Progress report 2023

UOB

# Forging our net zero future

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## Progress report 2023

November 2024

## Contents



# Foreword

The world is getting warmer and carbon emissions are rising. In Asia, severe weather such as heatwaves, droughts, storms and floods are affecting lives and livelihoods of millions of people.

Businesses are increasingly focusing on sustainability and transforming their models to decarbonise. However, the world is not decarbonising fast enough to limit global warming to 1.5°C. Many factors – including geopolitical issues and infrastructure needs – are making the transition challenging.

As a bank, we must focus our efforts on where we can make the greatest impact. We are deepening our support of clients in their decarbonisation journeys and remain committed to a just transition that ensures the well-being of the planet and its people.

Our support extends beyond financing green technologies, such as renewable energy and energy efficiency solutions. Companies also need financing to support their transition efforts in changing their way of doing business, as well as in their supply chains, as they respond to the growing sustainability demands from their regulators, investors and customers.

Achieving net zero requires the entire ecosystem and value chains to work together. The right regulatory environment, policies, incentives and targets are essential. Embedding sustainability skillsets is also necessary for the structural shift to a sustainable economy.

This is the third year of tracking our progress towards net zero. We are making good progress and are below the reference pathways for the five sectors.

We are committed to being a long-term enabler for our clients across our key markets in Southeast Asia. We are working with our ecosystem partners on sector-specific technologies, financial solutions and capacity-building initiatives.

We need pragmatic solutions to accelerate the transition where possible, and perseverance to work through short-term challenges. With vision, leadership, conviction and the long term in mind, we will continue to catalyse change and impact.

**Wee Ee Cheong**
**Deputy Chairman and Chief Executive Officer**
UOB
November 2024

# Highlights

## Our net zero commitment, targets and progress

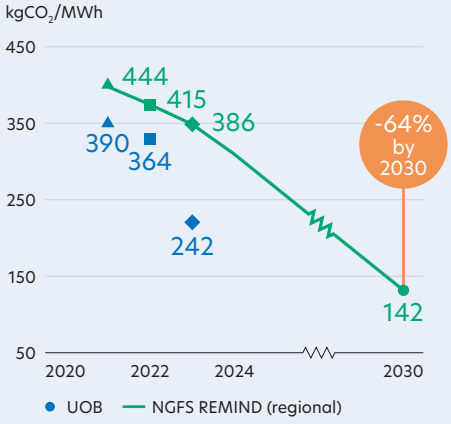
### Energy

▲▲ 2021 ■■ 2022 ◆◆ 2023

#### Power

Reduction targets:
**64%** by **2030**
**98%** by **2050**

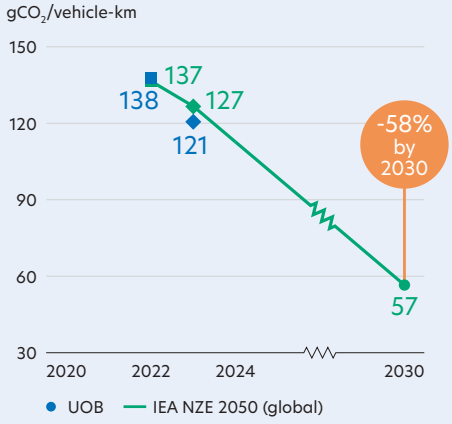
37% below pathway




#### Automotive

Reduction targets:
**58%** by **2030**
**net zero** by **2050**

4% below pathway




Note: We have updated both our reference pathway, including our 2030 target, and portfolio data to be in line with the latest market practice. For data consistency, we have omitted 2021 figures.

#### Oil and gas (O&G)

**No new project financing** for upstream projects approved for development after 2022

#### Coal

**No new project financing** of greenfield or expansion of coal-fired power plants and thermal coal mines; **Exit financing** for thermal coal sector by 2039

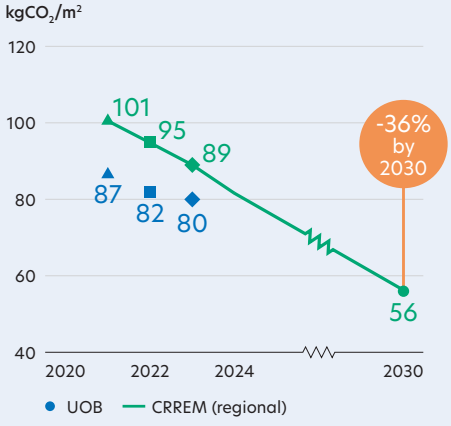
### Built environment

▲▲ 2021 ■■ 2022 ◆◆ 2023

#### Real estate

Reduction targets:
**36%** by **2030**
**97%** by **2050**

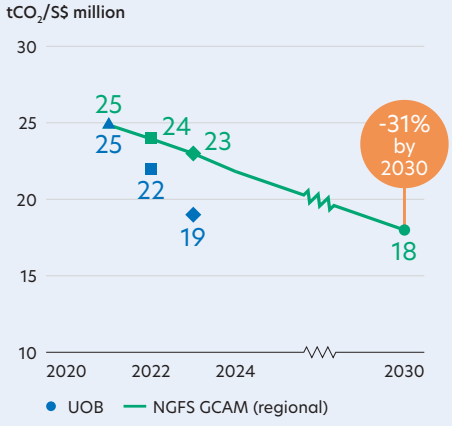
11% below pathway




#### Construction

Reduction targets:
**31%** by **2030**
**85%** by **2050**

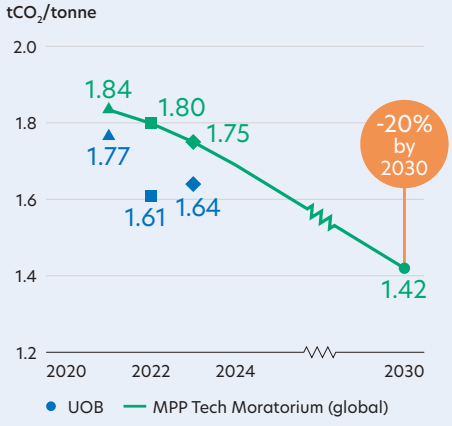
18% below pathway




#### Steel

Reduction targets:
**20%** by **2030**
**92%** by **2050**

6% below pathway



# Introduction

Climate change continues to be an urgent issue around the world. The World Meteorological Organization noted that 2023 was the warmest year on record, with the span of 2015 to 2023 being the warmest nine years recorded on Earth.

In 2023, a record high of global atmospheric carbon dioxide ($CO_2$) was also measured, including an 1.1% increase in energy-related $CO_2$ emissions, according to the International Energy Agency (IEA). Current $CO_2$ emissions are far from falling at the rapid rate required to meet global net zero targets by 2050.

Closer to UOB's home, Southeast Asia remains one of the most vulnerable regions in the world to severe weather, which affects millions of people in densely-populated areas and coastal zones. Various parts of Southeast Asia have been under the grips of severe droughts and heat waves; Singapore, Thailand and Vietnam experienced national record high temperatures in May 2023.

Southeast Asia is also being highly impacted by sea level rise, with the region experiencing on average 4.53mm of sea level rise annually over the last decade, the highest among all sub-regions across Asia. As a result of climate-related disasters, more than 4 million people in Southeast Asia were displaced in 2023[1].

The Intergovernmental Panel on Climate Change (IPCC) has projected that if the trajectory of limited climate change mitigation continues, the impact on Southeast Asia's core economic sectors could lead to the region losing more than 35% of its gross domestic product (GDP) by 2050[2]. A 2023 study also estimated a population-weighted GDP loss of 14.1% in Southeast Asia in 2022 due to climate events, highest among all sub-regions globally[3].

## The criticality of energy

Most Southeast Asian countries are developing economies with young populations and growing energy demand. While the region suffers from the effects of climate change, its high energy demand has also resulted in material contributions to global greenhouse gas (GHG) emissions. Accounting for an estimated 7.4%[4] of annual global emissions, the region's emissions is expected to continue growing at 3% per year, three times more than the global average[5].

Given that economic growth has yet to decouple from fossil fuel-related energy demand, Southeast Asia is faced with a dilemma of balancing the need to decarbonise, alongside the need to ensure energy security, affordability and its continued socioeconomic development.

1 Source: Internal Displacement Monitoring Centre, *Global Report on Internal Displacement 2024*, April 2024.
2 Source: IPCC, *Sixth Assessment Report*, August 2021.
3 Source: Gerard J. Mangone Climate Change Science & Policy Hub, University of Delaware, *Loss and Damage Today: How climate change is impacting output and capital*, November 2023.
4 Source: World Data Lab, World Emissions Clock database (calculated by adding up country-level emissions for Southeast Asia), accessed September 2024.
5 Source: IEA, *Southeast Asia Energy Outlook 2022*, May 2022.

## Introduction

In particular, with its current reliance on fossil fuels as the key energy source, Southeast Asia faces a number of challenges in the decarbonisation of the energy sector:

- Young fleet of coal-fired power plants (CFPPs) – Southeast Asia houses the youngest CFPPs in the world; approximately 53% of total capacity was less than 10 years old in 2023[6]. Significant costs will be incurred to decommission these CFPPs.

- Insufficient power grid development – Smart grids must be developed in tandem with renewable energy expansion. The lack of development of such grid infrastructure is seen as a key limiting factor in utility-scale renewables deployment.

- Government regulations – An enabling environment is needed to phase out coal power in favour of renewables development and incentivise energy efficiency. Ambitious investment plans and aligned net zero targets need to be coupled with clear and implemented national policies.

There are still significant opportunities despite the challenges. Southeast Asia's green transition could unlock US$300 billion in gross revenue annually by 2030, across a diverse cross-section of sectors – power, industrials, built environment, transportation and nature and agriculture. An estimated US$1.5 trillion is needed to fund net zero efforts to the end of this decade, of which only US$45 billion had been committed by 2023[7]. There is a clear role for financial institutions in Southeast Asia to support the transition of the real economy to a net zero future.


6 Source: World Bank, *Scaling Up to Phase Down: Financing Energy Transitions in the Power Sector*, April 2023.
7 Source: Bain & Company, GenZero, Standard Chartered and Temasek, *Southeast Asia's Green Economy 2024 Report: Moving the needle*, 2024.

## Our net zero commitment

UOB aspires to be the leading sustainable bank in Southeast Asia. Central to our sustainability strategy is our commitment to achieve net zero for our financed emissions by 2050. As a signatory to the Net Zero Banking Alliance (NZBA), we are committed to our role in catalysing and supporting the decarbonisation of our corporate clients, helping to drive a just transition as we balance growth and responsibility.

A just transition is underpinned by socioeconomic growth and improved energy access across the diverse economies in the region in which we operate. It looks beyond the direct efforts to reduce GHG emissions to ensure that socioeconomic concerns are addressed consciously, and lives and livelihoods of individuals and communities can continue to improve.

Our net zero targets are guided by credible scientific approaches aligning with global net zero models, using regional pathways, where possible, that represent the contributions of our key markets, namely, Singapore, Indonesia, Malaysia, Thailand, Vietnam and Greater China.

We have covered, for a start, six focus sectors grouped into two ecosystems: energy and the built environment. This represents about 60% of our corporate lending portfolio[8].

### Energy

**Power**
Reduce emissions intensity by **64%** by 2030 and **98%** by 2050

**Automotive**
Reduce emissions intensity by **58%** by 2030 and **net zero** by 2050

**Oil and gas**
No new project financing for upstream oil and gas projects approved for development after 2022

**Coal**
No new project financing of greenfield or expansion of coal-fired power plants and thermal coal mines; Exit financing for thermal coal sector by 2039

### Built environment

**Real estate**
Reduce emissions intensity by **36%** by 2030 and **97%** by 2050

**Construction**
Reduce emissions intensity by **31%** by 2030 and **85%** by 2050

**Steel**
Reduce emissions intensity by **20%** by 2030 and **92%** by 2050

Covers ~60% of our corporate lending portfolio

8 This includes business lending, specialised lending (including project finance), investment securities and debt capital markets underwriting for corporate clients.

# Introduction

These sectors were selected based on three key considerations:

- **Significance:** The six sectors are among the most material and interconnected in terms of decarbonisation efforts. Oil, gas and coal, for example, are responsible for more than 73% of direct emissions globally as the base supply of energy[9]. End-users, including power, automotive, real estate and steel, account for more than 60% of the emissions from burning fossil fuels[10].

- **Exposure and impact:** The six sectors make up the majority of our corporate lending portfolio and our financing can support the transition of our clients across these sectors. In the power and automotive sectors, low carbon technology is viable but requires substantial investment, while in real estate, there can be greater adoption of energy-efficient solutions. Although emissions in the steel and construction sectors will be more difficult to abate, the transition in these sectors is essential for our real estate clients in their own decarbonisation efforts.

- **Accessibility and availability of methodology and data:** We have chosen sectors in which meaningful emissions data is accessible or where there is an established data methodology for calculating estimates. Data quality and availability remains a challenge. We will update our methodology and sector coverage as data quality improves.

In order to meet our net zero commitment, we have developed a holistic transition plan focusing on four key areas.

**Our ambition is to be a leading sustainable bank in Southeast Asia, balancing growth with responsibility through supporting a just transition**

**Developing granular sectoral plans**

Setting targets, measuring progress, and capturing opportunities across sectors to achieve our overall decarbonisation ambitions

**Supporting our customers**

Providing advisory and financial solutions to help our customers in their decarbonisation journey

**Embedding net zero in our operating model**

Enhancing our operating model across governance, policies, processes and capabilities to support our decarbonisation efforts

**Driving effective stakeholder engagement**

Working collaboratively with a broader ecosystem of governments, regulators, industry and trade associations, and peers to drive collective action

9 Source: IEA, "Greenhouse Gas Emissions from Energy Data Explorer", August 2024.
10 Source: OurWorldinData.org, "Breakdown of carbon dioxide, methane and nitrous oxide emissions by sector", 2020.

# Introduction

This report is our annual update of our net zero commitment. It follows *Forging our net zero future*, our net zero whitepaper published in 2022, and our first progress report published in 2023. We will recap UOB's net zero pathways and targets for our focus sectors and assess progress toward our targets over the year against the context of various headwinds and tailwinds within each sector. We will also provide further details of our climate transition plan, including our actions to support our customers on their sustainability journeys, our operationalisation efforts across the Bank, as well as our partnerships in ecosystem programmes to push coordinated action.

## Natural capital and biodiversity

UOB has committed to being an early adopter of the Taskforce on Nature related Financial Disclosures (TNFD). Though measurement and target-setting for nature and biodiversity remain nascent, we recognise that natural capital has many intersections with the physical impacts of climate change, decarbonisation and net zero progress. We are currently studying the dependencies and impacts of our portfolio on nature, and will integrate these findings into future disclosures.

