towards net zero goals.

8

Mainstreaming Sustainability-Related Skillsets

to encourage adoption of green solutions and identification of green opportunities.

9

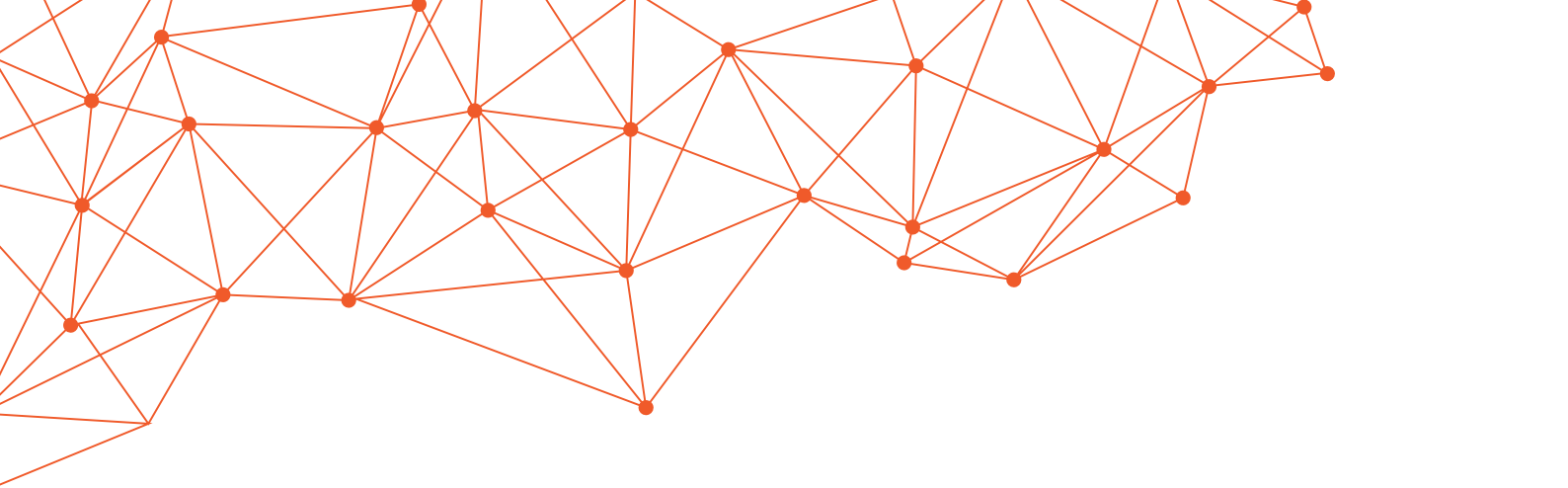
Boosting Infrastructure for Economies of Scale

to enhance the effectiveness of recycling programmes.

10

Growing a Recycling Knowledge Hub for the Region

that can deliver high value recycled products to close the circular economy loop.



SUSTAINABILITY IN BUSINESS, SUSTAINABILITY AS BUSINESS: GREEN GROWTH OPPORTUNITIES FOR SINGAPORE COMPANIES



INTRODUCTION

With sustainability coming of age in the past decade, sustainability-related trends have taken centre stage as key stakeholders

from governments, investors, corporates, and individuals refreshed their commitments to meet sustainability goals. While sustainability encompasses a range of environmental, social and governance issues, environmental sustainability has been a key focus area with increasing momentum to decarbonised economies. Ahead of the United Nations Climate Change Conference 26 (COP 26) where governments are due to strengthen their contributions to the Paris Agreement, there has also been greater alignment among stakeholders as they strive to achieve carbon neutrality by 2050. For example, the Race To Zero global campaign has successfully brought on board 733 cities, 31 regions, 3,067 businesses, 173 investors, and 622 Higher Education Institutions to join 120 countries in the Climate Ambition Alliance, in working towards a zero carbon recovery. Singapore too is set to transform from a 'Little Red Dot' to a 'Bright Green Spark' as the nation gears up to bring Singapore Green Plan 2030 to fruition. For businesses, this will involve being part of an environmentally sustainable future – **sustainability in business**, as well as capitalising on opportunities to pivot to new solutions, products, and markets attuned to serve the green economy – **sustainability as business**.

RISING STAKEHOLDER ACTION



GOVERNMENTS

Across the world, governments are making new and bold climate change commitments. The European Union, USA, Japan, and South Korea are some that have committed to become carbon neutral by 2050, with China set to reach the same milestone by 2060.

Singapore's 2050 goal is to halve carbon emissions from its 2030 peak, with an aim to achieve net zero emissions in the second half of the century. The Singapore Green Plan 2030 is a comprehensive plan that underscores the nation's commitments to the Paris Agreement and the 2030 Agenda for Sustainable Development, positioning sustainability as a core pillar of Singapore's post COVID-19 growth plans.



INVESTORS

At COP 25 in 2019, 613 investors representing US\$37 trillion in assets called on governments to step up their efforts against climate change. BlackRock, the world's largest asset manager, has also declared that they would avoid investments with high sustainability-related risks and acknowledged that climate transition presented a 'historic investment opportunity'. Other examples of strong investor commitment in the transition towards zero emissions include the United Nations-convened

Net-Zero Asset Owner Alliance, which represents an international group of 58 institutional investors committed to transitioning their investment portfolios to net zero emissions by 2050, and the Climate Action 100+, a US\$54 trillion investor-led initiative aimed at engaging with companies that are strategically important to the net zero emissions transition. As environmental sustainability emerges as an increasingly significant factor in the investing process, sustainability investing is set to become mainstream as all players in the financing value chain, including financial institutions and insurance providers, start to recognise that companies solving the world's biggest challenges are best positioned to grow.



