



CARBON PRICING  
LEADERSHIP COALITION  
SINGAPORE



Global Compact  
Network Singapore

# Singapore Business Carbon Report 2022

Leading business transformation:  
actioning carbon management

Supported By:

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Environment  
Agency  
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Amidst rising economic challenges and geopolitical tensions, Singapore remained steadfast in tackling climate change in 2022. We raised our climate ambition to achieve net zero by 2050, supported by our Singapore Green Plan 2030 and concrete policy moves. We made into law our plan to increase carbon tax decisively from 2024, to signal clearly our intention for climate action.

Our transition towards net zero requires everyone to play a part. Businesses will need to transform their operating models and develop new capabilities to meet growing demand for greener products and services. Decarbonisation will bring about long-term benefits including cost savings from improved energy and resource efficiency. Companies can also gain better access to capital as well as opportunities in new and emerging markets.

The ability of the private sector, especially our small and medium enterprises (SMEs), to transition towards low carbon operations will be crucial in Singapore's economic transformation. SMEs account for almost half of our Gross Domestic Product (GDP) and the collective efforts of both our large-emitting industries and SMEs to decarbonise can create a ripple effect through supply chains and help to establish Singapore's competitive edge early in the low carbon economy.

The Government has stepped up measures to support our companies to reduce their carbon footprint, build capabilities, and seize new opportunities in sustainability. These include the Enterprise Sustainability Programme (EnterpriseSG), and the Energy Efficiency Fund (NEA). As the operating landscape evolves, we will continue to review our support measures to ensure our companies' economic competitiveness, while preparing them for a low-carbon future.

Beyond Government support, many from the private sector are sharing their expertise and knowledge to uplift our SMEs for the green economy. I thank the UN Global Compact Network Singapore and the Carbon Pricing Leadership Coalition for being a part of this enabling ecosystem. I am glad to learn that more than 370 companies have benefitted from the LowCarbonSG programme since its launch in 2021. With the introduction of the Decarbonisation for Singapore Enterprises Playbook, I hope that more SMEs will gain the confidence to kickstart their decarbonisation journey.

The green transition is no longer an option. It is a necessity. As we navigate towards a net zero future, each of us as policymakers, businesses, and individuals will have a role to play. Let us build on our strengths as we collectively journey towards a green, liveable, and climate-resilient Singapore.



# Grace Fu

Minister for Sustainability  
and the Environment



As the decarbonisation arm of UN Global Compact Network Singapore (GCNS), Carbon Pricing Leadership Coalition Singapore (CPLC Singapore) is pleased to publish its second annual Singapore Business Carbon Report (2022). This report builds on the success of the inaugural 2021 report, which announced the launch of the LowCarbonSG programme and provided insights gleaned from its pioneer participants.

This report encourages companies to kickstart their carbon management journey by helping them understand and appreciate the business benefits behind measuring and reducing carbon emissions. From this report, companies can also learn about:



Benefits and imperatives of measuring and monitoring carbon emissions, including how it reduces operational costs and strengthens the bottom line;



Step-by-step guide to measure, track and reduce carbon emissions, via the recently launched Decarbonisation for Singapore Enterprises Playbook



Future proofing businesses and accessing opportunities in the areas of Green economy, Green procurement and sustainable financing



Overview of regional policies and trends on carbon management, including Singapore's enhanced Nationally Determined Contributions (NDCs), and



Sectorial benchmarking through an in-depth analysis of the additional Carbon Emissions Recording Tool (CERT) submissions in 2022

Packed with useful information, this report also provides breadth through think pieces and spotlight on partner companies' good practices.

A deep dive into the analysis of CERT submissions to date reveals that the majority of participating companies have successfully reduced carbon emissions across at least one of three categories.\*

Over a quarter also attained more than a 5% year-on-year reduction in absolute emissions. These encouraging statistics are proof for more companies to start measuring, reducing and managing their carbon footprint.

**Esther Chang**  
Executive Director



**Terence Tan**  
Director, Carbon Management



# LowCarbonSG at a glance

Launched by Ms. Grace Fu, Minister for Sustainability and the Environment, at the GCNS Virtual Summit, LowCarbonSG aims to empower businesses with the knowledge, competencies, and resources necessary to transition to a low-carbon economy.

The programme includes workshops on carbon management and enables companies to build the habit of tracking their emissions with GCNS' CERT monthly. This aligns with Singapore's revised NDC of around 60MtCO<sub>2e</sub> in 2030, after peaking earlier, and its national climate target of achieving net-zero emissions by 2050.

The programme also supports the Singapore Green Plan 2030 which aims to achieve a more sustainable future.

In addition, CPLC Singapore publishes the annual Singapore Business Carbon Report as part of their efforts to help companies reduce emissions. This complements our continual effort in capability building and upskilling, networking, knowledge sharing, and thought leadership.

## About

**A capability-building programme aimed at enabling local businesses in Singapore to monitor and reduce their carbon emissions.**



## Launch Date

**26 October 2021**



## Stakeholders

**Led by CPLC Singapore, with support from National Environment Agency (NEA) and Enterprise Singapore (EnterpriseSG)**





## LowCarbonSG Benefits

### Guidance on Emissions Tracking and Reduction Solutions

### Tools and Resources



Complimentary access to Carbon and Emissions Recording Tool (CERT)



Access to Carbon Management workshops by CPLC Singapore and accompanying playbook on carbon management



Information on government grants to facilitate adoption of sustainable solutions



Personalised assistance from CPLC Singapore on completing CERT



Matching to solution providers to facilitate adoption of low-carbon solutions

### Recognition



Recognition on the LowCarbonSG website



Usage of LowCarbonSG Participant Logo to communicate your ambition on decarbonisation

# A typical roadmap for LowCarbonSG participants

To track the effectiveness of upcoming decarbonisation solutions, participants need to first establish a baseline to measure against. To achieve this, the past twelve months data on energy, fuel, waste, water and transportation is consolidated.

With the historical statistics as foundation, participants can now better understand their operations from a carbon emissions perspective and are ready to learn more about managing it. Participants undergo a workshop providing hands-on guidance on how to use the CERT to measure and monitor carbon emissions. This improves the visibility of their energy, fuel and water usage. To strive toward an emission reduction ambition, participants will also be provided with resources such as low-carbon solutions that doubles up as an operation cost control.

Participants keen to achieve the LowCarbonSG Participant Logo simply have to complete two CERT submissions at designated milestones during the programme.

Beyond monitoring their emissions, participants are also encouraged to reduce and track their emission intensities across six metrics: productivity units, gross revenue, expenses, net profit, gross floor area, and employee headcount.

At the end of the day, participants will successfully build carbon management expertise and enhance their access to the opportunities unique to the green economy. These opportunities are not limited to the access to sustainable financing, but also an appeal to increasingly sustainability-conscious customers and investors which can in turn improve business resilience.

→ Interested participants simply need to register their interest [here](#).

**To track the effectiveness of upcoming decarbonisation solutions, participants need to first establish a baseline to measure against.**

**At the end of the day, participants will successfully build carbon management expertise and enhance their access to the opportunities unique to the green economy.**





## Enrollment

Get in touch with the CPLC Singapore team to enrol into the LowCarbonSG programme for your company.



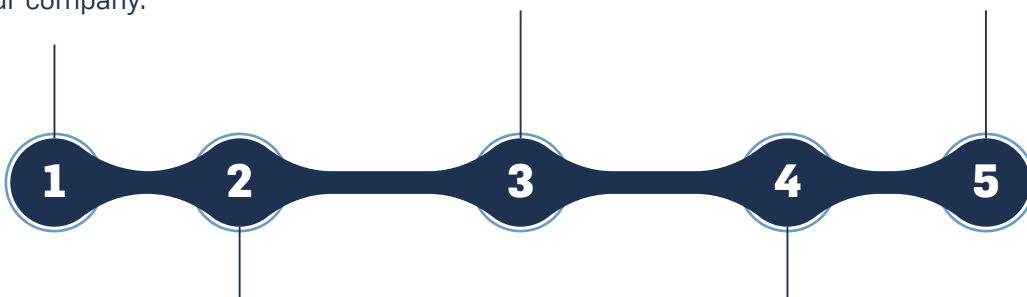
## 1st Submission

Upon successful submission, company will be rewarded the LowCarbonSG Participant Logo.



## 3rd Submission

Company can renew year of LowCarbonSG Logo for every year it submits its data.



## Carbon Management Workshop

Sign up for the next available run of our workshop to learn about carbon management principles, best practices and the use of CERT to monitor your company's carbon emissions.



## 2nd Submission

Upon successful submission, company will be rewarded the LowCarbonSG Participant Logo. If company reduces its emissions, it will be rewarded an additional Certificate.



### • Continue the programme

### • Operational emissions

✓ **Monitor emissions:**  
LowCarbonSG Logo

✓ **Reduce emissions:**  
LowCarbonSG Logo and Certificate

### • Baseline emissions



# Achievements thus far

Since its launch, LowCarbonSG has upskilled 600 individuals from 373 companies.

As the programme continues to bring value to its participants' carbon management process, we are also onboarding new participants who are keen to kickstart their decarbonisation journey.

Companies that have successfully measured and monitored their carbon emissions will be awarded a LowCarbonSG Participant Logo.

→ Register your interest [here](#) to find out how you can benefit.

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# What's new?

In January 2023, we launched the Decarbonisation for Singapore Enterprises Playbook.