# 2023 progress

## Overall methodology and approach

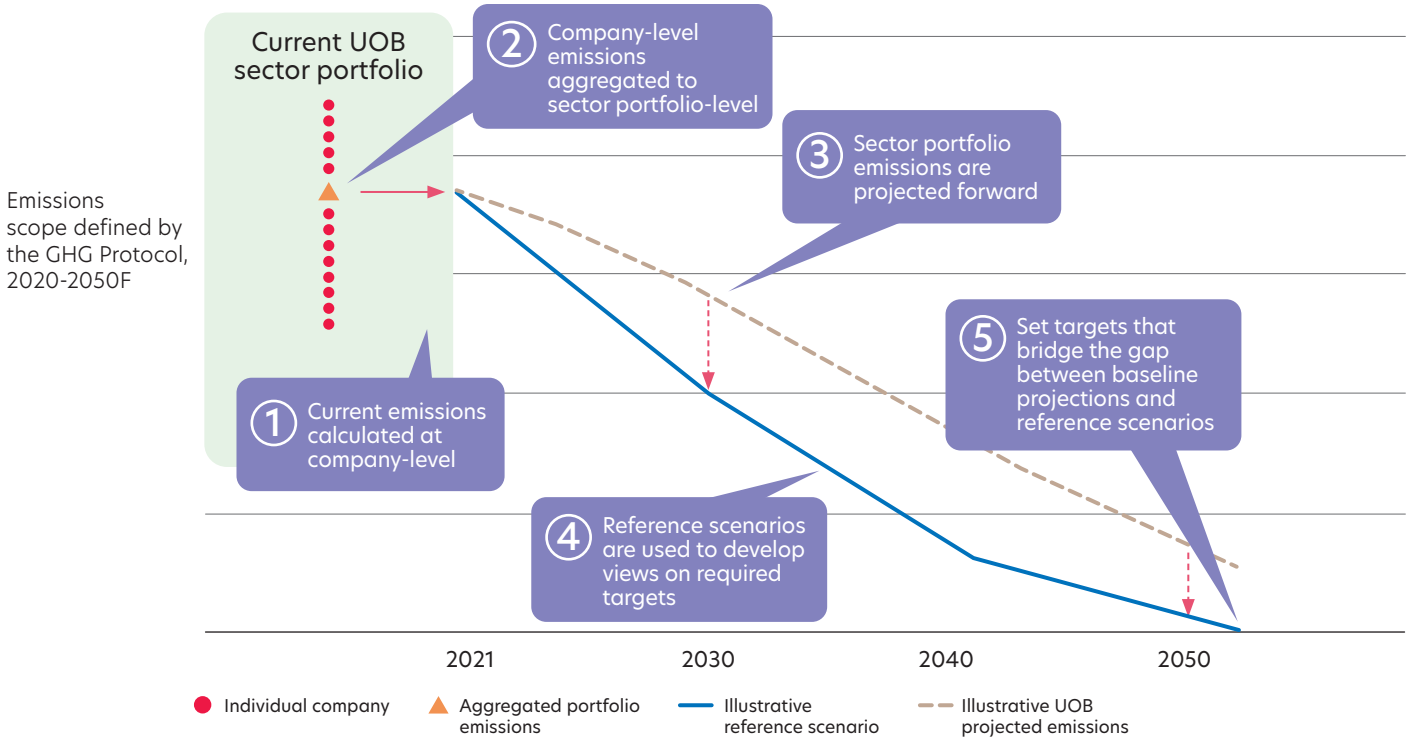
Our baselining and target-setting approach was established using relevant internationally- and regionally-recognised pathways, methodologies and guidance to ensure alignment with global best practices. The primary resources consulted included those from the Glasgow Financial Alliance for Net Zero (GFANZ), Partnership for Carbon Accounting Financials (PCAF), Paris Agreement Capital Transition Assessment (PACTA) and Science Based Targets initiative (SBTi). We continue to consult these resources to ensure appropriate alignment with market practice as we update our progress.

We have taken into account sector- and market-specific differences through utilising regional pathways where possible. We believe this reflects more accurately the context of the varied transition progress of the economies in Southeast Asia. We recognise that the pace of climate transition across economies and sectors cannot be homogeneous, and countries and companies will face different challenges and opportunities and decarbonise at different speeds.

Regional pathways were used for the power, real estate and construction sectors. As credible regional pathways become available for the remaining sectors, we will adopt them as appropriate.

To establish our targets and baselines, we followed a robust, five-step approach, which begins with understanding emissions at a client level and weighting these emissions proportionate to our exposure at the portfolio level. This approach has been adopted across all sectors and markets.

### Our five-step approach to setting targets and baselines



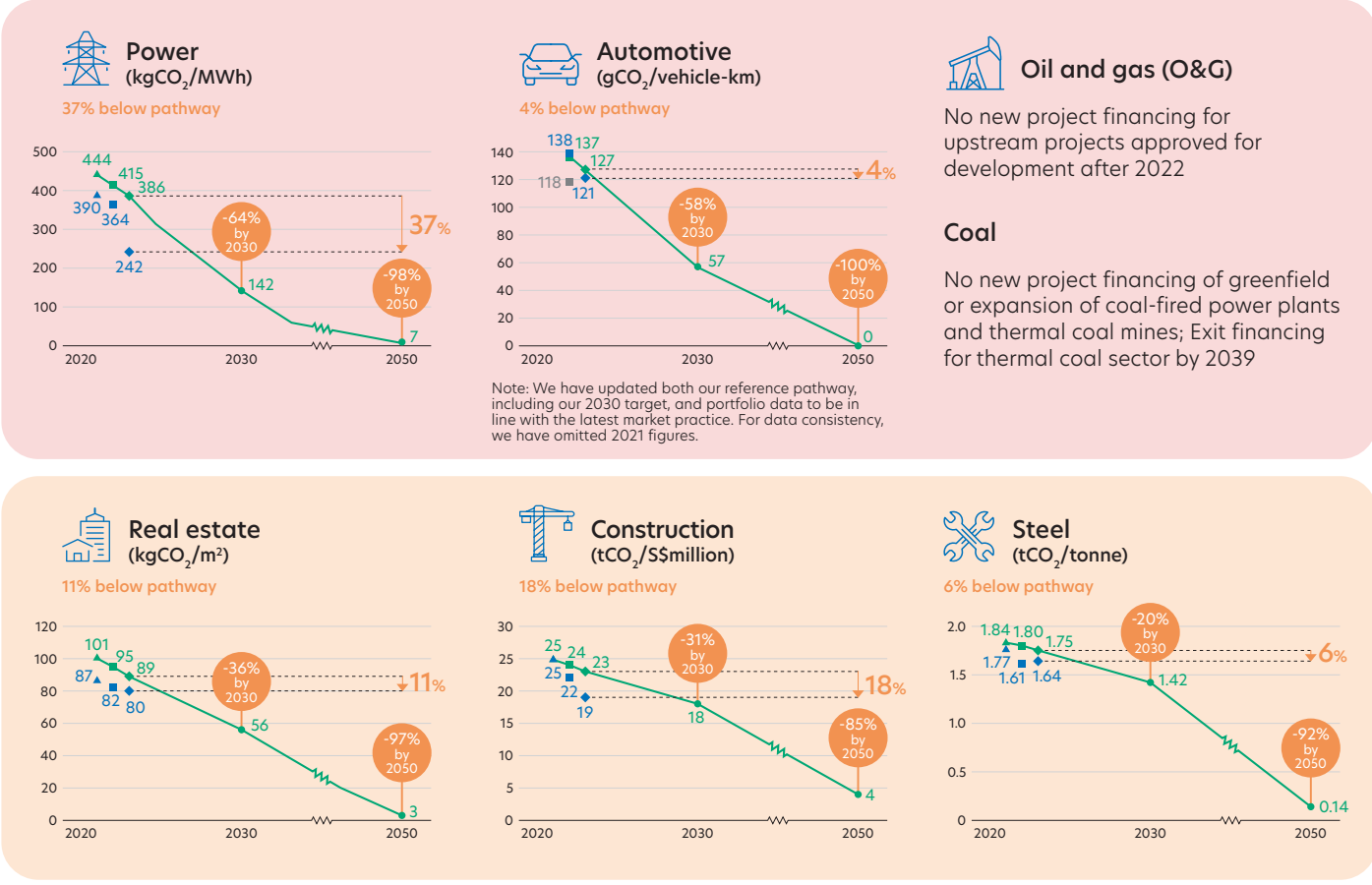

Further details on our methodology can be found in Appendix.

2023 progress

# Overview of 2023 results

We used 2021 data as the baseline when assessing our financed emissions intensity across our priority sectors and setting our targets. This report covers our progress based on the updated 2023 data.

## Overview of emissions intensity by sector



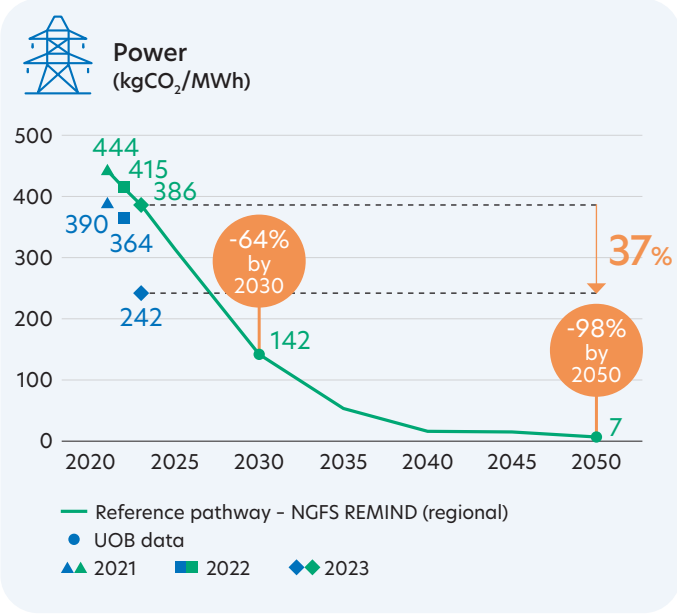

Note: We have updated both our reference pathway, including our 2030 target, and portfolio data to be in line with the latest market practice. For data consistency, we have omitted 2021 figures.

Emissions intensities remain below the reference pathways across all five sectors for which we have set net zero targets. We saw year-on-year reductions across four sectors – power, automotive, real estate and construction, while steel sector emissions increased minimally from the previous year.

Though we have had improvements in the quality of our reported data, we note that there is still a high reliance on proxy data across all sectors. What follows is a deep dive into each sector, covering our results and our attribution analysis, support of our clients, and a view on emerging technologies, tailwinds and headwinds.

# Power

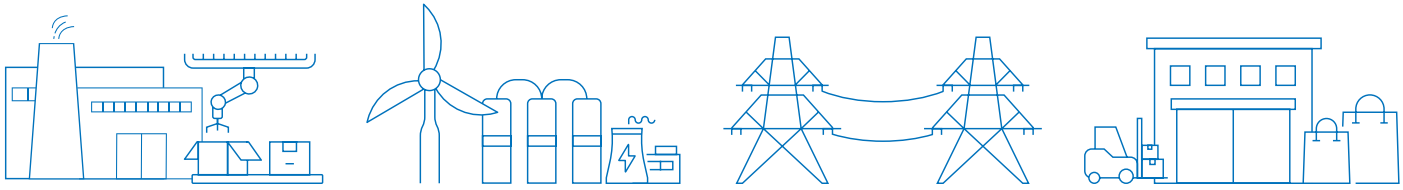
| | |
|---|---|
| **Commitment** | 64% reduction by 2030 (interim) and 98% by 2050 |
| **Metric measured** | Physical emissions intensity, measured as kilograms of $CO_2$ produced per megawatt hour of energy produced ($kgCO_2/MWh$) |
| **Emissions scope** | Scope 1 for generation companies |
| | Scope 3 for equipment manufacturers (limited to downstream Scope 3 emissions from power generation) |
| **Value chain scope** | Generation companies |
| | Equipment manufacturers |
| **Reference pathway used** | Regional – Network for Greening the Financial System Regional Model of Investment and Model Development (NGFS REMIND) |




## Sector coverage

### Power sector value chain

**Equipment manufacturers** › **Power generators** › **Transmitters and distributors** › **Retail, wholesale and trading**



- Examples: turbines, solar panels, and wind turbine manufacturers
- Primary impact on emissions arises from the support of different types of electricity generation

- Examples: power plants and wind farms
- Primary source of emissions from the value chain

- Running of national grid infrastructure
- Responsible for procuring different sources of power and ensuring efficiency through minimising leakage and intermittency

- Link between power generation and end-consumers
- Responsible for procuring energy from different sources

Excluded from target calculation

Our calculations for the power sector's financed emissions include those from power generation and equipment manufacturing, which account for about 44% of global GHG emissions[11], and equipment manufacturing, such as that of solar panels and wind turbines and which account for a smaller percentage of the sector's emissions. Combined, they cover the majority of emissions in the sector.

We excluded transmission companies, electricity distributors, retailers and wholesalers, as the key industry levers to decarbonisation are primarily upstream. Also, data constraints make it impossible to accurately assess the sources of energy procured by retailers, and methodologies for assessing the impact of grid infrastructure are not yet fully developed.

We have chosen the NGFS REMIND model to guide the regional reference pathway for the decarbonisation of our power sector portfolio, which follows our preference to account for Southeast Asia's context wherever possible.

We have restated our 2022 financed emissions from 382 $kgCO_2/MWh$ to 364 $kgCO_2/MWh$ due to improved data quality.

Additionally, for our 2023 financed emissions calculations, we have used an updated version of our data source that accounts for percentage ownership from an asset level. Where possible, we have used this information to provide more accurate reporting.

## Our progress and support of clients

We have seen a year-on-year decline in emissions intensity in the power sector, with our financed emissions intensity currently at 37% below our reference pathway, NGFS REMIND.

The change in our portfolio emissions in 2023 was driven primarily by improvements in our existing clients' emissions intensities, as well as the emissions intensities of new clients added to our portfolio during the year, the majority of which were renewable energy clients.

11 Source: IEA, *CO2 Emissions in 2022 – Analysis - IEA*, March 2023.

Over the medium term, we expect our emissions intensity to continue improving, as the power sector remains focused on shifting to lower carbon fuel sources and the development of renewable energy stays on a growth trajectory.

To this end, we continue to support our energy clients in the power sector committed to decarbonisation, working in tandem to finance their GHG emissions reduction efforts and renewable energy projects. We will also continue to support the transition of our high-emitting energy clients.

Through collaborations with our key clients, we also seek to support the various players in the power sector by financing renewable energy developments and broadening our range of sustainable ecosystem solutions. Such players include manufacturers, suppliers, contractors, and distributors who supply raw materials, components, and equipment, as well as handle distribution and installation.

We also seek to capture the interconnectivity opportunities within ASEAN and with Greater China, focusing on the cross-border export of renewable energy and equipment for renewable energy sources. Support from these value chain participants will be crucial to increase the use of renewables in the region.

## Emerging technologies, tailwinds and headwinds

Southeast Asia is home to one of the fastest-growing power markets globally, with power demand projected to increase 60% over the next two decades. Specifically, an annual growth rate of 5% is expected over the next decade, driven by rising urbanisation, industrialisation and a general uplift in living standards. The region's power industry faces the dual challenge of meeting expanding energy needs, while addressing the climate crisis. To transition the region to net zero and strengthen the region's energy security and accessibility, opportunities exist for greater investments in renewable technologies and interconnectivity of power grids.

However, there remains a sizeable gap between current investment trends and the region's long-term decarbonisation goals, as Southeast Asia accounts for only 2% of global investment in clean energy[12].

### Technologies

Emerging technologies in power generation are revolutionising energy production and enhancing the efficiency of renewables and low carbon alternatives. Next-generation solar photovoltaics (PV), such as perovskite solar cells, offer higher efficiency and lower production costs, compared with conventional silicon-based cells. Such solar cells can also be integrated into building materials to create energy-generating surfaces. Wind power is also advancing, with larger and more efficient turbines featuring advanced blade designs, and the expansion of floating offshore wind farms allowing for turbines in deeper waters with stronger, more consistent winds.

Energy storage technologies are crucial for managing intermittent renewable energy sources. Advanced battery technologies, such as solid-state and flow batteries, provide more efficient and longer-lasting energy storage solutions. Green hydrogen production, powered by renewable energy, offers a versatile and sustainable energy carrier for power generation, industrial processes and transportation.

Geothermal heat extraction and utilisation for power generation could be another developing new technology. One example is the use of closed-loop heat extraction systems and this works by having pipes installed underground in a loop. The pipes can transport fluids that transfer heat from the hot granite layers to the surface, where the heat is then used to generate electricity in the power plant.

Small modular reactors (SMRs) represent an emerging nuclear technology that offers a safer and more flexible approach to nuclear power. Singapore is actively exploring SMRs as part of its energy strategy, highlighted by a 30-year nuclear deal with the United States (US) to study advanced reactors. This will provide deep civil nuclear expertise aligned with high standards of safety, security, and non-proliferation.

In addition, artificial intelligence (AI) and smart grid technologies are optimising energy distribution and consumption. AI-driven predictive maintenance and grid management improve reliability and efficiency, while smart grids facilitate the integration of diverse energy sources and enhance demand response capabilities.

12 Source: IEA, *World Energy Investment 2024*, June 2024.

## 2023 progress

### Tailwinds

The increasing adoption of renewables is a tailwind, with falling costs of renewable technologies, particularly solar and wind energy, making them increasingly competitive with fossil fuels. This shift is propelling the deployment of renewables, and the International Renewable Energy Agency (IRENA) projects that by 2050, renewable energy will comprise 55% of the energy mix in Southeast Asia[13].

Natural gas is increasingly accepted as a transition fuel, especially in Southeast Asia, where it is vital to ensure a just and equitable energy transition focused on the early retirement of CFPPs. For example in Malaysia's National Energy Transition Road launched by Prime Minister Anwar Ibrahim in August 2023, natural gas was positioned as a pivotal transitional fuel. Singapore's Second Minister for Trade and Industry Dr Tan See Leng also highlighted liquefied natural gas (LNG)'s key role as a transition fuel at the recent GasTech conference in September 2023.