CORPORATES

Along with the mindset shifts in the investment community and the general public, there is a growing number of companies that have set out clear plans to incorporate sustainability into their growth and development strategies. To date, more than 1,600 businesses are working with

the Science Based Targets initiative (SBTi)¹ to reduce their emissions² in line with climate science. The large multinationals are by and large, seasoned in this. Nonetheless, as supply chains go green, there will be both direct and indirect trickle-down impetus throughout supply chains as small and medium enterprises (SMEs) get pulled along by the green bandwagon.

Strengthening Commitments to Green Supply Chains

City Developments Limited (CDL)

CDL's SBTi targets include reducing 59% of their Scope 1 and 2 GHG emissions of their Singapore operations by 2030 (benchmarked against emissions in 2007). To achieve these targets, CDL has made commitments to strengthen supply chain engagement to help suppliers switch to lower-carbon building materials and methods.

As the first real estate developer in Singapore and the first real estate conglomerate in Southeast Asia to sign the World Green Building Council's (WGBC) Net Zero Carbon Buildings Commitment, CDL is dedicated to achieving net zero operational carbon by 2030 for their new and existing wholly-owned assets and developments under their direct operational and management control. In deepening their ambitious decarbonisation goals, CDL is reviewing its SBTi-validated GHG reduction targets to align with a 1.5°C warmer scenario-compliant business model.

Evonik

Evonik is a specialty chemicals company with an international presence. The company's sustainability strategy is rooted in the potential of sustainability as a growth driver. In addition to achieving their targets for greenhouse gas emissions ahead of schedule, the company has set more ambitious targets to reduce their absolute Scope 1, 2 and 3 emissions. Evonik acknowledges that sustainability should be optimised along the entire value chain and believes in working with their suppliers to further reduce the company's carbon footprint, through the use of more sustainable raw materials and biotechnology wherever possible. Evonik is also pooling its activities for circular plastics in a global program as part of the transition to a circular economy.

This includes additives and technologies that make mechanical and chemical recycling more efficient, as well as increasing the use of raw sustainable raw materials from circular sources.

Frasers Property

Frasers Property was the first SGX-listed real estate company to announce its commitment to a net zero carbon goal across its entire value chain by 2050. Besides tracking, reducing and offsetting carbon emissions from owned or controlled sources (Scope 1) and those indirectly as a result of its energy usage (Scope 2), Frasers Property recognises a substantial proportion of carbon emissions from its tenants, contractors, suppliers, and vendors (Scope 3). The ambitious 2050 target of achieving net-zero (Scopes 1, 2 and 3 carbon emissions) across its entire real estate value chain requires the concerted efforts of all its stakeholders. Its Australia, Industrial and UK business units would also achieve net zero carbon much earlier by 2028 and 2030, with business practices and processes aligned with a science-based approach.

Frasers Property is also one of the leading SGX-listed real estate companies in green and sustainable financing. Financing the majority of its new sustainable asset portfolios with green and sustainable financing by 2024 is among the five sustainability goals of the Group. To date, the Group has secured green and sustainability financing totalling over \$6 billion since the Group entered its first green loan in September 2018. In September 2021, the Group also issued \$200 million sustainability notes due in October 2028 at a fixed interest rate of 3% per annum – their second sustainability notes issuance.

3M

3M's sustainability efforts started in 1975 with its successful Pollution Prevention Pays program. They have achieved a reduction of greenhouse gas emissions by nearly 70%, set zero waste targets for their manufacturing sites and committed to further driving sustainability in their supply chains. The 3M plant in Tuas Singapore is a zero-landfill site where 100% of the waste generated is converted into energy or recycled. 3M Tuas also features a 2.2-megawatt photovoltaic rooftop solar system that can generate annual average electricity of 2,400 MWh. This is equivalent to electricity usage for 506 units of 4-room HDB flats. As a result of its environmental practices, the plant has earned many international environmental standards that include the ISO 14001 (environmental management systems),

ISO 9001 (quality management systems) and more. In fact, the company's 2025 Sustainability Goals go beyond their own impact and compliance goals to also include their suppliers and customers. For example, every new product would need to have a 'Sustainability Value Commitment' prior to its commercialisation and the company has focused on providing solutions to help their customers reduce emissions. In 2019, 3M's solutions helped to avoid 17 million metric tons of emissions. Globally, 3M expects to invest approximately USD\$1 billion over the next 20 years to accelerate new environmental goals: achieve carbon neutrality by 2050, reduce water use by 25% at its facilities, and return higher quality water to the environment after use in manufacturing operations.

OPPORTUNITIES AND RECOMMENDATIONS



The reduction of greenhouse gas (GHG) emissions, including carbon dioxide, is central to efforts to address climate change. Companies will increasingly be forced to re-examine and account for not just their own internal emissions-contributing processes but also those of their partners in the supply chain. SMEs make up the backbone of supply chains and have critical roles to play in this green

transformation. According to a recent survey by the Sustainable Living Lab in collaboration with SBF and other partners, SME survey participants identified market opportunities (47%), reputation improvements (39%) and cost reduction (39%) as the top three value propositions for pivoting towards sustainability. Yet, more than half of SME respondents shared that their current and future sustainable practices were aimed solely at adhering to regulatory and policy requirements. These results allude to the lack of a business case as well as challenges in identifying and capitalising on these green opportunities.

This paper incorporates feedback from an industry consultation exercise that took place from April to October 2021. More than 100 companies across different sectors and TACs were engaged in interviews and focus group discussions to identify the challenges and recommendations on how companies, including SMEs, can realise the full potential of the green agenda.

The consultations resulted in the identification of four opportunities associated with local and global transformation efforts to address GHG emissions:



Growing Need for Energy Efficiency Solutions



Responding to a Growing Market for Green Materials, Products and Processes



Data-Driven Solutions as a Key Enabler



A Bigger Role for Recycling

(A) GETTING THE FIRST FOOT IN: GROWING NEED FOR ENERGY EFFICIENCY SOLUTIONS



Building construction and operations contribute to almost 40% of global GHG emissions³. In Singapore, more than one third of the country's electricity is consumed by buildings⁴. Operational carbon of a building, which refers to carbon emitted during the operation of a building, makes up 70% of carbon emissions from buildings⁵. Reducing building operational carbon targets has therefore been a key focus area for carbon reduction targets in Singapore.

