Forging our net zero future

Progress report 2022

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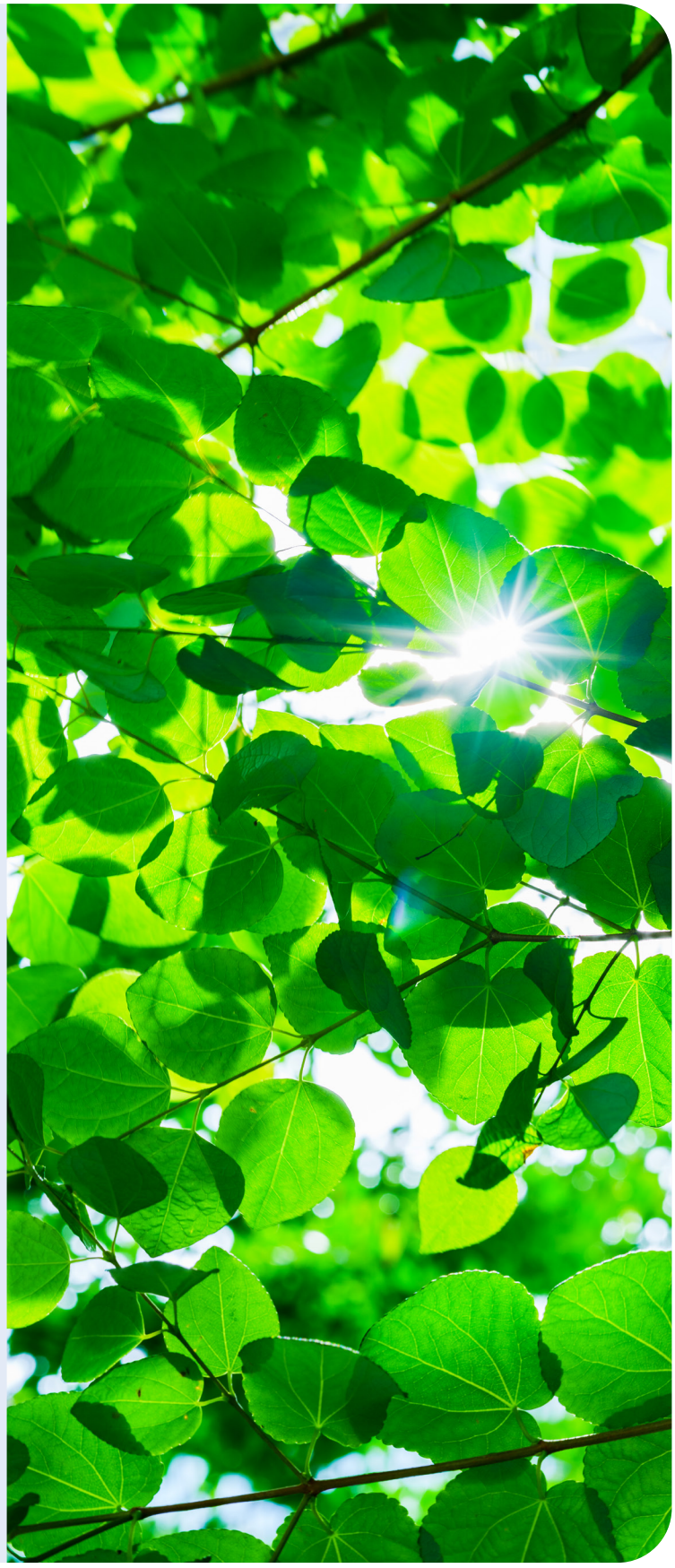
October 2023

Contents

Certain figures presented in this report may not add up to the respective totals or reflect the absolute values due to rounding.



Foreword

The time has come for us to act. Countries, industries and corporates need to work together to reduce greenhouse gas emissions globally. We can do this through investing in new and practical technologies, redesigning supply chains and rethinking business models. This is a green revolution, much like the industrial revolution.

The road ahead will not be easy. Asia and its diverse economies need to keep up with the pace of industrialisation and urbanisation for lives and livelihoods to keep thriving. Yet, there is an urgency to decarbonise and a need to cut our reliance on fossil fuels.

At UOB, we support an orderly and just transition to net zero so that economies continue to grow and people's access to energy continues to improve. It is built on our promise to do right by our customers and stakeholders.

We have doubled down on our efforts to support our customers, including small- and medium-sized enterprises, on their own transition journey. We customise solutions to our customers' operating environment, sector and value chain. We also connect them to solution providers and offer them funding critical to their transition.

We have taken steps to transform our operating processes to become a net zero bank. We have also made progress in deepening our collaboration with the larger ecosystem of stakeholders comprising international standards-setting bodies, local and regional regulators, industry and trade associations, solution providers and the wider community.

Such conversations will help drive greater clarity of transition pathways, policies, guidelines and other measures critical to meeting net zero goals in Asia. We need greater coordination, as well as collective expertise across all levels of government, economy and society to effect transformative changes.

As a leading financial institution and responsible steward, UOB is here to catalyse funding and ecosystem-wide support to ensure a just transition. We want to create a positive impact for individuals, businesses and communities so that together, we can build a sustainable future for the people and businesses in our home region of ASEAN and those connecting with the region.

Wee Ee Cheong
Deputy Chairman and Chief Executive Officer
UOB
31 October 2023

Highlights

Just transition in Southeast Asia

UOB is committed to supporting a just transition in the region, adopting an ambitious net zero commitment balanced with a pragmatic market- and sector-specific approach.

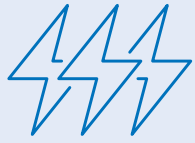
7.5%

8.5%

Southeast Asia's contribution to global GHG emissions[1] and population[2] means it has a significant role to play in global decarbonisation.

High reliance on fossil fuels for power generation

Growing energy demand



Southeast Asia faces the dual challenge of achieving decarbonisation, while ensuring continued economic growth and improved access to affordable energy across the diverse economies in the region.

Clear national policies and targets to drive decarbonisation

Access to high quality emissions data

Harmonisation of methodologies for emissions estimations and transition plan assessments

Collective efforts by the broader ecosystem to unlock key enablers will be critical to a successful delivery of global net zero.

1 World Data Lab, World Emissions Clock database (calculated by adding up country-level emissions for Southeast Asia), accessed September 2023.
2 Worldometer, Population statistics database, accessed September 2023.

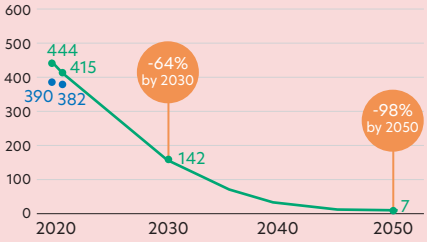
Highlights

UOB's commitment to net zero by 2050

We are making good progress on our net zero commitment across six focus sectors, which cover approximately 60% of our corporate lending portfolio.

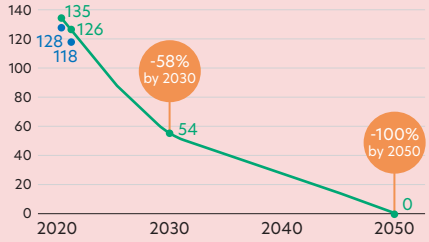
Power
($kgCO_2/MWh$)

8% below pathway



Automotive
($gCO_2/vehicle-km$)

7% below pathway

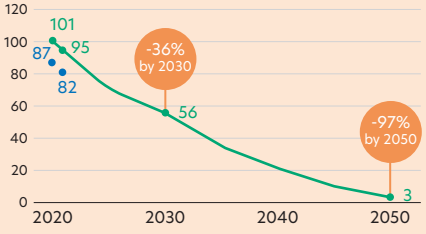


Oil and Gas

We commit to no new project financing for upstream oil and gas projects approved for development after 2022.

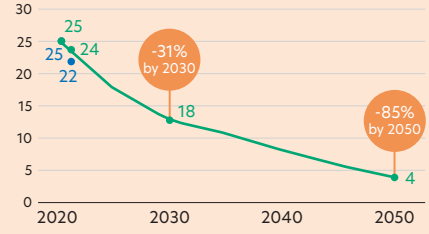
Real estate
($kgCO_2/m^2$)

14% below pathway



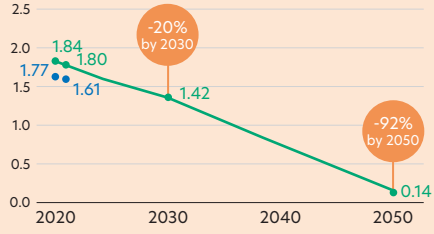
Construction
(tCO_2/Smillion$)

9% below pathway



Steel
($tCO_2/tonne$)

10% below pathway



☐ Energy ☐ Built environment ● UOB data — Reference pathways

- **Power:** NGFS REMIND (regional)
- **Automotive:** IEA NZE (global)
- **Real estate:** CRREM (regional)
- **Construction:** NGFS GCAM (regional)
- **Steel:** MPP Tech Moratorium (global)

7-14%
below target reference pathways achieved across our emissions intensity metrics

S$38 billion
extended in sustainable financing as at September 2023

10
initiatives embarked across governance, risk management, policies and processes, as well as capabilities and culture, as part of our holistic, Bank-wide transformation programme to embed climate considerations into our operating model

Introduction

Measures to combat climate change have become more critical and more urgent globally. In early September 2023, a stocktake by the United Nations[3] acknowledged progress in this challenge, but warned that much more is needed to reach global aspirations.

Southeast Asia is one of the most vulnerable regions to climate change. The region is experiencing rising sea levels, heat waves, droughts, and increasingly severe rainstorms and floods. Inaction threatens Southeast Asia's core economic sectors and could lead to the region losing more than 35% of its gross domestic product by 2050[4]. Global decarbonisation is critical to stem the most severe climate events.

Southeast Asia also represents an important region for global decarbonisation efforts. It accounts for 7.5% of annual global emissions[5], while its energy demand has shown a consistent average increase of about 3% over the past two decades and will continue to increase towards 2030 under current policy settings[6]. However, the region's reliance on fossil fuels, particularly coal, is significant. Coal accounted for more than 25% of the primary energy supply in 2020 and the young fleet of coal-fired power plants has an average age of 12 years[6,7]. The region is facing dual challenges of achieving decarbonisation while also ensuring continued economic growth and access to energy.

The transition away from fossil fuels will require massive shifts, including the deployment of new technology, an upheaval of supply chains and the transformation of business models across all sectors. It will also require significant investment and deployment of capital. McKinsey & Company estimates that an average of US$3.1 trillion would be needed annually until 2050 for the Asia Pacific to reach net zero[7]. Of this, about 62% has been earmarked for the power and transportation sectors[8]. Commercial banks are key players in driving decarbonisation efforts, with estimates suggesting banks could fund about US$2.0 trillion to US$2.6 trillion of the required amount, making the climate transition a significant opportunity for banks globally[9].

3 United Nations Sustainability Development Goals (SDG) Summit, Speech by H. E. Mr. António Guterres, United Nations Secretary-General, September 2023.
4 Intergovernmental Panel on Climate Change (IPCC), *Sixth Assessment Report*, August 2021.
5 World Data Lab, World Emissions Clock database (calculated by adding up country-level emissions for Southeast Asia), accessed September 2023.
6 International Energy Agency (IEA), *Southeast Asia Energy Outlook 2022*, May 2022.
7 ASEAN Centre for Energy, *Challenges and Implications of Coal Phase-down to the ASEAN Energy Landscape*, January 2022.
8 McKinsey Global Institute, *The net-zero transition: What it would cost, what it could bring*, January 2022.
9 McKinsey & Company, *Financing the net-zero transition: From planning to practice*, January 2023.

Our net zero ambition

UOB aspires to be a leading sustainable bank in Southeast Asia. Recognising the substantial impact that financial institutions can have in catalysing and facilitating decarbonisation, we seek to balance growth with responsibility through supporting a just transition.

In October 2022, we shared our commitment to achieving net zero for our financed emissions by 2050, and became a signatory of the Net Zero Banking Alliance (NZBA).

UOB's commitment to net zero is underpinned by our strong belief in the principles of a just transition, an approach that emphasises economic growth and improved energy access across the diverse economies in the region. It looks beyond the direct efforts to reduce greenhouse gas (GHG) emissions to ensure that socioeconomic concerns are addressed consciously, and that the lives and livelihoods of individuals and communities can continue to improve.

We have adopted a pragmatic view and our commitments are grounded in the realities of the region, with a specific focus on our key markets, namely Singapore, Indonesia, Malaysia, Thailand, Vietnam and Greater China. We are guided by credible scientific approaches in setting our net zero targets, aligning with global net zero models where possible, and using regional pathways that represent the fair contributions of our key markets.

Our net zero commitment covers six focus sectors that represent about 60% of our corporate lending portfolio. These can be grouped into two ecosystems in terms of their emissions: energy and the built environment.

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

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

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. 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. UOB's financing strategy can have near-term impact on the power and automotive sectors, where low-carbon technology is viable but requires substantial investment, as well as in the real estate sector where energy-efficient infrastructure is also available. 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 decarbonisation efforts.

- **Accessibility and availability of methodology and data:** Challenges surround data quality and availability, and we have chosen sectors in which meaningful emissions data is accessible or where there is an established data methodology for calculating estimates. Our methodology and sector coverage will be updated as data quality improves.

Since setting our targets in October 2022, we have developed a holistic operationalisation programme focusing on four key areas, namely developing granular sectoral plans, supporting our customers, embedding net zero in our operating model and driving effective stakeholder engagement.

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

This paper follows *Forging our net zero future*, our net zero whitepaper published in 2022. 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 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.

10 University of Oxford, *Our World in Data - Emissions by sector*, 2020.

Our net zero targets and progress to date

After our initial efforts to assess our financed emissions profile from our 2021 baseline and to set our targets, we have mapped our progress with updated data and results from 2022. All sectors remained below the reference pathways.

Overall methodology and approach

In setting our targets and measuring our baseline financed emissions, we examined the most relevant internationally and regionally recognised approaches, pathways, and guidance to ensure alignment with global best practices. Among the principal resources were:

- the Glasgow Financial Alliance for Net Zero (GFANZ), for guidance on how financial institutions should set targets and use sectoral pathways;
- the Partnership for Carbon Accounting Financials (PCAF), for data quality score guidance on what data and methodologies to use to calculate client-level GHG emissions;
- the Paris Agreement Capital Transition Assessment (PACTA), for guidance on both client-level GHG emissions calculations and aggregation of our emissions; and
- the Science Based Targets initiative (SBTi), for sector-specific target-setting guidance.