As weather patterns become more erratic and geopolitical risks emerge, natural gas remains critical to energy security, and to supplement intermittent or variable renewable energy sources. For example, Singapore's Energy Market Authority (EMA) has been calling for tenders for new gas-fired combined cycle gas turbine power plants that are hydrogen-ready for deployment in 2029 and 2030, and have awarded tenders to put in place fast-start power generation units, even as the country looks to import renewable energy. This highlights the need to balance immediate energy demands while embarking on its energy transition.

For countries with geographical constraints such as Singapore, low carbon alternatives including clean hydrogen and ammonia have the potential to replace natural gas in power plants. This requires the replacement or retrofitting of power plants to allow the input or blending of clean hydrogen and ammonia into the fuel mix. Singapore's EMA and Maritime and Port Authority have shortlisted two consortia – Keppel's Infrastructure Division and Sembcorp-SLNG – to provide a low or zero carbon ammonia solution on the country's Jurong Island for power generation and bunkering. This is expected to provide ammonia bunkering capacity of at least 100,000 tonnes and generate 55 to 65 megawatts (MW) of electricity per annum.

| | Renewable power generation commitments | Coal phase-out commitments |
|---|---|---|
| Singapore | At least 2 gigawatt-peak (GWp) in solar energy deployment by 2030, to meet ~3% of projected electricity demand | Phase-out of unabated coal power by 2050; 96% of power generation currently from natural gas |
| Indonesia | 34% share of renewables in power generation by 2030, and net zero emissions within the power sector by 2050 | PLN (largest state-owned power utility) stated target to phase-out CFPPs by 2056 |
| Malaysia | 31% share of renewables installed capacity by 2025, and 40% by 2035 | Reduce CFPPs to 50% by 2035 and completely retire all of them by 2044 |
| Thailand | 50% share of renewables in the power generation mix by 2037, and 74% by 2050 | Phase-out by 2040s |
| Vietnam | 31-39% of power generation and around 75% of generation capacity from renewables by 2030 | Phase-out planned for completion by 2050 |
| Hong Kong | 15% share of renewables in the fuel mix for power generation by 2050 | Phase-out by 2035, retaining coal only as a back-up option |
| China | 33% share of renewables for national power consumption, and a 50% increase in renewable energy generation | Phase-out set to begin in 2026 |

13 Source: IRENA, *Renewable Energy Outlook for ASEAN*, 2022.

## 2023 progress

Coal transition mechanisms are also gaining momentum. According to IEA, to align with a 1.5°C scenario, approximately 100 gigawatts (GW) of CFPPs need to be phased out by 2030. Countries including Indonesia, Malaysia and Thailand have strengthened their commitments to phase out coal by setting more ambitious targets and bringing forward timelines for complete retirement.

### Headwinds

Despite the positive tailwinds, several headwinds challenge the transition to a sustainable power sector in Southeast Asia. The current power market structure in the region is a significant barrier to the integration of varied renewable energy sources. Issues such as the lack of a competitive wholesale electricity market in some countries, contractual inflexibility, grid capacity constraints and shortage of key raw materials will require long-term fiscal and political commitments to overcome and ensure the necessary transition.

Vietnam has taken a move in this direction, with new regulations allowing large electricity consumers, such as industrial parks, to purchase electricity directly from renewable energy producers instead of the state-owned distributor. A similar pilot project for a direct power purchase agreement for businesses has also been approved in Thailand.

Balancing the cost of energy with energy security presents another challenge for countries, such as Singapore, which face geographical and topographical constraints in relying solely on renewables. Lower carbon hydrogen, whether green (produced by electrolysis using renewable energy) or blue (produced conventionally with carbon capture), has been suggested as a potential fuel source for power generation. However, producing lower carbon hydrogen is energy-intensive and costly.

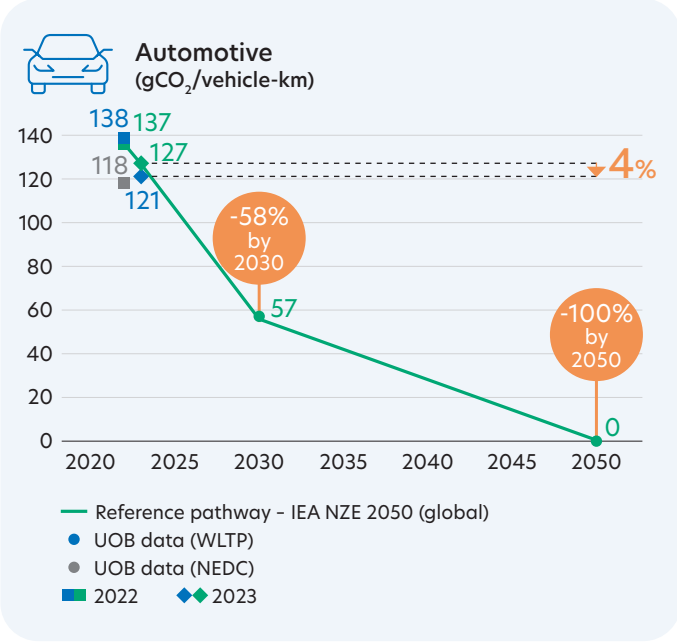
Waste-to-energy could be an affordable and quick interim solution for the region, given previous projections of waste generation to grow to more than 300 million tonnes by 2030[14]. When compared with traditional waste management methods, waste-to-energy offers benefits such as avoiding direct incineration of waste without energy generation, reducing landfilling that may produce methane, and providing opportunities for resource recovery. However, the challenge is that this energy source is not widely accepted as renewable due to the emissions it generates.

Under the Singapore Taxonomy, for example, waste-to-energy is not considered green if plant efficiency is less than 25% or bottom ash recovery is more than 75% recovery of metal from ash.

14 Source: United Nations Environment Programme, *Waste Management in ASEAN Countries: Summary Report*, February 2017.

# Automotive

| | |
|---|---|
| **Commitment** | 58% reduction by 2030 (interim) and net zero by 2050 |
| **Metric measured** | Physical emissions intensity, measured as grams of $CO_2$ produced per vehicle kilometre travelled ($gCO_2$/vehicle-km) |
| **Emissions scope** | Scope 3 (tailpipe emissions) |
| **Value chain scope** | Manufacturers |
| | Dealers |
| | Automotive financial leasing companies |
| **Reference pathway used** | Global – IEA Net Zero Emissions by 2050 (NZE) |

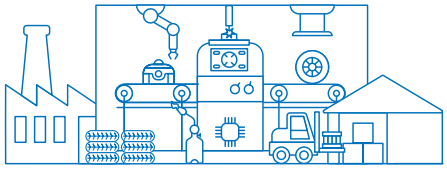



Note: We have updated both our reference pathway, including our 2030 target, and portfolio data to be in line with the latest market practice. For data consistency, we have omitted 2021 figures.

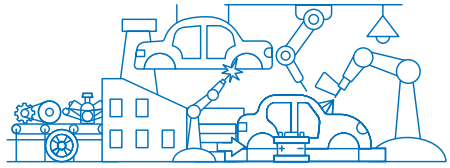
## Sector coverage

### Automotive sector value chain

**Upstream: Parts manufacturers** › **Midstream: Original equipment manufacturers** › **Downstream: Dealers and automotive financial leasing companies**



- Manufacturing of automotive vehicle parts and accessories such as tyres and engines
- Minimal emissions released from manufacturing process, limited control on end-vehicle types



- Manufacturing and assembly of automotive vehicles
- Minimal emissions released from manufacturing process but significant influence on end-vehicle types

- Retail distribution and financial leasing of automotive vehicles
- Minimal emissions released during distribution/financing process but moderate influence on vehicle purchase decisions

Excluded from target calculation

Passenger cars and trucks contribute about 13% of total emissions globally[15], primarily through their manufacturing, assembly and use. Tailpipe emissions from burning diesel fuel and petrol when vehicles are driven account for the bulk of these emissions at about 84%[16].

Our emissions calculations include manufacturers, dealers and automotive financial leasing companies, as they cover the most material emissions within the automotive sector. They also account for the majority of our lending activities in the sector. We have excluded upstream players, such as parts manufacturers, from our analysis because their activities and emissions data are difficult to track. We hope to expand coverage of upstream activities in our targets and baselining efforts when these data become widely available.

In improving the quality of our data, we updated our data source for our sector emissions intensity from the New European Driving Cycle (NEDC) to the Worldwide Harmonised Light Vehicle Test Procedure (WLTP). WLTP's measurement methodology takes into account more realistic driving behaviours, including a greater range of driving situations, higher average speeds and longer test distances, resulting in higher overall emissions intensities. This move is aligned with market standards in the European Union (EU), Japan and Singapore.

Our reference pathway and financed emissions reflect this updated data source, and we have restated our 2022 data to 138 $gCO_2$/vehicle-km from 118 $gCO_2$/vehicle-km using WLTP data for comparison purposes. Moving forward, we will no longer reference NEDC data.

15 Source: IEA, *Net Zero Roadmap: A Global Pathway to Keep the 1.5C Goal in Reach*, September 2023.
16 Source: CDP, *CDP Technical Note: Relevance of Scope 3 Categories by Sector*, revised June 2024.

## Our progress and support of clients

We saw a year-on-year improvement in the sector's emissions intensity levels from 2022 to 2023, with our financed emissions intensity at 4% below our reference pathway, IEA NZE.

Overall, the data demonstrated a significant shift in the types of cars being manufactured – from a majority of internal combustion engine (ICE) vehicles to a larger proportion of plug-in hybrid and electric vehicles (EVs). Further, new financing in 2023 was on average extended to both existing and new clients with lower emissions intensity than in 2022.

The reduction in our financed emissions was also due to increased financing of the EV value chain. We have been using green financing within the EV sector as an active lever through which we manage our financed emissions, and as a key focus area within our commercialisation strategy. As a result, we saw a significant increase in our green financing within the automotive sector, which translated into a larger proportion of green financing within the sector portfolio. Green financing also formed a significant percentage of our new client portfolio in 2023.

UOB has launched sustainable EV financing across several Southeast Asian markets, including Singapore, Malaysia and Thailand. Our U-Drive programme aims to facilitate the adoption of EVs by providing a comprehensive set of solutions and partnerships designed to support the entire EV ecosystem. These include automotive component suppliers, brand owners, dealers, charging point operators and end-users. The programme offers benefits that range from reductions in operating costs and carbon emissions, flexible financing options that simplify the electrification journey, to other services to support auto brands' market penetration and drive EV adoption.

Moving forward, we expect the sector's emissions intensity to continue improving as countries persist in their move towards adopting more EVs and as our exposure to the EV value chain increases, though this may be muted as adoption rates are lower than forecasted.

## Emerging technologies, tailwinds and headwinds

The global EV market has experienced rapid growth over the past decade, with global EV stock surpassing 14 million by 2023, a significant leap from just over 1 million in 2015[17]. This surge has been driven by technological advancements, environmental concerns and supportive government policies. Investments in the EV market in India and Southeast Asia are projected to reach US$1.3 trillion by 2030[18], with major automakers, tech companies and investors channelling billions into EV development, charging infrastructure and related technologies.

In Southeast Asia, rapid urbanisation, air pollution and increasing environmental awareness are driving the demand for cleaner transportation solutions. Singapore, Indonesia, Malaysia, Thailand and Vietnam are making strides in promoting EV adoption, as investments flow into establishing manufacturing plants, developing charging infrastructure and creating conducive policies. For example, Thailand aims to become a regional EV hub, with plans to produce 1.2 million EVs annually by 2036, attracting investments from global and local manufacturers.

### Emerging technologies

The EV sector is undergoing rapid advancements driven by the need to enhance vehicle range, reduce manufacturing costs and improve battery recycling. Several cutting-edge technologies are at the forefront of this transformation, promising to overcome existing limitations and propel the EV market into a new era of efficiency and sustainability.

Solid-state batteries, which use a solid electrolyte, offer higher energy density, improved safety and faster charging time compared with traditional lithium-ion batteries. Another innovation, silicon anode batteries, can store more energy, potentially increasing EV range and longevity. Advances in battery recycling, led by companies such as Redwood Materials and Li-Cycle, allow efficient recovery of valuable materials, reducing environmental impact and lowering costs. Additionally, "second life" batteries can be repurposed for energy storage systems, extending their usefulness beyond their initial automotive application.

17 Source: IEA, *Global EV Outlook 2024*, 2024.
18 Source: Temasek, *Powering an affordable EV revolution in emerging Asia*, 2024.

## 2023 progress

Manufacturing innovations, such as dry battery manufacturing process, 3D printing, advanced robotics, automation and modular design, are reducing production costs and enhancing efficiency in the EV manufacturing process. Enhanced battery management systems, which incorporate AI and machine learning, enable real-time monitoring and predictive maintenance, in turn optimising performance and extending battery life. Ultra-fast charging technology is also advancing, with the goal of recharging EVs to 80% capacity in under 20 minutes, addressing a major concern for potential EV users.

These technological advancements are pivotal in driving the growth of the EV market, making EVs more efficient, affordable and sustainable. As these technologies mature, they are expected to accelerate EV adoption significantly and contribute to a cleaner, more sustainable transportation future.

### Tailwinds

The EV market in Southeast Asia is benefiting from several tailwinds that are driving its growth. Chief among these is the implementation of supportive government policies. While the EV market in Southeast Asia is not homogenous with countries at different stages of adoption and development, many governments have set ambitious targets for EV adoption and are rolling out policies to encourage greater uptake.

In addition to Thailand, which aims to become a regional EV hub, other countries in the region are implementing measures such as tax incentives, subsidies and developing better infrastructure to promote EV adoption.

| | EV adoption and usage targets |
|---|---|
| Singapore | No more new registration of diesel cars and taxis by 2025, and all vehicles on the road to run on cleaner energy by 2040. |
| Indonesia | EVs to account for 20% of all vehicles on the road by 2025, with the aim to electrify all vehicles by 2050. |
| Malaysia | 25,000 public charging points and 100,000 private charging points by 2030, and EVs to account for 38% of all vehicles sold by 2040. |
| Thailand | Production of 6,220,000 EVs by 2030. |
| Vietnam | Production, assembly and import of automobiles and motorcycles using fossil fuels to be discontinued by 2040, and transportation sector to be completely green by 2050. |
| China | EVs to account for 20% of all vehicles sold by 2025. |

## 2023 progress

### Headwinds

Despite the positive tailwinds, the EV market in Southeast Asia faces several significant challenges that could impede its growth. One major issue is lower-than-forecasted adoption rates, due to uncertainties about the resale value of EVs in the secondary market and slower-than-expected growth in charging infrastructure.

While there has been progress in EV adoption, the pace has been moderate, with penetration rates falling below 20% and ICE vehicles still dominating 90% to 95% of new car sales in countries such as Indonesia, Malaysia and Thailand.

Conflicting policies further complicate the adoption of EVs in Southeast Asia. Despite the commitment of many countries to increase investments in the EV sector, the absence of clear policies on critical issues, such as sales bans of ICE vehicles, has slowed EV adoption, particularly in developing countries. Additionally, fuel subsidies in countries such as Indonesia, Malaysia and Thailand make traditional energy sources financially more attractive than cleaner alternatives, creating an additional barrier to EV adoption.

Despite these challenges, the market for electric vehicles remains resilient. Tight margins, volatile battery metal prices, high inflation and the phase-out of purchase incentives in some countries have not dampened EV sales, indicating strong market resilience and growth potential.

# Oil, gas and coal

## Oil and Gas (O&G)

We commit to no new project financing for upstream O&G projects approved for development after 2022.

## Coal

We commit to exit financing for the thermal coal sector by 2039, as an enhancement to our existing prohibitions on new project financing of greenfield or expansion of CFPPs and thermal coal mines.

Given the continued significance of oil, gas and coal as an energy source across Southeast Asia, we have made core commitments in this sector as we continue to work with our stakeholders, including clients, regulators, governments, industry associations and communities, on a credible regional energy transition. We are committed to a just transition, and acknowledge that abruptly phasing out oil, gas and coal use in the region would be neither realistic nor feasible, considering Southeast Asia's stage of economic development and energy maturity.