Supported by EnterpriseSG and NEA, this comprehensive guide shares the benefits of carbon emission reduction and espouses on how businesses, especially SMEs, can take actionable steps in their carbon reduction journey.



→ Download a copy [here](#) to explore the various transition resources available such as programmes and grants.

In March 2023, GCNS was appointed as one of the training partners for the new Enterprise Sustainability Programme (ESP) Decarbonisation Courses.

A specially curated professional certificate course, the **'Carbon Accounting & GHG Management - Key to a Low-Carbon Future'** aims to equip participants with knowledge and tools to transit companies towards a low carbon economy. The course is tailored to be comprehensive to all employee types regardless of their expertise on sustainability.

Participants will be able to:

- Acquire knowledge and application skills in carbon management - including carbon accounting and reporting
- Receive guided training on the calculation of carbon footprint using the CERT tool
- Set actionable targets and identify key decarbonisation pathways

70 per cent of the course fee will be subsidised by Enterprise Singapore (subject to eligibility conditions\*).

→ Learn more about the course [here](#).

→ Check out the launch of Enterprise Singapore's new courses in this EnterpriseSG's media [release](#).



# LowCarbonSG 2022 Insights

## Introduction

The first batch of LowCarbonSG participating companies completed the programme in 2022. These firms established baseline emissions using CERT, attended a Carbon Management workshop, completed two emission data submissions and continuously monitored their emission levels.

This study reviews the CERT data from all eligible submissions and summarises key insights of an average carbon emission profile and common areas of improvement. The analysis aims to provide benchmarks for companies, especially SMEs, who intend to start their carbon footprint reduction journey.

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→ The full report with more details can be downloaded [here](#).

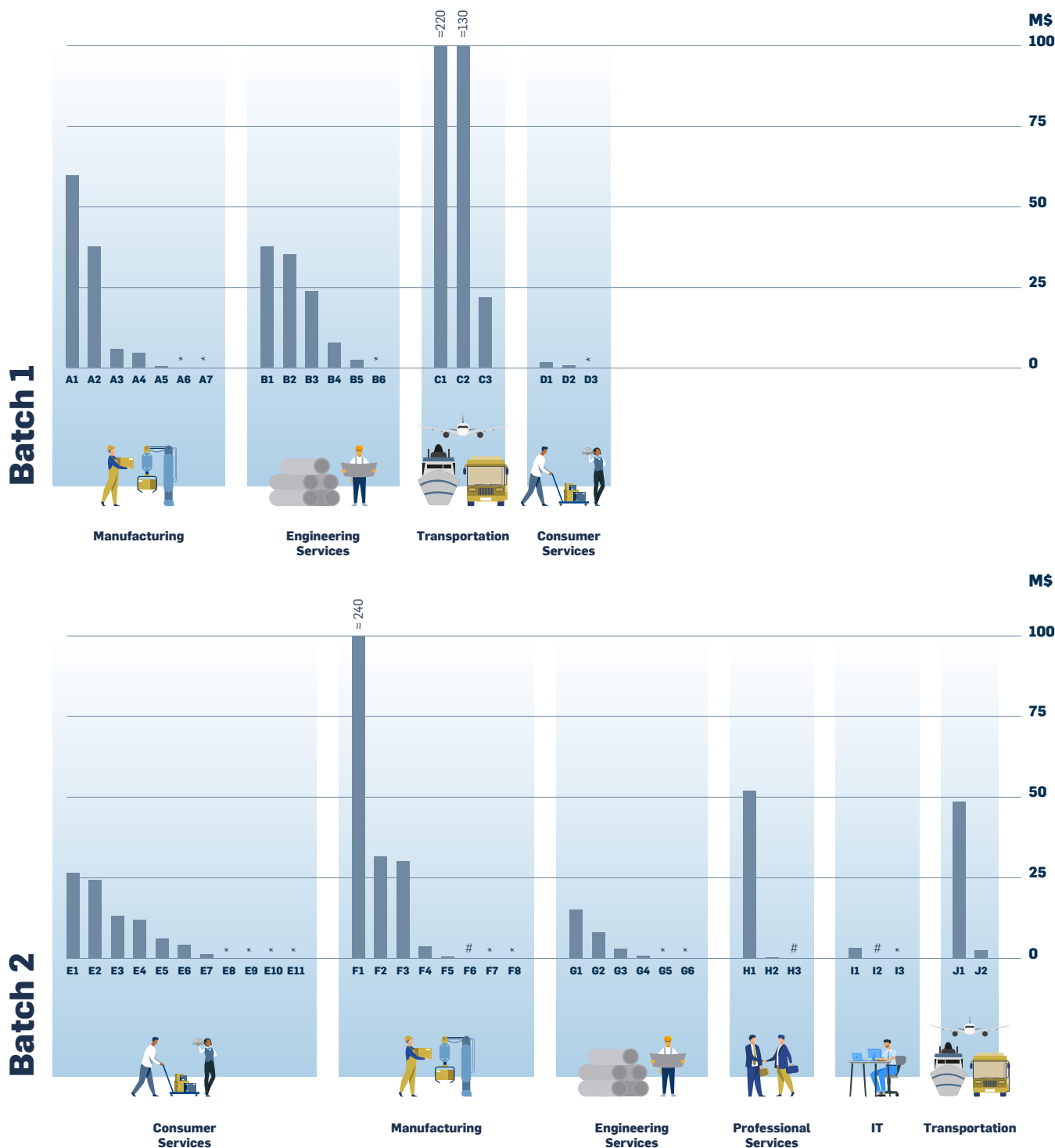
The numbers presented in this section are based on prevailing data at the point of publication and will be updated from time to time due to new information and data points.





## Company Profile by Revenue & Sectors

The study encapsulates 24 months of data from the first batch of 19 companies which completed the LowCarbonSG programme between 2020 and 2022. The second batch of 33 firms which are halfway through their programme submitted 12 months of their data.



\* Data not available at time of publication

# Revenue under M\$1

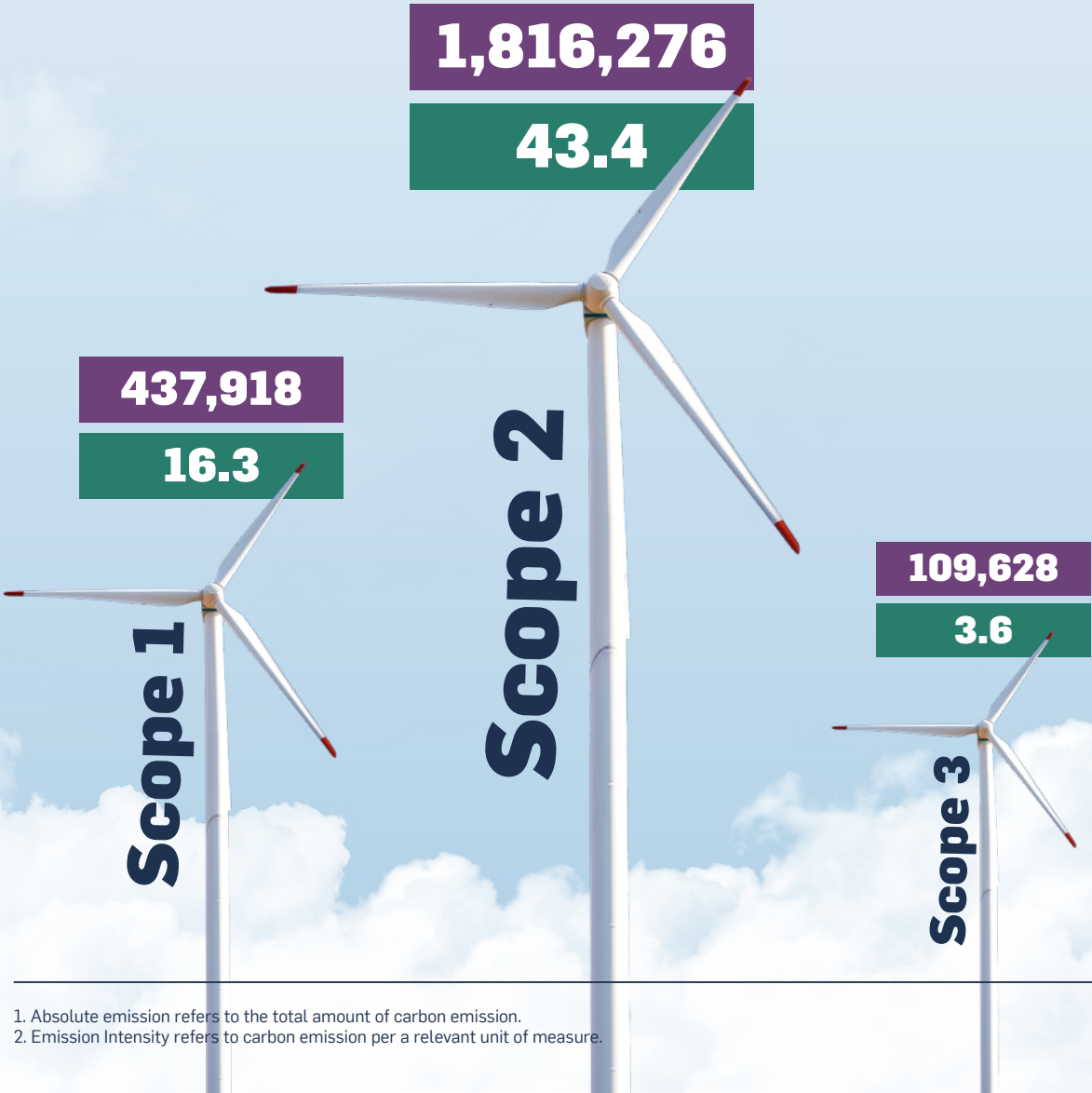
- Consumer Services – Hotels, Restaurants & Leisure, Diversified Consumer Services
- Engineering Services – Engineering design, Construction and Installation, Maintenance, Repair and Overhaul, Cleaning and Waste management
- IT – Telecommunication Services - Diversified/Wireless Telecommunication Services; Software & Services - IT Services, Software
- Manufacturing – Pharmaceuticals, Biotechnology & Life Sciences - Biotechnology, Pharmaceuticals, Life Sciences Tools and Services
- Professional Services – Process & Industrial Plant Engineering Design & Consultancy Services; Renting, Servicing & Trading of Equipment & Machineries; Diversified Financial Services, Consumer Finance, Capital Markets, Mortgage REITs
- Transportation – Air Freight & Logistics, Airlines, Marine, Road & Rail, Transportation Infrastructure