Drivers of Energy Efficiency in Singapore

Singapore Green Building Master Plan Targets

Green 80% of Singapore's buildings Gross Floor Area (GFA) by 2030

80% of new developments to achieve Super Low Energy status from 2030

Achieve 80% improvement in energy efficiency (over 2005 levels) for best-in-class green buildings by 2030

Building and Construction Authority (BCA) Green Mark Certification Scheme

Minimum Green Mark Score raised to reflect raised energy efficiency performance, in line with the Super Low Energy Programme⁶

Minimum Energy Efficiency Standards (MEES)

Mandates optimisation of energy usage for water-cooled chilled water systems in industrial facilities

The National Environment Agency (NEA) is also exploring the feasibility of extending MEES to other industrial systems and equipment

Others

Mandatory periodic energy audits

Mandatory annual submission of building information and energy consumption data⁷

The adoption of energy efficiency solutions such as the use of energy-efficient equipment and lighting, smart energy monitoring systems as well as Heating, Ventilation and Air Conditioning (HVAC) optimisation technologies, is often a company's first foray into sustainability. Adoption of energy efficiency solutions has also been touted as

'low hanging fruit' since it is associated with the tangible benefit of cost savings. This advantage, along with the need to meet low energy targets, is expected to drive up demand for energy efficient solutions in Singapore. Local energy efficiency solution providers, including SMEs in the ecosystem, should gear up to tap on these opportunities.

SME Energy Efficiency Solution Providers in Singapore

Barghest Building Performance (BBP)

BBP enables businesses to achieve energy and cost savings using HVAC optimising technologies, proprietary software algorithms, Internet of Things (IoT), Artificial Intelligence (AI) and machine learning. Their funding model allows clients to adopt the solutions without any upfront cost and BBP is only paid out of clients' savings, giving new customers further incentive to use their solutions.

In 2014, BBP helped LumiLEDs' central chiller plant achieve an efficiency of 0.64 kW/RT (27%) and annual energy cost savings of over \$700,000. The project also resulted in LumiLED winning the BCA Green Mark Platinum Award, the first manufacturing plant in Singapore to be awarded the Green Mark Platinum by the BCA for Existing Buildings. In fact, BBP's latest advanced analytics offering, BBP Analyse+, can help building operations achieve an operational efficiency above the BCA Green Mark Platinum standards.

BBP is actively looking into ways for their clients to offset carbon footprint, including translating carbon avoidance, achieved with BBP's energy

optimisation solutions, into carbon credits that can be traded with other organisations who may need concession in meeting their carbon reduction goals.

Cyclelect Electrical Engineering

Cyclelect Electrical Engineering provides engineering and technical solutions for the purposes of engineering, building and maintaining energy efficient systems. Of note, the company offers integrated energy solutions through waste energy recovery systems and renewable energy generation, to enable the running of energy efficient power systems. To date, the company has helped their clients recover 28,500 RT recovered energy to chilled water, 150 T/H energy from waste heat (steam), 18 MW of energy from waste and 40 MW of solar energy.

Cyclelect Electrical Engineering will be installing the electrical infrastructure of the new NEA Tuas Nexus Integrated Waste Management Facility (IWMF). The IWMF aims to operate more sustainably through new cutting-edge waste treatment technologies and Cyclelect Electrical Engineering's extra-low voltage systems.

Recommendation 1: Going Global with Energy Efficiency Solutions

The growing demand for energy efficiency solutions is not unique to Singapore. In Asia especially, energy consumption is expected to increase to up to 56% of global energy consumption by 2035⁸.

Hence, energy efficiency solutions will be key in enabling sustainable economic growth. While access to energy and energy consumption requirements differ, policy makers in the region have also increasingly recognised and agreed on the need to reduce emissions by means of greater energy efficiency.

Nationally Determined Contributions (NDCs) with Measures for Greater Energy Efficiency

Brunei

Aims to reduce emissions by at least 10% through better supply and demand management of electricity consumption by 2035, including implementation of minimum efficiency for all new power plants.

Indonesia

Intends to reach net zero emissions by 2060. Will run energy efficiency campaigns to enhance awareness of all stakeholders on the benefits of improved energy efficiency and consumption patterns. Indonesia also intends to implement energy efficiency measures to be carried out by all energy consuming sectors through improvement of device efficiency and energy system efficiency.

Vietnam

Acknowledges the challenges surrounding greater energy efficiency, due to little financial support and lack of technology. Vietnam will continue to improve the policies related to climate change mitigation and energy efficiency development, including energy prices, to better mobilise investments for climate action.

The potential growth in regional demand for energy efficiency solutions presents opportunities for local companies, including SMEs, with this expertise. Nevertheless, those doing so will need to navigate uncertainties arising from the variance in or absence of building codes in certain markets, as well as the need to identify reliable and competent partners to carry out the requisite installation and maintenance works. Support in the area of business facilitation through robust partner and solution matching is thus critical to the internationalisation efforts of local energy efficiency solution providers.

Recommendation 2: Driving Uptake of Energy Efficiency Solutions Among SMEs

While larger corporations have embraced energy efficiency solutions, there is untapped potential and critical need to accelerate the adoption of energy efficiency solutions by the SME population. However, there are challenges with unlocking this segment. For a start, given the heterogeneity of SMEs, customised efforts are required to engage SMEs at different stages of their growth journey to internalise the benefits of, and thus adopt energy efficient solutions. As potential solution adopters, some SMEs may not even be aware of the need and benefits of energy efficiency solutions, especially if the savings are perceived as insignificant relative to the additional expenditure and effort required to navigate a seemingly complex web of solutions and changes. Encouraging the adoption of energy efficiency solutions by SMEs could entail putting in place structured programmes tailored for groups of SMEs with similar pain points, adoption concerns and benefits.