We believe that robust, aggressive plans will be needed to successfully address the sector's mitigation needs. However, the current O&G decarbonisation pathways are not realistic in their reflection of critical aspects of a just transition given the diverse and developing nature of the region's economies. Therefore, we have set commitments that reflect limiting the new supply of O&G, and exiting the thermal coal sector.

In setting these commitments, we were guided by groups, including the IPCC, IEA and NGFS. We will focus on limiting the supply of fossil fuels to the main economy, avoiding an overabundance of cheap fuels and supporting an orderly transition, all while balancing the need for socioeconomic growth in the region. The transition away from fossil fuels and concurrently scaling up renewable and clean energy sources across the region must take into consideration the need for energy security, and has to be undertaken in a just, orderly and equitable manner.

UOB acknowledges the practical realities of Southeast Asia. We are committed to promoting economic growth and enhancing energy access across the region's diverse economies, while supporting the challenging decarbonisation of the oil, gas and coal sector. Through expanding our portfolio of transition solutions for the sector, we encourage the adoption of emissions reduction technologies and the development of low-emissions fuel substitutes. We will work closely with our clients to assess the technological and commercial viability of new energy innovations, and help them in their efforts to facilitate the sector's transformation.

## Emerging technologies, tailwinds and headwinds[19]

Decarbonising the O&G sector is crucial for sustainable development, but remains a significant challenge for Southeast Asia. Under current national policies, demand for O&G is expected to increase from 2023 to 2028, with forecasts indicating a compounded annual growth rate of 1.9% for oil products and 5.7% for natural gas[20].

Southeast Asian governments have adopted the policy that gas is a transition fuel. The region is expected to make the strategic switch from coal to natural gas as a transition fuel to meet rising industrialisation and energy demands, while ensuring a stable and secure source of energy to complement the intermittency of renewables.

The industry is characterised by a mix of developed and developing markets, with Indonesia, Malaysia and Thailand among the top producers and consumers of O&G. Indonesia and Malaysia are key gas-producing countries that export LNG to meet growing demand, while Singapore is actively strengthening its position as the region's natural gas trading hub. National oil companies in the region are often major employers and key contributors to GDP, which means the transition to a net zero future must be managed carefully to ensure a fair and just transition.

### Emerging technologies

At COP28, the United Nations Framework Convention on Climate Change (UNFCCC) acknowledged carbon capture utilisation and storage (CCUS) as an important emissions reduction technology that can be applied across the energy system. CCUS complements the push towards substantial reductions in overall fossil fuel use and increasing the adoption of renewable energy options. Continual advancements are being made to improve the energy- and cost-efficiency of CCUS to reduce the amount of $CO_2$ released in oil and natural gas production. CCUS is also a necessary option for achieving net zero emissions in hard-to-abate sectors such as cement, steel and fertiliser production with no current alternative technologies available.

### Tailwinds

Several tailwinds, including improved extraction and processing technologies and methods, are driving decarbonisation efforts in the region's O&G sector. Digitalisation, electrification, reduced methane emissions, enhanced leak detection, vapour recovery and advanced gas seals are some of the enhancements being deployed to improve operational efficiency and reduce environmental impact.

CCUS technologies are gaining momentum in Southeast Asia. Emitters in Singapore and Southeast Asia are also studying the value chain for capturing, transporting and permanently storing their emissions. For example, the Singapore Government has formed a consortium with Shell and ExxonMobil, called S-Hub, to study a cross-border CCUS project with a target commencement date of 2030. Malaysia aims to establish three CCUS hubs by 2030, with a storage capacity of up to 15 million tonnes per year. In Indonesia, several CCUS projects are currently in the study and preparation stages, including BP's Tangguh LNG project, which has been approved for the Vorwata CCUS initiative.

Driven by pressure from customers seeking greener alternatives and the need to meet net zero targets, companies are forming partnerships to develop green solutions across different industries. Various O&G companies are looking to establish bio-refineries to produce certified biofuels for hard-to-abate transportation sectors that cannot be electrified. Key players in Southeast Asia are also looking to diversify to the production of low carbon hydrogen to meet future demand.

19 This section focuses on O&G. Tailwinds and headwinds for the coal sector can be found within the Power section.
20 Source: BMI Fitch Solutions database, accessed October 2024.

## 2023 progress

### Headwinds

Despite the positive tailwinds, several headwinds could impede the decarbonisation efforts of the O&G sector. Many Southeast Asian countries lack regulatory measures to support the deployment of new technologies. For example, clear standards need to be established for permanent carbon storage and the transfer of carbon ownership between countries. Low carbon technologies tend to be more expensive, necessitating the development of appropriate national carbon pricing models to encourage adoption. Out of the major O&G hubs in the region, Singapore was the first to introduce a carbon tax for the O&G refining sector, as well as other major industries. To soften the tax burden and maintain competitiveness with refiners in other regions, rebates of up to 76% of the carbon tax would be provided to refiners and petrochemical companies in 2024 and 2025. Thailand plans to introduce a carbon tax on oil products by 2025.

Socioeconomic considerations further complicate the decarbonisation of the sector in the region. Achieving national climate goals must be balanced with ensuring energy security and a just and equitable transition for national employment. Governments need to ensure that electricity remains accessible and affordable to maintain a minimal standard of living, while workers in the O&G sector must be equipped with the necessary skillsets to transition into jobs in low carbon energy sectors.

| | Carbon tax policies |
|---|---|
| Singapore | S$25 per tonne for companies emitting more than 25,000 mega tonnes (MT) $CO_2$-equivalent annually until 2025; to increase to up to S$45 per tonne for 2026 and 2027, and S$50 to S$80 per tonne by 2030; Up to 76% of carbon tax costs for refining and downstream sectors in 2024 can be claimed back through rebates for 2024 and 2025 |
| Indonesia | No carbon tax announced at this point |
| Malaysia | No carbon tax announced at this point |
| Thailand | Carbon tax to be introduced on oil products by 2025 |
| Vietnam | No carbon tax announced at this point |
| Hong Kong | No carbon tax announced at this point |
| China | No carbon tax announced at this point |

# Built environment

## Sector coverage

### Built environment value chain – real estate, construction and steel sectors

**Material manufacturing (cement* and steel)** › **Construction** › **Development and operations**

- Examples: cement and steel manufacturers
- Responsible for operational emissions during manufacturing processes such as cement calcination and plant fuel use

- Examples: construction companies and contractors
- Responsible for operational emissions during construction processes such as vehicle fuel use, and electricity used in construction sites

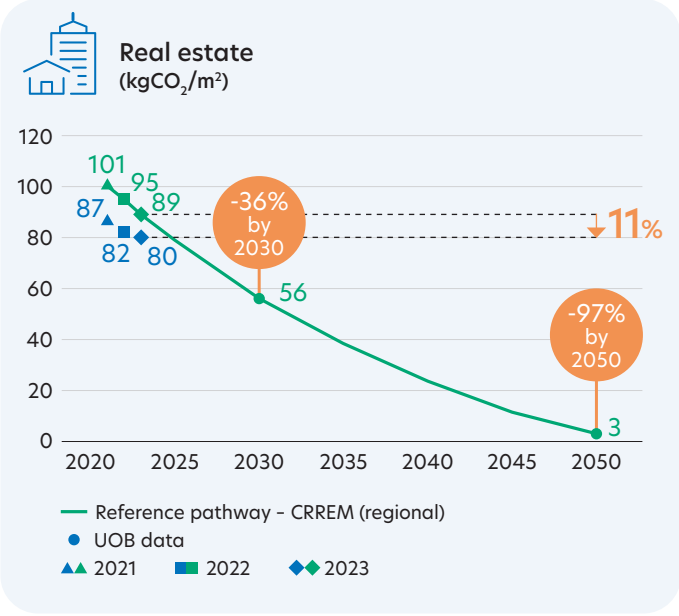
- Examples: real estate developers and operators
- Responsible for operational emissions in building operations such as electricity used

* Cement is excluded from target calculation

# Real estate

| | |
|---|---|
| **Commitment** | 36% reduction by 2030 (interim) and 97% by 2050 |
| **Metric measured** | Physical emissions intensity, measured as kilograms of $CO_2$ produced per square metre of floor space ($kgCO_2/m^2$) |
| **Emissions scope** | Scope 1 and 2 operational emissions |
| **Value chain scope** | Investment companies |
| | Real estate investment trusts |
| | Developers |
| | Operators |
| **Reference pathway used** | Regional – Carbon Risk Real Estate Monitor (CRREM) |

## 2023 progress

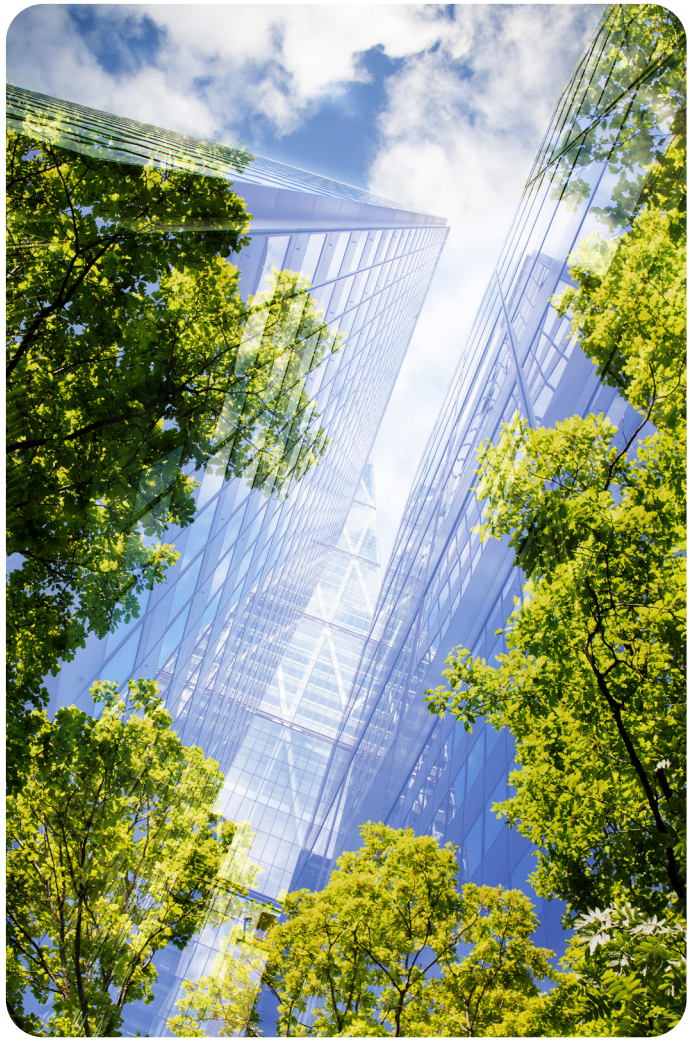



Operational emissions from the real estate sector contribute about 28% of GHG emissions globally[21] and are typically generated by the energy used during building operations, either directly by the burning of fossil fuels, for instance in furnaces, or indirectly through electricity use.

We have focused on Scope 1 and 2 emissions in the real estate sector, the largest contributor to sectoral GHG emissions. These operational emissions can be managed directly and controlled by our clients, allowing more opportunities for emissions reduction interventions. Scope 3 emissions, generally linked to materials used in construction such as steel, are also significant. However, embodied emissions data remain scarce. As methods for calculating embodied emissions and data quality improve, we will incorporate these into our financed emissions calculations and targets.

## Our progress and support of clients

We saw a year-on-year improvement in the real estate sector's emissions intensity, with our financed emissions intensity at 11% below our reference pathway, CRREM.



On average, emissions intensities improved for our clients in this sector. This is attributed primarily to overall lower emissions intensities in our proxy data, and improvements in emissions data reported by our clients. We note that client-level data remains a challenge in the sector, with a heavy reliance on proxy data.

In addition, in 2023 we added new clients with lower emissions intensities, primarily in the industrial and residential segments.

21 Source: GRESB, "What is embodied carbon in the real estate sector and why does it matter?", 3 March 2023.

Moving forward, we expect the sector's emissions intensity to continue improving as the construction of new buildings complies with heightened energy efficiency requirements, and as the retrofitting of older buildings continues apace. We also see the increased purchase of renewable energy certificates (RECs) by real estate clients with decarbonisation commitments. To this end, we will deepen our focus on providing financing in these areas.

UOB has developed a comprehensive sustainable financing framework and a suite of solutions to support the decarbonisation of the real estate sector. Our emphasis is to grow financing for the development of certified green and energy-efficient buildings, the installation of renewable energy systems, and energy efficiency retrofits. We work closely with the entire value chain – from property developers to operators, investment companies to consultants, and contractors to building materials suppliers – to encourage the adoption of green and energy efficiency standards for buildings. Our U-Series ecosystem solutions are designed to support these efforts, ensuring that the real estate sector can meet its sustainability goals.

## Emerging technologies, tailwinds and headwinds

Demand in Southeast Asia's real estate sector is expected to rise in tandem with economic growth, and it is expected that this growing demand will increasingly shift towards green buildings. With operational emissions from the real estate sector contributing to around 30% of $CO_2$ emissions globally, the sector has been an early mover on decarbonisation. This is driven by the adoption of mandatory and voluntary local certification schemes, and net zero commitments among tenants and investors, translating into higher demand for green buildings. Various studies have highlighted that green criteria have become a key factor in leasing and investment decisions, with rental premiums of 10% to 30% being observed for offices with strong sustainability credentials in Singapore[22].

### Emerging technologies

Building owners with large portfolios often struggle to manage energy audits and decarbonisation plans efficiently. AI technology, now commercially viable, offers a solution when coupled with physics-based modelling. It enables portfolio owners to quickly identify decarbonisation opportunities, such as optimising heating and cooling systems, exploring solar or geothermal power, and improving insulation. AI technology can also reduce costs significantly and help expedite the achievement of net zero commitments.

As temperatures rise, so does the demand for cooling to manage thermal comfort, leading to higher energy consumption and carbon emissions. Passive cooling strategies, such as night purging, cross-ventilation and evaporative cooling, offer environmentally-friendly alternatives to traditional methods. These techniques require the rethinking of how buildings are designed and constructed to harness natural airflow and temperature variations, in turn reducing reliance on energy-intensive cooling systems.

Singapore has led the way by fully recognising the energy-saving potential of passive design strategies in its Building and Construction Authority (BCA) Green Mark certification. Adoption, however, has been slow in other countries. To this end, the Clean Cooling Collaborative, a philanthropic initiative of ClimateWorks Foundation, is setting aside US$1.5 million for research on scaling the adoption of passive cooling solutions in residential housing across the region[23].

### Tailwinds

Robust tenant demand for green offices has been a significant driver of the commercial segment's decarbonisation progress. Increasingly, companies are expecting green features in office premises as a minimum requirement for site selection, so that they are able to reduce their operational $CO_2$ emissions and meet their own net zero targets. Despite green offices commanding a rental premium due to higher upfront capex costs, corporate tenants in Singapore have been willing to pay the difference given the energy- and cost-efficiencies projected over the long term.

In addition, the availability of green building standards and certifications in each country is a tailwind, though many continue to be voluntary in the region. Further progress is likely to be driven by a proposal to develop an ASEAN Green Building standard, which would harmonise a common set of standards for net zero buildings across the region.

22 Source: JLL, *The value of sustainability: Evidence for a green premium in Asia*, November 2022.
23 Source: Clean Cooling Collaborative, accessed September 2024.

## 2023 progress

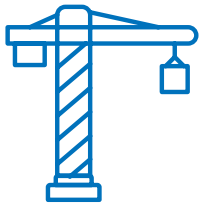
### Headwinds

Several headwinds will challenge the decarbonisation of the real estate sector. Electricity emissions make up a majority of operational emissions in real estate, hence further decarbonisation of the sector will be highly dependent on the decarbonisation of the energy grid. This has challenges in Southeast Asia as mentioned in the Power section. In addition, the need to build capacity and skills for construction and engineering roles will be crucial as green buildings continue to gain momentum. More training programmes in the region such as Singapore's Green Mark Professional Qualification Scheme will be needed to grow the pool of qualified technical professionals to deliver on net zero buildings.