# Average Emissions

Capturing Scope 1, 2 and 3 emissions, the charts show the mean absolute emissions and mean emissions intensity (per S\$1000 of revenue) on an annual basis. The emissions intensities are normalised by the company's revenue during the corresponding period. Emissions intensities typically give a more meaningful measure of how well businesses manage their emissions when business activities fluctuate.

**Scope 2 emissions forms the largest part of the companies' overall emissions. It comprises over 50% for both categories - absolute emissions and emissions intensity by revenue.**

|                                            |                                                                               |
|--------------------------------------------|-------------------------------------------------------------------------------|
| Mean annual Absolute Emissions<br>/ kgCO2e | Mean annual Emissions Intensity by Revenue<br>/ kgCO2e per S\$1000 of revenue |
|--------------------------------------------|-------------------------------------------------------------------------------|



1. Absolute emission refers to the total amount of carbon emission.  
2. Emission Intensity refers to carbon emission per a relevant unit of measure.

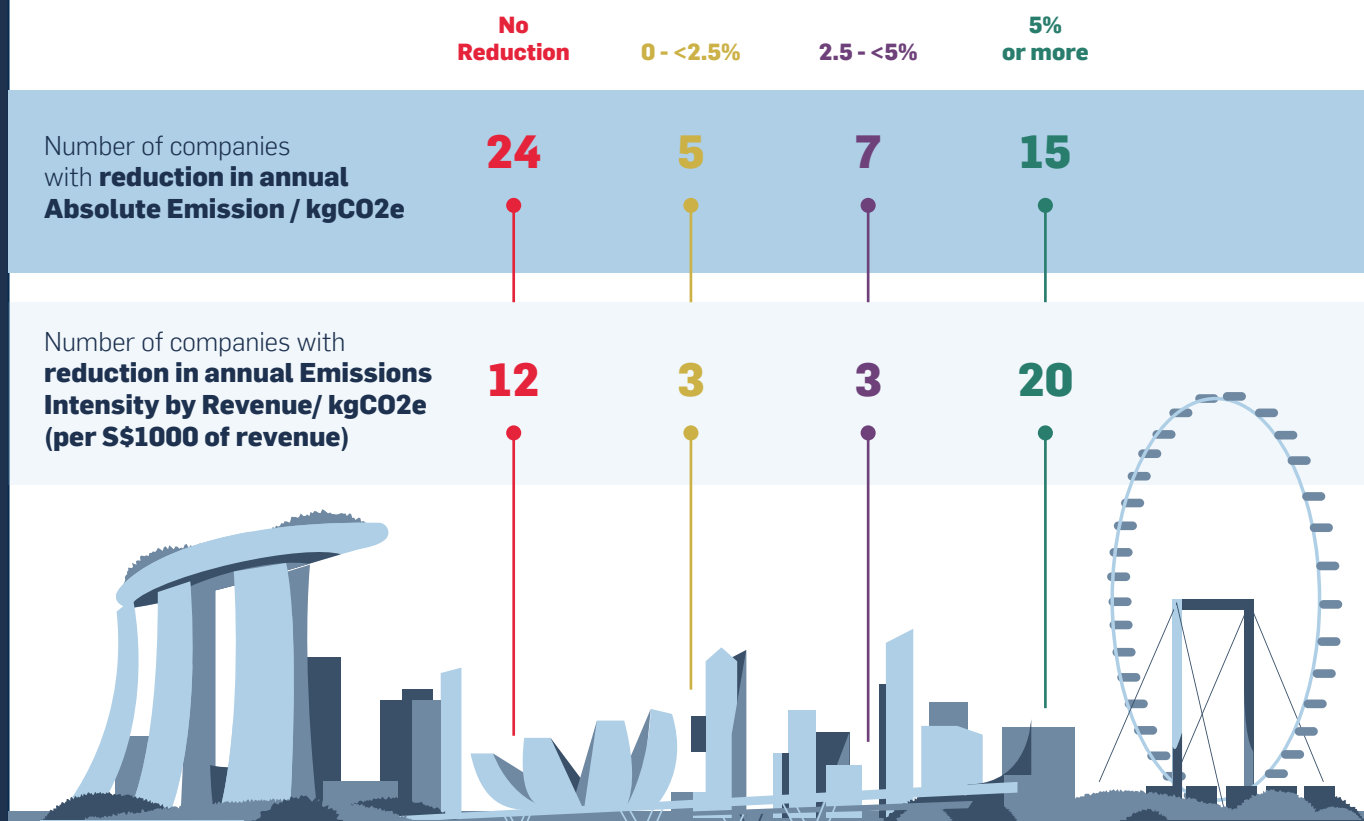
## Average Improvements

Capturing Scope 1 and 2 emissions, the charts show improvements made in the reduction of absolute emission and mean emission intensity (per S\$1000 of revenue) on an annual basis. This formula below illustrates how the improvements are measured by comparing the latest period of the company's emissions against their annualised baseline emissions.

$$\% \text{ change} = (\text{Latest emission} - \text{Baseline emission}) / \text{Baseline emission}$$

this measurement only take into consideration Scope 1 and 2 emissions.

**A majority of the companies achieved their emissions reduction with varying degrees of success across all three categories - absolute emission and emission intensity by revenue and employee.**





## Data Summary: Company Profile

The study encapsulates data from the first batch of 19 firms collected across 24 months between Q3 2021 and Q3 2022. The second batch of 33 companies submitted 12 months of their data from Q4 2020 to Q4 2022.

The percentage of companies in the first and second batch of companies who successfully reduced carbon emissions is quite comparable. In comparison, the second batch performed better due to a higher baseline stemming from a generally higher economic activity due to the relaxing of COVID-19 restrictions.

Scope 2 emissions, which are indirect emissions arising from the purchased energy of the company, took up the largest portion (almost half) of overall absolute emissions for both batches of companies.