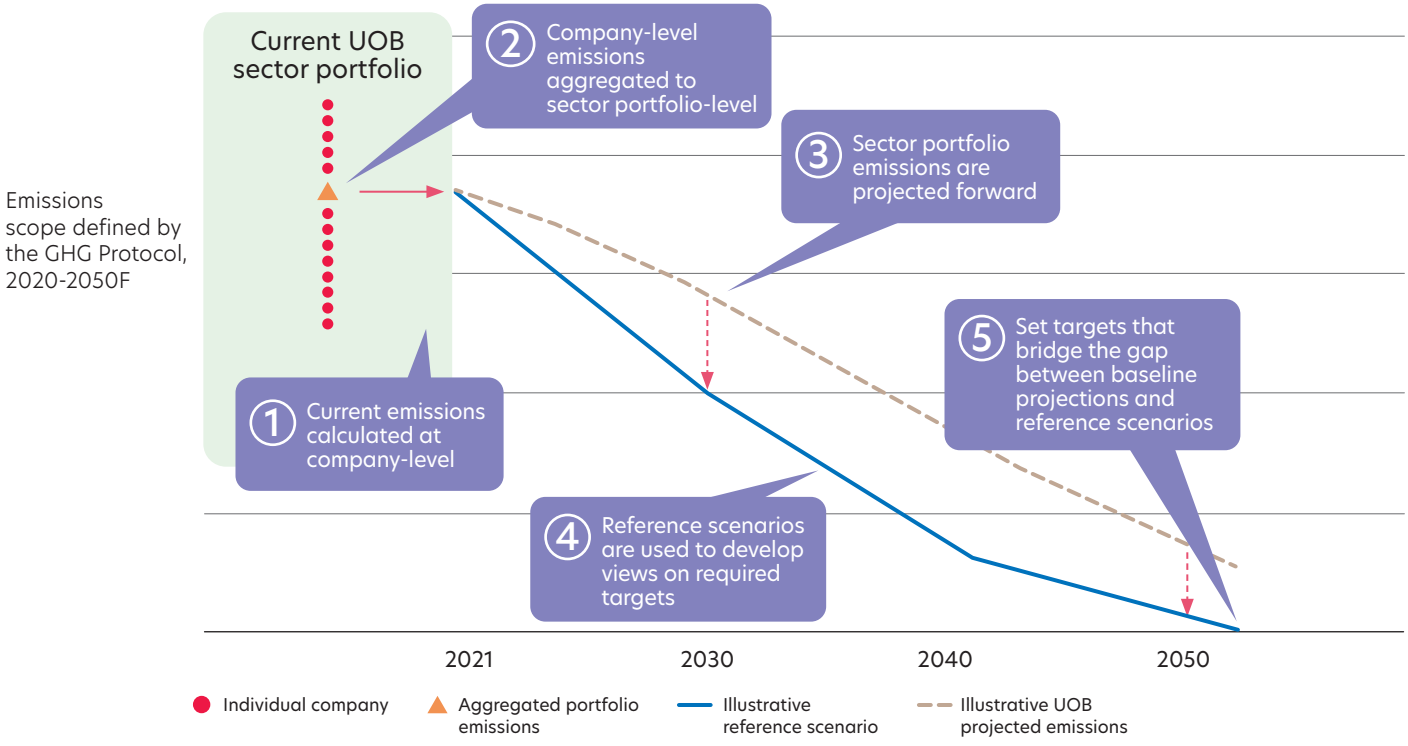
We also considered sector- and market-specific realities when setting targets, which aligns with our commitment to a just transition. Our target-setting approach recognises that climate transition cannot be homogenous across sectors or markets, especially as companies and countries will decarbonise at different speeds and face varying obstacles. We have taken into account these sectoral and country differences through the application of region-specific pathways to appropriately reflect the realities and contributions of different sectors and markets in our portfolio.

Notable sectors for which regional pathways were available and were consulted include power, real estate, and construction. 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 net zero targets and progress to date

Our five-step approach to setting targets and baselines



Further details of our methodology can be found in Appendix A.

Our net zero targets and progress to date

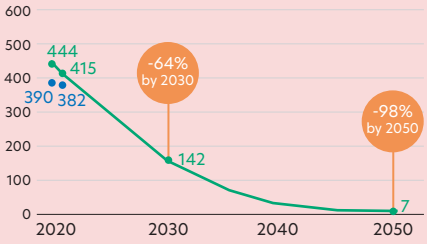
Overview of 2022 results

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 2022 data.

Overview of emissions intensity by sector

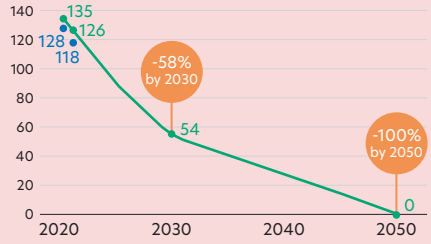
Power
(kgCO_2/MWh)

8% below pathway



Automotive
(gCO_2/vehicle-km)

7% below pathway

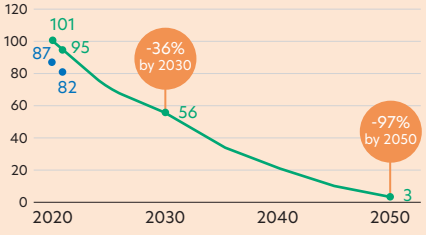


Oil and Gas

We commit to no new project financing for upstream oil and gas projects approved for development after 2022.

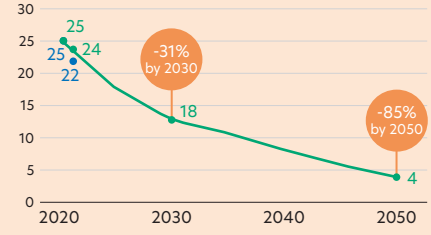
Real estate
(kgCO_2/m²)

14% below pathway



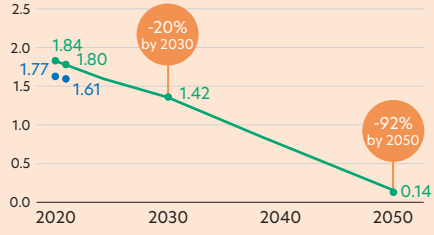
Construction
(tCO_2/S$million)

9% below pathway



Steel
(tCO_2/tonne)

10% below pathway



Energy Built environment UOB data Reference pathways

- **Power:** NGFS REMIND (regional)
- **Automotive:** IEA NZE (global)
- **Real estate:** CRREM (regional)
- **Construction:** NGFS GCAM (regional)
- **Steel:** MPP Tech Moratorium (global)

Our net zero targets and progress to date

Emissions intensities declined across all five sectors where we have made net zero targets in 2022 when compared to our baseline emissions intensities measurements in 2021. We remained below the reference pathways in all five sectors. When calculating our updated financed emissions, we note that there remains a high reliance on proxy data as client-level data remains a challenge across all sectors. However, we are seeing positive trends in emissions reduction in both proxy and reported data.

Moving forward, we will look to grow opportunities with our clients to support their decarbonisation efforts.

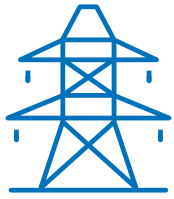
As part of our 2023 business strategy refresh, UOB has integrated commercialisation opportunities which will help drive the decarbonisation of our target sectors. This is an extension and refinement of our existing efforts to support the decarbonisation efforts of our clients. In some markets, we have identified near-term opportunities and have begun to expand our efforts. In particular, we are focused in the near term on the automotive sector, given the support of electric vehicle (EV) adoption in many of our key markets, and the energy sector, given widespread commitments to renewables across Southeast Asia.

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 electric arc furnace (EAF) production methods and usage of scrap metal
		Support research and development of new technologies to improve plant efficiency

Power

Emissions from power generation account for about 41% of global GHG emissions[11] where power-generating companies are typically responsible for the majority of emissions. A small portion of the emissions in the sector are derived from equipment manufacturing, for instance solar panels and wind turbines.



Target	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)

To reflect the source of emissions in this sector, our focus for financed emissions is on power generation and equipment manufacturing. In our analysis, 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.

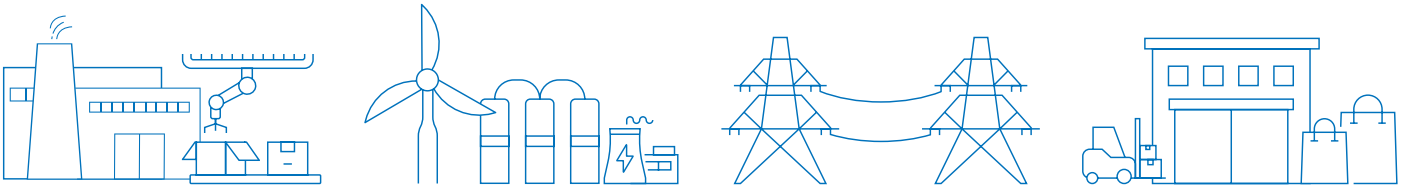
We have chosen the NGFS REMIND model to guide the regional reference pathway for the decarbonisation of our power sector portfolio, which follows our preference to account for Southeast Asia's unique situation and conditions wherever possible.

11 IEA, *Net Zero by 2050 A Roadmap for the Global Energy Sector*, May 2021.

Our net zero targets and progress to date

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

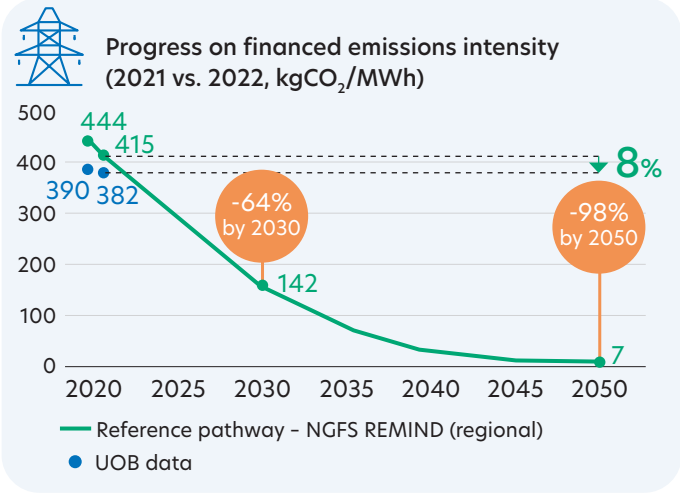
- Running of national grid infrastructure
- Responsible for procuring different sources of power and ensuring efficiency through minimising leakage and intermittency

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

Excluded from target calculation

For the power sector, our targets are to reduce financed emissions by 64% by 2030 and 98% by 2050. Our 2021 baseline emissions intensity for this sector was registered as 390 $kgCO_2$/MWh, which was below the region's average of 444 $kgCO_2$/MWh. Note that we have updated the 2021 baseline to 390 $kgCO_2$/MWh from 365 $kgCO_2$/MWh, due to model refinements.

Power sector financed emissions intensity baseline, targets and progress



We have seen a slight year-on-year improvement of our emissions intensity in the power sector. Our financed emissions intensity is currently 8% below our reference pathway, NGFS REMIND.

The change in our portfolio emissions in 2022 was driven primarily by changes in exposure to clients, though our non-renewable energy portfolio clients also improved their emissions intensities. In 2022, we added new renewable energy clients and limited our exposure to new clients with high emissions intensities.

We continue to support our energy clients in the power sector that are committed to decarbonisation, working in tandem to finance their GHG emissions reduction efforts and renewable energy projects. We project an observable decline in financed emissions in 2023 as key clients strategically decarbonise their portfolios.

Over the medium term, we expect our emissions intensity to continue to improve as the power sector continues to focus on a shift to lower carbon fuel sources and renewable energy continues to grow. We will build on the success of our U-Solar programme, which has expanded to more markets and larger ecosystems, and focus on supporting the transition of our high-emitting energy clients.

Our net zero targets and progress to date

Tailwinds and headwinds

Rapid urbanisation and continued economic growth in Southeast Asia will drive increased demand for electricity throughout the region. Power generation in the region is expected to triple by 2050 from 2020 levels. With the IEA estimating that by 2050, approximately 44% of Southeast Asia's power could be supplied by renewable energy[12], this presents a significant opportunity.

However, this dramatic shift comes with challenges, as most of Southeast Asia remains reliant on fossil fuels for electricity. In 2020, coal fuelled more than 40% of the power generation in the region[13]. In addition, coal-fired power plants (CFPPs) in Southeast Asia are relatively young with decades remaining in their expected operational life, making them challenging assets to wind down[14].

Nonetheless, given the emergence of new technologies and policy tailwinds as governments increasingly set national targets around the usage of renewable energy, it is possible to envision a lower emissions future for the sector. To achieve this, we see three key decarbonisation levers:

1. **Increased adoption of renewables:** As more countries commit to net zero targets, they are concurrently deploying and investing in renewable energy to strengthen supply chains and increase capacity for power generation.

2. **Technological innovations:** Technologies are emerging with improved quality and conversion efficiency that address the intermittencies of renewables and that upgrade power infrastructures to support new types of renewable energy.

3. **Concurrent phase-out of fossil fuels**: Phasing out of high-emitting assets such as CFPPs will be essential to drive down emissions in this sector. This must be in tandem with increasing renewable energy capacity.

Any transition within the power sector is critically dependent on a dramatic increase in electricity generation through renewable sources, such as solar and wind, replacing fossil fuel-powered generation. There are key policy tailwinds supporting this shift. In many of our core markets across Southeast Asia and Greater China, governments have declared their commitments to move away from fossil fuels to renewable energy sources for their electricity needs. They have also set clear quantitative targets and timelines around this[15].

Renewable power generation commitments by market

Singapore	At least 2 Gigawatt-peak (GWp) in solar energy deployment by 2030, to meet ~3% of projected electricity demand
Indonesia	34% share of renewables in power generation by 2030, and net zero emissions within the power sector by 2050
Malaysia	31% share of renewables installed capacity by 2025, and 40% by 2035
Thailand	50% share of renewables in the power generation mix by 2037, and 74% by 2050
Vietnam	31-39% of power generation and around 75% of generation capacity from renewables by 2030
Hong Kong	15% share of renewables in the fuel mix for power generation by 2050
China	33% share of renewables for national power consumption, and a 50% increase in renewable energy generation

12,13 IEA, *Southeast Asia Energy Outlook 2022*, May 2022.
14 Monetary Authority of Singapore (MAS), Working Paper on Accelerating the Early Retirement of Coal-Fired Power Plants through Carbon Credits, 26 September 2023.
15 Singapore government, *Singapore Green Plan 2030*, accessed September 2023; Malaysian government, *National Energy Policy 2022-2040*, September 2022; Malaysian Investment Development Authority and Reuters, *Malaysia's renewable energy transition*, 20 June 2023; Thai government, *Thailand's Long-term Low GHG Emissions Development Strategy (Revised version)*, November 2022; *Bangkok Post*, "Thailand ramps up shift to renewables", 4 May 2023; IEA, *Thailand's Clean Electricity Transition*, May 2023; Fitch Ratings, "Vietnam's PDP8 roadmap for energy transition sets ambitious medium-term targets", 12 June 2023; Hong Kong government, *Hong Kong's Climate Action Plan 2050*, October 2021; Energy Foundation China, "China's 14th Five-Year Plans on Renewable Energy Development and Modern Energy System", 5 September 2022.

Our net zero targets and progress to date

To facilitate this transition, a massive amount of investment is needed across a diverse array of renewable technologies, particularly solar, wind, hydro, geothermal and biomass. Each country will have its own focus, depending on resource availability, state of existing energy infrastructure and economic feasibility. For instance, Vietnam is leaning on wind power, while Singapore is exploring hydrogen's potential and has committed to increasing solar capacity[16]. At the same time, Singapore takes a pragmatic approach to the energy transition and believes that natural gas will continue to be a vital source of energy, especially in Asia until it is fully replaced by hydrogen[17].

Developing robust supply chains to support these national agendas will be essential, and countries have already started investing in capabilities relevant to their transition plans. For example, outside China, Malaysia and Vietnam are already among the world's largest manufacturers of solar cells and modules, catering to the region's need for factories specialising in solar panels[18].

Beyond policy tailwinds driving a shift to renewables, technology innovations are also necessary, particularly to address issues such as the intermittency of renewables. Expanding the use of renewables requires cost-effective energy storage solutions to ensure the stability of energy supply. In addition, better grid management and control through advanced algorithms and real-time monitoring systems could also balance supply and demand and mitigate grid instabilities[19]. Power infrastructure also needs to accommodate the shift to renewables. As renewables expand, power grids need to connect remote renewable generation sites with power markets, balance power between distribution grids, and ensure system reliability.