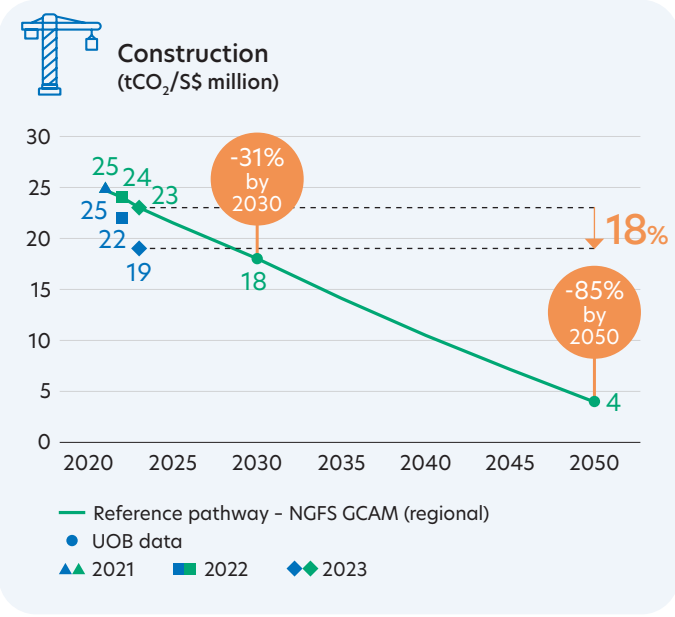
Finally, while the commercial segment has made substantial strides towards the adoption of green practices, progress has been slower in the residential segment, where there is a highly disaggregated market. In Southeast Asia, the perceived long payback period for energy-efficient investments remains a barrier, even though operational cost savings can be substantial over time.

| | Real estate policies and commitments |
|---|---|
| Singapore | Mandatory Green Mark Certification Scheme with ongoing enhancements and revisions; 80% of all buildings to be certified green by 2030 |
| Indonesia | Voluntary certifications include Green Building (GB) and Bangunan Gedung Hijau (BGH) (Green Building), with associated incentives from local town councils |
| Malaysia | Voluntary Green Building Index (GBI) rating system for certification of green developments |
| Thailand | Voluntary TREES (Thailand's Rating of Energy and Environmental Sustainability) certification, adapted from Leadership in Energy and Environmental Design (LEED) |
| Vietnam | Voluntary LOTUS certification, tailored to local construction practices |
| China | Mandatory Green Building Evaluation Standard, with ongoing enhancements and revisions |
| Hong Kong | Voluntary Building Environmental Assessment Method (BEAM) Plus and BEAM Plus for Existing Buildings certification, but mandatory for all government and public sector buildings to attain at least a Gold certification |

# Construction



| | |
|---|---|
| **Commitment** | 31% reduction by 2030 (interim) and 85% by 2050 |
| **Metric measured** | Economic emissions intensity, measured as tonnes of $CO_2$ produced per S$ million in revenue ($tCO_2$/S$ million) |
| **Emissions scope** | Scope 1 and 2 operational emissions |
| **Value chain scope** | Construction companies (construction, demolition, renovation, installation) |
| **Reference pathway used** | Regional – NGFS Global Change Assessment Model (GCAM) |




# 2023 progress

## Sector coverage

The construction sector accounts for about 11% of total global carbon emissions[24]. Sectoral emissions are primarily from fuel used by construction equipment and heavy-duty vehicles and electricity use and emissions from the manufacture and transportation of materials, also known as embodied emissions.

As data and calculations on embodied emissions remain relatively nascent, we have excluded them from our sector coverage and targets. We endeavour to include such emissions in our sector targets when quality data is available. However, we have accounted for a major contributor to embodied carbon in the built environment value chain by setting a net zero target for steel.

We segmented the construction value chain into construction, demolition, renovation and installation. We then focused on the Scope 1 and 2 emissions for construction and demolition as these components are responsible for the majority of carbon emissions within the value chain. Renovation and installation companies require less energy and are typically less emissions-intensive. We have chosen to focus on operational emissions because they can be directly managed and are within the control of construction companies.

The metric used in our assessment of this sector is tonnes of $CO_2$ ($tCO_2$) produced per S$1 million in revenue. We have chosen a revenue-based emissions intensity metric for greater comparability across a broad range of construction projects in real estate and infrastructure, such as industrial plants and roads. This metric also provides better comparability with construction companies' own targets.

Further, the choice of metric reflects that there is currently limited data available using a physical-based metric as most construction companies do not disclose their emissions breakdown by project type or the size of the constructed area, such as kilometres for roads or square metres for buildings.

## Our progress and support of clients

We saw a year-on-year improvement of the emissions intensity for the construction sector, with our financed emissions intensity at 18% below our reference pathway, NGFS GCAM.

On average, emissions intensities improved for our clients in this sector due to a decrease in emissions in proxy data by country. We rely heavily on proxy data as the measurement and reporting of carbon emissions within the construction sector are still at a nascent stage, especially among the small- and medium-sized enterprises (SMEs) in Southeast Asia, which comprise a large part of our portfolio.

The decrease in emissions intensities is further amplified by the growth in company revenues that resulted from a rise in demand in construction projects post-COVID. In Singapore, for example, construction demand increased 13% from 2022 to 2023[25,26].

In subsequent updates to our construction target-setting, we will consider including the impact of Scope 3 when the data are available and feasible. While we have increased our sustainable financing of construction clients year on year through green financial supply chain management solutions, there is no direct impact on our sectoral emissions intensity given our methodology only considers the operational emissions (Scope 1 and Scope 2) of our construction clients.

We expect client and proxy emissions intensity levels to continue improving as the construction sector's Scope 1 and Scope 2 emissions decline with more decarbonisation initiatives. These include investments in renewable energy, energy efficiency improvements and increased efforts to electrify vehicle fleets.

We remain focused on supporting green building ecosystem players' value chains and the decarbonisation efforts around Scope 3 embodied carbon emissions.

24 Source: GRESB, "What is embodied carbon in the real estate sector and why does it matter?", 3 March 2023.
25 Source: BCA, "Singapore's Construction Demand to Remain Strong in 2023", 12 January 2023.
26 Source: BCA, "Steady Demand for the Construction Sector Projected for 2024", 15 January 2024.

By working closely with construction and infrastructure businesses to encourage low carbon construction processes and the adoption of sustainable building materials, UOB is supporting the construction sector on its path to decarbonisation. Our suite of sustainable financing solutions is developed for value chain players across the entire construction ecosystem, including main contractors, sub-contractors and material suppliers. We will continue to enhance our sustainable finance offerings for specific sectors with interdependencies with construction, such as renewable energy, energy efficiency and the use of sustainable building materials.

## Emerging technologies, tailwinds and headwinds

Most of the decarbonisation efforts in the built environment in the past were focused on the operation of buildings. As green building standards mature and become widely adopted, more attention has shifted up the value chain to the emissions footprint of construction activities. Apart from the direct emissions from construction activities, the construction sector is also a major producer and consumer of materials such as concrete, and the embodied emissions from the production and transportation of these materials must also be addressed.

In Southeast Asia, the importance and need for the construction sector to decarbonise is likely to grow, bolstered by economic growth, rapid urbanisation and increased government spending on public infrastructure such as roads, railways and water. Due to the complexity of the construction value chain and dependencies on national power infrastructure, efforts to drive decarbonisation in this sector will require a multi-faceted approach, including the commercialisation of new technologies, availability of renewable energy infrastructure and collaborations among all value chain participants.

### Emerging technologies

Several emerging technologies have the potential to significantly reduce the emissions footprint of the construction sector. One such technology is energy storage systems (ESS), which are still in the early stages of adoption in the sector. When ESS are used to manage energy from renewable sources, the energy grid or hydrogen fuel cells, they eliminate fuel consumption and $CO_2$ emissions during operations. Deployed in hybrid mode with diesel generators on construction sites, ESS can reduce daily fuel consumption by up to 90%, saving more than 200 tonnes of $CO_2$ during its operating life[27].

Singapore's Accelerating Energy Storage for Singapore Programme is facilitating ESS adoption by promoting use cases and business models. In Thailand, a strategic supply agreement has been signed between Gulf Energy Development and Sungrow for solar PV and battery energy storage system projects.

3D concrete printing (3DCP) also offers a greener alternative to traditional construction methods. It uses precise amounts of material required for construction, minimising the use of concrete, a major source of $CO_2$ emissions. Moreover, 3DCP allows for on-site production, reducing the need for transportation of materials and prefabricated components, thus lowering the emissions footprint associated with logistics. In Singapore, 3DCP has been applied to landscaping structures in new housing estates such as Bidadari and Tengah. However, the overall environmental impact of 3DCP depends on the specific materials and energy sources used. Innovations in these areas will further enhance the sustainability benefits of this technology.

There are also ongoing advancements in low carbon cement. Siam Cement Group (SCG) launched its high-quality low carbon super cement in Thailand and Vietnam in April and June 2024 respectively. The company is further developing its low carbon cement technology which allows for an increased proportion of clinker substitution in the production process that will lead to a 40 to 50% reduction in $CO_2$ emissions compared with conventional cement[28].

27 Source: Altas Copco, *Energy Storage Systems*, accessed September 2024.
28 Source: Siam Cement Group, "SCG Unveils Strategic Plan for Challenging Future, Strengthening Vietnam's Petrochemical Project to Cope with Prolonged Volatility, and Advancing Green Innovations Across All Businesses Through Inclusive Green Growth", 16 September 2024.

## 2023 progress

### Tailwinds

Several tailwinds, including the increasing adoption of proven technologies, are accelerating the decarbonisation of the construction sector in Southeast Asia. For example, prefabrication and modular construction methods have a lower emissions footprint and are gaining popularity as sustainable solutions for urban housing challenges. Companies such as Woh Hup, Sunway Construction and Dragages Singapore are leading the way with new facilities to meet the growing demand. Hong Leong Asia and Sunway Construction's new prefabrication hub in Punggol, Singapore, which started operations in July 2023, is estimated to help in the construction of about 17 blocks of public housing flats[29] per year.

The adoption of drone technology is also helping to increase efficiency, reduce waste and optimise resource use. Compared with traditional methods, the reduction of site survey timing from weeks to days, coupled with better accuracy, has led to reduced time on site, lower fuel consumption for transportation and lower emissions generated from survey equipment. The precise measurement and real-time monitoring of material usage have also proven to reduce waste of construction materials and in turn, embodied emissions.

In addition, favourable government policies and initiatives are playing a vital role in supporting the construction sector to decarbonise. In Singapore, the Singapore Building Carbon Calculator (SBCC), developed by the BCA and Singapore Green Building Council in 2023, was designed to calculate embodied carbon for the built environment, helping developers better assess construction emissions and encourage the sourcing of greener materials and manufacturers.

While there is a current lack of quality data in the construction sector, the expected implementation of Scope 3 emissions reporting requirements in Singapore from FY2026 will help to improve the sector's ability to track and measure decarbonisation across its value chain.

### Headwinds

Despite the positive momentum, the construction sector in Southeast Asia faces several headwinds that could slow its decarbonisation efforts.

The complexity of the construction value chain could make it harder to have visibility over the extent of emissions performance and decarbonisation efforts. This is due to the industry practice of sub-contracting work, potentially leading to a large number of participants in the value chain. Buy-in and collaboration across these value chain players towards a like-minded goal of decarbonisation would be challenging but key for success.

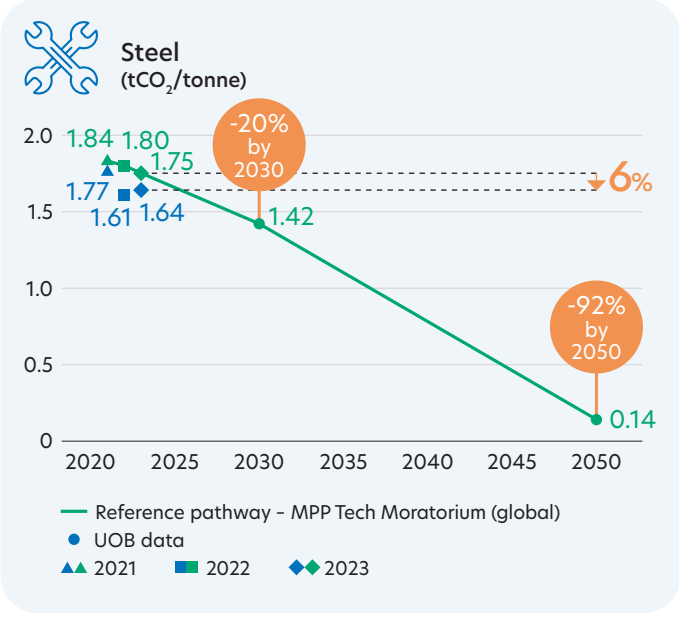
The transition from coal power to renewables presents another challenge, as the construction sector will be dependent on the national pace of decarbonisation for the energy sector in order to switch its energy sources. While ambitious net zero targets and investment plans exist across the region, more needs to be done by governments to follow through with clear policies for the power sector.

29 Managed by Singapore's Housing & Development Board.

## 2023 progress

# Steel

| | |
|---|---|
| **Commitment** | 20% reduction by 2030 (interim) and 92% by 2050 |
| **Metric measured** | Physical emissions intensity, measured as tonnes of $CO_2$ produced per tonne of crude steel made ($tCO_2$/tonne) |
| **Emissions scope** | Scope 1 and 2 for crude steel producers |
| | Scope 3 for others |
| **Value chain scope** | Crude steel producers and wholesalers |
| | Fabricated metal producers and wholesalers |
| **Reference pathway used** | Global – Mission Possible Partnership (MPP) Tech Moratorium |




## Sector coverage

### Steel sector value chain

**Mines: Raw material extraction** › **Steel plants: Crude steel production** › **Factories: Fabricated metal products** › **Traders: Facilitation of commodity movement**

- Extraction of raw materials for steel production e.g. iron ore, coal
- Scope 3 downstream emissions are most significant, largely attributed to crude steel production

- Production of crude steel via blast furnace-basic oxygen furnace (BF-BOF), scrap-based electric arc furnace (EAF) and/or direct reduction iron-EAF (DRI-EAF) methods
- Combined Scope 1 and 2 most significant due to carbon-intensive production methods

- Manufacturing of fabricated goods involving steel e.g. steel billets, tubes
- Scope 3 upstream emissions are most significant, largely attributed to crude steel production*

- Facilitation of the movement of commodities
- Scope 3 upstream emissions are most significant, largely attributed to crude steel production*

Excluded from target calculation
* Upstream emissions related to raw materials such as mining of iron ore/metallurgical coal are not included in our scope

The steel sector accounts for 7% of GHG emissions globally, primarily from metallurgical coal burned during the refining process[30]. As steel is a crucial material in many industries, including construction and infrastructure, decarbonising the sector is critical to meet global net zero targets.

The value chain for the steel sector includes the extraction of raw materials (iron ore and metallurgical coal), steel production, fabrication of metal products, as well as steel trading on commodities markets.

As the majority of emissions arise during production, our baselining and target-setting efforts focused on Scope 1 and 2 emissions from crude steel production, and the Scope 3 upstream emissions of fabricated metal producers and traders.

## Our progress and support of clients

The steel sector's emissions intensity rose slightly year on year, though our financed emissions intensity remains 6% below our reference pathway, MPP Tech Moratorium.

Our client-level data remain limited in the sector, given our exposure to smaller steel producers and traders in Southeast Asia. As such, our calculations are primarily based on proxy data.

Emissions intensities based on proxy data for 2023 increased, in particular for steel plants in China and Southeast Asia. This is attributed to a higher proportion of high-emitting BF-BOF steel plants, versus the lower emissions EAF or DRI-EAF steel plants.

30 Source: Global Energy Monitor, *Pedal to the Metal 2024: Building Momentum for Iron and Steel Decarbonization*, July 2024.

## 2023 progress

It is estimated that 83% of emissions from Southeast Asian countries' steel production will be from high-emitting BF-BOF furnaces as new capacity continues to be added[31]. Though we are actively supporting our clients' transition to lower emissions technology, we anticipate our emissions reductions for the sector will be muted given our high reliance on proxy data for financed emissions calculations.

UOB plays a proactive role in supporting the steel industry's transition towards decarbonisation. Through our sustainable trade finance offering, we have been facilitating the sector's shift towards using more scrap steel as feedstock, and promoting the adoption of EAF production methods. UOB's Transition Finance Framework also supports clients in developing and implementing credible transition plans, ensuring that they navigate the complexities of decarbonisation effectively and sustainably. We also have sustainable finance offerings for the power sector, given steel's dependencies on power.