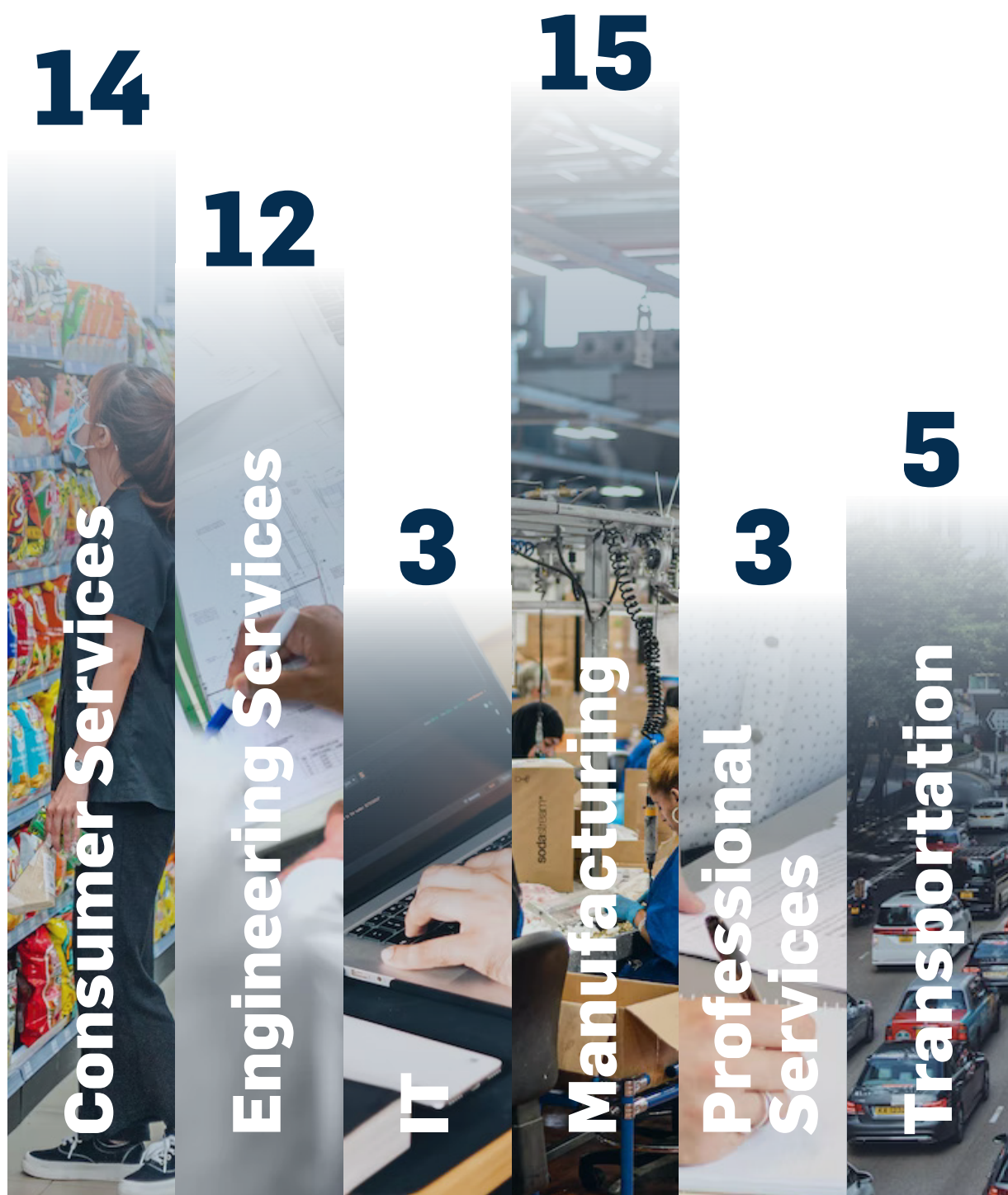
## Recommendations

Companies can start their low-carbon transition journey by focusing on energy efficiency improvements such as the installation of solar panels, smart sensors and energy monitoring system, and switching to renewable energy sources to address their main sources of emissions. In this report, there are resources pertaining to grants and certifications to aid businesses in addressing these concerns.

## Sectoral Analysis

### About the Data: Sectoral profiles

Summarised in the table below are participating companies from a range of sectors. Sectors that do not have a minimum of five companies are excluded from the analysis. This leaves us with the areas of Consumer Services, Engineering Services, Manufacturing and Transportation. As our databases expand in future, we will be able to report on the other sectors.

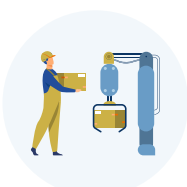
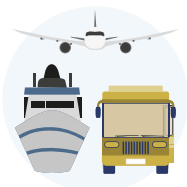


# Sectoral Averages

## About the chart

Capturing scope 1, 2 and 3 emissions, the charts show the mean absolute emission and mean emission intensity (per S\$1000 of revenue) across four industries: consumer services, engineering services, manufacturing and transportation.

**The manufacturing sector exhibited the highest emissions profile across both categories of measurements, with Scope 2 emissions being the biggest contributor.**

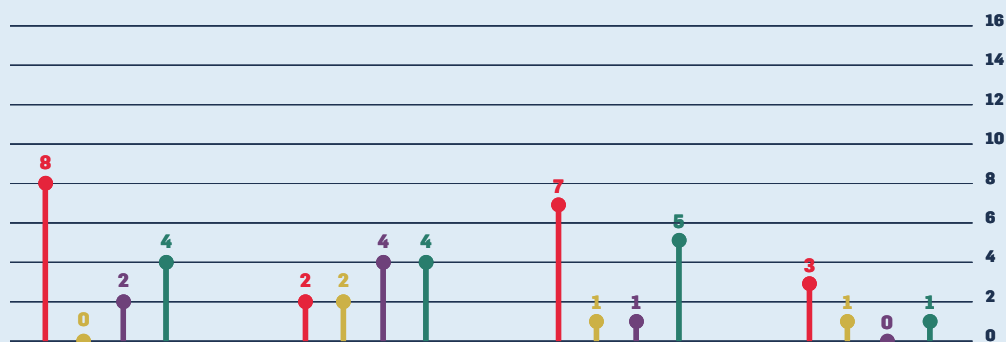
|                                                                                                                 | Mean annual Absolute Emission / kgCO2e | Mean annual Emission Intensity by Revenue / kgCO2e per S\$1000 of revenue |                                    |  |
|-----------------------------------------------------------------------------------------------------------------|----------------------------------------|---------------------------------------------------------------------------|------------------------------------|--|
|                                                                                                                 | Scope 1                                | Scope 2                                                                   | Scope 3                            |  |
|  <p>Consumer Services</p>    | <div>84,235</div> <div>3.63</div>      | <div>1,297,453</div> <div>92.83</div>                                     | <div>85,971</div> <div>3.32</div>  |  |
|  <p>Engineering Services</p> | <div>226,973</div> <div>9.92</div>     | <div>124,997</div> <div>6.88</div>                                        | <div>35,458</div> <div>1.20</div>  |  |
|  <p>Manufacturing</p>        | <div>1,014,316</div> <div>28.85</div>  | <div>1,643,385</div> <div>46.61</div>                                     | <div>254,177</div> <div>7.54</div> |  |
|  <p>Transportation</p>       | <div>930,790</div> <div>10.97</div>    | <div>1,214,070</div> <div>14.30</div>                                     | <div>82,437</div> <div>0.97</div>  |  |

## Sectoral Improvements

### About the chart

Covering scope 1 and 2 emissions, the charts show the improvements in absolute emission reduction and mean emission intensity (per S\$1000 of revenue) on an annual basis across the four industries.

Number of companies with **with reduction in annual Absolute Emission / kgCO<sub>2</sub>e**



Number of companies with **reduction in annual Emissions Intensity by Revenue / kgCO<sub>2</sub>e per S\$1000 of revenue**



Number of companies with **reduction in annual Emissions Intensity by Employee / kgCO<sub>2</sub>e per Employee**



Consumer Service

Engineering Service

Manufacturing

Transportation

No  
Reduction

0 - <2.5%

2.5 - <5%

5%  
or more



## Summary

The manufacturing sector enjoyed around 20% revenue increase between the Baseline and subsequent submissions, indicating a healthy increase in activity. Despite this, the mean absolute emissions only increased by around 2%, with the biggest increase being from Scope 3. The mean emissions intensity by revenue decreased by around 25%, with the biggest reductions being from Scope 1 and 2. This indicates that there was an underlying improvement in GHG emissions, perhaps from energy efficiency improvements resulting in more efficient manufacturing operations.

Conversely, companies in the related engineering services sector suffered revenue decrease compared to baseline, though the decrease in absolute emissions was much smaller relatively. Scope 1 emissions intensity by revenue in particular increased by some 16%, compared to a much smaller magnitude of change for Scope 2 and 3. This may indicate the possibility of lower efficiency in Scope 1 emissions such as consumption of fuel for stationary or transportation applications.

The consumer services sector saw an increase in absolute emissions of 7%, particularly in Scope 2. This is not surprising given the sector almost doubled its turnover compared to baseline. This may stem from the sector's susceptibility to stringent COVID-19 regulations during the pandemic and the subsequent resumption of normalcy, leading to a fast pace of recovery. However, its significantly lower emissions intensity by revenue of almost 30% suggest that firms may have taken advantage of the pandemic's lull period to enhance operational efficiencies, leading to better emission control as their businesses recovered.

The transportation sector had the fewest number of companies in our CERT pool and also the widest spread of company size (by revenue). Any insights drawn must accordingly be taken with some caution. Nevertheless, it can be observed that whilst revenue remained essentially flat, Scope 1 and 2 absolute emissions and intensity by revenue all declined. Whereas Scope 3 emissions (absolute and intensity by revenue) increased by 15-18%. This may be due to an increase in their employees' commute to offices and air travel, following the relaxation of COVID-19 regulations.