In addition, technologies to ease the transition will be needed to ensure energy resilience and stability, while reducing emissions. This could include moving to cleaner fuels such as natural gas for power generation and deploying carbon capture, utilisation, and storage (CCUS) measures to reduce emissions from ongoing coal- or natural gas-fired operations.

Lastly, to decarbonise the power sector significantly, high-emitting power assets such as CFPPs need to be phased out gradually. It is estimated that, if left to operate without active intervention, CFPPs will exhaust two-thirds of the carbon budget remaining to keep the global temperature rise within 1.5°C by 2050[20]. Southeast Asia has a young and active fleet of CFPPs. There are many active efforts, for instance, by the Just Energy Transition Partnership (JETP) in Indonesia and the MAS, exploring mechanisms including carbon credits and deployment of concessionary capital to improve the economics of the early phase-out of these plants.

16 IEA, *Decarbonisation Pathways for Southeast Asia*, April 2023.
17 Ministry of Trade and Industry, Speech by Minister Tan See Leng at the Gastech 2023 Opening Ceremony, September 2023.
18 IEA, *Trends in Photovoltaic Applications 2022*, 2022.
19 *Sustainable Review,* "Grid Integration of Renewable Energy", 9 June 2023.
20 MAS, Working Paper on Accelerating the Early Retirement of Coal-Fired Power Plants through Carbon Credits, 26 September 2023.

Our net zero targets and progress to date

Coal phase-out commitments by market[21]

Singapore	Phase-out of unabated coal power by 2050; 96% of power generation today is already from natural gas
Indonesia	PLN (largest state power utility) stated target to phase out coal power plants by 2056
Malaysia	7 GW of coal-fired capacity to be retired by 2033; zero new coal projects to be approved (as of June 2021)
Thailand	Focus is on shift towards renewable energy to reduce reliance on natural gas (~60% of Thailand's electric power is generated from natural gas), rather than coal
Vietnam	Coal phase-out planned for completion by 2050
Hong Kong	Coal phase-out by 2035, retaining coal only as a back-up option
China	Phase-out set to begin in 2026; however, additional coal power capacity continues to be built (52 GW approved in the first half of 2023)

There are also certain challenges countering these tailwinds. While the costs of renewable technologies have fallen in recent years, further innovation in areas such as materials, design and manufacturing processes is needed to make them more cost-competitive.

Building and upgrading to a fit-for-purpose grid infrastructure will also be challenging. As countries expand renewables capacity, one result could be severe grid congestion. The size and complexity of grid infrastructure projects pose logistical and financial challenges that require close collaboration between governments, utility providers, the private sector and financial institutions.

To seize the decarbonisation opportunities within the power sector in Southeast Asia and tackle some of the challenges presented, UOB is partnering with key clients, supporting them in their transition journey through financing their renewable energy developments. We will expand our ecosystem solutions in renewables, extending our support to contractors and manufacturers involved in the supply of raw materials, components, and equipment as well as their distribution and installation. Support of these value chain players is essential to expand the use of renewables in Southeast Asia.

21 Singapore's National Climate Change Secretariat, "Joint press release by NCCS, MSE and MTI: Singapore to phase out unabated coal power by 2050", 4 November 2021; Organisation for Economic Co-operation and Development (OECD), *RUPTL 2021-30: PLN steps up ambitions to accelerate clean energy investments in Indonesia*, 16 November 2021; Malaysian government, *National Energy Policy 2022-2040*, September 2022; Thai government, *Thailand's Long-term Low GHG Emissions Development Strategy (Revised version)*, November 2022; World Economic Forum, Vietnam's National Electricity Development Plan/Power Development Plan 8, 23 May 2023; Hong Kong government, *Hong Kong's Climate Action Plan 2050*, October 2021; Centre for Research on Energy and Clean Air, "China permits two new coal power plants per week in 2022", 27 February 2023.

Automotive

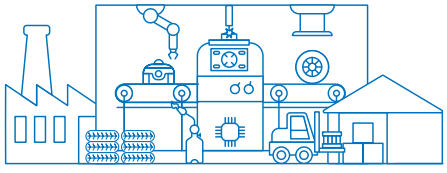
Passenger cars and trucks contribute about 9% of total emissions globally[22], largely as a result of manufacturing, assembly, and use. Tailpipe emissions from burning diesel fuel and petrol when vehicles are driven account for the bulk of these emissions at about 84%[23].

Target	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)

We have included manufacturers, dealers and automotive financial leasing companies within our scope to address the most material areas of emissions within the automotive sector, and together they cover the majority of our lending to this sector. For now, 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 the coverage of upstream activities in our targets and baselining efforts as these obstacles are overcome.

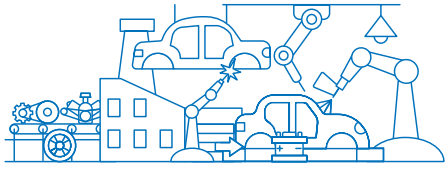
Automotive sector value chain

Upstream: Parts manufacturers ›



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

Midstream: Original equipment manufacturers ›



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

Downstream: Dealers and automotive financial leasing companies

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

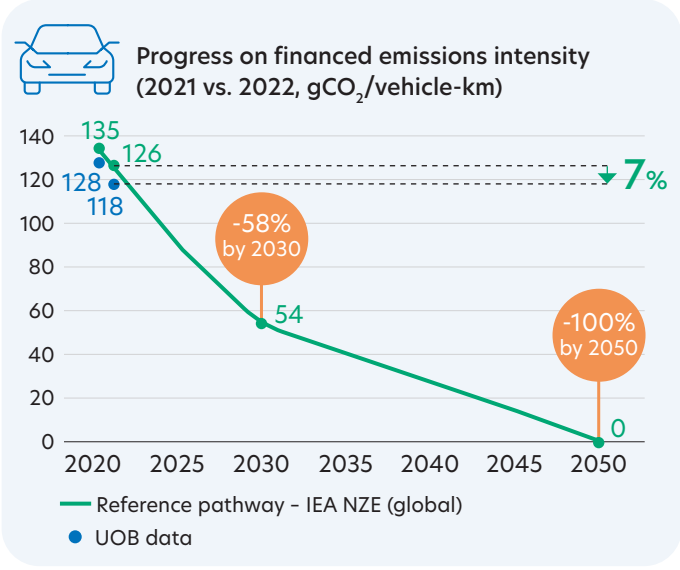
Excluded from target calculation

22 IEA, *Net Zero by 2050 – A Roadmap for the Global Energy Sector*, May 2021.
23 CDP, *CDP Technical Note: Relevance of Scope 3 Categories by Sector*, January 2023.

Our net zero targets and progress to date

For the automotive sector, our targets are to reduce financed emissions by 58% by 2030 and to reach net zero by 2050. Based on our 2021 baselining exercise, our emissions intensity for this sector was 128 gCO_2/vehicle-km.

Automotive sector financed emissions intensity baseline, targets and progress



In the automotive sector, we have seen a year-on-year improvement of our emissions intensity between 2021 and 2022. Our financed emissions intensity is 7% below our reference pathway, IEA NZE. On average, emissions intensities improved for our clients across the value chain, in manufacturing as well as distribution and leasing.

In general, we observe an increase in the volume of hybrid and EV manufacturing as well as an increase in hybrid and EV sales. We also see progress in new vehicle sales shifting away from internal combustion engine (ICE) vehicles, though this has not yet matched the increase in hybrid and EV vehicle production.

Our new financing in 2022 (both to existing and new clients) was, on average, to clients with lower emissions intensity than our baseline in 2021.

Moving forward, we expect our emissions intensity to continue to improve as countries continue to move towards adopting more EVs and as our exposure to the EV value chain increases.

Tailwinds and headwinds

The automotive industry has high potential and scope for a clean energy transition, particularly with the growing use of EVs and increasingly energy-efficient ICE vehicles. Further, this potential lies not only in shifting ownership in the region away from ICE vehicles, but also in manufacturing EVs for the world. Already, Southeast Asia is a major centre for automotive manufacturing, producing 4.4 million vehicles in 2022[24], from motorcycles to trucks.

There are two key decarbonisation levers for the automotive sector:

1. **Shift to use of EVs:** Given the majority of emissions in automotive usage come from tailpipe emissions — about 65% to 80% of the total[25] — electrification of vehicles to eliminate these emissions will be a key driver. To achieve this, production, distribution, and adoption of EVs within the region must continue to expand significantly.
2. **Abatement of material emissions:** Though a smaller proportion, emissions from the material production of automotives composes 18% to 22% of a vehicle's total emissions[26], presenting another opportunity to decarbonise through use of energy-efficient production methods, low-energy materials, and green design in manufacturing.

The shift to EVs will benefit substantially from policy tailwinds and government imperatives to phase out ICE vehicles. Government programmes in Southeast Asia, for example, are offering significant support for the change-over by establishing clear targets and incentives. They have also set clear timelines around this[27].

EV adoption and usage targets by market

Singapore	All new car and taxi registrations to be of cleaner-energy models from 2030 and all vehicles to run on cleaner energy by 2040
Indonesia	Produce 600,000 EVs by 2030 and 1,000,000 by 2035, and reduce import duties from 50% to zero for EV makers
Malaysia	38% share of all vehicles sold by 2040
Thailand	30% of all vehicles made in Thailand 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	Targets for 20% share of EVs in all vehicles sold by 2025

24 Statista, "Number of motor vehicles produced in ASEAN from 2013 to 2022", February 2023.
25,26 McKinsey & Company, *The zero-carbon car: Abating material emissions is next on the agenda*, September 2020.
27 Singapore government, *Singapore Green Plan 2030*, accessed September 2023; Malaysian government, *National Energy Policy 2022-2040*, September 2022; Reuters, "Indonesia gives automakers more time to qualify for EV credits in investment bid", 10 August 2023; Thai government, "Initiative to promote EV production according to 30@30 policy", 22 October 2021; Vietnamese government, "Vietnam's Action Program for Transition to Green Energy and Mitigation of Carbon Dioxide and Methane Emissions from Transportation, Decision no. 876.QD-TTg", 22 July 2022; Chinese government, "China EV Industry Development Plan 2021-2035", 20 October 2020.

Our net zero targets and progress to date

In addition to policy incentives, increased affordability through a decrease in manufacturing costs is needed to drive consumer adoption.

If the combination of government-driven policy incentives, increased availability, and increased affordability of EVs is successful, the International Renewable Energy Agency (IRENA) estimates that sales of four-wheeled EVs in Southeast Asia could surge to 13 million by 2030 and to 38 million by 2050, reaching about 80% of the market[28]. This would represent a transformation of the automotive sector, from where EVs only held 2% of market share in 2022. Two-wheeled EVs would also sell in the hundreds of millions by 2050 in this scenario[29].

Expanding EV production in Southeast Asia will be essential to support the growth in EV use in the region. This expansion also provides an opportunity for decarbonisation through addressing emissions within manufacturing and production processes.

There have already been shifts towards EVs within the manufacturing and assembly in parts of the automotive value chain. Governments can encourage local manufacturing and assembly of these and other components. Indonesia, for example, is a major producer of batteries for EVs and requires that EVs contain at least 40% local content to qualify for subsidies and other incentives[30]. Malaysia is promoting an Automotive High-Tech Valley to create a manufacturing and technology hub for next-generation vehicles. Automotive assembly plants in the region are also evolving toward the production of EVs. One plant in Thailand with an annual capacity of 150,000 EVs is expected to be online in 2024[31], and Indonesia also has plans to establish EV production.

Countering these positive trends, headwinds remain. Despite increased affordability, prices remain a central obstacle for broader adoption of EVs by buyers compared with prices of ICE vehicles[32]. Increased investments and innovation in batteries – a major cost component – will be critical to reaching price parity. Targeted regulations and government incentives such as fiscal incentives and subsidies, for example purchase subsidies and vehicle purchase and registration tax rebates, will be needed to encourage adoption.

Further investments in charging infrastructure, as well as customer education, will be important. Estimates by McKinsey & Company suggest that Southeast Asian markets will collectively require 30 times more public alternating current and direct current charging points than are available today to support projected numbers of registered EVs by 2030[33].

To encourage the transition in the automotive sector in Southeast Asia, UOB is committed to supporting the region's evolving EV ecosystem, for instance, through our U-Drive suite of solutions. Through U-Drive, we offer a comprehensive range of sustainable financing solutions for the entire EV ecosystem. Through this holistic approach, we seek to support change in Southeast Asia's automotive sector to drive innovation and usher in a new era of electrified mobility in the region.

28 Counterpoint Research, "Electric Vehicles Gain Ground in Southeast Asia; Thailand Dominates Volumes", 31 March 2023.
29 IRENA, *Energy Transition Investment Opportunities in Southeast Asia*, 2022.
30 The International Council on Clean Transportation, "Indonesia's historic announcement proves the country's transport future is electric", 3 May 2023.
31 Bloomberg, "China's BYD Signs Deal to Build First EV Plant in Thailand", 7 September 2022.
32,33 McKinsey & Company, "Capturing growth in Asia's emerging EV ecosystem", 30 June 2022.

Oil, gas and coal

Given the significance of oil, gas and coal as a power source throughout Southeast Asia, we have made core commitments in these sectors even as we continue to advocate for credible energy transition pathways that balance decarbonisation with economic growth. This emphasis is driven by our commitment to a just transition, as well as an acknowledgement 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.

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 diverse and developing nature of regional economies, we believe that current O&G decarbonisation pathways are not realistic in their reflection of critical aspects of a just transition. Robust, aggressive plans will be needed to successfully address the sector's mitigation needs. Despite the difficulties, we recognise that any meaningful climate transition programme must encompass the oil, gas and coal sector to be effective, and we have set commitments that reflect limiting the new supply of oil and gas and exiting the thermal coal sector.

In setting these commitments, we were guided by groups, including the Intergovernmental Panel on Climate Change (IPCC), IEA and NGFS, that assert the world must live on existing fossil fuel resources without developing new non-renewable sources. We will focus on limiting the supply of fossil fuels to the main economy, avoiding an over-abundance of cheap fuels, and supporting an orderly transition, all while balancing this with the need for socioeconomic growth in Southeast Asia. We will also further drive the shift to renewable and clean energy sources within the region.

Our net zero targets and progress to date

Tailwinds and headwinds

Southeast Asia's energy demand is on the rise. According to the IEA, demand for oil and natural gas is expected to increase towards 2050 under current national policies. Demand for natural gas, in particular, is expected to double from 2020 levels by 2050[34]. The demand growth necessitates substantial energy imports. Recognising the role of natural gas as a transition fuel in the journey towards net zero, Singapore is actively strengthening its role as the regional natural gas trading hub[35].

While oil and natural gas production remain essential for supporting the region's economic development, decarbonising the sector becomes imperative as countries commit to net zero goals. Key decarbonisation levers include:

1. **Improving operations:** Control of methane emissions, which is a significant contributor to overall GHG emissions;

2. **Utilising CCUS technologies:** Reduction of the amount of carbon dioxide (CO_2) released, including for liquefied natural gas (LNG) and natural gas that will play a critical role as transition fuel in the period leading up 2030; and

3. **Producing sustainable, low carbon fuels:** Shift to fuels such as hydrogen and biofuels as an alternative to high-emitting fossil fuels.

Emission reductions in operations, including extraction and production, could be delivered by better control of methane, a significant source of GHG emissions. This could be achieved through enhanced leak detection, vapour recovery, and advanced gas seals[36]. Additional reductions could be achieved through switching to electric equipment and adopting more energy-efficient processes. Regional examples include Malaysia's Petronas pledging to eliminate flaring and venting of methane by 2030[37], and Thailand's PTT targeting full clean energy utilisation, including renewables and co-generation with CCUS, in its chemical manufacturing processes by 2050[38].