## Emerging technologies, tailwinds and headwinds

By 2030, the global steel market will undergo significant shifts driven by urbanisation, infrastructure development and the transition to renewable energy. The realisation of net zero emissions in steel production by 2050 will require a 50% reduction in emissions by 2030.

While regulatory pressures, growing demand for low carbon steel and technological advancements are driving progress, significant challenges such as high costs of decarbonisation measures and coal dependency must be addressed. In Southeast Asia, costs to deploy green hydrogen technology and retrofit existing steel plants to adopt low carbon production methods are high, especially as carbon pricing to enhance the economic viability of decarbonisation efforts is low or absent in domestic markets. Additionally, infrastructural gaps, including underdevelopment in renewable energy and hydrogen transport networks, complicate the transition in the region.

Given that the region also exports steel to global markets, its competitiveness is at risk if environmental regulations and carbon pricing mechanisms in export markets tighten. Coordinated efforts from governments, industry stakeholders and financial institutions will be essential to overcoming these obstacles.

### Emerging technologies

The shift towards hydrogen-based steelmaking is a promising development in steel production. Traditional steel production relies heavily on coal and coke, which are carbon-intensive and contribute significantly to $CO_2$ emissions. In contrast, hydrogen-based steelmaking, particularly using the direct reduction of iron ore with hydrogen, offers a cleaner alternative. In this process, hydrogen gas, instead of carbon-based materials, is used as a reducing agent. When hydrogen reacts with iron ore, water vapour rather than carbon dioxide is produced, significantly reducing the emissions footprint of steel production.

Countries such as Sweden are pioneering this technology with initiatives like the Hydrogen Breakthrough Ironmaking Technology project, which aims to create fossil-free steel by 2035. The adoption of hydrogen in steelmaking could potentially reduce emissions by up to 90%, positioning it as a critical solution for achieving carbon neutrality in the industry. However, challenges remain in scaling up hydrogen production and ensuring a steady supply of green hydrogen, which must be produced using renewable energy sources.

Another critical technology for decarbonising steel production is CCUS. CCUS involves capturing $CO_2$ emissions from steel plants, and storing them underground or repurposing them for industrial use. This technology is particularly important for the steel industry because it can be integrated into existing production processes, making it a viable option for reducing emissions without overhauling entire systems.

CCUS technology has seen significant advancements in recent years, with projects such as ArcelorMittal's initiative in Europe that aims to capture and convert $CO_2$ emissions into valuable products including bioethanol. The successful implementation of CCUS could significantly reduce the carbon intensity of steel production, making it an essential component of the industry's net zero transition.

31 Source: Southeast Asia Iron and Steel Institute (SEAISI), "Southeast Asian steel capacity expansion unsustainable: SEAISI", May 2024.

## 2023 progress

### Tailwinds

The steel industry's decarbonisation is supported by several tailwinds. Stricter environmental regulations and carbon pricing mechanisms, particularly in Europe and North America, are significant drivers of global decarbonisation. The EU's Carbon Border Adjustment Mechanism (CBAM) and the Emissions Trading System (ETS) are pushing steelmakers globally to invest in cleaner technologies so as to remain competitive. China's dual carbon goals and output curtailment policies are also compelling the industry to shift towards greener production methods. These policies are reshaping the global market, influencing regions including Southeast Asia, where steel producers must adapt to avoid losing access to critical export markets.

End-user industries such as automotive, construction and consumer goods are increasingly demanding low carbon steel to meet their sustainability targets. Companies committed to net zero emissions are prioritising suppliers that can offer low carbon steel. This demand is creating a premium market for low carbon steel products, providing steelmakers with new opportunities to differentiate themselves, while driving investment in cleaner production technologies.

Advancements in technology, such as hydrogen-based steelmaking, and the increased use of EAFs and CCUS are crucial for reducing the emissions footprint of steel production. Although these technologies are still in the early stages, they represent significant potential for transforming the steel industry.

### Headwinds

Despite the positive momentum, the steel industry in Southeast Asia faces several headwinds that could slow its decarbonisation efforts.

The transition to low carbon production methods involves significant costs, including retrofitting plants and developing new infrastructure. These costs can make low carbon steel less competitive, especially in countries with low to no carbon pricing. In Southeast Asia, the variability in economic development and regulatory environments across the region complicates the economic viability of such investments, making it difficult for some companies to justify the high costs without stronger incentives. This is true, in particular, for companies with sales limited to domestic markets, or export markets without regulation on carbon emissions.

Carbon leakage, where production shifts to countries with less stringent emissions regulations, could occur. Mechanisms such as the CBAM aim to address this, but their effectiveness in complex trade environments is yet to be fully proven.

Weak demand for low carbon steel may also slow down investment into low carbon production methods, as companies are unable to secure financing and commit to these projects due to market uncertainty.

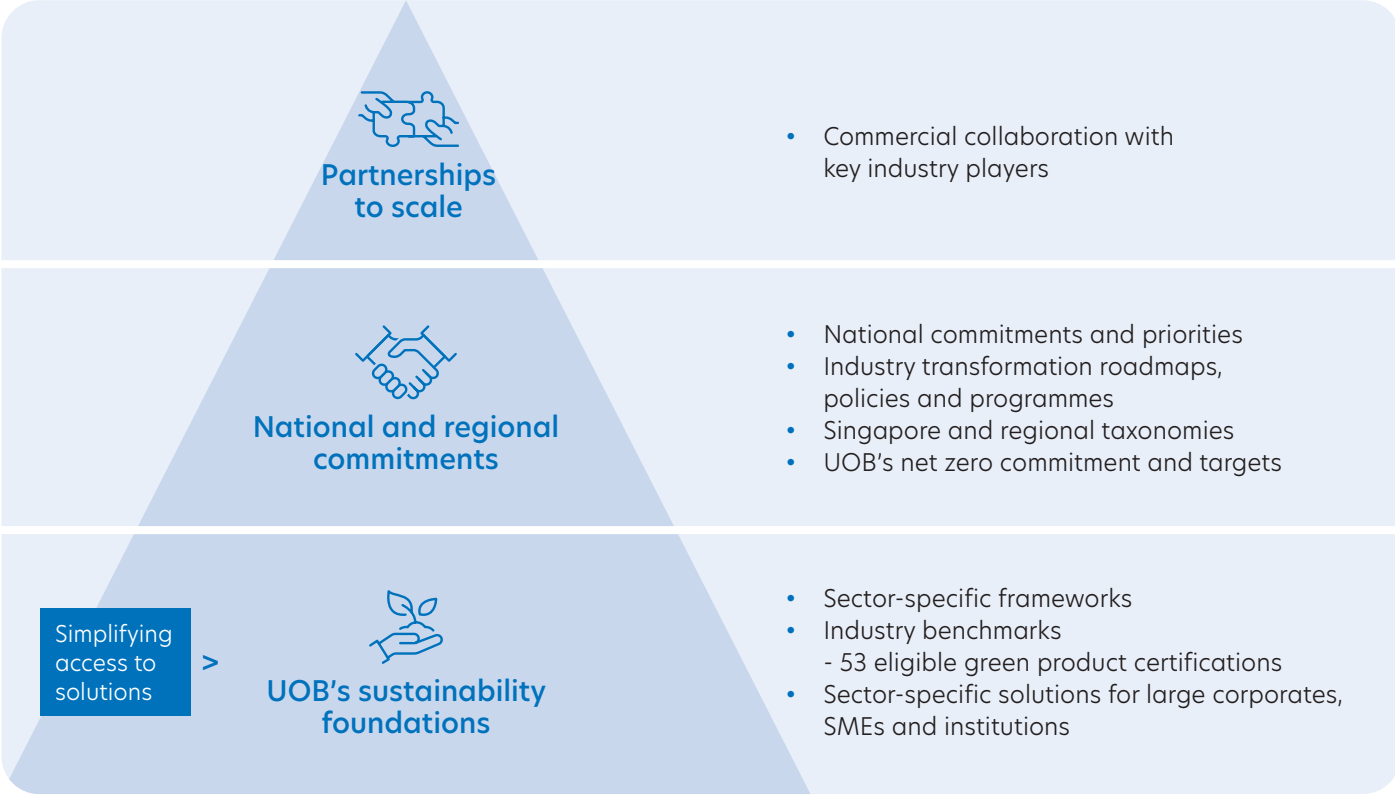
Countries such as Indonesia and Vietnam rely heavily on coal for steel production and energy generation. While national commitments are in place to phase out coal, this will require significant investment in renewable energy and green hydrogen infrastructure, as well as strong policy support.

# Supporting our customers

Central to our net zero strategy is our support of clients in the decarbonisation of their businesses and capturing opportunities from the net zero transition. We are focused on gaining a deep understanding of our clients' decarbonisation journeys, and providing sustainable finance through a comprehensive suite of frameworks and solutions, including sector-specific solutions that serve end-to-end needs. Our client engagement is complemented by programmes that seek to support ecosystem change through advisory and solutions beyond banking.

To deepen our support of our clients' transition, UOB has integrated commercialisation opportunities focused on the decarbonisation of our target real economy sectors. Our sustainable finance solutions seek to facilitate sectoral transformation, from specific companies' own business transformations through to their entire supply chains. A part of our strategy emphasises near-term regional opportunities across sectors. These include the automotive sector, in light of the support of EV adoption in many of our core markets, and the energy sector, given widespread commitments to renewable energy across Southeast Asia.

We are also focused on supporting SMEs' decarbonisation efforts and the role they play in value chain decarbonisation.



## Overview of opportunities identified by sector

| Ecosystem | Focus Sector | Opportunities |
|---|---|---|
| Energy | Power | Work with power generation companies and equipment manufacturers to adopt decarbonisation targets |
| | | Increase financing for new renewable energy projects |
| | Automotive | Work with equipment manufacturers, dealers and automotive financial leasing companies to support EV supply chains |
| | | Increase financing for EV-focused businesses |
| | Oil and gas | Work with companies in hard-to-abate sectors to finance renewable energy, low emissions fuel alternatives and emissions reduction technologies |
| Built environment | Real estate | Work with property developers, operators, investment companies and real estate investment trusts to encourage adoption of energy efficiency standards for buildings |
| | | Increase financing to support the retrofitting and upgrading of existing buildings with energy-efficient equipment and installation of renewable energy |
| | Construction | Work with contractors and material suppliers to increase financing to green building construction activities and encourage the increased usage of sustainable building materials for better life cycle cost and to lower embodied carbon emissions |
| | | Increase financing of on-site renewable energy |
| | Steel | Support crude steel and fabricated metal producers and traders towards EAF production methods and usage of scrap metal |
| | | Support research and development of new technologies to improve plant efficiency |

## Our sustainable finance offerings

To help simplify access to sustainable financing for companies looking to build resilient businesses, we have in place sustainable finance frameworks that are aligned to internationally-recognised standards, principles and guidelines, including the Loan Market Association/Asia Pacific Loan Market Association Green Loan Principles and Sustainability Linked Loan Principles. These frameworks, which obtained independent second-party opinions, set out the eligible projects or activities that qualify for green and sustainability-linked loans and bonds, trade finance and other retail banking products.

Parallel to our internal efforts, various national green taxonomies are being developed across our key markets. We are constantly reviewing and aligning our own sustainable and transition finance frameworks to reflect the relevant regional taxonomies as and when they are finalised. This seeks to ensure that the financing extended continues to support the sustainability goals in the region in which UOB operates.

Through our sustainable finance offerings, we aim to achieve the following objectives:

- Provide our customers with ways to contribute to sustainable growth and development;
- Drive emissions reductions and sustainability targets through loans linked to emissions abatement and sustainability wherever possible;
- Hasten the climate transition even for clients in sectors that are energy-intensive and difficult to abate; and
- Support sustainability integration through entire sector value chains.

## Supporting our customers

| | |
|---|---|
| **Sustainable Finance Framework for Green Building Developers and Owners** | Supports green building developers and owners across eight asset classes: data centres, hospitals, hotels, industrial buildings, offices, residential properties, restaurants and retail spaces. |
| **Smart City Sustainable Financing Framework** | Supports green assets, projects and activities relating to sustainable cities, e.g. renewable energy, green building construction, energy efficiency, climate change adaptation, water management, waste management and green transport. |
| **Food and Agribusiness Framework** | Supports food and agribusiness companies and their full spectrum of food production activities. |
| **Green Financing for Circular Economy Framework** | Supports green assets, projects and activities relating to circular economy. |
| **Transition Finance Framework** | Supports the transition of the energy intensive and hard-to-abate sectors. |
| **Sustainable Trade Finance Framework** | Supports trade financing of recognised green products and industry certifications. |
| **Sustainability Linked Financing Framework** | Supports companies with financial incentives to achieve agreed sustainability performance targets based on the company's sustainability strategy. |

The Food and Agribusiness Framework and Sustainability Linked Financing Framework are the latest additions to our suite of sustainable finance frameworks, launched in 2023 and 2024. They were designed to support food and agribusiness companies and the full spectrum of food production activities in creating more sustainable operations and value chains, and to simplify – in particular SMEs' – access to sustainability-linked financing respectively.

## Support for SMEs

SMEs are the foundation for the region's economies, accounting for 97% of all businesses in Southeast Asia and 67% of the working population[32]. They are increasingly feeling pressure from their customers and regulators to decarbonise their businesses. However, they often lack the resources or capacity to calculate their GHG emissions and develop transition plans in their journey towards decarbonisation.

Findings from the *UOB Business Outlook Study 2024* showed that 87% of SMEs surveyed in the region identified that sustainability is important to their businesses, but only less than half of businesses have started implementing sustainable practices[33].

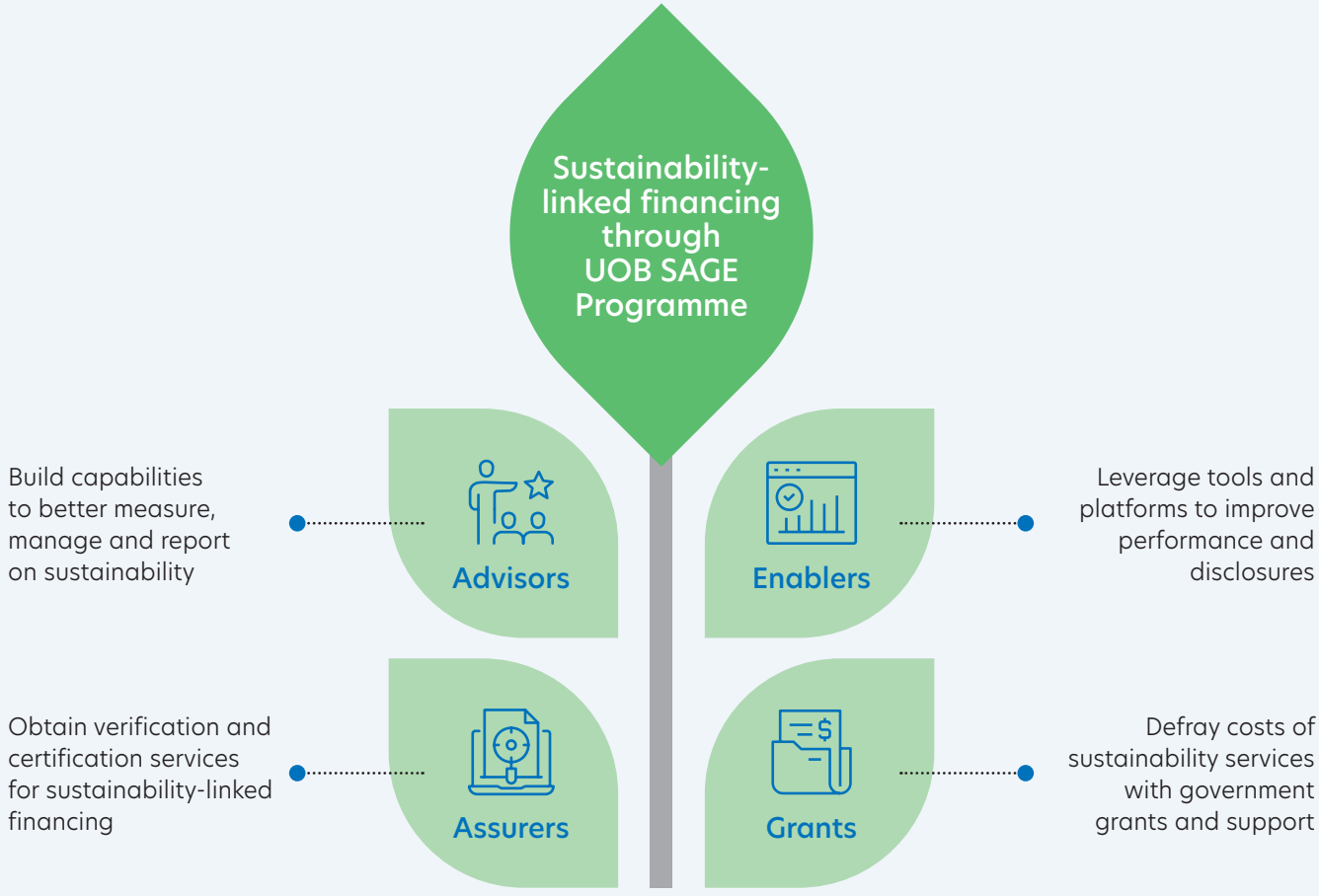
SMEs identified training programmes and easier access to funding and grants as examples of the type of support that would help with the incorporation of sustainable practices into their strategies.