## Recommendations

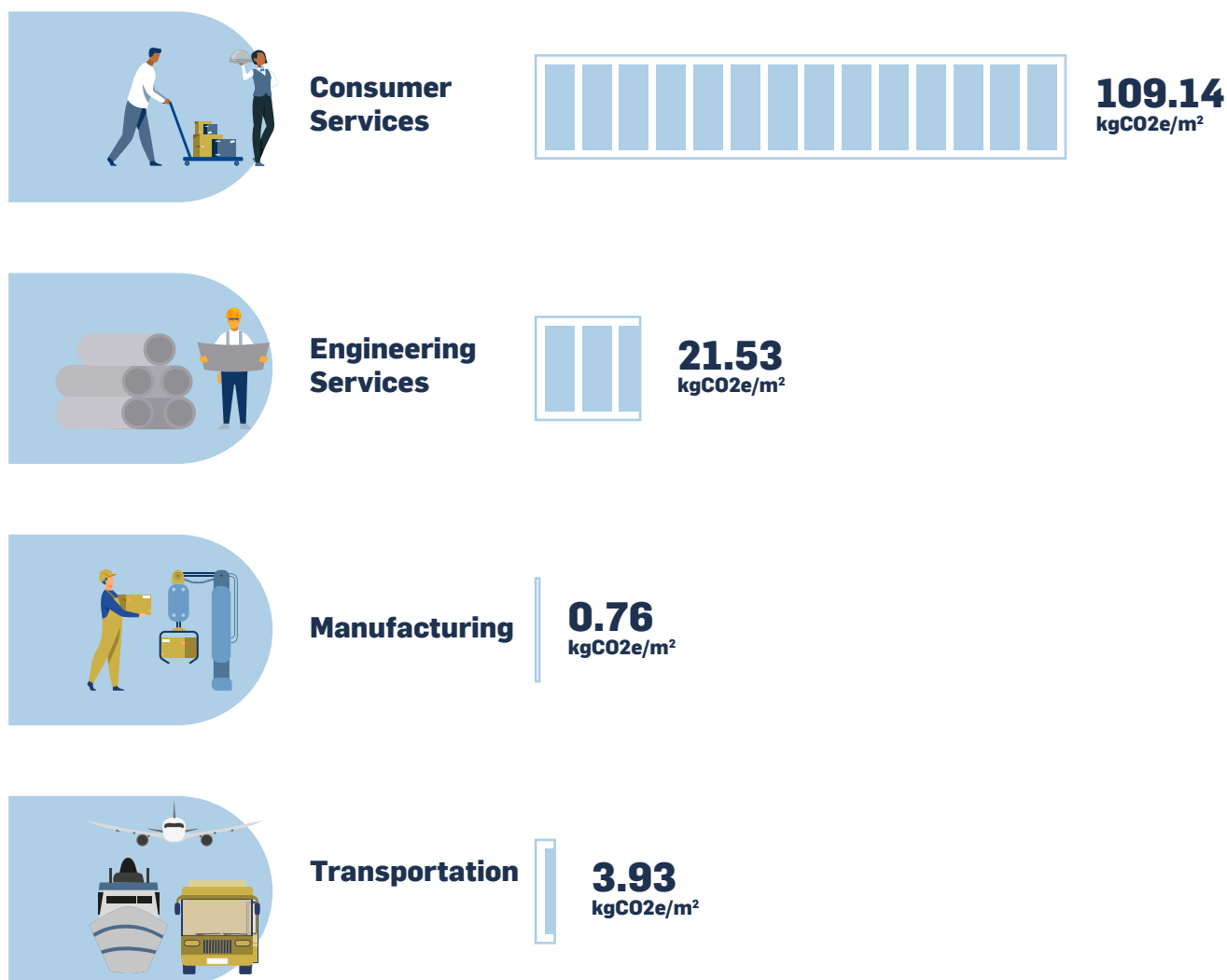
To address commuting-related emissions, companies can implement flexible working arrangements - an approach that is also promoted by the public sector. Companies can explore carpooling, bus chartering or encouraging the use of public transportation. However, it is worthy to note that there are social cohesion advantages to having staff return to the office. Working from home also does not eliminate carbon footprint totally as employees still use electricity and air-conditioning while working at home.

# Electrical Energy Efficiency Analysis

## Summary

Scope 2 emissions, largely reported with electricity drawn from the grid, is a determining factor of a facility's electrical energy efficiency. To accurately gauge the facility efficiency, a form of emissions intensity metric is needed. This can be calculated by dividing scope 2 emissions by the Gross Floor Area (GFA) in square meters.

## Electrical Energy Efficiency (average Scope 2 emissions/GFA)



The average scope 2 emissions intensity by GFA across all participating companies in our programme is 2.94 kgCO<sub>2</sub>e/m<sup>2</sup>. The sector with the highest emissions intensity by GFA is consumer services at 109.14 kgCO<sub>2</sub>e/m<sup>2</sup>. This is significantly higher than the overall average, which is dominated by the low emissions intensity of the manufacturing and transportation sectors.

The high emissions intensity of consumer services may be explained by the fact that consumer services tend to have higher activity in their premises due to customer footfall. Furthermore, there was a slight increase in emissions intensity given the increase in business activity in the sector following the relaxation of pandemic restrictions.

## Summary

The pandemic has significantly disrupted companies across sectors in varying ways. However, the resulting lull period also presented firms with an opportunity to plan and take action in managing their emissions. This proved to be beneficial when business activities resumed as Singapore transitioned to live with COVID-19.

The LowCarbonSG programme and CERT tool have acted as a springboard for firms to jumpstart their carbon management journey. It is heartening to see the efforts, commitment, and accompanying results from all participating companies. Through the sharing of the information in this section, we hope that firms better understand where they stand and are encouraged to continue monitoring their progress and further reduce their carbon emission. Collectively, this will not only contribute to our economy, but also help to progress Singapore towards our Net Zero target by 2050.

## Recommendations

Companies can seek grants to support energy efficiency improvement projects. NEA's Energy Efficiency Fund (E2F), for instance, provides the manufacturing sector with means to adopt energy-efficient measures on their premises. Certifications in energy efficiency such as ISO 17743 (Energy Savings) and ISO 50001 (Energy Management Systems) can also help to build up in-house energy efficiency competencies. These measures allow companies to directly reduce emissions related to electrical energy consumption. In addition, EnterpriseSG's Enterprise Development Grant (EDG) and Energy Efficiency Grant (EEG) also supports companies to improve their energy consumption and reduce carbon emissions.

More details on journeying towards a low-carbon future can be found in our [Decarbonisation for Singapore Enterprises Playbook](#).

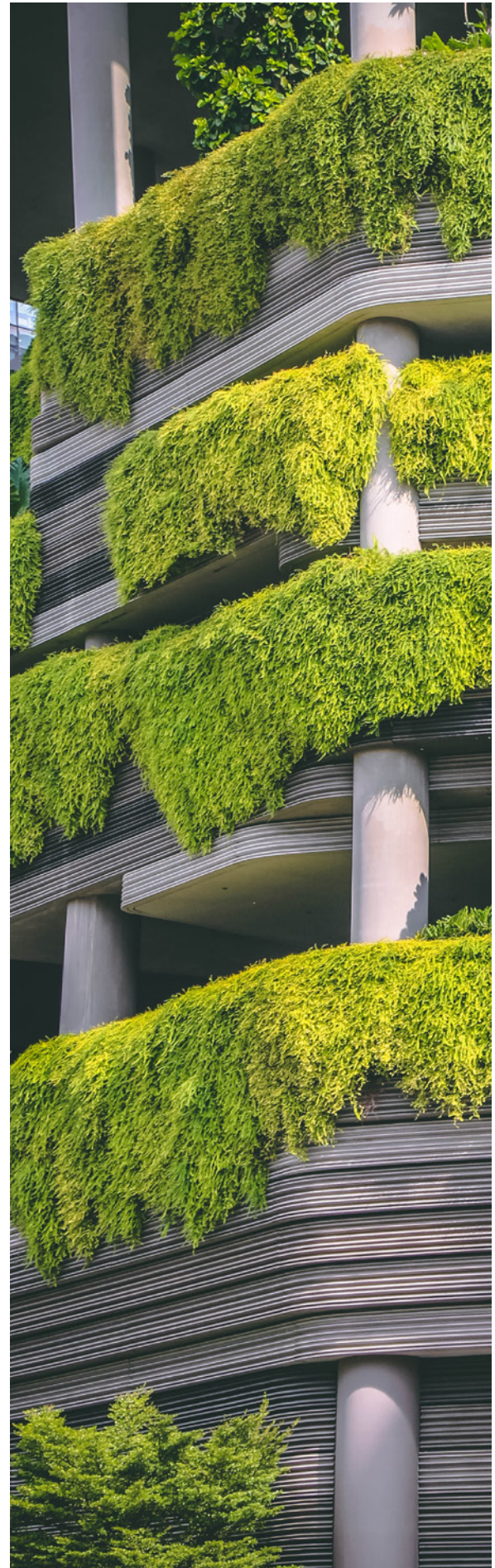


# LowCarbonSG Participant Spotlight

Our LowCarbonSG participants have achieved incredible success on their carbon management journey. Beyond securing sustainability-linked financing, many have gone on to implement new and innovative sectoral decarbonisation solutions. These success stories are a testament to the power of taking decisive action and committing to a sustainable future.

We are proud to share these inspiring stories to encourage other companies to kickstart their own journey towards a more sustainable future. Every step, no matter how small, counts. Every carbon emission reduced contributes to building a more resilient business.

**Beyond securing sustainability-linked financing, many have gone on to implement new and innovative sectoral decarbonisation solutions.**





# Dyna-Mac Engineering Services Pte Ltd



<https://www.dyna-mac.com/>

## How Dyna-Mac, used OCBC's Sustainability Linked Loan to support its Decarbonisation Strategy.

Established in 1990, Dyna-Mac is a global engineering, procurement & construction service provider for the energy market with a focus in offshore and onshore structures as well as modules for carbon capture storage. The sustainability journey for Dyna-Mac started in 2020 and was driven by the need for cost reduction to stay competitive. For the firm, sustainability enabled them to return to profitability in 2021.

**With advice from its financial partner, OCBC, Dyna-Mac recognised the need to future-proof their business by overcoming the cost challenge from the impending carbon tax increase and the demand challenge arising from customers' preference for more sustainable practices.**

This motivated them to embark the next lap of their 2022 sustainability journey as a member of the CPLC - an ecosystem of like-minded organisations and institutions driving the decarbonisation agenda.

As LowCarbonSG partner, Dyna-Mac uses CERT to set practical and achievable emission reduction targets that comply with international standards. They aim to reduce the carbon emission intensity of their business operations by 25% within 5 years.

In the early stages of Dyna-Mac's sustainability journey, the company focused on simple and achievable tasks to reap low-lying fruits. Examples include replacing lights to more energy-efficient LED ones and installing solar panels in their workplace. Encouraged by these early successes, they pursued more sophisticated solutions. Dyna-Mac relooked at their operations and swapped out diesel for electrical power, and upgraded their machine software to lower raw material waste and scrap.