This would allow solution providers to reach a critical mass of SMEs to achieve economies of scale, as well as to facilitate risk-share in the investment of time and costs. The success of such programmes, including potential sandbox projects, require tight collaboration between industry ecosystems, the private sectors, and the public sector to identify suitable SME groups to target, facilitate regular and timely communication (for example, ahead of the construction of a new manufacturing facility), as well as to channel adequate public and private sector support to incentivise adoption. In particular, banks and financial investors have vital roles to play in this collaboration, to aid SMEs in financing energy efficiency projects. Building landlords and managers must also be brought into the conversation, in ensuring that building lease contracts can encourage collective investment in solutions that benefit from economies of scale and typically have longer Return on Investment (ROI) periods.

Helping SMEs Finance Energy Efficiency Solutions

Zero Capital Partnership Scheme

The SGBC-BCA Zero Capital Partnership Scheme (ZCPS) provides building owners, even those without upfront capital and technical expertise, with access to an accredited energy performance contracting (EPC) firm which can provide financing options and facilitate the application of relevant grants or incentive schemes to fund the retrofit works.

United Overseas Bank (UOB)

UOB's newly launched U-Energy programme is Asia's first integrated financing platform to drive the adoption of energy efficiency projects. It simplifies sustainability by providing a one-stop platform for commercial and industrial building owners, as well as homeowners, helping them to cut carbon emissions and enjoy the benefits of energy savings.

The U-Energy platform has a panel of energy service companies that customers can tap on for energy efficiency projects. These U-Energy partners can support common energy efficiency projects such as improving chiller and air conditioning efficiency, installing solar panels on rooftops, switching to LED lights, optimising energy and power management systems and changing the building façade to reflect direct sunlight to reduce heat absorption, as well as replacing elevators with energy-regeneration technology. UOB's flexible financing options enable commercial and industrial building owners to opt for a direct purchase of the energy-efficient equipment or system with UOB's green financing or take up the 'energy-as-a-service' model where UOB will provide green loans to the U-Energy partners at no upfront cost to building owners⁹.

Recommendation 3: Nurturing Energy Sector Talents

As solution providers gear up to meet a growing market, a key concern would be ensuring a pipeline of skilled engineers and technicians that are able to deliver those solutions. As there are no specialised courses catered to the energy sector, most new hires would only be equipped with general engineering knowledge and would require extensive on-the-job training.

To better equip the sector with skilled manpower, the industry could work with Post-Secondary Education Institutions (PSEIs) and Institutes of Higher Learning (IHLs) on work-study or attachment programmes, to expose students or potential Singapore Certified Energy Managers (SCEMs) to hands-on experience and practical training. Additionally, proactive, and collaborative steps should be taken at the industry level to enhance and promote the image of the energy sector in order to attract engineering talents.

Empowering a Greener Workforce

Johnson Controls

Energy efficiency is one of the key missions of Johnson Controls. The company recognises that technology companies have to assume a bigger role in empowering the workforce to ride the waves of change. Besides offering internships to expose students to real-life learning, Johnson Controls has been leading the way in deepening partnerships with many institutes. In 2018, Johnson Controls opened the first fully functioning chiller plant system designed for a classroom setting in Singapore at the Institute of Technical Education College East Campus. This gives students unprecedented access to live systems to

experiment and operate in real time. In 2020, Johnson Controls launched the OpenBlue Innovation Center in the National University of Singapore (NUS), with the support of the Economic Development Board (EDB), to pioneer smart and sustainable technologies for the built environment. The Center adopts a multidisciplinary approach, collaborating closely with NUS to use the campus as a living laboratory, while engaging the larger built environment ecosystem to accelerate change. More recently, in 2021, Johnson Controls partnered Ngee Ann Polytechnic and Skillsfuture Singapore to provide mid-career jobseekers with digital and smart facilities management skills.

(B) THE NEXT HOOK: DATA-DRIVEN SOLUTIONS AS A KEY ENABLER



In many instances, the same digital and data-driven solutions that are used to optimise operational and organisational processes can also support companies in their transition to become a more environmentally sustainable company. In its simplest form, digital products such as electronic documents reduce the demand for energy and raw materials. More sophisticated

solutions exist in the form of smart buildings systems that optimise energy usage based on need, predictive systems that augment production efficiency, as well as vehicle tracking and management software that help to move people and goods more effectively and shrink the carbon footprint of transportation. Other useful data-driven solutions could also include building of new platforms and digital tools that help companies simplify the monitoring and reporting of environmental risk, in a form that is recognised by regulators, investors and other stakeholders.

To this end, data-driven solution providers that are already providing process optimisation solutions can leverage existing expertise and technologies to reposition their offerings to support the sustainability ambitions of their customers and expand to tap the green market as well.

Data-Driven Green Solutions

SWAT Mobility

SWAT Mobility (SWAT) is a leading mobility tech startup in Southeast Asia, delivering optimised transport solutions to drive operational efficiency, cost savings and reduction of carbon footprint. Through the use of SWAT's dynamic, high-capacity algorithm, customers across Asia are able to offer demand-responsive transport solutions for their workforce, and also enjoy the flexibility of reconfiguring transport options to meet the changing workplace safety management measures.

SWAT's core mobility engine empowers customers to achieve efficient route planning, optimised transport pooling and automated transport planning.

This contributes to lower pollution and carbon emissions through the deployment of the right number of vehicles to achieve the desired transportation outcomes.

To help customers drive towards their net zero emissions objectives, SWAT offers a data-driven approach to baseline existing transport carbon emissions and works collaboratively with the customers to improve their carbon footprint. In addition, SWAT's technology is autonomous vehicle (AV) and electric vehicles (EV) - ready, and the company is well-positioned to support customers in their transition towards EVs.