We remain focused on supporting our SME clients on their decarbonisation journey. On top of one-on-one engagement with our clients through advisory services, we have rolled out several initiatives to support SMEs on a larger scale.

32 Source: Asian Development Bank, "Realizing the Potential of Over 71 Million MSMEs in Southeast Asia", March 2022.
33 Source: UOB, "UOB Business Outlook Study 2024 (Regional): Positivity and resilience take centre stage", 22 April 2024.

## Sustainability-Linked Advisory, Grants & Enablers (SAGE) Programme

UOB SAGE simplifies sustainability-linked financing for SMEs, encouraging them to meet pre-agreed sustainability performance targets (SPTs). Through our partnerships with Enterprise Singapore and a network of sustainability experts, we assist SMEs in enhancing sustainability practices efficiently, saving time and resources.




### Benefits

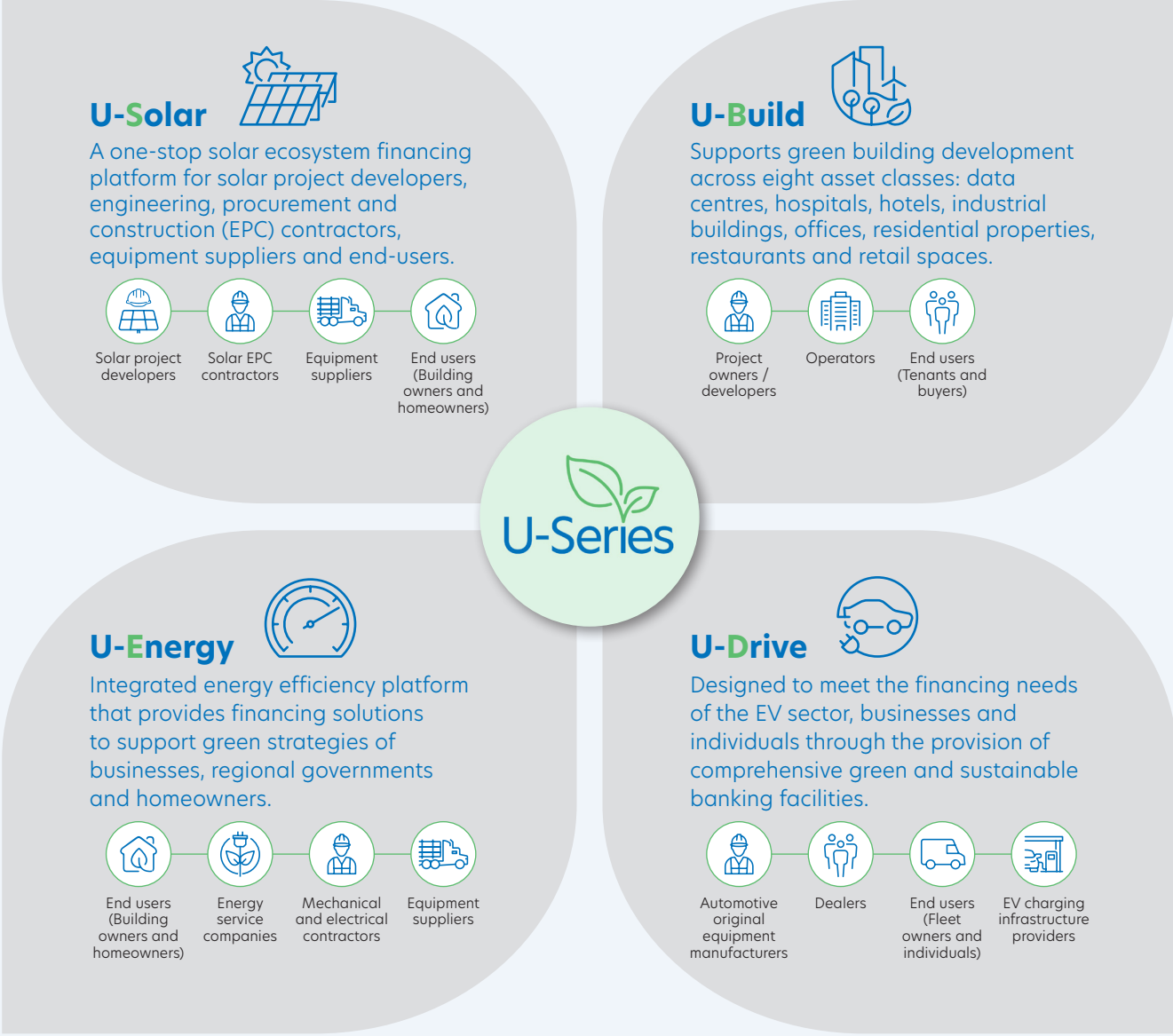
- Access discounted services from specialised sustainability partners
- Reduce time and expenses associated with setting SPTs

  (Validated by independent second-party opinion provider, ERM)
- Enjoy financial incentives for meeting annual SPTs

## Supporting our customers

### U-Series

UOB's U-Series are ecosystem solutions designed to meet end-to-end needs across four major decarbonisation themes – solar power, green buildings, energy efficiency and electric vehicles. These solutions provide a one-stop shop to enable the investment into and implementation of green solutions.



# Embedding net zero in our operating model

To deliver on our net zero ambition, we have set out an operationalisation plan to embed net zero across our organisation. This is an ongoing process. Since announcing our commitment, we have undergone a holistic exercise to understand the changes and updates needed across our organisation to support the delivery of our commitment and targets.

We have completed, over the last 12 months, the design of a multi-pronged net zero operationalisation programme covering three major pillars – governance, risk management and business policies and processes, and capabilities and culture. We have also embarked on our implementation plan, a process that will be refined, reviewed and updated on an annual basis.

We recognise that we are at the beginning of a long-term journey that will require continual adjustments to ensure that the focus of our efforts remains on the vision of supporting real economy decarbonisation.

## Governance

1. Governance model
2. Target operating model
3. Disclosures and internal reporting

## Risk management and business policies and processes

4. Quantitative environmental risk appetite
5. Sector policies
6. ESG risk assessment and management
7. Underwriting and deal approval process

## Capabilities and culture

8. Capability building plan
9. KPIs and remuneration
10. Data and technology capabilities and architecture

# Governance

Governance is key to our commitment to net zero. As part of our operationalisation process, we seek to embed net zero at every level and function where needed, to ensure responsibility and accountability.

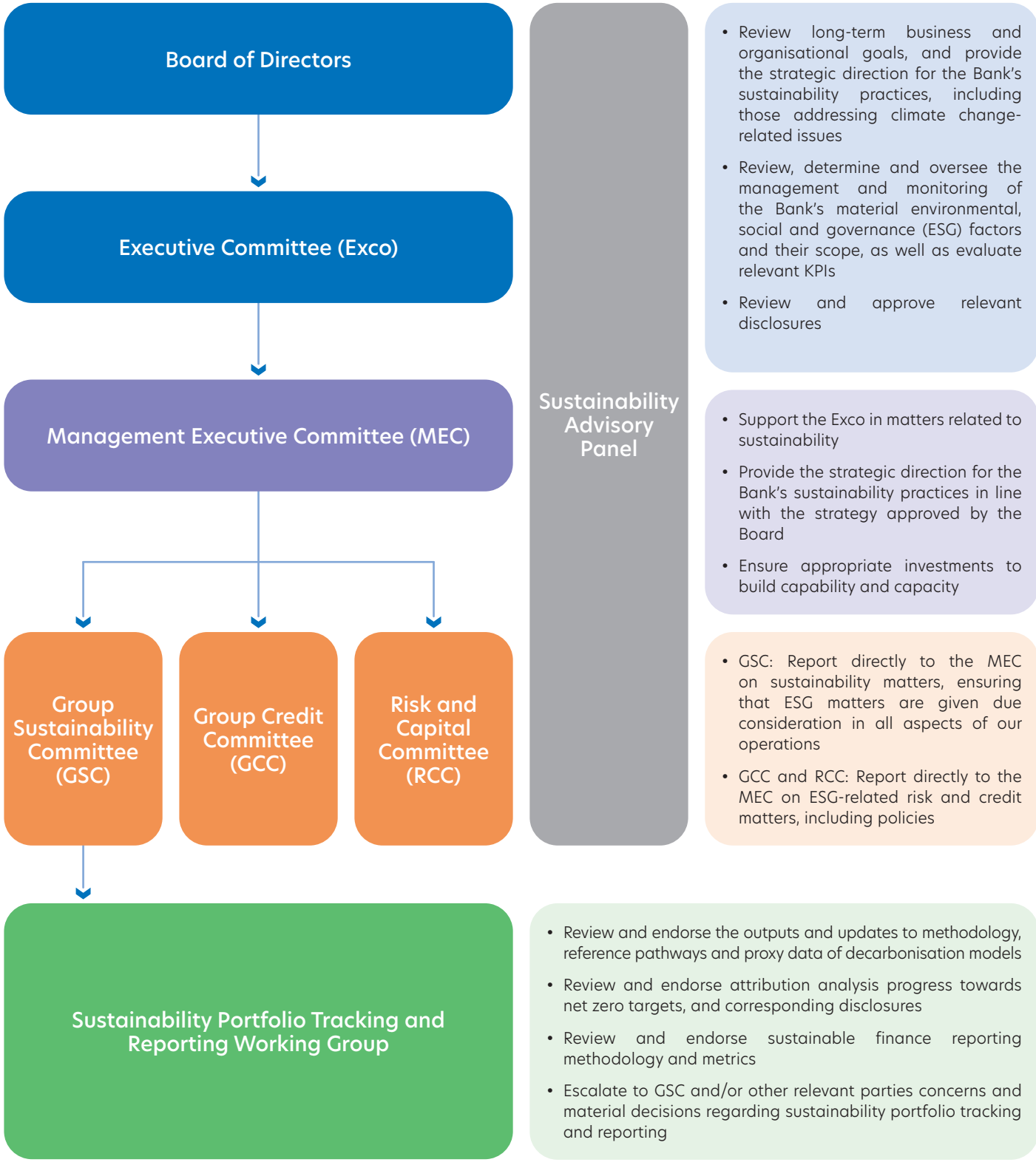
## Governance model

We have reviewed and made relevant updates to our governance model to ensure we have oversight and compliance to regulatory, sectoral and stakeholder expectations related to our sustainability strategy. This is grounded on the below principles:

- Ensure effective governance and oversight on sustainability matters;
- Ensure that sustainability matters have sufficient attention from the Board;
- Ensure connectivity among functions on targeted topics related to sustainability and climate;
- Ensure formal escalation processes and accountability.

Our climate governance is managed through existing senior management committees with specific sustainability-related forums and working groups. Following our review, we have added and expanded existing working group responsibilities to cover net zero reporting responsibilities and implementation of initiatives.

## Embedding net zero in our operating model



## Embedding net zero in our operating model

Material issues related to net zero and sustainability, and our annual net zero progress, are presented to the UOB Board of Directors for their consideration, guidance and approval, on a regular basis. Topics deliberated by the Board in the last 12 months included regulatory developments, internal policies, indirect impact through our financing and investment activities, progress on our net zero commitment and our initiatives to support our customers on their sustainability journey.

The Board also receives quarterly updates on sustainability-related developments, including twice-yearly capacity-building sessions on climate-related topics, alongside the expert guidance of our Sustainability Advisory Panel.

### Sustainability Advisory Panel

Our Sustainability Advisory Panel plays a key role in advising our Board of Directors and Management on key climate and sustainability-related matters. They provide guidance, specifically on our net zero operationalisation programme, sustainability-related commercialisation planning, net zero disclosures, as well as initial work related to nature and biodiversity.

We also defined specific roles and responsibilities for each management level committee (GSC, GCC and RCC) related to net zero.

At the working level, we have established additional working groups and committees with specialist insights to support executive and Board-level forums. These are focused on implementation, and incorporate decision-making input from senior colleagues across functions with the required subject matter and technical expertise.

### Target operating model

Our net zero operationalisation programme included a review of all Group Wholesale Banking processes, including escalation and decision-making related to net zero. Appropriate design updates to standard operating procedures and roles and responsibilities have largely been completed and are currently undergoing implementation.

### Disclosures and internal reporting

The Sustainability Portfolio Tracking and Reporting Working Group has been established to ensure governance and accountability for all internal and external reporting. The working group is responsible for methodology, output of models, and any updates or market developments that may require enhancements to reporting.

# Risk management and business policies and processes

Climate is an important aspect of environmental, social and governance (ESG) management. Our environmental risk appetite and sector policies provide guidelines and guidance to steer our corporate lending portfolio to support our net zero commitments. We have further aligned escalation processes and clarity around roles and responsibilities of the first and second lines of defence.

## Qualitative environmental risk appetite statement

Our Risk Appetite Statement covers ESG considerations, including a climate-related quantitative metric, among others.

## Sector policies

We completed a review of relevant policies to support our net zero commitment, including the UOB Group Responsible Financing Policy and sector-specific policies.

Our Group Responsible Financing Policy, guided by the Guidelines on Responsible Financing by The Association of Banks in Singapore (ABS), is integrated into our credit evaluation and approval processes. It is applicable to all borrowers of Group Wholesale Banking and the Bank's capital market underwriting activities. The policy is guided by our Group Environmental Risk Management Framework and is embedded within the Group's corporate credit policy. It is reviewed annually and approved by the GCC under the oversight of the Board Risk Management Committee.

Our responsible financing sector policies set out mandatory requirements and recommendations on managing the ESG risks of our lending portfolio in areas such as human rights, labour and working conditions, pollution prevention, resource efficiency, community health and safety, and biodiversity conservation. These sector policies cover sectors sensitive to ESG issues. Risks covered are applicable throughout the financing life cycle.

Our net zero operationalisation efforts also include updates to our policies including additional considerations of ESG-related risk in green sectors which we project to grow significantly. In addition, we enhanced our governance processes to support our oil, and gas and coal commitments.

## ESG risk assessment and management

Our responsible financing checklists, which incorporate the ABS's Environmental Risk Questionnaire, guide our climate risk assessment and engagement with corporate clients on the identification of environmental risks and sustainability-related engagement opportunities.

We are also building tools and assessment capabilities for client transition plans, as well as establishing a climate risk scorecard to understand the impact of climate and related risks and opportunities on a client-by-client basis. The implementation of these tools will be focused on supporting our clients in a pragmatic and appropriate manner in the Southeast Asian context, taking into considerations sectoral and regional developments.

## Underwriting and deal approval process

We have done an end-to-end review of our loan approval process to integrate appropriate roles and responsibilities and escalation processes where needed – these have been codified in our target operating model and changes are currently being implemented. We will review these processes and our target operating model annually to ensure compliance and alignment to meet our net zero commitment.

# Capabilities and culture

Operationalisation of our net zero commitment will necessarily require transformation of our people and technology. Reaching our net zero commitments will require capacity building of our employees, integration of sustainability into key performance indicators (KPIs) and renumeration, and enhancements to our data and technology capabilities.

## Capacity building plan

We continued to roll out training to strengthen our internal capabilities around sustainability. In addition to a mandatory Sustainability 101 e-learning module, we launched the UOB Sustainability Academy in September 2024 to offer a series of training modules across ESG topics, including climate change and net zero, to all UOB Group employees globally.