The resulting diesel and electricity consumption were monitored, tracked and reported monthly through CERT under the LowCarbonSG programme. This comprehensive and routine reporting allowed the firm to respond swiftly to any unnecessary areas of energy consumption. As a result, Dyna-Mac achieved their five-year target of a 25% emission reduction within the first year.

Having these results audited and verified allowed them to convert their existing bank facility to a sustainability-linked loan (SLL) from OCBC at a reduced rate.<sup>13</sup>

→ Hear more from Mr. Lim Ah Cheng, Executive Chairman and CEO of Dyna-Mac, [here](#).

→ Find out more about OCBC Bank Sustainable Financing options for SMEs [here](#).

**LowCarbonSG provided Dyna-Mac with CERT – a simple yet powerful tool that saves both time and effort in GHG inventory data entry.**

<sup>13</sup> Applicable if the agreed-upon Sustainability Performance Targets (SPTs) are met.



# Hong Lam Marine Pte Ltd


**HONG LAM MARINE**
<https://www.honglam.com.sg/>

Incorporated in 1981, Hong Lam Marine Pte Ltd (Hong Lam Marine) is a leading bunker craft operator providing international services. They operate a fleet of 34 tankers with a total tonnage of about 300,000 DWT.

The company's journey started with their CEO, Ms Caroline Yang, who was concurrently the president of the Singapore Shipping Association. Determined to improve the global climate, she recognised the impetus to take the first step and joined the LowCarbonSG programme. The agenda was clear from the get-go - to gain knowledge in carbon management and to explore ideas with fellow partners in carbon emission reduction.

"The first step begins with us" - Ms Caroline Yang, CEO of Hong Lam Marine

As a partner in the LowCarbonSG programme, Hong Lam Marine established their baseline emission levels by tracking the company's carbon emission using CERT. The information gathered allowed them to validate the effectiveness of various sectoral decarbonisation solutions implemented on their vessels. For instance, Hong Lam Marine uses Hempel X7 Silicone coating on the underwater hull of their vessels which helps to reduce drag. In addition, they also make use of marine fuel additives which helps to reduce emissions, coupled with regular hull cleaning.

The company went a step further to initiate digitalisation efforts by adopting Mariapps and the Seven Ocean systems for ship management, ESKER for supplier management, and the Electronic Bunker Delivery Note (E-BDN) to do away with erroneous and inefficient physical documentation.

In April 2022, Hong Lam Marine was awarded the Maritime SG Carbon50 Award for their green initiatives involving the use of biofuels and regular hull cleaning to reduce carbon emission. The company also signed a Memorandum of Understanding (MOU) with PaxOcean Engineering Pte. Ltd. and classification society Bureau Veritas (BV) to jointly develop a low carbon emission ammonia bunker vessel design.

With consistent guidance from CPLC and monthly energy consumption data through CERT, Hong Lam Marine was well equipped to track and reduce their emissions systematically and accurately. This not only resulted in cost savings that improved their bottom line, but also boosted innovative improvements that streamlined their business operations. With sustainability in mind, Hong Lam Marine managed to position themselves as leaders in the maritime arena.



**"The first step begins with us"**

- Ms Caroline Yang, CEO of Hong Lam Marine

**This not only resulted in cost savings that improved their bottom line, but also boosted innovative improvements that streamlined their business operations.**

# LowCarbonSG Participants Logo recipients:

CPLC Singapore would like to congratulate the recipients of our LowCarbonSG Participant Logo

## 2021 Logo Recipients

Accudyne Industries Asia Pte Ltd  
Alphatron Marine Systems Pte Ltd  
Baristart Sentosa  
Containers Printers Pte Ltd  
Eng Hup Shipping Pte Ltd  
FOC Sentosa Pte Ltd  
Guava Amenities Pte Ltd  
Jason Electronics  
Jurong Port Pte Ltd  
MTQ Engineering Pte Ltd  
Matex Holdings Pte Ltd  
Maximator Far East Pte Ltd  
Merlin Entertainments Singapore Pte Ltd  
Mount Faber Leisure Group Pte Ltd  
Mun Siong Engineering Ltd  
OVOL Singapore Pte Ltd  
Ola Beach Club  
Olam Cocoa Pte Ltd  
Penguin International Ltd  
Rumours Beach Club  
SEATOBAG Pte Ltd  
SEPPURE Pte Ltd  
SWTS Pte Ltd  
Sasha's Fine Foods Pte Ltd  
Sentosa Golf Club  
Shiok Meats Pte Ltd  
StarHub Ltd  
Strategic Marine (S) Pte Ltd  
TurtleTree Labs Pte Ltd  
Uniweld Products (USA) Pte Ltd  
Vac-Tech Engineering Pte Ltd  
W Singapore Sentosa Cove Hotel

## 2022 Logo Recipients

Capella Hotel, Singapore  
Coastes Pte Ltd  
Dyna-Mac Engineering Services Pte Ltd  
GAC (Singapore) Pte Ltd  
GreenA Consultants Pte Ltd  
Hashstacs Pte Ltd  
ICF International Pte Ltd  
Jurong Port Pte Ltd  
KL Resources Pte Ltd  
LeVeL33 Pte Ltd  
N&E Innovations Pte Ltd  
New Toyo Aluminium Paper Product Co. (Pte) Ltd  
Ngo Chew Hong Edible Oil Pte Ltd  
Oasia Resort Sentosa  
Princeton Digital Group (Singapore) SG1 Pte Ltd  
Shandi Global Pte Ltd  
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# Carbon tax increase: Impact on SMEs

## About Carbon Tax

A policy-based approach, carbon tax aims to reduce GHG emissions by taxing carbon-intensive activities. By giving a dollar value to these harmful gases, the otherwise hidden social and environmental costs of GHG emissions are now directly linked to a company's bottom line.

Carbon tax was introduced in 2019 in Singapore at a rate of 5 per tonne of CO<sub>2</sub><sup>e</sup> emissions, and is scheduled to increase to S\$25 in 2024, and S\$50-S\$80 by 2030. While it is an effective way to tackle climate change, it can adversely impact SMEs with tight budgets. The analysis below details how carbon tax can affect SMEs through the energy channel.

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## Impacts of a Carbon Tax Increase

### SMEs in Singapore

The increase in carbon taxes will almost certainly result in higher energy costs for businesses, thereby impacting their bottom line. With comparatively limited resources as opposed to larger firms, SMEs may struggle to absorb these additional costs. Seeking aid from government grants and schemes can help SMEs transition to a low-carbon economy. However, these measures may still be insufficient to offset the impact of carbon taxes on SMEs.

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## Electricity prices

While carbon tax is hailed as an effective policy tool to reduce GHG emissions quickly, policymakers need to weigh its pros and cons on end-consumers. One significant downside of carbon pricing is the impact on electricity prices.

Our research team consolidated historical data on carbon tax rates and electricity prices from 1985 to 2022 across 31 countries (including Singapore). A multivariate regression analysis predicts that electricity prices will increase by S\$0.282/MWh if the carbon tax rate increases by S\$1. This suggests that a carbon tax rise from the current level of S\$5/tCO<sub>2</sub>e to S\$25/tCO<sub>2</sub>e in 2024 and S\$80/tCO<sub>2</sub>e by 2030 will likely result in an increase in electricity prices by S\$5.64/MWh and S\$21.15/MWh respectively.

To put these figures in perspective, a household using 1000 kWh per month will incur a substantial increase of S\$5.64 in the monthly electricity bill in 2025, and S\$21.15 in 2030, from its current bill of approximately S\$290.00.

Higher electricity prices disproportionately affect low-income households more, leading to increased energy poverty. Moreover, it can weaken the competitiveness of energy-intensive industries through higher production costs. It should be noted that carbon tax increases will not only impact electricity prices as analysed, but also fuel prices. This eventually trickles down to other elements of the supply chain and the broader economy, including cost of food, transportation and other essentials.

Despite the negative repercussions, there are significant positive impacts to the environment that we cannot ignore. Carbon tax actually incentivises industries and individuals to actively minimise their carbon footprint by lowering GHG emissions. Recognising both the boon and bane of carbon tax, it is imperative for policymakers to consider mitigating measures, such as revenue-neutral taxes, to ensure that low-income households and specific industries can ease gradually into a low-carbon economy.

## The Energy Channel and SMEs

The energy channel encompasses the relationship between energy consumption, energy prices, and business outcomes. Our research team has found that higher electricity prices lead to increased production and corporate revenue. Similarly, greater electricity consumption is associated with increased production. However, when both electricity prices and consumption rise, there is a decrease in productivity, accompanied by higher corporate revenue and expenses. In light of these findings, SMEs have several options:

1

### **Raise product prices to offset the indirect costs resulting from higher carbon taxes.**

This strategy may not be suitable for all SMEs, particularly those in highly competitive markets. However, if successful, our study indicates that higher electricity prices can contribute to increased production and corporate revenue.

2

### **Lower electricity consumption to minimize the impact of higher carbon taxes on their bottom line.**

This approach may reduce productivity and business outcomes. Nevertheless, our study discovered that a 1% increase in electricity prices led to a 0.026% decrease in electricity consumption, ultimately resulting in a 1.21% reduction in gross revenue.