Modern CCUS technologies can be deployed in oil and natural gas production to capture and separate CO_2 from fuels before combustion or to capture it after combustion from flue gases.

While CCUS technologies in Southeast Asia are still relatively new, momentum seems to be increasing. Malaysia, for instance, aims to establish three CCUS hubs by 2030, totalling a storage capacity of up to 15 million tonnes a year[39]. In Indonesia, a series of projects are currently in the study and preparation stages. Notably, BP's Tangguh CCUS project secured planning approval in 2021 and is progressing towards the final investment decision[40].

Oil and natural gas firms in the region are exploring the production of low carbon fuels, such as hydrogen and biofuels. Hydrogen, currently produced mainly through steam methane reforming (SMR), is shifting towards cleaner methods such as electrolysis and SMR with CCUS. Southeast Asia's hydrogen sector is emerging, with Brunei piloting liquefied hydrogen supply to Japan, Malaysia launching an integrated hydrogen production plant, and Pertamina testing a hydrogen plant with geothermal integration in Lampung[41,42]. The region, notably Indonesia, is also a biofuel hub and various Southeast Asian countries have blending mandates to encourage biofuel use in transportation to promote biofuel integration[43]. Oil and natural gas operators such as Pertamina and Petronas are actively developing biorefineries to meet these mandates and boost biofuel production.

34 IEA, *Southeast Asia Energy Outlook 2022*, May 2022.
35 Ministry of Trade and Industry, Speech by Minister Tan See Leng at the Gastech 2023 Opening Ceremony, 5 September 2023.
36 IEA, "Methane Abatement", accessed September 2023.
37 Petronas, *Petronas' Pathway to Net Zero Carbon Emissions 2050*, November 2022.
38 PTT Global Chemical, *GC's decarbonization pathways*, November 2021.
39 Carbon Capture & Storage (CCS) Institute, *Global Status of CCS 2021*, 2021.
40 BP Indonesia, "Enhanced gas recovery/carbon capture, utilization and storage", accessed September 2023.
41 *The Star*, "Sarawak ventures into the green hydrogen economy", 19 June 2023.
42 Pertamina, "Pertamina NRE, Krakatau Steel, and RAJA Collaborate to Develop Hydrogen Pipelines", 12 November 2022.
43 Asean Centre for Energy, "ASEAN bets on biofuel, but feedstock crunch could void the gamble", 15 May 2023.

Our net zero targets and progress to date

These decarbonisation opportunities will be fuelled by significant tailwinds. Governments across the region are pursuing net zero goals and exploring regulations and policies related to carbon credits and carbon tax to enhance the economic viability of various decarbonisation efforts. O&G companies are also setting their net zero goals. Technology advancements, particularly in emerging technologies such as CCUS and hydrogen, will play an important role in supporting these developments.

Nevertheless, realising these opportunities today will likely face some significant headwinds. While many technologies are available, their cost competitiveness remains a hurdle. For example, many countries lack sufficient carbon pricing to make carbon capture economically attractive given its high cost. However, with market growth, technological advancements and economies of scale, costs are expected to decrease, similar to the trends seen in wind and solar energy.

Further, certain project revenue streams rely heavily on regulations, making the stability of these regulations a critical concern. Many of the policies on carbon tax and carbon credits in the region are still evolving. O&G companies need to continuously observe the regulatory movements and factor in the uncertainties of regulatory changes in their project planning.

And finally, infrastructure remains insufficient to expand the use of CCUS technologies and alternate fuels, and upgrades are complex and expensive. For example, while natural gas pipelines could potentially be used to ease the safe transportation and storage of hydrogen, the technical and economic feasibility depends on many complex factors[44].

To support the transition of the O&G sector, UOB is committed to working with companies in their decarbonisation endeavours. We have developed the UOB Transition Finance Framework and solutions to support the decarbonisation of this hard-to-abate sector. UOB's commitment is grounded in the realities of Southeast Asia, where we operate, and takes into consideration the just transition of the region as we continue to support economic growth and improve energy access across the diverse economies in the region. Our environmental commitments integrate energy security and economic growth, as well as economic and social equity and equality. Southeast Asia has been reliant on fossil fuels such as oil and natural gas to drive massive economic expansion, urbanisation and industrialisation in the past two decades, and the shift towards decarbonisation can result in trade-offs with real-life consequences.

We will support the adoption of emissions reduction technologies and the development of low emissions fuel alternatives by developing and providing green, sustainable, and transition financing solutions. We recognise that this transition is not only essential in meeting net zero targets, but also offers avenues for innovation, growth and long-term resilience. While the region will benefit from technological advances and solutions on the decarbonisation journey, cost may be a limiting factor to widespread adoption and Southeast Asia will likely experience greater challenges on the net zero journey. Hence, we remain dedicated to collaborating closely with our oil and natural gas clients, working with them to drive meaningful impact and contribute to a more sustainable future.

44 Belfer Center, *Hydrogen Deployment at Scale: the Infrastructure Challenge*, August 2021.

Real estate

Operational emissions from the real estate sector contribute about 28% of GHG emissions globally 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[45]. The real estate sector is especially important to UOB because it composes a significant portion of our portfolio.

Target	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)

We have focused on Scope 1 and 2 operational emissions in the real estate sector, which capture the largest portion of GHG emissions. These operational emissions can also be managed directly and controlled by our clients, allowing us to effect meaningful change in emissions levels collectively. Scope 3 emissions, generally linked to materials used in construction such as steel, are also significant. However, data constraints for these embodied emissions, as they are also called, prevent us from effectively and accurately measuring them. As methods for calculating embodied emissions and data quality improve, we will incorporate these into our scope.

45 GRESB, "What is embodied carbon in the real estate sector and why does it matter?", 1 March 2023.

Our net zero targets and progress to date

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

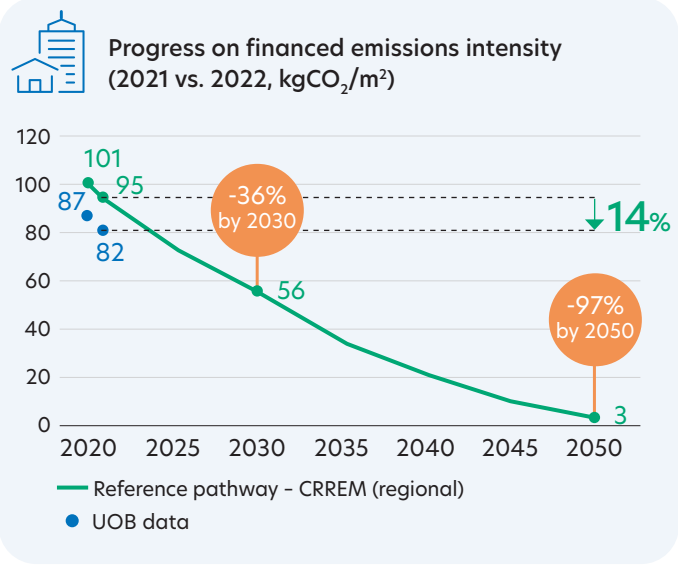
- Examples: construction companies and contractors
- Responsible for operational emissions during construction processes such as vehicle fuel use, and electricity used in construction sites

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

* Cement is excluded from target calculation

Our target for the real estate sector is to reduce financed emissions by 36% by 2030 and 97% by 2050. In our 2021 baselining exercise, emissions intensity for this sector was 87 $kgCO_2/m^2$.

Real estate sector financed emissions intensity baseline, targets and progress



In the real estate sector, we have seen a year-on-year improvement of our emissions intensity between 2021 and 2022. Our financed emissions intensity is 14% below our reference pathway, CRREM.

On average, emissions intensities improved for our clients in this sector. We attribute this primarily to lower emissions intensity in our proxy data from 2021 to 2022 as well as more clients reporting actual emissions data. On average, our reported data has lower emissions intensity than proxy data. We note that client-level data still remains a challenge in the sector and there is a heavy reliance on proxy data.

In 2022, we added new clients with lower emissions intensities and grew our sustainable finance exposure year on year by more than 20%.

Moving forward, we expect our emissions intensity to continue to improve as new building construction follows improved energy efficiency standards and we continue to see the growth of retrofitting of older buildings. We will increase our focus on providing financing to these assets.

Our net zero targets and progress to date

Tailwinds and headwinds

Rapid urbanisation in Southeast Asia will considerably increase demand for building development, making the need to reach net zero in this sector all the more urgent. In 2022, there were about 300 million people living in cities throughout Southeast Asia, and their numbers are expected to increase to about 500 million by 2050[46].

This growth in urban development coincides with increased regulatory scrutiny, as many governments across Southeast Asia are working to monitor and lower the emissions produced by everyday building operations, largely from cooling and ventilation, and drive a greater proportion of green buildings within their respective markets. Singapore's Green Plan 2030 stipulates that 80% of buildings in the country based on gross floor space should be certified green by 2030 compared with about 55% in 2022[47]. Malaysia has established the Green Technology Financing Scheme[48] to provide funding for the sector to adopt sustainable technologies that create energy efficiencies throughout a building's operations.

Overall, five themes can be explored to push decarbonisation in the real estate sector:

1. **Energy efficiency:** Implementation of measures to reduce use of electricity, fossil fuels and water in ongoing operations;

2. **Use of green energy:** Shift to renewable energy sources, such as microgrid solar panel systems;

3. **Innovative technology:** Deployment of modern systems in new and older buildings that generate energy savings, such as smart lighting systems, district cooling, energy and water consumption optimisation, carbon trackers, and waste management systems;

4. **Material, design, and process:** Reduction of embodied emissions, for instance from the production and transportation of materials, and adopting sustainable materials in building construction; and

5. **Transparency:** Greater transparency around the impact of decarbonisation efforts, in part to encourage investment, as well as monitor progress.

These measures present significant sustainability opportunities, either through implementation in new buildings or retrofitting programmes in older buildings to upgrade them to be green-certified. Indeed, as regulators impose greater mandates on real estate emissions, including closer scrutiny of embodied emissions, retrofitting green systems into older buildings will gain urgency and scale.

Increased regulatory support will be a crucial incentive for the real estate sector to accelerate its decarbonisation efforts while also providing tactical support. For example, in its push to reduce real estate emissions, Singapore has implemented a Green Mark Certification Scheme for buildings, which provides internationally-recognised green credentials for buildings' sustainability performance[49]. Such efforts increase transparency, opening funding opportunities for decarbonisation initiatives. Dedicated public funds that assist owners in reducing their buildings' emissions are appearing throughout Southeast Asia.

Such policy direction has given rise to net zero commitments from within the sector. For instance, City Developments Limited (CDL) became the first real estate company in Southeast Asia to sign the Net Zero Carbon Buildings Commitment by the World Green Building Council (WorldGBC), and has set out a plan to achieve net zero for assets directly under its control by 2030[50]. Similarly, CapitaLand Investment has announced its aims to reduce absolute Scope 1 and 2 emissions by 46% from its 2019 baseline, through a combination of strategies including reducing energy use, improving efficiency, deploying more on-site renewable energy, and purchasing green power in markets where allowable[51]. Beyond the environmental benefits, such efforts can lower a building's operating costs, making it more attractive to investors.

46 ASEAN Secretariat, *ASEAN Key Figures 2021* and *ASEAN Sustainable Urbanisation Report 2022: Sustainable Cities towards 2025 and Beyond*, December 2022.
47 Singapore government, *Singapore Green Plan 2030*, accessed September 2023.
48 Malaysian government, Green Technology Financing Scheme, accessed October 2023.
49 Building and Construction Authority (BCA), Green Mark Certification Scheme, accessed October 2023.
50 CDL, "CDL pledges net zero operations by 2030", 3 February 2021.
51 CapitaLand Investment, "CapitaLand Investment commits to Net Zero by 2050", 31 May 2022.

Our net zero targets and progress to date

Real estate policies and commitments by market[52]

Singapore	Launched mandatory Green Mark Certification Scheme in 2005, with ongoing enhancements and revisions, 80% of all buildings to be green-certified by 2030
Indonesia	Voluntary local certifications: Green Building (GB) and Bangunan Gedung Hijau (BGH) (Green Building), with associated incentives from local town councils
Malaysia	Voluntary local certification: Green Building Index (GBI) rating system for certification of green developments
Thailand	Voluntary local certification: TREES (Thailand's Rating of Energy and Environmental Sustainability), adapted from Leadership in Energy and Environmental Design (LEED) for the local context
Vietnam	Voluntary local certification: LOTUS, tailored to adapt to Vietnamese construction practices
Hong Kong	Voluntary local certification: Building Environmental Assessment Method (BEAM) Plus and BEAM Plus for Existing Buildings; mandatory for all government and public sector developments to attain Gold or above
China	Launched mandatory Green Building Evaluation Standard in 2006, with ongoing enhancements and revisions

To achieve further decarbonisation of the real estate sector, there are a few headwinds that must be overcome. Success in decarbonising the real estate sector is fundamentally linked to the progress in reducing emissions in the power sector. Power generation in Southeast Asia remains heavily reliant on plants fuelled by coal and natural gas. Countries across the region have however, set targets on shifting their energy mix towards renewable energy. For example, Indonesia's national electricity plan targets to achieve 23% of renewables in its electricity mix by 2025 from 14% in 2021, and large state-owned utilities are building additional capacity across hydro, geothermal, and solar to drive this[53]. As this progresses, it will have a complementary effect on greening the real estate sector. Lastly, the push to certify the real estate sector green has not been homogenous across many markets. There has typically been a more significant focus on the commercial segment than on residential, where policies and regulations have been slower to encourage decarbonisation.

Immediate opportunities in this sector are likely to be more prevalent in markets that have already established policies and building certifications to encourage decarbonisation in the sector.

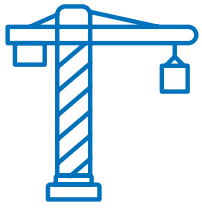
UOB has developed a granular plan to support the decarbonisation of the real estate sector and address some of the challenges it faces. We will focus on increased financing for the development of certified green and energy-efficient buildings, installation of renewable energy, and energy efficiency retrofits. We will also work closely with the end-to-end real estate value chain – from property developers to operators, and investment companies to contractors and building materials suppliers – to encourage adoption of energy efficiency standards for buildings. We have designed and launched our U-Series ecosystem solutions to support these efforts.

52 Singapore government, *Singapore Green Plan 2030*, accessed September 2023; BCA, Green Mark Certification Scheme, accessed October 2023; Green Building Index Malaysia, accessed October 2023; United Nations Environment Programme, Regulation of the State Minister for the Environment No. 08/2010 on the criteria and certification of green buildings (Indonesia), accessed October 2023; Thai Green Building Institute, *Thai's Rating of Energy and Environmental Sustainability for Existing Building: Operation and Maintenance*, 2017; Vietnam Green Building Council, LOTUS certification system, accessed September 2023; Hong Kong Green Building Council (HKGBC), *HKGBC BEAM Plus: New Buildings*, 2019; IEA, GB/T 50378-2019 Assessment standard for green buildings (revision) (China), accessed October 2023.

53 WorldGBC, *Bringing Embodied Carbon Upfront*, 2019.

Construction

Globally, about 11% of total carbon emissions are produced by the construction sector. This comes mostly from fuel used by construction equipment and heavy-duty vehicles and electricity use, and also from embodied emissions, created during the manufacture and transportation of materials. However, complete embodied emissions data sets and calculations remain relatively nascent. When this data is available, we will endeavour to include it in our construction sector targets. In the meantime, we have accounted for a major contributor to embodied carbon in the built environment value chain by setting a net zero target for steel.