CO2 Connect (CO2X)

CO2X was incorporated as a joint venture between three Singapore technology companies – Ascent Solutions, Evercomm Singapore and Hashstacs (STACS). The company aims to bring together core capabilities in the Internet of Things (IoT), Digital Asset Modelling Language (DA/ML) and Blockchain to acquire data from the real world and subject it to carbon footprint computation that is backed by international standards. Based on the tracking and calculation, users can make changes to

their strategies to bring emissions down. These savings can be quantified and blockchained to attract green financial services such as loans, investments, and insurance. The platform will also help users generate reports compliant with international standards that can assist them with green accreditations at a fraction of the cost as compared to hiring a 3rd party verification company. The company is targeting the transport and logistics industry for a start but is confident that the same solution can also be applied to the built environment, construction, and manufacturing.

Recommendation 4: Aggregating Data for Optimisation and Sustainability

While data is critical to optimising decision-making, there is a limit to how much data a single company is able to amass and process. In order to maximise the benefits from data-driven solutions for operational optimisation, government agencies and sectoral TACs could look into creating platforms to support the aggregation of non-commercially sensitive data from companies.

For example, energy consumption from industrial operations could be aggregated and shared among a group of companies, to help them better understand where they stand and if they could improve energy efficiency. In a more advanced effort, TACs and government agencies could also explore collaborating to identify and collate localised data, such as the carbon footprint of manufacturing processes, logistics operations and waste management efforts. These would ensure greater access to, and accuracy of relevant information required to derive end-to-end carbon footprint estimates to track and reduce emissions at a company level. Existing efforts to aggregate and access sustainability-related data in Singapore include the Monetary Authority of Singapore's Project Greenprint, a platform aimed at

connecting SMEs and FinTech firms working on green projects with financial institutions and investors¹⁰.

Recommendation 5: Simplifying Wayfinding through Pre-Identified Green Solutions

SMEs often cite the diversity of sustainability frameworks and standards, as well as complexity in monitoring and reporting sustainability outcomes as barriers to getting started. Furthermore, despite the potential of data-driven sustainability solutions to bring about productivity and cost savings, they are often perceived as complicated, expensive, and targeted at the 'big boys'.

Similar to the approach of pushing out pre-approved digitalisation solutions to help SMEs use digital technologies and build stronger digital capabilities, specific end-to-end green solutions could be pre-identified for SME adoption. To ensure that the most appropriate and attractive solutions are developed and identified to support companies in their sustainability transformation, TACs and the public sector should be prepared to develop clear sector-specific environmental sustainability targets as well as articulate the most appropriate monitoring and reporting frameworks.

(C) GOING TO THE ROOT: RESPONDING TO A GROWING MARKET FOR GREEN MATERIALS, PRODUCTS AND PROCESSES



Demand drivers with significant purchasing power are starting to lay down commitments to green their supply chains. The GreenGov.SG initiative will, among other requirements,

require government agencies to purchase products that meet high efficiency or sustainability standards. Government agencies will also take into consideration companies' sustainability-related policies and practices when evaluating government tenders. Singapore's furniture manufacturing sector, supported by the Singapore Furniture Industries Council (SFIC), has responded swiftly to the changing demand landscape and is proactively transforming their product offerings to offer more sustainable products to their global clientele. Increasingly, companies that have taken efforts to green their processes or offer green products, will find themselves gaining a competitive advantage relative to those that have fallen off the green bandwagon.

Capitalising on Sustainability for Growth

Charge+

Charge+ is a leading Electric Vehicle (EV) charging solutions provider for Singapore and Southeast Asia. Their roadmap is to implement 10,000 EV charging points by 2030 in Singapore and they just won the first EV charging governmental tender for the setting up of charging infrastructure across HDB, JTC, URA, NParks and PA carparks.

EVs represent one key pillar under the Singapore Green Plan 2030 whereby up to 50% carbon emissions can be achieved with the conversion of every Internal Combustion Engine (ICE) vehicle to EV. By proliferating charging infrastructure across multiple locations, ranging from commercial and industrial buildings, and residential locations, Charge+ is playing a key role in catalysing EV adoption for Singapore. Beyond individual car owners,

Charge+ also enables corporates, such as SingPost and PUB, to achieve fleet electrification by providing comprehensive EV charging solutions that serve their needs.

As the EV landscape evolves in Singapore, Charge+ constantly innovates to solve the various pain points experienced by the ecosystem. For example, Singapore is land - scarce and there is very little space in carparks to set up large EV chargers. Hence, to enable the proliferation of EV chargers across Singapore, the company designed an ultra-slim charger, which is only 10cm wide and can charge two EVs at the same time. It is the world's slimmest charger and it was created in Singapore, for Singaporeans.

GUAVA Amenities

GUAVA Amenities is one of the largest guest amenities companies in Singapore. The company has more than 100 global partners in manufacturing, distribution, and product development. The company stumbled on sustainability as a business in 2014-2015 when it realised that there was cost reduction when their products were manufactured closer to the location of demand. As a result of this decentralised manufacturing model, the company was also able to reduce the carbon footprint of their products as they would be shipped over a shorter distance. GUAVA believes that sustainability will continue to give them a competitive edge over their peers and has since ventured into other sustainability initiatives such as providing sustainable packaging solutions.

MaCh eX

MaCh eX is a leading IoT solutions provider in Singapore. The company develops their own in-house IoT devices and platforms to provide sustainable solutions, like solar powered container tracking systems. Their specially designed cargo containers are equipped with IoT systems that allow for real-time cargo tracking, including providing information on its location, speed, cargo quantity and location within the container. A large differentiating factor of MaCh eX's smart cargo system is the use of solar energy. The solution helps to save costs, while providing an ongoing supply of power to ensure that the device is always active.

Recommendation 6: Incentivising Early Adopters

For companies that do not interact with the demand drivers directly and are further downstream in supply chains, such as logistics companies, the impetus to adopt or offer sustainable solutions is much lower. This is especially due to a perceived lack of genuine demand and a significantly higher cost premium for first movers in this transition.