3

### **Alleviate the effects of increased carbon taxes and electricity prices by improving energy efficiency.**

This can be accomplished through various means, such as installing energy efficiency monitoring systems at facilities or implementing cultural changes in operations by turning off machinery and lights when not in use. By enhancing efficiency in electricity consumption, SMEs may be able to counterbalance carbon tax expenses while simultaneously improving their bottom line through reduced energy costs.

The study found that a 1% increase in electricity prices resulted in a 0.026% decrease in electricity consumption, leading to a 1.21% decrease in gross revenue.

By developing efficiency in electricity consumption, SMEs may be able to offset carbon tax costs while improving their bottom line through lower energy expenses.



## Conclusion

The planned increase in carbon tax in Singapore will impact SMEs significantly, especially through the energy channel. However, SMEs can tap on the opportunity to be more competitive by lowering carbon emissions since corporates are increasingly looking at sustainable supply chains.

SMEs can mitigate the impact of higher carbon tax on their operations through several means. For instance, carbon tax costs can be passed on to customers through higher product prices, and electricity consumption can be reduced to offset increased energy costs. In the long run, improved energy usages will also aid in lowering operational costs and mitigating associated risks.

However, SMEs are urged to urgently reduce energy consumption through energy-efficient practices in their operations and lowering their carbon emissions. As this not only help them mitigate the impact of carbon tax but can also help them gain competitive advantages such as a lower operational cost, better business resilience and a more sustainable supply chain. To achieve that, SMEs can consider looking at installing energy efficiency monitoring systems, instilling a consume-only-when-in-use energy culture amongst employees, investing in renewable energy sources such as solar panels, and upgrading less efficient equipment.

SMEs can actively explore various government assistance in their transition towards a low-carbon economy. These financial grants and subsidies help SMEs invest in energy-efficient infrastructure, education and training on sustainable practices, as well as partnerships with industry experts to develop and implement sustainable solutions. By doing so, the government can propel SMEs to remain competitive and contribute to Singapore's efforts in reducing carbon emissions to combat climate change.

**SMEs are urged to urgently reduce energy consumption through energy-efficient practices in their operations.**

# Regional business landscape: Climate change and GHG emission

## An Overview: Carbon Pricing and Taxes In ASEAN

In 2021, ASEAN contributed to 3.5% of the global GDP at \$3.3 trillion. Forecasted to grow to 5.2%, it is projected to be one of the fastest growing regions in 2023 according to the OECD. In 2020, 6 major countries in ASEAN emitted around 1,630 MtCO<sub>2</sub>e of greenhouse gases, or 3.3% of global emissions. Despite this relatively modest contribution, countries like Indonesia, Philippines, Thailand and Vietnam face a high risk of repercussions from both extreme weather events and associated socio-economic losses, being ranked in the Top 40 (out of 180 countries).

Widely seen as one of the main policy instruments, carbon pricing increases the uptake momentum for GHG emission reduction. While it fails to resolve the socio-economic root causes of rising GHG emissions such as energy and food for a growing world population, carbon pricing aids in underscoring the direct relationship between GHG emissions and profit.

This levels the playing field between consumers and producers of fossil fuel and renewable energy, and balances government regulation with consumer demand. In turn, this allows market forces to determine a lowest-overall-cost outcome to society.

### Sources for Summary of Key Renewable Energy Metrics and Carbon Pricing in 6 ASEAN Countries

<sup>1</sup> Source: Countryeconomy.com, 2020; may differ slightly from individual country reporting

<sup>2</sup> <https://worldpopulationreview.com/country-rankings/renewable-energy-by-country>

<sup>3</sup> Germanwatch Global Climate Risk Index 2021 – a lower score indicates a higher risk. Ranking is out of 180 countries

<sup>4</sup> <https://think.ing.com/articles/indonesia-carbon-tax-on-hold-but-investment-in-electric-cars-could-pay-off/#:~:text=The%20planned%20carbon%20tax%20of,generation%20in%20the%20medium%20term.>

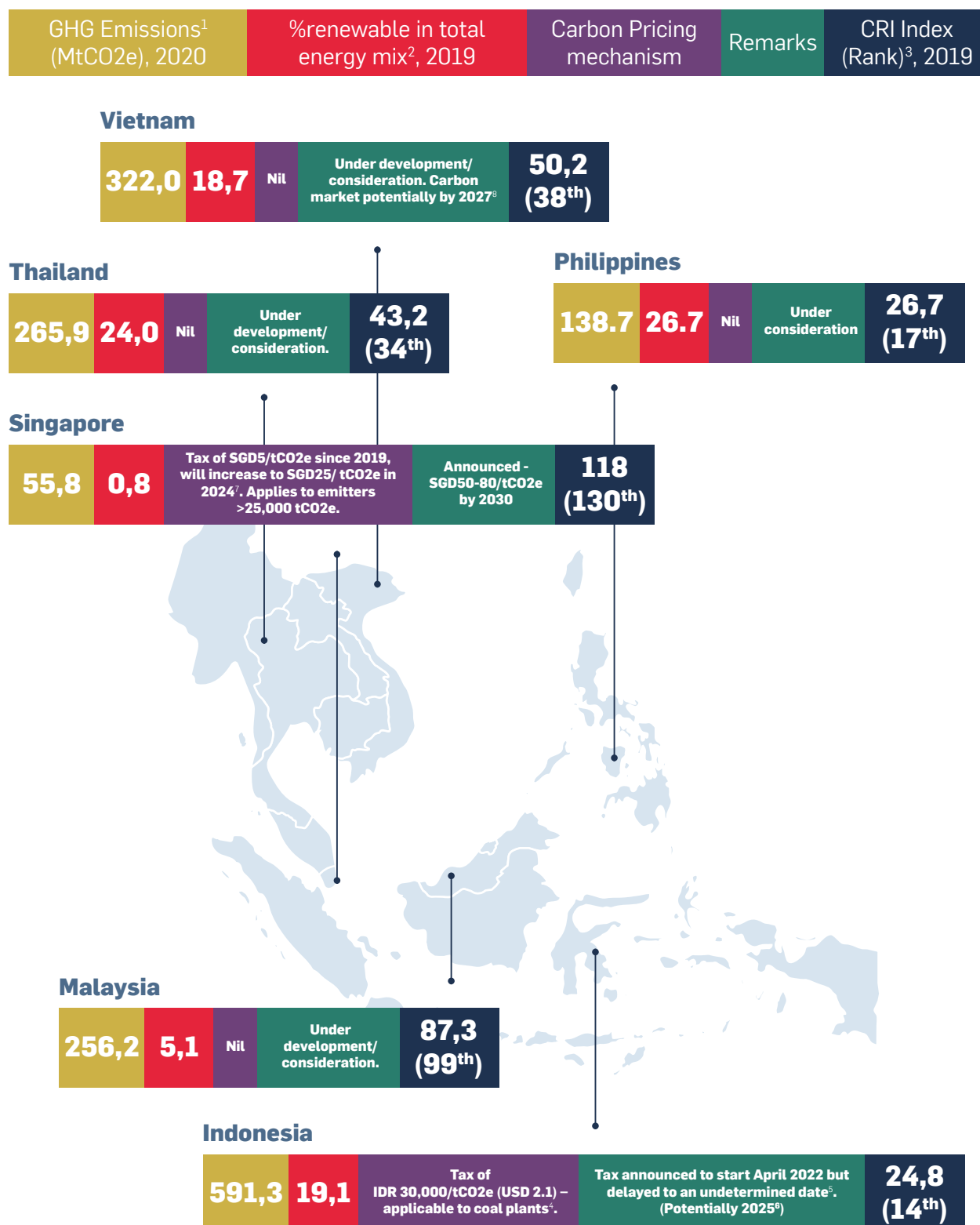
<sup>5</sup> <https://www.argusmedia.com/en/news/2345415-indonesia-delays-carbon-tax-scheme-again-on-global-risk>

<sup>6</sup> <https://www.lexology.com/library/detail.aspx?g=e06fb190-379a-4ef8-abbcd248f0f3a55a>

<sup>7</sup> <https://www.nccs.gov.sg/singapores-climate-action/carbon-tax/#:~:text=The%20carbon%20tax%20level%20is,give%20emitters%20time%20to%20adjust.&text=To%20achieve%20our%20climate%20ambition,tCO2e%20by%202030.>

<sup>8</sup> <https://www.lexology.com/library/detail.aspx?g=e06fb190-379a-4ef8-abbcd248f0f3a55a>

# Summary of Key Renewable Energy Metrics and Carbon Pricing in 6 ASEAN Countries





Carbon pricing, imposed in any variation from tax to trade restrictions, is largely in its infancy stage of adoption within ASEAN. This stems from concerns about the drag it can put on economic prosperity and access to affordable energy. Currently, Singapore is the sole country with a carbon tax regime since 2019, with an upcoming meaningful increase due in 2024. In fact, Climax Impact X (CIX), a global marketplace and exchange for high-quality carbon credits, was launched in 2021 and had its first successful trade auction in November 2022. Indonesia was slated to commence its carbon tax in April 2022, but the deadline has since been postponed twice due to unforeseen economic considerations.

Other ASEAN countries have initiated serious studies, but formal carbon pricing mechanisms are yet to be enforced. Thankfully, complementary developments such as the Voluntary Carbon Market launching in March 2023 in Bursa Malaysia<sup>9</sup>, as well as Thailand's first carbon credit exchange named FTIX that launched in January 2023, are in place.