Target	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)

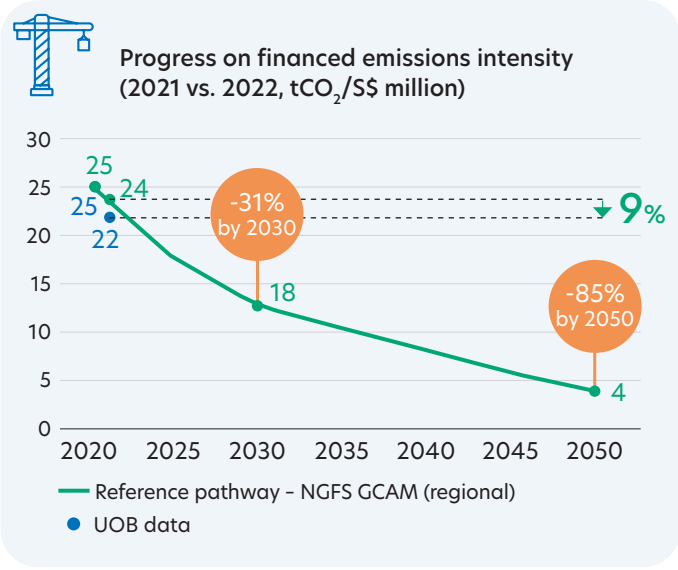
To generate our assessments, we segmented the construction value chain into construction, demolition, renovation and installation. We then focused on the Scope 1 and 2 operational emissions for construction and demolition as these components are most responsible for carbon emissions within the value 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 main 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 with regard to a physical-based metric. 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.

UOB's targets for the construction sector are to reduce financed emissions by 31% by 2030 and 85% by 2050. Our 2021 emissions intensity baseline was 25 tCO_2/S$ million, which was on par with the regional NGFS GCAM reference scenario value.

Construction sector financed emissions intensity baseline, targets and progress



In the construction sector, we have seen a year-on-year improvement of our emissions intensity between 2021 and 2022. Our financed emissions intensity is currently 9% below our reference pathway, NGFS GCAM.

On average, emissions intensities improved for our clients in this sector. We attribute this in part to an increase in data quality where we were able to reduce our reliance on proxy data by 7%. The majority of clients improved their emissions intensities with reported data compared with proxy data.

We also noted that proxy data has had slight improvements in emissions intensities in all markets where we have clients, accounting for some of the decline in our sector emissions intensity. Note that the measurement and reporting of carbon emissions within the construction sector is 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. In contrast, our construction clients in developed markets have lower reported emissions intensities given the stronger momentum to support sustainable operations in construction.

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

Moving forward, we expect our emissions intensity to continue to improve as the construction sector's Scope 1 and Scope 2 emissions decline with on-site and fleet electrification and greater efficiency. We will also intensify our efforts to focus on green building ecosystem players' value chain to support decarbonisation around Scope 3 embodied carbon. We have started to encourage developers, building owners and contractors to begin the adoption of sustainable building materials that improve an asset's lifecycle cost while lowering embodied carbon.

Tailwinds and headwinds

GHG emissions from the construction sector have been largely neglected in the past as attention was focused on a building's carbon footprint during operations rather than during construction. But rapid construction spurred by Southeast Asia's economic growth and urbanisation has turned the spotlight to the challenges and opportunities as this sector works toward reaching net zero.

After a slowdown brought by the COVID-19 pandemic, the sector is seen rebounding strongly. Euromonitor forecasts that Asia Pacific will account for nearly 40% of the global construction industry's output value by 2030, while its construction and real estate production value is set to grow annually at a rate of 6% up to the same year[54]. Parallel to construction itself, the region is one of the world's largest producers and consumers of construction materials, such as steel and concrete. These embodied emissions, caused by the production and transportation of materials used, must be addressed alongside direct emissions from construction equipment, vehicles, and on-site generation among other sources.

We have identified five major themes that are crucial to addressing emissions linked to the construction sector:

1. **Material reduction:** Lower demand for resources through design and process optimisation, for example by reducing waste and optimising use;

2. **Sustainable materials:** Shift from traditional materials to more sustainable materials, such as low carbon bricks and high performance materials;

3. **Circularity approaches:** Increase in closed-loop circularity of materials and components such as steel, concrete, and glass, for instance through re-use and recycling, to lower demand;

4. **Process improvement:** Reduction of carbon footprint through low carbon alternatives, such as greater use of renewable fuels and low- or no-carbon feedstock and developing of green processes; and

5. **Energy efficiency:** Substitution of electric alternatives for on-site equipment and vehicles that use fossil fuels and other efficiency opportunities.

Several trends across Southeast Asia support the effort to decarbonise the construction sector. For one, governments are increasing disclosure requirements on embodied emissions, improving data quality and creating a more transparent system. In Singapore, a Singapore Building Carbon Calculator focused on estimating embodied emissions for projects to help engineers and developers was launched in June 2023[55]. Such efforts to drive more use of embodied carbon accounting will be essential to increase transparency around projects and meaningful actions to reduce emissions.

The private sector, of course, has a critical role to play. Through a mixture of stringent commitments and meaningful action, companies can lead ambitious net zero agendas across Southeast Asia. Immediate steps could include on-site electrification and conversion to electric equipment and low carbon materials, as well as adopting modern processes and designs that are more energy efficient and reduce waste.

Progress in decarbonising the construction sector could also be slowed by internal and external challenges. A shortfall of quality data remains a core problem in Southeast Asia and elsewhere, particularly for tracking and measuring embodied emissions. While progress is being made to increase transparency, more remains to be done. In addition, Southeast Asia's reliance on coal for electricity will counteract some of the benefits of moving from fossil fuels to electricity on construction sites and along the supply chain.

UOB will support the construction sector on its path to decarbonisation. We will work closely with construction and demolition businesses to encourage low carbon construction processes. We also plan to increase financing of on-site renewable energy. To support our efforts, we are developing targeted ecosystem solutions and enhancing our sustainable finance offerings, as well as crafting plans for specific sectors with interdependencies with construction, such as renewable energy, energy efficiency and the use of sustainable building materials.

54 Euromonitor International, *Construction and real estate in Asia Pacific*, October 2021.
55 *The Straits Times*, "More decarbonising initiatives for S'pore's built environment sector in move towards net-zero by 2050", 28 June 2023.

Steel

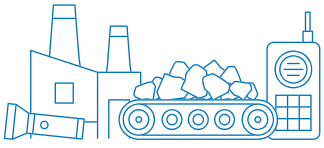
Globally, the steel sector accounts for about 8% of GHG emissions, primarily from metallurgical coal burned during the refining process[56]. As steel is a crucial material in many industries, including construction and infrastructure, decarbonising the sector would be a critical step in the path toward net zero.

Target	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

The value chain for the steel sector begins with the extraction of raw materials, such as iron ore and metallurgical coal, and proceeds through steel production and fabrication of metal products until finally being traded on the commodities markets. As the majority of emissions arise during production, our baselining and target-setting efforts have focused on Scope 1 and 2 emissions from crude steel production, as well as the Scope 3 upstream emissions of fabricated metal producers and traders[57].

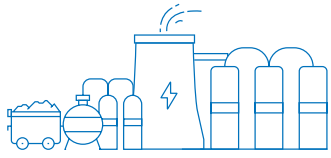
Steel sector value chain

Mines: Raw material extraction ›



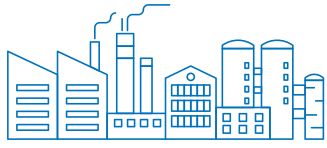
- Extraction of raw materials for steel production e.g. iron ore, coal
- Scope 3 downstream emissions are most significant, largely attributed to crude steel production

Steel plants: crude steel production ›



- Production of crude steel via Blast Furnace-Basic Oxygen Furnace (BF-BOF), scrap-based EAF and/or Direct Reduction Iron-EAF (DRI-EAF) methods
- Combined Scope 1 and 2 most significant due to carbon-intensive production methods

Factories: Fabricated metal products ›



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

Traders: facilitation of commodity movement

- 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

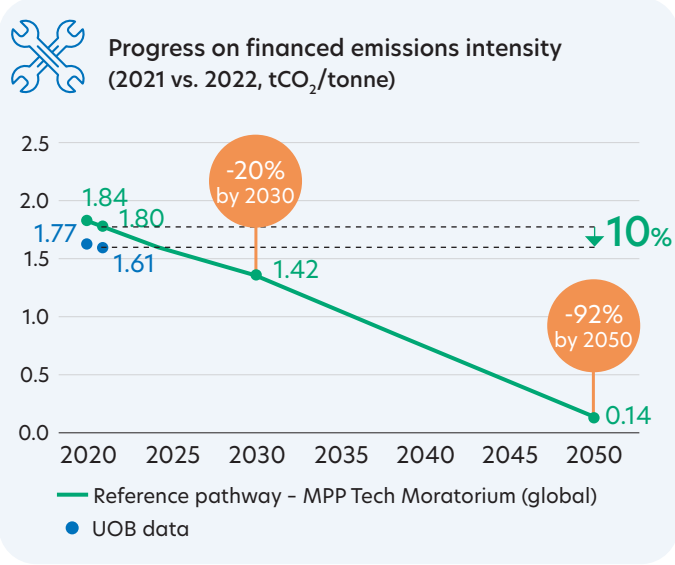
56 IEA, *Iron and Steel Technology Roadmap*, October 2020.

57 Limited to fabrication and trading around crude steel produced only.

Our net zero targets and progress to date

For the steel sector, our target is to reduce financed emissions by 20% and by 92% by 2050. Our 2021 emissions intensity baseline was 1.77 tCO_2/tonne.

Steel sector financed emissions intensity baseline, targets and progress



In the steel sector, we have seen a year-on-year improvement of our emissions intensity between 2021 and 2022. Our financed emissions intensity is 10% below our reference pathway, MPP Tech Moratorium.

On average, emissions intensities improved for our clients in this sector. We attribute this to both a decrease in the reported emissions factors for BF-BOF and EAF steel-making processes as well as an increase in the share of production of EAF steel plants.

Our client-level data remains sparse in the sector given our exposure to smaller steel producers and traders in Southeast Asia, so our calculations are primarily based on proxy data. This data, taking into account global and regional averages across steel production and emissions, have shown decreases in emissions intensity which indicates a pivot towards more less energy-intensive steel production methods. Sources point to a significant increase of the use of EAF technology, with Global Energy Monitor indicating a 10% increase in shift to more efficient EAF technology[58].

In 2022, we extended financing to existing clients whose emissions intensities, on average, were lower than our baseline in 2021.

Moving forward, we expect our emissions intensity to continue to improve as technological advances in plant efficiency continue to scale and we continue to support our clients to adapt less energy-intensive EAF production methods.

58 Global Energy Monitor, *Pedal to the Metal 2023*, July 2023.

Tailwinds and headwinds

While global demand for steel may be dampened by macroeconomic and geopolitical conditions – particularly high inflation globally and high energy prices driven by the war in Ukraine[59], demand in Southeast Asia is expected to grow by about 4% annually through 2030. This derives from the region's continued urbanisation and economic growth, which in turn increases demand for buildings – construction alone accounts for about half of steel use.

Steel production is one of the world's most carbon-intensive industries[60]. The challenges of decarbonising the sector should not be understated, but at the same time, the potential benefits from success are substantial. We have identified three core levers that must be considered to bring down emissions from the sector:

1. **Lower-carbon steel production:** Reduction of carbon use through using the more efficient EAF production method;

2. **Increased energy efficiency:** Optimisation of materials used for production and switch to less carbon-intensive energy sources including renewable energy where possible; and

3. **Wider adoption of new technologies:** Deployment of technologies to capture emissions or increase productivity.

More than two-thirds of global steel production relies on BF-BOF, a process that generates 2.3 tCO_2 for every tonne of crude steel produced[61]. Most of the remaining production uses the more efficient EAF method, which cuts emissions to 0.6 to 1.4 tCO_2 for each tonne of crude steel produced[62]. Increasing the share of EAF-based steel production is essential towards decarbonising the steel sector, particularly if the sector can shift towards the scrap-based EAF method whenever possible. Wide adoption of scrap-based EAF is contingent on the availability of high-quality steel scrap materials, and the increased decarbonisation impact of EAF also depends on the availability of renewable energy sources.

Given the widespread use of the BF-BOF method today, about 75% of the steel sector's energy demand is met by coal[63]. Greater efficiency of BF-BOF production is an important decarbonisation lever as steel production in Southeast Asia will continue using this method in the near term. Optimising iron content and increasing the use of biomass for fuel are among the measures already available for reducing coal use in traditional steel production. Steel mills can also turn to renewable energy sources for a share of their electricity needs. In the longer term, hydrogen-based steel production is being tested in many markets, including a project expected to start in Thailand in 2027[64]. The process has been proven to reduce emissions to near zero, but development remains in the early stages.

Adopting innovative new technologies can also help the steel sector reduce its emissions. Innovative methods for CCUS, for example, can be incorporated into the design of new projects and retrofitted into existing ones. These technologies could cut carbon emissions by up to 85% by some estimates[65].

Decarbonisation of the steel sector faces many challenges. The IEA estimates that the average age of blast furnaces globally is about 13 years, roughly a third of their expected lifespan. If these furnaces remain status quo in their operations, they will be responsible for about 65 gigatonnes of GHG emissions for the remainder of their operating lifespan.

59,63,65 IEA, Iron and steel overview, accessed October 2023.
60 World Steel Association; IEA, *Iron and Steel Technology Roadmap*, October 2020; IEA, *Emissions Measurement and Data Collection for a Net Zero Steel Industry*, April 2023.
61,62 MPP, *Net-Zero Steel Sector Transition Strategy*, October 2021.
64 South East Asia Iron and Steel Institute (SEAISI), "Meranti launches Thai green steel project", 17 May 2023.

Our net zero targets and progress to date

Also, many of the technological advances remain costly and largely untested, creating another hurdle. According to McKinsey's estimates, unit production costs at sustainable steel plants could be about 30% higher than those at traditional plants because of capital expenses and increased operating costs[66]. This will be challenging for a sector already struggling under thin margins, and adoption will be sluggish. Regulatory encouragement and lower costs as technologies are further developed could spur greater momentum for the adoption of sustainable practices.

Banks can play a critical role in supporting the steel sector on its path to decarbonisation. To date, UOB has encouraged and supported the steel industry in adopting more scrap steel as feedstock, which is evidenced by our Sustainable Trade Finance (STF) facilities offering on scrap purchase. Beyond this, UOB has developed a granular sectoral plan to drive this agenda and support crude steel and fabricated metal producers and traders in adopting EAF production methods. We will also double down on supporting research and development into technologies to improve plant efficiency to make them more affordable to a wider range of companies in the sector. As part of this initiative, we have enhanced our sustainable finance offerings and developed additional sectoral plans for sectors such as power, on which there are substantial dependencies.

66 McKinsey & Company, "McKinsey Quarterly - Transition to Net Zero: Steel", 1 August 2022.

Supporting our customers

We are deeply committed to supporting our clients in decarbonising their businesses and capturing opportunities from the net zero transition. To do this, we ensure that we have a deep understanding of our clients' decarbonisation journeys, a comprehensive suite of sustainable finance products, including sector-specific solutions that serve end-to-end needs, and the ability to catalyse the transformation of ecosystems through advisory and solutions beyond banking.

Our sustainable finance offerings

We continue to develop and expand our suite of sustainable finance frameworks and solutions. As each sector faces unique challenges and opportunities, we have developed a set of sector-based frameworks, each with a defined list of green and/or social activities that can be financed using our sustainable financing products.

In addition to our three sustainable finance frameworks focused on green buildings, smart cities and the circular economy, we launched the UOB Sustainable Trade Finance Framework in 2021, and the UOB Transition Finance Framework in 2022 to support clients in hard-to-abate sectors.