Government support and incentives are therefore critical in helping companies 'normalise' sustainability. Demand drivers are keystone in greening supply chains. Their green policies have the potential of creating a multiplier effect by creating demand scale, thus paving the way for the SMEs to follow. To avoid the perception of greenwashing, genuine attempts to green supply chains must go beyond perfunctory exercises to identify the most convenient and cost-effective solutions, to ensure that outsourced operations and downstream processes that contribute to their product or service are also aligned with sustainability targets. Of note, the public sector must be prepared to 'walk the talk' by taking the lead to articulate more deliberate and bolder sustainability demands on their suppliers and to support larger corporations to do the same.

Recommendation 7: Leveraging Ecosystem Strengths for Growth

There is room for more collaboration among industry stakeholders to increase the momentum towards net zero goals. TACs can play essential roles in bringing together industry stakeholders to set targets and roadmaps for such a transition. Collaborative learning and experience sharing will help even manpower lean SMEs to build capabilities and identify green solutions and demands. In addition, given a growing demand to green entire supply chains, TACs can work together to connect companies in different parts of the value chain to develop stronger end-to-end green value propositions.

The real estate ecosystem, for example, has shown increasing aggressive interest in reducing embodied carbon to achieve net zero goals by 2050. In fact, the recently revised BCA Green Mark scheme placed greater emphasis, among other criteria, on the reduction of embodied carbon in developments. The Singapore Green Building Council's (SGBC's) Embodied Carbon Pledge is an effort to rally support for ecosystem cooperation towards net zero goals while the Green Building Product Certification Scheme encourages the integration of sustainability standards and mainstreaming sustainability skillsets.

Singapore's green construction standards and capabilities are ahead of the region. Given greater demand for green buildings, solution providers that can offer environmentally friendly construction practices and materials will obtain a significant competitive edge over their peers. However, there appears to be a gap between the demand and supply for these low carbon products and processes. For instance, 39 real estate companies have pledged SBTi targets involving the reduction of Scope 3 emissions but to date, no construction material company has come round to setting such targets¹¹.

According to the International Finance Corporation, sustainable building investment

opportunities in Southeast Asia are estimated to be worth US\$18 trillion, an indication that there could be potential for local construction companies to leverage their expertise to scale up beyond Singapore¹². Given that the sector is capital and risk intensive, construction companies can consider partnering waste management companies, energy efficiency solution providers and even the furniture sector, to provide unique green solutions. In this regard, government agencies should continue to support companies through providing incentives, bridging loans and business matching, to help companies leverage ecosystem strengths to grow both locally and internationally.

Construction Companies at the Forefront of Low Carbon Products and Technologies

Pan-United

As a key player in the built environment sector, Pan-United is focused on integrating sustainable practices in the construction sector. Since their first foray into using an industrial by-product (Ground Granulated Blast Furnace Slag or GGBFS) to replace cement, the company has produced over 300 high-performance concrete mixes, of which half are low carbon, that meet challenging construction demands while reducing resource wastage and carbon emissions. Today, the company is the largest provider of green concrete in Singapore.

The company recently partnered with Canadian clean technology company CarbonCure Technologies to bring their breakthrough carbon dioxide (CO₂) injection technology for concrete production, to Asian markets. They are also working closely with South Korea's largest ready-mix concrete company, Eugene Corporation, to explore opportunities to adopt their Artificial Intelligence for Ready-Mix Concrete platform, which optimises day-to-day operations to improve productivity.

United Tec Construction

A specialist in prefabricated precast volumetric construction (PPVC), United Tec Construction is a leading contractor in Singapore's PPVC scene. Though the company was only founded in 2018, it has been involved in several prominent projects including the landmark Avenue South Residence project, which is poised to be the world's tallest modular building upon completion in 2022. This is a huge milestone as it places Singapore on the map in the PPVC sector and goes to show how far Singapore's technology has come.

The advancement of PPVC in Singapore's real estate ecosystem has been crucial to the local building industry's success in the sustainability space. Aside from benefits such as lower manpower requirements and reduced on-site pollution, given that the building units are manufactured in factories off-site, PPVC offers many other advantages in terms of its sustainability. For instance, the PPVC process enables a decrease in the amount of construction material utilised, which is significant because of the high carbon footprint arising from manufacturing of construction materials such as concrete.

Recommendation 8: Mainstreaming Sustainability-Related Skillsets

'Digital Fluency' is one of the 16 Critical Core Skills (CCS) identified by SkillsFuture Singapore (SSG) deemed essential in the workplace, regardless of sectoral or technical focus. Basic proficiency requires an individual to perform work processes and activities using identified digital technology tools, systems, and software, whereas intermediate proficiency entails identifying opportunities and evaluating risks of integrating digital technology tools, systems and software across work processes and activities. Individuals at the Advanced proficiency level are expected to drive the creation of a digital culture and environment, educating stakeholders across the organisation on the benefits and risks of digital technology tools, systems, and software.

The Ministry of Sustainability and the Environment (MSE) estimates that the pursuit of sustainable development will create at least 55,000 new and upgraded jobs over the next 10 years¹³. Like with 'Digital Fluency', sustainability is an emerging theme that will be relevant across all industry types, and there is scope to mainstream sustainability-related skillsets. Depending on competency level, this could involve awareness of sustainability reporting frameworks and standards, a basic understanding of sustainability concepts such as materiality and classification of GHG emissions, as well as more advanced functions such as green procurement, carbon tracking and measurement, and the preparation of sustainability reports. With these competencies in place, companies will be better equipped to take up green solutions, as well as identify green growth opportunities and demand drivers

(D) CLOSING THE LOOP: A BIGGER ROLE FOR RECYCLING



Singapore will implement Extended Producer Responsibility (EPR) laws for packaging waste by 2025.