Although most carbon pricing impose costs on activities within its own respective countries, the European Union (EU) has announced a Cross Border Adjustment Mechanism (CBAM) scheme scheduled to take effect on 1 October 2023. The intention is to plug "carbon leakage" when companies move production out of the EU and/or import from countries with lower or no carbon taxes. Currently, companies in ASEAN may not be much affected as the CBAM only applies to carbon intensive products which are not main exports from ASEAN. These products include cement, iron and steel, aluminum, fertilisers, electricity and hydrogen. However, it is within reasonable grounds to expect the CBAM to cover all imports in the long run.

**Carbon pricing, imposed in any variation from tax to trade restrictions, is largely in its infancy stage of adoption within ASEAN.**

Given each country's distinctive constraints, each requires a unique decarbonisation journey. Singapore, for instance, was ranked 1st in Asia based on World Economic Forum (WEF)'s 2021 Energy Transition Index, and aims to achieve net zero by 2050 despite renewable energy accounting for under 1% of its energy source. Since the ambitious nation is limited by land and natural resource availability, it requires access to the region for cleaner energy. On the other hand, Philippines has the highest renewable energy penetration across major ASEAN countries at 26.7%. It has, however, committed to a comparatively conservative NDC target due to a host of challenges such as natural disasters, poverty, and an ageing infrastructure<sup>10</sup>. Nevertheless, its abundant energy sources like geothermal, hydro, wind and solar makes it well-positioned to further its proportion of renewable energy. World Wildlife Fund (WWF) Philippines, for example, has challenged the government to target for 50% renewables by 2030<sup>11</sup>.

CPLC Singapore will continuously monitor international carbon pricing developments, with an acute focus in ASEAN. We will keep you, our valued partners, abreast with insights to make informed choices to grow and expand your businesses across borders. In the following section, we have collaborated with our UNGC local network partners to deep dive into Malaysia and Sri Lanka's key business developments and GHG emission landscape.

**Given each country's distinctive constraints, each requires a unique decarbonisation journey.**

<sup>9</sup> Malaysia Stock Exchange; <https://www.bursamalaysia.com/trade/market/voluntary-carbon-market-exchange/overview>

<sup>10</sup> <https://unfccc.int/sites/default/files/NDC/2022-06/Philippines%20-%20NDC.pdf>

<sup>11</sup> <https://www.wwf.org.ph/what-we-do/climate/renewables/renewables-to-power-ph-dev/>

# Insights from one of Malaysia's leading conglomerates

IJM Corporation Berhad, one of Malaysia's leading conglomerates, aligns its climate strategy with their Sustainability Roadmap (2023-2025) by focusing on physical and transition risks alongside carbon emission reduction. The company conducted a thorough assessment of their carbon footprint to develop a sound and actionable Carbon Reduction Strategy. The exercise entails a two-pronged approach in assessing the Group's end-to-end value chain emissions and identifying emission reduction opportunities. Their FY2022 GHG emissions assessment began with operations in Malaysia where they reported the group's Scope 1, Scope 2 and 6 out of 15 categories of Scope 3 emission (Purchased goods and services, Waste generated, Business travel, Employee commuting, Downstream leased assets and Investments).

The company shared various regulatory, technology and market considerations. One key development on the regulatory front is the launch of the voluntary carbon market, anticipated introduction of carbon tax, and the adoption of Task Force on Climate-Related Financial Disclosures (TCFD) by 2025 for large corporations. In the technology domain, the cost and availability of green technologies<sup>12</sup> are increasingly favourable due to increased adoption. Market developments, especially in the area of green building requirements, has been facing new requirements from local councils.



Kuala Lumpur City Council, for instance, imposed a 30% Renewable Energy benchmark for residential & commercial projects. There is also a growing market for green products, which is echoed by investors' heightened emphasis on corporate sustainability and opportunities for sustainability-related financing.

**IJM Corporation Berhad, one of Malaysia's leading conglomerates, aligns its climate strategy with their Sustainability Roadmap (2023-2025) by focusing on physical and transition risks alongside carbon emissions reduction.**

<sup>12</sup> green technologies include Carbon Capture, Usage and Storage (CCUS), hydrogen, bio-fuel, Electric Vehicles (EVs), renewable energy and low-carbon building materials.

# Insights on the ambitious nation of Sri Lanka



As a small island, Sri Lanka contributes just 0.08% of GHG emissions as of 2022. The country has nevertheless pledged to reduce GHG emissions by 14.5% conditionally and 4% unconditionally, as well as achieve 70% renewable energy by 2030. As of March 2023, 16 companies have committed to the Science Based Targets initiative (SBTi). Its Stock Exchange encourages listed firms to report on Global Reporting Initiative (GRI) and Climate-related Financial Disclosure (TCFD) disclosures. Many private sector entities have also stepped up to champion sustainability in their internal operations and support the local communities that they are working in.

The country's main economic drivers lie in tourism, tea export, apparel, textile, rice production and other agricultural products. Since the Easter Attacks in 2019, Covid-19 and economic crises in 2019, Sri Lanka has been trying to overcome their currency devaluation. Nonetheless, Sri Lanka ranks 99 out of 190 countries according to the World Bank Ease of Doing Business Ranking in 2019. The barriers to easing business dealings include a lack of financial support and capacity, and increasing uncertainty stemming from the current economic crisis and exacerbated by the climate crisis.

Under the 2020 policy framework in Sri Lanka, SMEs were defined as entities with under 300 employees and an annual turnover of under USD 4.41 million. Overall, SMEs take up 75% of all Sri Lanka's enterprises. In 2022, they accounted for over 20% of exports, 45% of employment, and 52% of GDP, proving their vital role in the economy.

SMEs are disproportionately vulnerable to climate shocks because they operate in shorter business cycles, making it harder to plan for climate risks.

Commercial bank loan schemes also rely heavily on collateral-based lending, which means that young SMEs may find it hard to secure such loans. The repercussions of a lack of climate risk planning and financing can be evinced through a 2017 study about a flood in the western province of Sri Lanka, where 80% of businesses affected were SMEs, but only 49% of them had an insurance policy that covered the flood-related damages. In response, the United Nations Environment Programme (UNEP) launched the Building Businesses' Climate Resilience (BBCR) project in 2021 to allow SMEs to respond and adapt to flood risks through a Disaster Risk Management (DRM) and business continuity tool.

Overall, as early adopters of climate reporting, SMEs in Sri Lanka are now being influenced to understand the importance of sustainability from larger companies in their supply chain.

**SMEs are disproportionately vulnerable to climate shocks because they operate in shorter business cycles, making it harder to plan for climate risks.**



# About Us

## UN Global Compact Network Singapore (GCNS)

UN Global Compact Network Singapore (GCNS) is the Singapore chapter of the United Nations Global Compact. As the leading voice on corporate sustainability, GCNS drives multi-stakeholder action to forge a more sustainable future, founded on the Ten Principles of the United Nations Global Compact and the Sustainable Development Goals.

Through various platforms and partnerships, GCNS advances the stewardship of sustainable business practices and Singapore's national agenda of becoming a regional sustainable business hub. In addition, GCNS nurtures the next generation of responsible business leaders through its youth initiatives.

GCNS supports the Singapore chapter of the World Bank Group's Carbon Pricing Leadership Coalition (CPLC). GCNS is also proud to have the Singapore Business Federation (SBF), National Trades Union Congress (NTUC) and Singapore National Employers Federation (SNEF) as Principal Members.

➔ [Learn more about GCNS here.](#)

## Carbon Pricing Leadership Coalition (CPLC) Singapore

Convened and supported by the World Bank Group since November 2015, the Carbon Pricing Leadership Coalition (CPLC) advances effective carbon pollution pricing systems and expands their use globally, helping countries to maintain competitiveness, create jobs, encourage innovation, and achieve meaningful emissions reductions.

CPLC Singapore is the first official Carbon Pricing Leadership Coalition chapter, jointly launched by UN Global Compact Network Singapore and CPLC Singapore.

It aims to encourage the private sector to collaborate through using internal carbon pricing as a mechanism to reduce greenhouse gas emissions beyond Singapore's carbon tax ambitions.

CPLC Singapore will facilitate dialogue, knowledge sharing and collaborations on carbon pricing and management among leaders of the public and private sectors, as well as academia and provide platforms to raise concerns, share success stories, and overcome carbon pricing implementation challenges.

➔ [Learn more about CPLC Singapore here.](#)

# Acknowledgements

GCNS is grateful for the following partners for their inputs and support

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OCBC Bank is the longest established Singapore bank, formed in 1932 from the merger of three local banks, the oldest of which was founded in 1912. It is now the second largest financial services group in Southeast Asia by assets and one of the world's most highly-rated banks, with Aa1 by Moody's and AA- by both Fitch and S&P. Recognised for its financial strength and stability, OCBC Bank is consistently ranked among the World's Top 50 Safest Banks by Global Finance and has been named Best Managed Bank in Singapore by The Asian Banker.

OCBC Bank and its subsidiaries offer a broad array of commercial banking, specialist financial and wealth management services, ranging from consumer, corporate, investment, private and transaction banking to treasury, insurance, asset management and stockbroking services.

OCBC Bank's key markets are Singapore, Malaysia, Indonesia and Greater China. It has more than 420 branches and representative offices in 19 countries and regions. These include over 200 branches and offices in Indonesia under subsidiary Bank OCBC NISP, and over 60 branches and offices in Mainland China, Hong Kong SAR and Macau SAR under OCBC Wing Hang.

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