Parallel to our internal efforts, various national green taxonomies are being developed across our key markets[67]. We are constantly reviewing and aligning our own sustainable and transition financing 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.

67
- The final Singapore green taxonomy is expected to be published by the end of 2023 after three rounds of consultation. Source: Monetary Authority of Singapore, *Green Finance Industry Taskforce: Cultivating Singapore's Sustainable Finance Ecosystem to Support Asia's Transition to Net-Zero*, June 2023.
- Hong Kong is developing a prototype of its own green taxonomy. Source: Hong Kong Monetary Authority, *Prototype of a Green Classification Framework for Hong Kong*, 30 May 2023.
- Bank of Thailand officially adopted a green taxonomy in June 2023. Source: Bank of Thailand, "Joint Press Release Publication of Thailand Taxonomy Phase I", 30 June 2023.
- Bank Negara Malaysia published an early version of a local green taxonomy in 2021. Source: Bank Negara Malaysia, "Climate Change and Principle-based Taxonomy", 30 April 2021.
- ASEAN Taxonomy for Sustainable Financing version 2 by the ASEAN Taxonomy Board was published/updated in June 2023.

Supporting our customers

Sustainable Finance Framework for Green Building Developers and Owners

Supports companies in developing, retro-fitting, operating green buildings and driving energy efficiency. Covers both green and sustainability-linked financing for global real estate financing across eight asset classes:

- Data Centres
- Hotels
- Industrial
- Restaurants
- Hospitals
- Residential
- Retail
- Offices

Smart City Sustainable Financing Framework

Supports companies contributing to the creation of sustainable and smart cities through the following:

- Renewable Energy
- Green Building Construction
- Energy Efficiency
- Climate Change Adaptation
- Water Management
- Waste Management
- Green Transport

Green Financing Framework for Circular Economy

Supports companies in the 3R (renew, reuse and reduce) businesses.

- Plastics Recycling
- Metals Recycling
- Electronics Recycling
- Product as a Service
- Circular Designs

Sustainable Trade Finance Framework

Supports the needs of companies for shorter term financing (<1 year) using a 'principles-based' approach.

- Pure-play green companies or green projects
- Companies with recognised, sustainable industry certifications

Transition Finance Framework

Supports the transition of energy-intensive, fossil fuels/brown sectors, and 'hard-to-abate' sectors.

- Oil, Gas & Chemicals
- Transportation and Logistics
- Fossil Fuels Power Generation
- Metals & Mining
- Carbon Capture and Storage (CCS)/Carbon Capture, Utilisation and Storage (CCUS)
- Carbon Credits/ Offsets

Green or social loans

Loans that are directed to an eligible project with clear environmental and/or social benefits.

Sustainability-linked loans

Loans that incentivise borrowers to achieve pre-agreed sustainability targets for key performance indicators (KPIs). Loans can be used for general corporate purposes.

Sustainable trade finance

Loans that support typical business applications that are carried out in a green or sustainable manner.

Transition finance

Products that support the transition of borrowers in energy-intensive and hard-to-abate sectors.

Green & Sustainable Liabilities Framework

Green and sustainable term deposits fund eligible assets* that allow deposits to create additional environmental and social impact.

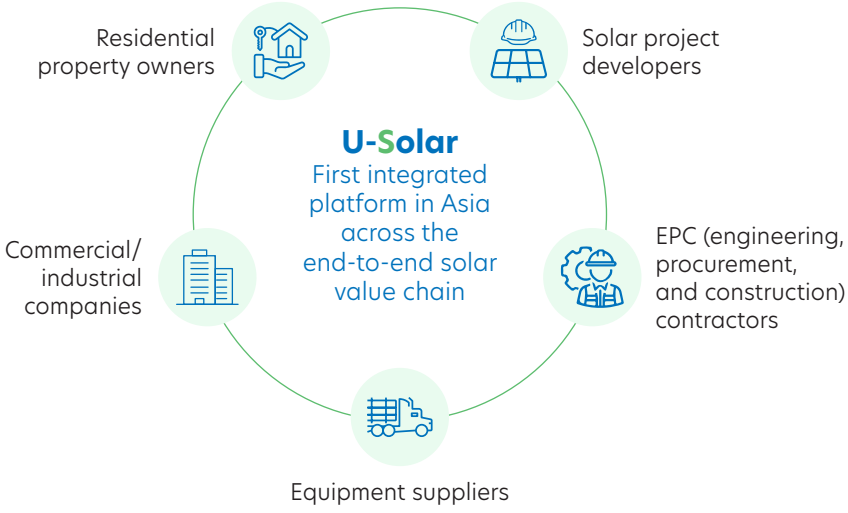
* Assets are aligned to UOB's Sustainable Finance Frameworks as well as the UOB Group Sustainability Bond Framework

Our ecosystem solutions

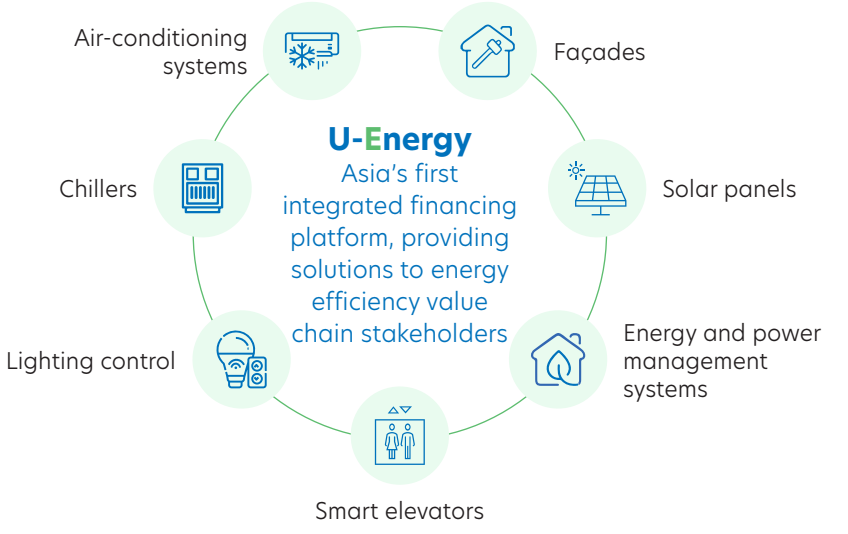
While our sustainable finance frameworks provide the umbrella structures for financing activities, our ecosystem solutions take an approach that is beyond banking to connect players across sectoral value chains. These solutions include:

- **U-Solar**, which targets the shift to solar energy within the power sector;
- **U-Energy**, which supports energy efficiency projects in the real estate sector; and
- **U-Drive**, which aims to drive the development and adoption of EVs in the automotive sector.

We continue to develop more of such solutions, with a fourth to go live in the coming months.

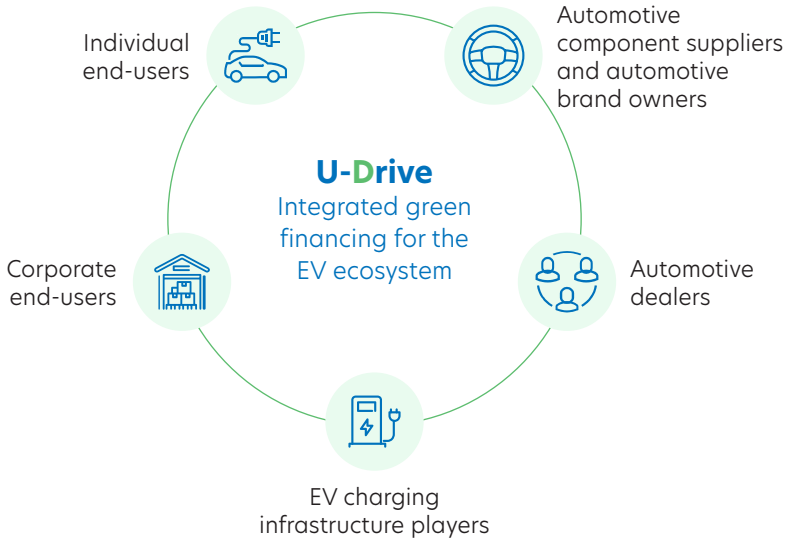


- Connects companies and individuals to UOB's solar partners to simplify the switch to solar
- Makes sustainable energy more accessible and affordable for all, with competitive financing packages
- Drives a multitude of benefits for end-users, e.g. a one-stop shop solar solution and up to 25% savings on electricity bills



- Promotes sustainability awareness to the general public
- Supports energy efficiency ecosystem players with end-to-end solutions on one platform
- Simplifies end-user energy efficiency project financing, including commercial and industrial assets as well as residential properties

Supporting our customers



- Supports the automotive electrification journey end to end
- Supports brands' penetration/expansion into local markets
- Increases market adoption of EVs

Samwoh is a Singapore-based engineering and construction company. Its ambition for a greener built environment sector led to the launch of its new headquarters, the Samwoh Smart Hub.

Unveiled in late 2022, the facility is Singapore's first positive-energy industrial building constructed using 100% recycled construction materials. Positive-energy buildings produce more power than they consume. The Samwoh Smart Hub relies on smart building management systems to minimise energy consumption, including the use of sensors to optimise temperature and humidity within the facility.

In addition, Samwoh Smart Hub's close to 2,600 solar panels generate enough energy to achieve a net energy surplus. The building's asphalt production plant is also 15% more energy-efficient than a conventional one. These measures contributed to Samwoh Smart Hub's Green Mark Platinum Positive Energy certification from the Singapore BCA.

UOB was integral in supporting the construction of the Samwoh Smart Hub, providing tailored solutions and expertise through the UOB Sustainable Finance Framework for Green Building Developers and Owners.

Supporting our customers

TML Energy is one of Indonesia's leading EPC companies for renewable energy. The company has been working with UOB as part of the U-Solar programme to help transition commercial and residential client projects to greener solutions.

As part of the programme, TML Energy constructed a rooftop solar power system for a beauty services SME in Indonesia. This project was entirely financed by UOB under the U-Solar programme.

There have been substantial benefits to the SME. With the installation of solar panels, the SME was able to save on both electricity consumption and associated bills, reducing repayment pressures and therefore able to focus more on running their business. Importantly, the SME can reduce its reliance on fossil fuel-based electricity by using solar energy, reaping the longer-term benefits of clean energy for business and the environment.

BYD is a China-based automotive manufacturer that was looking to enter the Thai market.

UOB stepped in to help BYD understand the local automotive market, introduce BYD to regional dealers with whom we had strong relationships with and set up a series of meetings between BYD and the dealers. The outcome of these meetings was a greatly expanded dealership network for BYD in Thailand.

At the same time, Rever Automotive, a Thai automotive distributor, was looking for a banking partner to provide green trade financing facilities for the import of BYD's EVs. Given UOB's connections to both parties as part of the U-Drive programme, we were able to drive an effective collaboration across the EV value chain end to end – from upstream manufacturer to downstream distributor.

Our support for SMEs

SMEs are the bedrock of the region's economies, accounting for 97% of all businesses in Southeast Asia and 67% of the working population[68]. However, they also need the most help in decarbonisation, often lacking the resources or capacity to calculate their GHG emissions and develop transition plans.

Findings from the *UOB Business Outlook Study 2023* showed that 88% 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[69]. More than a quarter of SMEs cited insufficient knowledge to identify and execute the right initiatives as a key barrier to the implementation of sustainable practices.

We seek to help our SME clients on their journeys, particularly as the standards and requirements for carbon accounting and climate reporting become increasingly stringent and mandatory. Besides one-on-one engagement with our clients through advisory services, we have rolled out several initiatives to support SMEs on a larger scale. These include:

- UOB Sustainability Compass, an online tool that provides SMEs with a customised report consisting of clear and actionable insights based on their sector, business maturity and the stage of their sustainability programme. The report also provides information on regulations and standards that affect their sector and recommends suitable sustainable financing solutions.

- The FinLab's Sustainability Innovation Programme, a two-week training programme to help SMEs become more sustainable. Supported by Enterprise Singapore, the programme covers a variety of sustainability topics such as energy efficiency, sustainable finance, renewable energy certificates, sustainable packaging, carbon management and sustainability reporting. More than 400 SMEs across Southeast Asia participated in 2022.

68 Asian Development Bank, "Realizing the Potential of Over 71 Million MSMEs in Southeast Asia", 14 March 2022.
69 UOB, *UOB Business Outlook Study 2023 (Regional): Unpacking sentiments across ASEAN and China*, 30 June 2023.

Tailored solutions and partnerships with our clients

Continued engagement with our clients throughout their transition is vital, and this primacy drives our focus on providing them with end-to-end support on climate action. Our efforts include helping clients assess their transition plans, track progress and contribute positive impact within their ecosystems.

Over the past year, we have been developing approaches to assess our clients' transition plans to ensure that they are robust, in line with best practices and standards, and remain appropriate within our regional context.

We also work closely with clients that have taken on sustainability-linked financing solutions to set performance targets tailored to their business, sector, market and the maturity of their transition. In addition, we are exploring tools to help our clients monitor and report their climate-related data.

Another key effort is our collaborations with key clients to support ecosystem decarbonisation across their value chains. Examples of the notable memoranda of understanding we have signed over the past year were with:

- JTC in Singapore in April 2023, to draw on combined sustainability capabilities to accelerate the adoption of green solutions among Singapore businesses. The partnership includes supporting businesses as they work toward achieving net zero through capacity-building workshops;

- Keppel Corporation in Singapore in May 2023, to jointly develop a comprehensive suite of sustainability and digitalisation solutions that promote decarbonisation and offer these to businesses. One example would be to bring together the UOB Sustainability Compass and financing solutions with Keppel's expertise in providing energy optimisation, sustainable asset enhancement, connectivity and digitalisation solutions;

- SGS in Hong Kong in May 2023, to promote sustainable finance and contribute to environmental protection and sustainable development. This includes providing companies with services such as professional sustainable finance certification, evaluation and accreditation, as well as green and sustainable financial solutions; and

- Sunway Group in Malaysia in July 2023, to work together to achieve net zero by 2050 through using shared expertise, resources and networks to implement sustainable financing solutions, infrastructure and technologies at various divisions across Sunway's ecosystem, including retail, hospitality, healthcare, property, construction and building materials.

Embedding net zero into our operating model

In 2023, we began a holistic programme of work to ensure that our operating model is fit to deliver on our net zero commitment, even as many of the foundations were already in place.

We conducted a comprehensive review that enabled us to develop a net zero operationalisation programme covering core aspects of our operating model across governance, risk management, business policies and processes, as well as capabilities and culture. We are uplifting our operating model across 10 components to be fit for purpose in driving our climate ambitions.