These laws will make it mandatory for companies to collect, treat and dispose their products. To be part of a truly circular economy, companies must tap on recycling to close the loop. Recycling companies have a unique value proposition since they can create value out of products that would otherwise be incinerated, such as by allowing materials to be reused instead of procuring more raw materials. Of note, only 4% of plastic is recycled in Singapore¹⁴, which is indicative of the potential for plastic recycling companies to play a more strategic role in the pivot towards a greener economy. Additionally, given the Singapore government's plan to have vehicles run on cleaner energy by 2040, recycling used car batteries will be complementary to such sustainable development targets.

Recommendation 9: Boosting Infrastructure for Economies of Scale

Zero waste goals will require consistent and nationwide recycling infrastructure. The 'cradle-to-cradle' concept has by and large gained the interest of companies, which demonstrate an increasing interest in recycling and doing their part for the circular economy. However, many have cited the high cost and hassle of recycling as a major deterrent. While public education and awareness-building efforts must continue, the availability of collection and recycling facilities will be crucial in effective recycling programmes.

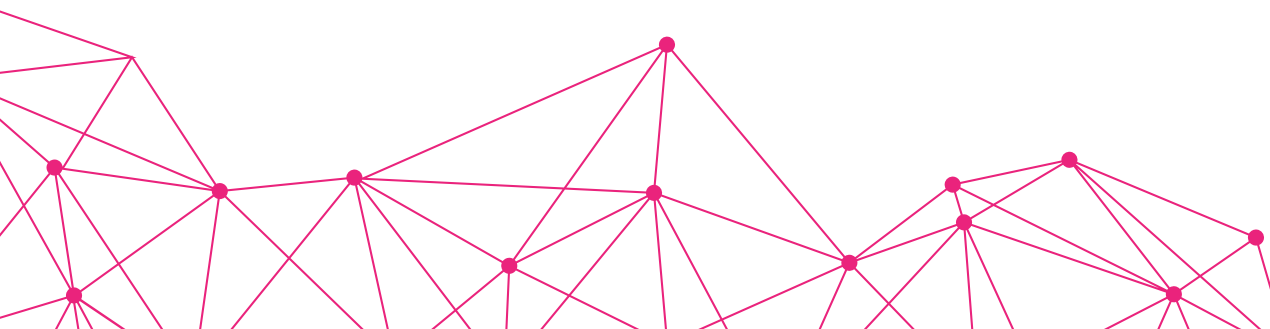
For example, given that sorting and processing contaminated waste require more space and manpower than most individual recycling companies can practically afford, the government may consider co-investing in waste processing facilities across Singapore and to encourage recycling companies to pull together resources to facilitate this important precursor step to recycling. In addition, companies in the recycling sector should be supported to pursue collaborations, joint ventures, mergers and acquisitions in order to help SMEs in this space achieve economies of scale to grow in Singapore and globally.

Public co-investment in recycling infrastructure would also allow collection infrastructure to be accessible to the public and for the most innovative recycling technologies to be made available in Singapore. These could reduce existing limitations on recycling, mainstream recycling habits and improve productivity of recycling operations.

Recommendation 10: Growing a Recycling Knowledge Hub for the Region

Today, many manufacturers are sceptical that recycled products will be as safe or durable as those made of virgin raw materials. These concerns are valid for materials that lose structural integrity upon recycling, but given growing improvements in recycling technology, recycling can still result in high value products. There is therefore a need for the recycling sector to take a targeted approach in recycling and to work more closely across sectors for that purpose. For example, recycling companies could work with manufacturers and retailers to study the volume of recycling feedstock and identify use cases for high value recycled products, to bridge the demand and supply gap.

Building local capabilities is key to the delivery of high value recycled products and in closing the circular economy loop. Of note, recycling firms can reap technology and knowledge transfer benefits by actively collaborating with local and international partners. There is room for the recycling sector to transform its labour-intensive image in favour of an industry that utilises cutting edge technology, to fulfil Singapore's commitment to sustainable development. In addition, PSEIs and IHLs could explore integrating environmental technology-related modules in their programmes, to help grow a ready pool of local talent for the recycling sector. With sufficient recognition for and support from homegrown expertise, local recycling companies can then leverage their reputation as industry incumbent to export their services to the rest of the region. Of note, intra-sector collaboration is essential for this transformation since there is little a single company can change alone.



One example of industry collaboration is through the Plastics Recycling Centre of Excellence (PRCOE), a committee of the Plastics Recycling Association Singapore (PRAS). The PRCOE aims to be a repository of data, knowledge and skills related to the recycling of plastics and will partner with leading centres of excellence around the world, to develop best practices suitable for Singapore. For a start, PRAS intends to match European recycling specialist companies with Singapore Precision Engineering firms,

to discuss with regard to potential collaboration on manufacturing of components and in developing local adaptations of recycling processes for Singapore and Southeast Asia. With strong global-local partnership, Singapore can build its own centre of excellence focused on the creation of recycling knowledge, the development of country and ASEAN region specific recycling solutions, and the training of a local workforce equipped with specialised recycling knowledge and skills.

Recycling Companies with Bold Visions

Magorium

Established in 2019, Magorium is a technology start-up. Through their patented technology, Magorium offers an innovative solution that turns plastic waste into building material, NEWBitumen, for asphalt road construction. Bitumen, a petroleum-based hydrocarbon, is a basic building block in the construction of asphalt roads and has few or no close substitutes. It is found in nearly all asphalt roads as an essential material.

Yet, the production of bitumen has severe environmental impacts, including air pollution, soil erosion, and so on. In this regard, as a synthetic material produced from plastic waste, NEWBitumen is a sustainable alternative with a significantly lower carbon footprint. Additionally, the technology which converts plastic waste into NEWBitumen depolymerises the plastic entirely, hence eliminating concerns of microplastic leaching. Contaminated plastics can also be used in the production of NEWBitumen, addressing the issue of hindrance of contamination in plastic recycling efforts in Singapore.