In 2024, we also launched a training programme for all frontline Group Wholesale Banking relationship managers, credit analysts and credit approvers globally. The training is focused on the fundamentals of net zero and decarbonisation, and tools our colleagues can tap to support our clients in their decarbonisation journey.

All Board directors and Management completed annual training on sustainability. They are regularly engaged in discussions on topics such as net zero, nature and biodiversity with the support of additional expertise and insight from the members of our Sustainability Advisory Panel.

We will continue to integrate sustainability-related training into our Group-wide and functional training academies.

## KPIs and renumeration

Our employees' remuneration is linked to our sustainability performance. Variable pay pool is based on the performance against the Group Balanced Scorecard, which includes ESG risk as part of the Group Risk Appetite Statement, as well as sustainability-related KPIs. Sustainability metrics are also integrated into the KPIs and appraisal process for colleagues from relevant functions. We have completed a review of existing KPIs and will continue to refine how our net zero strategy is adequately embedded into our employees' renumeration.

## Data and technology

Data and technology are central to the tracking and monitoring of our progress, risk management and opportunities related to net zero. They are enablers to the target operating model enhancements that we have designed. We have completed an extensive assessment of the existing technology capabilities and mapped out a multi-year investment and development plan focused on increasing efficiency and the ability to support our clients' net zero transition, while delivering on reporting, tracking and monitoring, stress testing and risk management efforts.

# Collaborating with a broader ecosystem

## Engagement with industry bodies and regulators

We continue to engage with our ecosystem partners at both the sectoral and national levels.

| Key stakeholders | How we are engaging them | Examples of engagement |
|---|---|---|
| **International alliances** | Signatories to the NZBA, GFANZ and Equator Principles | Co-chair of the GFANZ Asia Pacific Net Zero Public Policy workstream to help shape ambitious and credible public policies that support an equitable and just transition. |
| **Governments and regulators** | Engage regularly with regulatory bodies in the markets in which we operate to provide feedback on decarbonisation-related topics | Member of the Monetary Authority of Singapore's (MAS) Transition Credits Coalition (TRACTION); and engagement with the MAS Sustainable Finance Advisory Panel.<br><br>Member of Bank Negara Malaysia's (BNM) Joint Committee on Climate Change (JC3) to help build climate resilience within the Malaysian financial sector.<br><br>Co-chair of the JC3's SME Focus Group to help accelerate SMEs' transition and adoption of sustainable practices and business models.<br><br>Member of BNM's Climate Change Principle-Based Taxonomy Implementation Group.<br><br>Participant of the Bank of Thailand (BOT)'s Transition Plan Working Group, with the commitment to develop a transition plan for one priority sector by the end of 2025; and BOT's Financing the Transition programme to help promote green finance and support Thai SMEs in their transition. |
| **Industry bodies and business/trade associations** | Collaborate with industry bodies, businesses and trade associations to support real economy transition | Convening member of the Singapore Sustainable Finance Association; participant in taxonomy and blended finance workstreams and co-lead of the natural capital and biodiversity workstream.<br><br>Member of the Thailand Climate Business Network. |

### GFANZ Asia Pacific Public Policy Workstream

The GFANZ APAC Network workstream was launched to convene net zero-committed financial institutions to engage with regulators on the need for enabling policies that will accelerate financial flows towards the development of net zero and climate-resilient economies in the region. The workstream is currently engaging with regulators, financial institutions and real economy stakeholders across ASEAN.

# Looking ahead

In the three years since we announced our commitment to net zero in 2022, we are gaining more clarity on the opportunities and challenges around decarbonisation of the real economy. We have seen positive strides in a few sectors where technology adoption and policy support have aligned and decarbonisation pathways remained on target. We are also beginning to see emerging opportunities for decarbonisation efforts to scale, but require greater ecosystem and policy alignment.

## Positive progress

We see three major areas with continued significant emissions reductions via the adoption of mature technologies.

First, increased investments in renewable energy are driving notable emissions reductions across the power and real estate sectors. A significant part of our green financing portfolio growth was attributed to renewable energy projects, in particular solar, as the power sector continues to expand renewable energy sources and pivot away from its reliance on fossil fuels. Our real estate clients are also accessing renewable energy through on-site solar installation, power purchase agreements and RECs. These developments have been a major contributor to our clients' Scope 2 emissions reductions and are a key pillar to support the sector's decarbonisation.

Second, increased energy efficiency has been a key contributor to emissions reductions across the real estate and construction sectors. Greenfield real estate is being built with higher energy efficiency standards, while our real estate clients' brownfield retrofits are helping to reduce their energy consumption. In the construction sector specifically, we have seen clients' emissions reductions through greater commitments to on-site energy efficiency.

Lastly, we have also seen significant shifts in emissions reductions related to the expanded electric vehicle and hybrid vehicle production and distribution in the automotive sector. Correspondingly, there has been strong growth in our green financing of the electric vehicle value chain. Construction sector clients have also indicated an increase in electrification of their vehicle fleets.

A key common multiplier across all three areas of growth has been an enabling policy environment. Across UOB's key markets, governments have set renewable energy commitments in tandem with pledges to reduce their reliance on fossil fuel-based power. There are also regulations or policies for green buildings, including energy efficiency requirements. In Singapore, mainland China and Hong Kong, these requirements are mandatory, while in other markets, standards are implemented on a voluntary basis supported by incentives. Electric vehicles too have benefitted from conducive policies with targets on production, infrastructure and use.

The nexus of mature technologies and an enabling policy environment have allowed sectoral decarbonisation to progress at scale, where opportunities are bankable and scalable.

# Opportunities ahead

Future opportunities can be unlocked via regulatory requirements and sector-specific incentives that encourage businesses to pivot their strategies, and support the maturing and scaling of technologies.

Clear national, sectoral pathways would be a major driver to reach net zero in emerging markets. Sector-specific decarbonisation pathways linked to national net zero ambitions would serve to provide such clarity to real economy players on the pace of transition, and required investments needed by companies to meet overall decarbonisation targets.

This would provide a pragmatic roadmap for companies to align to sustainability requirements and spur decarbonisation investment and progress, if paired with regulations and incentives to support compliance.

Reaching net zero is highly dependent on the decarbonisation of the power sector across many sectors. Transition of the power sector is, though, proving to be challenging – we continue to see significant use of fossil fuels as an energy source, as energy demand grows at a faster rate than the installation of renewable energy capacity. In addition, significant investments are required to upgrade transmission and distribution infrastructure to manage renewable energy loads, in particular across ASEAN. Enabling policy environments are a major lever needed to accelerate the power sector transition.

In the absence of widespread investment into the decarbonisation of the power sector, other sectors' decarbonisation progress may be limited as energy use mitigation through energy efficiency solutions and technology adoption gains hit a plateau.

High quality GHG emissions data remain limited, resulting in a heavy reliance on proxy data. Though we see data quality improvements on the horizon as regulators and governments have begun to build a support environment for data reporting, there is still a lack of access to quality data, especially for SMEs. Greater data transparency across all sectors will support decarbonisation progress at both company and sectoral levels.

Implementation of these policies in multiples has even greater potential to unlock opportunities. In a recent study, impact on decarbonisation was found to be more sizeable if policies are a part of a policy mix rather than implemented alone[34].

With more policies in support of decarbonisation, we would see a greater number of publicly-disclosed transition plans. In the current landscape, credible transition plans are uncommon beyond financial institutions and large corporates. Without policies driving sector-wide target-setting, strategy development and disclosures, companies have limited incentives to set and share their transition planning activities. This in turn restricts the amount of transition financing flows and potentially stifles progress in the transition of hard-to-abate sectors.

A conducive policy environment will enable companies to develop and execute transition plans that are ambitious and achievable, allowing banks to deploy the financing needed at scale.

34 Source: Science, "Climate policies that achieved major emission reductions: Global evidence from two decades", August 2024.

# Our way forward

Our efforts are focused on supporting our clients' efforts to decarbonise. We have increased the sustainable financing extended to our clients as they invest in their decarbonisation strategies and set ambitious targets. We also continue to facilitate the development of long-term sustainability strategies through advisory and capacity building.

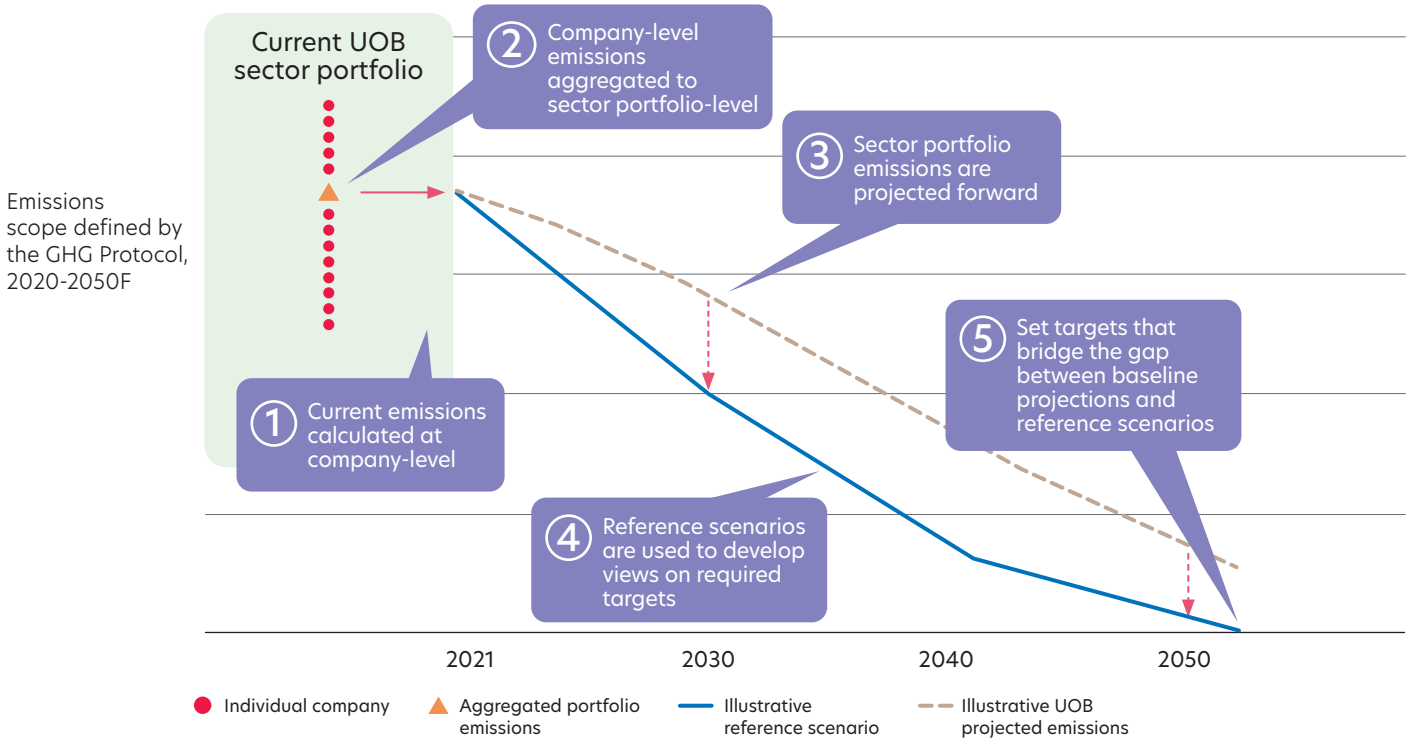
Our risk management policies and risk mitigation measures ensure that we monitor the progress of our clients' strategies, and that we continue to bank those who are considering sustainability from a pragmatic point of view. Our focus remains not on financial decarbonisation, but on supporting real economy transition.

Net zero target-setting is only the beginning of any net zero commitment. We stay committed to supporting our clients and communities in a just transition.

# Appendix

# Target-setting methodology

## Our five-step approach to setting targets and baselines




### 1. Calculate emissions at the company level for each client in the six focus sectors

We rely heavily on having relevant data, when setting a baseline and tracking our progress based on measuring and estimating our clients' emissions and emissions intensities. The availability and quality of emissions data are a challenge for banks globally, given this is still a nascent area for many companies and in many parts of the world.

The challenge is especially apparent for SMEs, which are an important part of our portfolio. Many of these clients are unlisted companies and have yet to report emissions publicly. In addition, the nature of our clients' operations creates greater complexity. Many operate across multiple markets and business lines, and we often support their businesses at both the headquarters level, where emissions reporting is more common, and in specific markets or specific activities, where granular data is less common. Such complications can lead to emissions accounting that may not materially represent the activity we are financing.

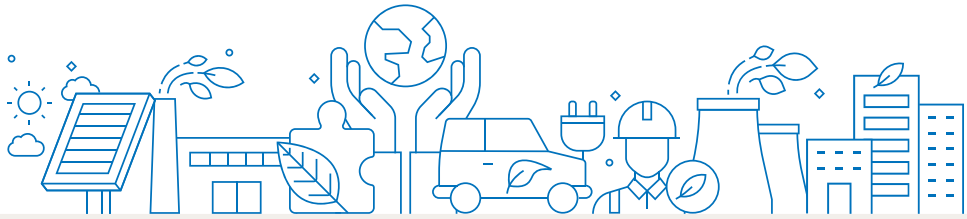
We used both PCAF and Paris Agreement Capital Transition Assessment (PACTA) approaches in our methodology for emissions calculations, tailored to specific portfolios and adjusted for data availability.

To calculate emissions intensity for each client, we have taken guidance from the PCAF approach when prioritising which data to use. In general, we have prioritised use of reported emissions data, before falling back on bottom-up calculation or use of proxies (aligned with how PCAF defines its data quality scores).

## 2. Aggregate our client emissions to create a UOB sector-level average, which was weighted based on our exposure to each client

We calculate our portfolio's sector emissions intensities by first finding the emissions intensity of each individual client, and then weight-averaging them based on the client's contribution to the total sector portfolio exposure.

We have taken this approach because as a bank, we are able to control the weight of each client's exposure in our portfolio, and we believe this should be reflected in each of our sector's average emissions intensity.



$$\text{Emissions intensity} = \Sigma_i \frac{\text{Exposure}_i}{\text{Total sector portfolio exposure}} \times \text{Emissions intensity}_i$$

*Where i = borrower or investee company*

## 3. Project future emissions taking into consideration company-specific plans, national commitments and potential technological developments

A number of inputs were used to project a momentum pathway for our portfolio. These fall into three groups:

1. **Company-specific plans:** We took into account instances in which our clients had their own transition plans and forecasts. Our ability to meet our targets is linked to these clients fully following their own decarbonisation commitments and strategies;

2. **National commitments:** We have considered governmental plans and targets where they pertain to relevant industries. For example, some countries in Southeast Asia have advocated the adoption of EVs and are phasing out fossil-fuel engines in the automotive sector or are seeking to increase renewable energy capacity to cut emissions in the power and oil, gas and coal sectors; and

3. **Technological developments:** We have also assessed the potential impact of technological innovation for each sector, for example the deployment of energy storage technologies for the power sector and the availability of electric equipment in the construction sector.

# Target-setting methodology

## 4. Establish reference scenarios with a science-based pathway to net zero by 2050

We have selected reference pathways grounded on science-based assumptions and have taken into account market- and sector-level specificities.

Three factors were especially important in selecting promising pathways:

1. **Data availability:** We ensured the pathways have appropriate data available for our sectors and selected metrics.
2. **Global credibility:** We selected science-based and 1.5°C-aligned methodologies, such as the Integrated Assessment Models (IAMs)[35], which are climate models that predict the factors and variables needed globally to reach net zero by 2050.
3. **Geographic relevance:** We selected regional pathways where relevant and available.

## 5. Set targets for 2030 and 2050 that bridge the gap between our projections and the reference scenarios

Aligned with GFANZ requirements, we have set interim emissions intensity targets for 2030 for each sector, as well as 2050 targets. Our aspiration is to meet these interim targets and create a credible decarbonisation path to the final 2050 targets.

To support this commitment, we focus on core levers that drive decarbonisation within each sector, directing more financing towards greener projects and activities and away from those that emit more carbon.

In ensuring that we support our clients through the transition, over the last year we have developed granular sectoral plans identifying opportunities for green and transition finance within each sector. These sectoral plans have been aligned with our broader business strategy.

35 IAMs are used extensively and trusted by the climate science community. They are typically maintained by research institutions, such as the Joint Global Change Research Institute and the Potsdam Institute for Climate Impact Research, or by global industry organisations, such as the IEA and MPP.

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