Key areas of focus of our net zero operationalisation programme

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

Learnings from our net zero operationalisation efforts

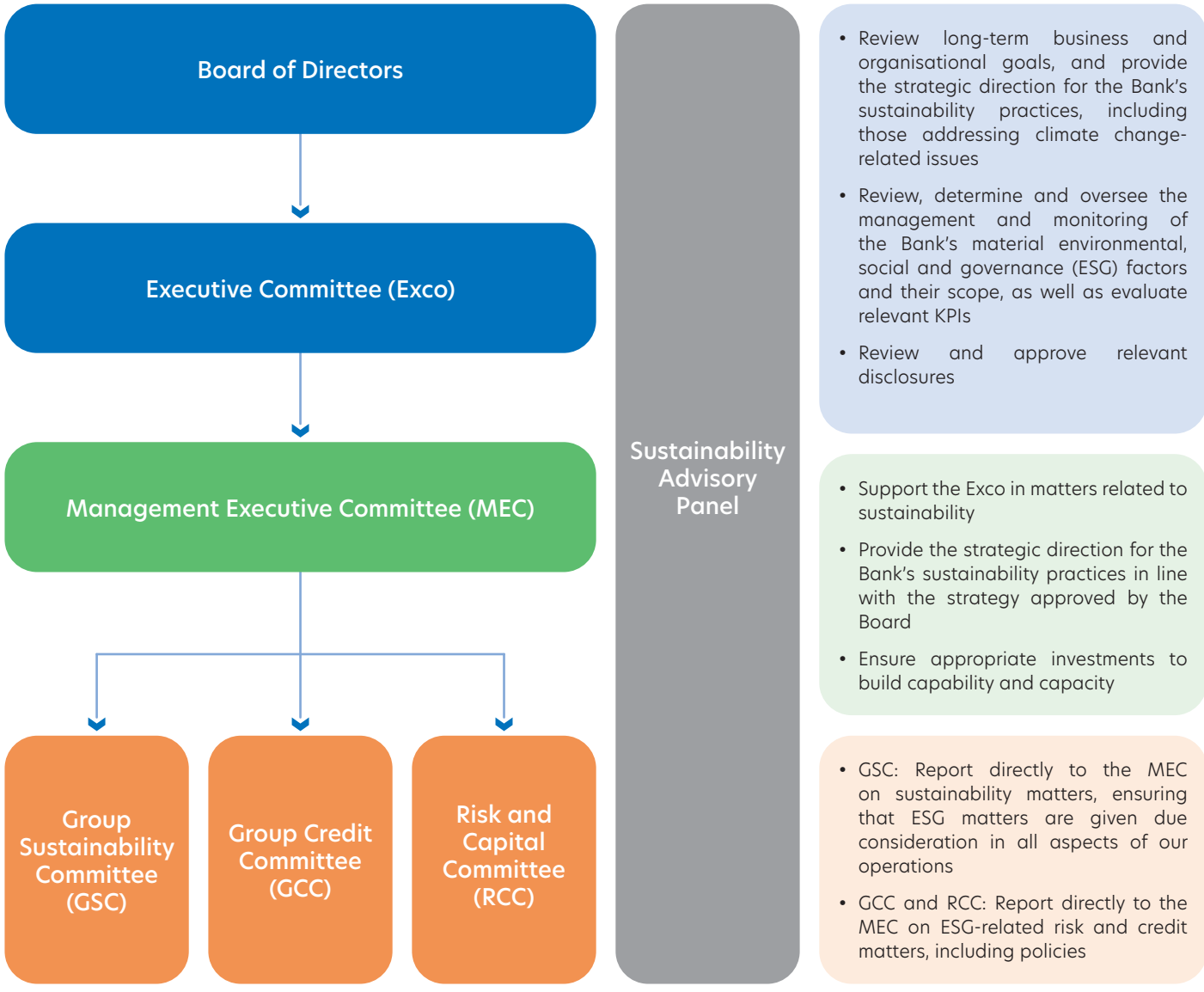
1. Transition requires a fundamental rewiring of the organisation – the impact of a decarbonisation commitment is far-reaching with Bank-wide effects across multiple functions and processes;
2. The starting point is to set the tone from the top – accountability must begin with the Board of Directors, CEO and the top management team and cascaded downwards;
3. Collaboration is key – participation and ownership need to come from all functions;
4. Every employee has a responsibility and a role to play – but this must be built on a common foundational understanding; and
5. Data and technology are critical enablers to the decarbonisation journey – tackle the challenge holistically.

Governance

As part of our commitment to sustainable growth, we embed net zero at every level, making it the responsibility of all key functions across UOB.

Governance model

We have put in place a robust governance framework for net zero, leveraging and aligning to the UOB Group Sustainability Framework, including the sustainability governance structure.



Similar structures have been set up within our banking subsidiaries to ensure that our sustainability strategy and objectives, including our net zero commitment, are effectively implemented in our key markets.

In October 2023, we also established a Sustainability Advisory Panel to provide external perspectives and independent advice to our Board and Management on various aspects of our sustainability strategy, targets and initiatives. The panel members are experts in the fields of climate science and sustainability in Southeast Asia, as well as the wider industrial economy, in particular energy transition, and were specifically selected to offer a broad set of perspectives from across the real economy.

Target operating model

As part of our operationalisation programme, we are reviewing and considering net zero-related enhancements into our existing governance forums. We will also establish new working groups specifically for areas including disclosure, ensuring that we have clearly-defined accountabilities and responsibilities in relation to net zero and climate-related activities across the Bank.

Disclosures and internal reporting

We continue to enhance our internal reporting and external disclosure capabilities, as we believe that quality monitoring and reporting provides transparency critical to ensuring that we have adequate early warning for any course correction that may be required.

Risk management and business policies and processes

Our environmental risk appetite and sector policies are important tools for steering our lending portfolio and ensuring that we are meeting our net zero commitment. These are supported with the appropriate escalation processes and clarity around roles and responsibilities of the first and second lines of defence.

Quantitative environmental risk appetite

ESG, including climate-related considerations, are included in our Risk Appetite Statement. We have bolstered our environmental risk appetite statement with a quantitative-related metric.

Sector policies

In operationalising our net zero commitment, we also conducted a review of relevant policies, including the UOB Group Responsible Financing Policy and sector policies, to ensure that we are adequately capturing our obligations related to decarbonisation.

Established in 2015, our Group Responsible Financing Policy adopts the Guidelines on Responsible Financing by The Association of Banks in Singapore (ABS) into our credit evaluation and approval processes. It applies to all borrowers of Group Wholesale Banking and the Bank's capital market underwriting activities. This policy is guided by our Group Environmental Risk Management Framework and is embedded within UOB 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 our net zero sectors, as well as other sectors sensitive to ESG issues. Risks covered are applicable throughout the financing life cycle.

ESG risk assessment and management

In 2022, we adopted the ABS' Environmental Risk Questionnaire to further strengthen our approach on climate risk assessment and engagement with corporate clients on the identification of environmental risks and sustainable financing opportunities.

We are working to further enhance this effort, for instance, by including an assessment of our clients' transition plans. While we continue to ensure that our policies are appropriate in the Southeast Asian context and that we support our clients through the transition, we will be seeking to assess more closely whether our clients' emissions profiles and transition plans are aligned with our commitment. Accordingly, we are developing an internal methodology to assess the quality of our clients' transition plans, taking into consideration the maturity of the sectors and markets in Southeast Asia.

Underwriting and deal approval process

As part of our net zero operationalisation programme, we have reviewed our loan approval processes, including a review of roles and responsibilities across our three lines of defence, to ensure that they support the alignment of our corporate loan portfolio to our net zero commitment.

Capabilities and culture

The operationalisation of our net zero commitment involves the transformation of not just our business models, governance and risk processes, but also changes in our people's behaviours and technology. This will require updates in our employee training and remuneration strategy, and improvements in our data and technology infrastructure.

Capability building plan

Strengthening our internal capabilities on ESG risk management remains a central focus. We continue to deliver the mandatory Sustainability 101 training that was completed by all employees in 2022, with all new employees projecting to complete the module in 2023.

All Board directors completed requisite training on sustainability, which included training on central topics around climate change issues and net zero. We are reviewing our capability needs across all business and support functions, and we will continue to deepen our competencies over the next year.

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 continue to refine how our net zero strategy is adequately embedded into our employees' renumeration.

Data and technology capabilities and architecture

Data and technology are critical enablers of our net zero programme. A successful execution requires enhancements of our end-to-end operating model, with similar holistic implications on technology and tooling. We are conducting an extensive assessment of the technology capabilities across all core processes relating to ESG to ensure that data is collected at the point of origination and flows through to disclosure.

Collaborating with a broader ecosystem

Our decarbonisation strategy cannot be achieved in isolation. Addressing climate change and working toward a net zero global economy requires urgent and coordinated action beyond what is already in place. Collaboration and collective efforts across sectors and borders will be vital if we are to use all the measures at hand to drive decarbonisation efforts in a fair and just manner across Southeast Asia.

Critical enablers to meeting net zero targets

Ensuring targets are credible	Driving net zero progress in the region
Availability of high quality GHG emissions data	Clear national and sectoral decarbonisation plans
Regional sectoral 1.5°C-aligned pathways from globally credible sources	Policies and incentives aligned to driving decarbonisation efforts
Alignment of methodologies to calculate credible transition pathways by sector	Common frameworks to assess client transition plans across sectors

Ensuring targets are credible

Our targets and net zero progress will reflect actual decarbonisation efforts only if the underlying data is accurate, the targets are realistic and achievable in the geographies we serve, and approaches are consistent across financial institutions.

Access to quality emissions data continues to be sparse and highly fragmented. The success of efforts such as Singapore's Project Greenprint, where the government aims to establish a common data utility, will be important in establishing a single source of credible data for emissions baselines. Similar efforts are also required in the rest of the region.

Setting realistic targets requires selection of regionally-relevant reference pathways. The pace of change and challenges will be different around the world, and even across Southeast Asia with its diverse economies. In emerging markets, the need to address both socioeconomic considerations and net zero ambitions is of greater urgency than in more developed areas. Just transition principles account for this by asserting that the transition must be orderly and equitable to ensure that the lives and livelihoods of individuals and communities can continue to improve.

As such, where possible, UOB has set targets using regional pathways that aim to represent the fair contributions of our key markets. For many sectors, however, credible regional pathways aligned with the 1.5°C goal are not yet available.

While there is a set of globally-recognised, established standard-setters, including PCAF, SBTi and GFANZ commitments are voluntary. We believe harmonising expectations and approaches to calculating financed emissions at a sectoral level will enable greater focus on achieving decarbonisation, rather than focusing on constructing bespoke target-setting methodologies.

Driving net zero progress in the region

A financial institution could achieve net zero on its portfolio without impacting real world emissions. At UOB, divestment solely for the purpose of managing emissions intensity is seen as stepping away from our responsibility. Instead, we focus on supporting our clients through the transition.

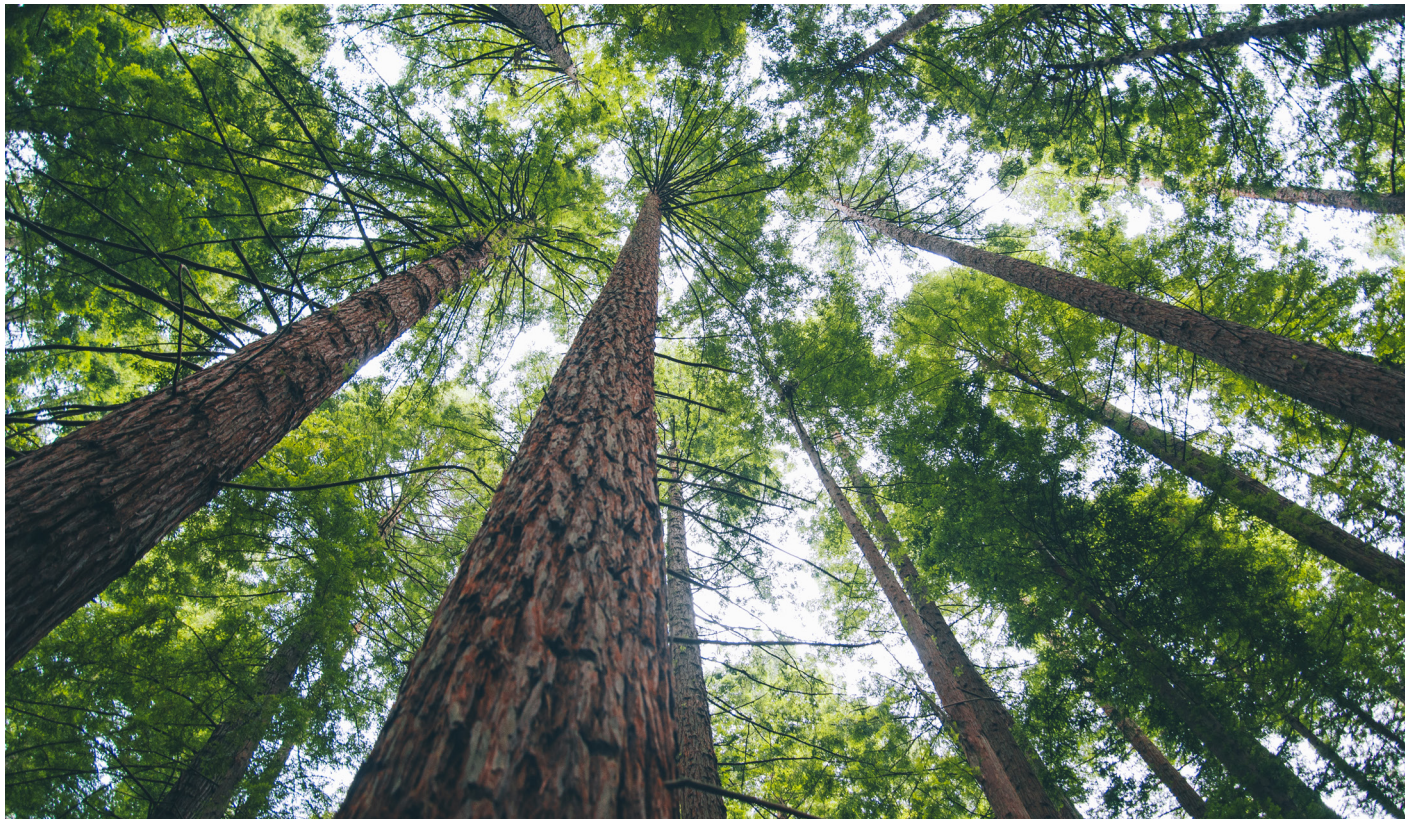
However, a single institution is not able to drive systemic change. Real and meaningful progress will require enablers that include national and sectoral decarbonisation plans, an aligned set of policies and incentives, as well as the harmonisation of methodologies and frameworks.

The establishment of sectoral decarbonisation plans and pathways at a country level is crucial for companies, especially SMEs with a lack of resources or capability, in setting their corporate net zero targets. Such pathways will also provide a roadmap for entire value chains that will align to changes and developments in individual markets.

A stronger alignment of policies and incentives linked to sectoral plans will also catalyse progress towards decarbonisation goals through support of the adoption of more sustainable business practices. We have observed some initial policy tailwinds that are already driving opportunities across sectors in the markets in which we operate, as well as some cross-cutting, enabling green policies. Policies supporting uptake of green finance, tax incentives supporting the growth of green sector companies and ecosystem development to drive innovation in green technology have been seen across all markets. Some markets have also implemented carbon tax policies to help drive reduction of carbon emissions. While nascent, these will be critical enablers to drive momentum across sectors.

Further guidance on what is considered a credible corporate transition plan in the country and sector context will enable companies to align their transition strategies to a benchmark backed by investors and financial institutions.

In aggregate, such measures have the potential to unlock transition finance at scale in supporting a just and effective transition towards net zero.