Magorium's value proposition is a testament to the possibilities that material science collaborations hold for the waste and recycling sector. The waste dealt with by waste management stakeholders can be raw material for material science players with the

capabilities of transforming the waste into value-added products, while generating viable revenue streams for all.

Alpha Biofuels x X-Inc

Alpha Biofuels is a local biofuels company that has been active in Singapore's clean energy scene since 2004. Through recycling used cooking oil collected from F&B establishments across Singapore into biodiesel, Alpha Biofuels's approach brings together different industries in exploring circular economy opportunities.

X-Inc is the parent of a group of companies that has been in the food business since the 1930s. Under its umbrella are FoodXservices Inc, GroXers Inc, LogiXtics Inc, X Properties Inc, and PlotX Inc – covering businesses from foodservice and retail to logistics and property. Since 2015, X-Inc has partnered with Alpha Biofuel in its sustainability journey by collecting used cooking oil from its F&B customers which is then recycled into biofuel for X-Inc's logistics fleet.

Alpha Biofuels recently also partnered up with stakeholders including Anglo American, Toyota Tsusho, and the Maritime and Port Authority to trial their recycled biofuel in ships. This move will potentially cut down on the carbon dioxide emissions released in the use of traditional marine fuel, in line with the sector's ambitious decarbonisation goals.

Wah & Hua

Wah & Hua is a homegrown, family-run waste management and recycling company that was established in 1978. The company provides Waste Collection, Recycling, Waste-to-energy, and Waste-to-Products services. They are known for their efforts in providing comprehensive technology-driven and sustainable waste management solutions. Wah & Hua's new integrated plant (sorting and incinerating functions in a single facility) in Tuas is expected to be ready in 2021.

Wah & Hua, together with Blue Planet Environmental Services, has intentions to grow their expertise both locally and in international markets. In 2020, Wah & Hua entered a joint venture with ALBA Group (ALBA W&H Smart City Pte Ltd) to provide household waste management and recycling solutions in the Jurong urban region. More recently, NEA also awarded the company a contract to provide household waste management and

recycling solutions in the Woodlands urban region from 1 January 2022.

V8 Environmental

A standard-bearer in pioneering new initiatives in the local waste management industry, V8 Environmental is the first in Southeast Asia to integrate robotic arms in its Material Recovery Facility (MRF). The integration of robotic arms has accelerated recycling rates by more than tenfold, as its robots are able to pick at a rate of 6000 picks/hr, compared to 500 picks/hr using traditional picking methods. Incorporating AI technology and working alongside skilled operators, the MRF is also able to accurately identify non-contaminated materials to ensure the recovery of higher value and quality materials. The MRF is also powered by solar energy, allowing V8 to grow sustainably in support of the nation's climate agenda.

CONCLUSION AND NEXT STEPS



Given the complexity of the green agenda and the need for collective action, sustainability often presents a conundrum to many companies worried about the cost of changing existing business practices. Yet, it is encouraging to see that the uneven recovery in global economies, due to the persistent COVID-19 pandemic, has not dented the focus on sustainability-related trends that are taking centre stage, as governments,

investors, and corporates double down on commitments to meet sustainability targets. The growing momentum of global sustainability efforts clearly illustrates that business sustainability and environmental sustainability are indeed two sides of the same coin, with economic rejuvenation and environment restoration being very much aligned in the next bound of growth.

There exist various green growth opportunities for Singapore companies. SMEs will be critical stakeholders in Singapore's vision for a green economy given their significant roles in supply chains. To avoid a tragedy of the commons, government action and regulatory support will be essential in helping companies 'cross the chasm' during this transition period. For a start, the government should be prepared to lead by example in reviewing and communicating a new green procurement policy. Initial support and incentives should also be made available to early adopters of green products and solutions, which will help catalyse the demand for products that may cost more at the start.

Yet, the government alone will not move the needle. Industry collaboration will be crucial in supporting companies to strengthen green capabilities and discover innovative solutions. TACs, with their strong industry know-how, wide reach and networks, will be an important piece to unlock meaningful partnerships. In particular, industry stakeholders should embrace cross-sector collaborative efforts that can provide a twofold effect of mainstreaming sustainable practices and creating growth opportunities for solution providers.

SBF, as Singapore's apex business chamber, will step up its efforts to help companies capitalise on suitable green opportunities. For a start, it is working with the SFIC and the SGBC to set up a new Alliance for Action (AfA) focused on unlocking the demand for low emitting solutions in indoor spaces.

This new AfA on Sustainable Spaces will explore how stakeholders across different sectors can come together to enhance the quality of indoor experiences through the following actions:

i

Advocate the use of low emitting materials and furnishings in indoor spaces.

ii

Build on industry standards for indoor air quality.

iii

Cultivate awareness on the importance of sustainable spaces.

SBF will also leverage its local and global networks to run opportunity-specific programmes to raise awareness for available green solutions, and their significance and benefits. For a start, SBF will work with interested energy efficiency solutions providers to curate outreach and matchmaking sessions for pre-identified SME segments. In addition, by facilitating sharing of adoption success stories among SMEs, this approach seeks to maximise networking mileage by connecting appropriate solution providers with potential adopters. Similar programmes could also be designed for digital solution providers, manufacturers, suppliers and recyclers that are interested in partnering specific sectors within Singapore and in international markets, with support from the GlobalConnect@SBF Initiative.

This paper has intentionally focused on environmental sustainability, for a start. However, sustainability also consists of interrelated social and governance issues that need to be addressed concurrently with the pivot towards a green economy. Environmental sustainability is just but the first step and stakeholders must work together to ensure that everyone can be part of the sustainable agenda. The late American environmental activist, Julia Bonds, famously declared that 'There are no jobs on a dead planet'. We still have time to build a sustainable and vibrant economy, but both private and public sector stakeholders must act now, by taking concrete steps in relooking the way we produce, the way we consume, and the way we live.

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