Collaborating with a broader ecosystem

Enabling green policies across markets

		Singapore	Malaysia	Indonesia	Thailand	Vietnam	China	Hong Kong
Overarching	Net zero target year	2050	2050	2060	2065	2050	2060 (carbon neutrality)	2050 (carbon neutrality)
	Carbon tax policies	✓ Launched in 2019 S$5/tCO$_2$e for first 5 years (up to 2023) Progressively rises thereafter to hit S$50-80/tCO$_2$e by 2030	Under consideration by Ministry of Finance No implementation date has been announced	✓ Planned to launch in mid-2022, however roll-out delayed due to adverse economic conditions Planned at US$2.1/ tCO$_2$e	✓ Planned to launch in 2024 Draft structure and details currently being developed by Thailand's Excise Department	Under consideration by Ministry of Natural Resources & Environment No implementation date has been announced	No explicit carbon tax policy in place	No explicit carbon tax policy in place
	Other green policies and schemes	✓ Sustainable Loan Grant Scheme (SLGS) supports businesses of all sizes in obtaining sustainable/ transition financing	✓ Green Technology Financing Scheme (GTFS 4.0), an RM1 billion fund to support six key sectors in driving green technological innovation	✓ Provide tax facilities (e.g. allowances, import duty exemptions, VAT reduction) to support development of renewable energy Issue green Islamic bonds (sukuk) to finance climate mitigation and adaptation projects	✓ Promote green sectors and industry actively, by offering a mix of tax- and non-tax-based incentives (e.g. exemption on corporate income tax or import duties, 100% foreign ownership allowed)	✓ Green sectors and industries eligible for tax incentives (e.g. reduced corporate tax, import duty exemption) "Draft Decision" released in 2022 also classifies eligibility of projects for green credit or green bonds	✓ *Green Bonds Endorsed Projects* Catalogue established in 2021, stipulating eligibility for green bonds Introduced carbon-emission reduction facility (CERF) in 2021, allowing banks to borrow at lower rates from PBOC for green loans	✓ Announced plan to establish HK as leader in green technology finance market in 2023 Set up HK$200 million Green Tech Fund to fund R&D of green technologies
	Energy *(Power, oil, gas and coal)* Renewable energy commitments	Solar energy deployment to minimum 2 GWp by 2030	31% share of renewables installed capacity by 2025, and 40% by 2035	34% share of renewables in power generation by 2030, and net zero emissions within the power sector by 2050	50% share of renewables in the power generation mix by 2037, and 74% by 2050	30-39% of power generation and around 75% of generation capacity from renewables by 2030	33% share of renewables for national power consumption, and a 50% increase in renewable energy generation	15% share of renewables in the fuel mix for power generation by 2050
	Phase-out plans	Phase-out of unabated coal power by 2050; 96% of power generation today is already from natural gas	7 GW of coal-fired capacity to be retired by 2033 Zero new coal projects (as of June 2021)	PLN (largest state power utility) stated target to phase out coal power plants by 2056	Focus is on shift towards renewable energy to reduce reliance on natural gas (~60% of Thailand's electric power generated from this), rather than coal	Coal phase-out planned for completion by 2050	Phase-out set to begin in 2026; however, additional coal power capacity continues to be built (52 GW approved in the first half of 2023)	Coal phase-out by 2035, retaining coal only as a back-up option
	Automotive EV targets and timelines	All new car and taxi registrations to be of cleaner energy models from 2030 and all vehicles to run on cleaner energy by 2040	38% share of EVs in all vehicles sold by 2040	Aims to produce 600,000 EVs by 2030 and 1,000,000 by 2035, and reduced import duties from 50% to zero for EV makers	30% of all vehicles made in Thailand to be electric by 2030	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	20% share of EVs in all vehicles sold by 2025	No new registration of fuel-propelled cars (including hybrid) after 2035 7,000 public EV charging facilities to be installed by 2025
	Built environment *(Real estate and Construction)*	Green Mark Certification Scheme, with ongoing enhancements and revisions 80% of all buildings to be green-certified by 2030	Voluntary local certifications available: GBI rating system for certification of green developments	Voluntary local certifications available: GB and BGH, with associated incentives from local town councils	Voluntary local certification available: TREEs, adapted from LEED for the Thai context	Voluntary local certification available: LOTUS, tailored to adapt to Vietnamese construction practices	Green Building Evaluation Standard, with ongoing enhancements and revisions	Voluntary local certification available: BEAM Plus and BEAM Plus for Existing Buildings; mandatory for all government and public sector developments to attain Gold or above
	Steel	Southeast Asia has typically accounted for a very small proportion of steel production globally (under 2% of globally produced tonnage in 2021)[70], hence the focus to date has been largely on expansion of capacity However, an influx of Chinese investment into the steel sector, particularly in Malaysia, Indonesia and Vietnam, is set to double production capacity in the region; further, only ~2% of this is set to be green EAF steel capacity[71] Given the dual challenges of over-capacity and increased emissions that this trend poses, it is to be expected that a tightening of policies will gradually take place in coming years					Energy efficiency guidelines issued in 2015 and revised on an ongoing basis; prioritises projects in the steel industry[72]	

✓ Implemented / in effect ✓ Planned/in development

Sources: Government policy documents: Singapore Green Plan 2030, Malaysia Renewable Energy Roadmap, Indonesia Just Energy Transition Partnership, Vietnam's National Electricity Development Plan/Power Development Plan 8, Thailand's Long-term Low GHG Emission Development Strategy, China's 14th Five-Year Plan on Renewable Energy Development 2021-2025, Hong Kong's Climate Action Plan 2050; IEA; Climate Action Tracker; OECD; World Bank; UNDP.

70 World Steel Association, Data and figures (calculated by looking at country-level data), April 2022.
71 SEAISI, *The ASEAN Steel Industry Development: Investment and Green Industry Challenges*, 30 March 2022.
72 IEA, Guideline for Energy Efficiency Credit (China), 17 May 2021.

Collaborating with a broader ecosystem

A whole ecosystem approach is needed to meet global net zero goals, and we have taken an active role to engage with our ecosystem partners at both a sectoral and national level.

UOB continues to deepen our collaboration with global and regional stakeholders by creating and expanding partnerships and ecosystems that support the just transition of the region and the real economy.

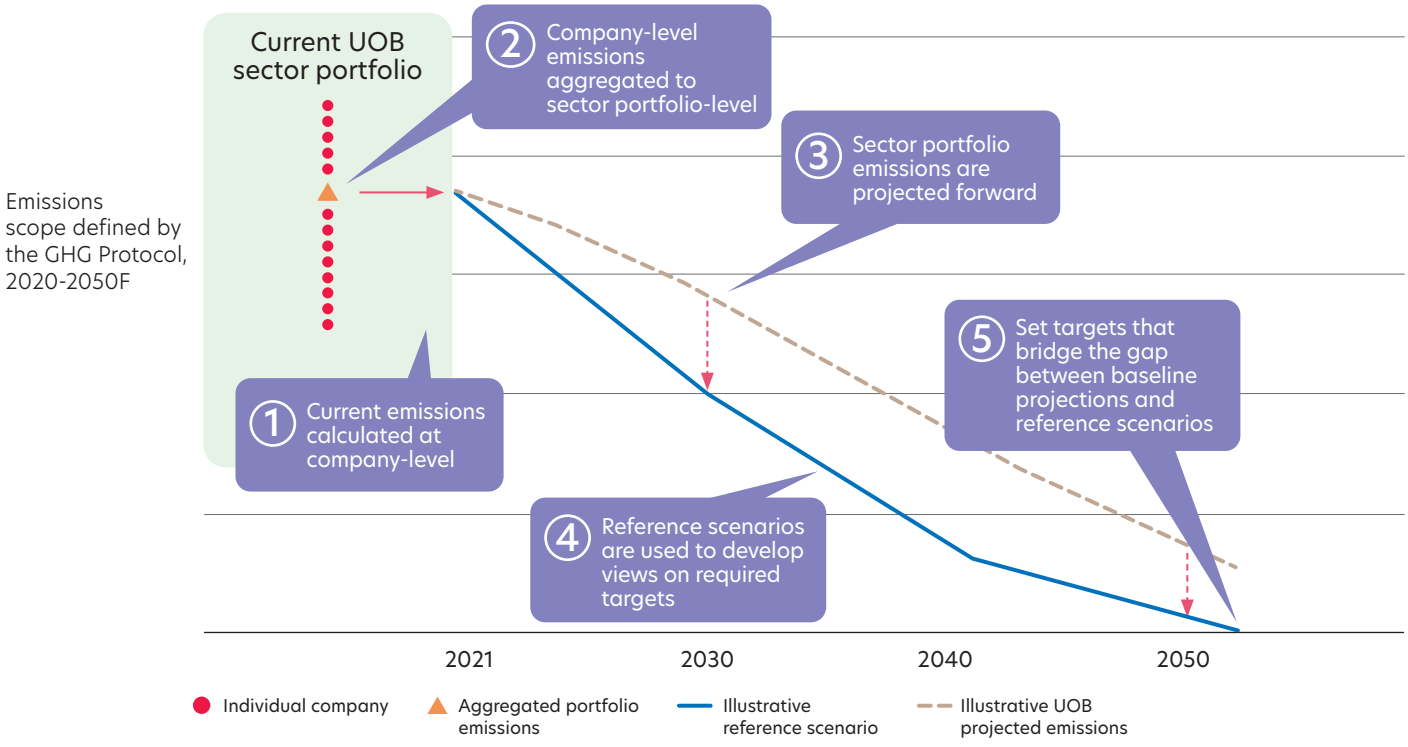
Key stakeholders	How we are engaging them	Examples of engagement
International alliances	Signatories to the NZBA, GFANZ and Equator Principles	Participate in the GFANZ Net Zero Public Policy workstream to help shape ambitious and credible public policies supporting an equitable and just transition
Governments and regulators	Engage frequently with regulatory bodies in the markets in which we operate to provide feedback and insights into topics such as climate risk, blended finance and sustainable finance taxonomy	Participate in the Monetary Authority of Singapore's Green Finance Industry Taskforce across initiatives, such as Risk Management Workstream, Green and Sustainable Trade Finance Solutions Working Group, Project Greenprint and Job Transformation Map, and will continue to strengthen our engagement with regulator via the soon-to-be-established Singapore Sustainable Finance Association Co-chair the SME Focus Group (SFG), a subgroup under the Joint Committee on Climate Change which was formed in 2019 to build climate resilience within the Malaysian financial sector. SFG's primary aim is to accelerate the transition and adoption of sustainable practices and business models by SMEs through a more targeted focus and strategy
Industry bodies and business/ trade associations	Collaborate extensively with industry bodies, businesses and trade associations to explore opportunities that drive the climate transition	Partner and participate in organisations and initiatives such as: • Asia Sustainable Finance Initiative • Asia Investor Group on Climate Change • Bank Negara Malaysia's (BNM) Joint Committee on Climate Change • BNM Climate Change Principle-Based Taxonomy Implementation Group • Association of Investment Management Companies (Thailand's) ESG Committee

Beyond the wider goal of driving a just transition within Southeast Asia, we also work with our various partners to explore opportunities to support our clients and their larger ecosystems in decarbonisation.

In addition, we participate in both global and regional thought leadership events, such as the United Nations Climate Change Conference (COP) meetings, Oxford Sustainable Finance Summit and the Singapore Fintech Festival, as well as engage regularly with local industry bodies and institutes of higher learning. In doing so, we share our insights into the role that financial institutions can play on the journey to net zero, and advocate for the need for ecosystem development and support, as well as the importance of a just transition in ASEAN.

Appendix A – 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.

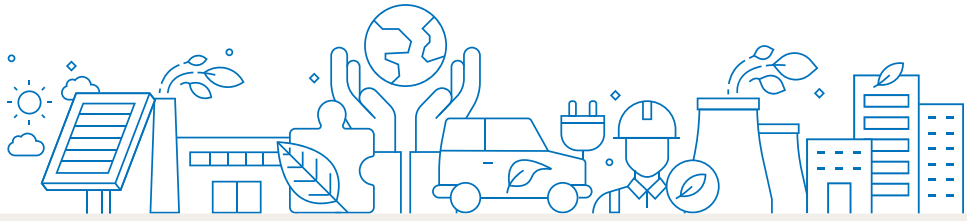
We used both PCAF and Paris Agreement Capital Transition Assessment (PACTA) approaches in our methodology for emissions calculations, tailored to specific portfolios and adjusted for data availability.

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.

Appendix A – 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. Note that in our 2021 report, we referenced 2020 data as the starting value for three reference pathways: automotive, power and steel. This has been updated to 2021 data in this report.

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)[73], 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.

73 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.

Appendix B – GFANZ-related disclosures overview

UOB became a member of GFANZ in 2022. GFANZ provides detailed recommendations and guidance around the consideration, implementation and reporting of net zero commitments. We have developed this progress report in alignment with its recommendations around disclosures.

Mapping of report contents to GFANZ requirements[74]

Area	GFANZ recommendations	Chapter reference	Section reference	Page reference
Foundations	Objectives and priorities	Introduction	Our net zero ambition	7
		Our net zero targets and progress to date	Overall strategy and approach	8
Implementation strategy	Products and services	Supporting our customers	Our sustainable financing solutions	36
			Our ecosystem solutions	38
			Our support for SMEs	41
	Activities and decision-making	Embedding net zero into our operating model	Governance	44
			Risk management and business policies and processes	45
	Policies and conditions	Embedding net zero into our operating model	Risk management and business policies and processes	45
Engagement strategy	Clients and portfolio companies	Supporting our customers	Supporting our customers	36
	Industry	Collaborating with a broader ecosystem	Collaborating with a broader ecosystem	47
	Government and public sector	Collaborating with a broader ecosystem	Collaborating with a broader ecosystem	50
Metrics and targets	Metrics and targets	Our net zero targets and progress to date	Overview of 2022 results	11
			Sector deep-dives (Power, Automotive, Oil & Gas and Coal, Real Estate, Construction, Steel)	13-35
		Appendix A	Target-setting methodology	51
Governance	Roles, responsibilities, and remuneration	Embedding net zero into our operating model	Governance	44
			Capabilities and culture	46
	Skills and culture	Embedding net zero into our operating model	Capabilities and culture	46

74 All GFANZ recommendations and optional disclosures are taken from the GFANZ report, *Financial Institution Net-zero Transition Plans: Fundamentals, Recommendations, and Guidance*, November 2022.

Glossary

Acronyms	Definition
ABS	The Association of Banks in Singapore
BCA	Singapore Building and Construction Authority
BEAM	Building Environmental Assessment Method
BF-BOF	Blast furnace-basic oxygen furnace
BGH	Bangunan Gedung Hijau (Green Building)
CCS	Carbon, capture and storage
CCUS	Carbon capture, utilisation and storage
CERF	Carbon-emission reduction facility
CFPPs	Coal-fired power plants
COP	Conference of the Parties to the United Nations Framework Convention on Climate Change
CRREM	Carbon Risk Real Estate Monitor
DRI-EAF	Direct reduction iron electric arc furnace
EPC	Engineering, procurement and construction
ESG	Environmental, social and governance
EV	Electric vehicle
GBI	Green Building Index
GHG	Greenhouse gas
GCC	Group Credit Committee
GFANZ	Glasgow Financial Alliance for Net Zero
GRESB	Global Real Estate Sustainability Benchmark
GSC	Group Sustainability Committee
GTFS	Green Technology Financing Scheme
IAM	Integrated Assessment Model
ICE	Internal combustion engine
IEA NZE	International Energy Agency Net Zero Emissions
IPCC	Intergovernmental Panel on Climate Change
IRENA	International Renewable Energy Agency
JETP	Just Energy Transition Partnership
KPIs	Key Performance Indicators
LEED	Leadership in Energy and Environmental Design
LOTUS	A set of voluntary green building rating systems developed by Vietnam Green Building Council (VGBC)
MAS	Monetary Authority of Singapore
MEC	Management Executive Committee
MPP	Mission Possible Partnership
NGFS REMIND	Network for Greening the Financial System Regional Model of Investment and Development
NGFS GCAM	Network for Greening the Financial System Global Change Assessment Model
NZBA	Net Zero Banking Alliance
PACTA	Paris Agreement Capital Transition Assessment
PCAF	Partnership for Carbon Accounting Financials
RCC	Risk and Capital Committee
SBTi	Science Based Targets Initiative
SFG	SME Focus Group
SLGS	Sustainable Loan Grant Scheme
SME	Small- and medium-sized enterprise
SMR	Steam Methane Reforming
STF	Sustainable Trade Finance
TREES	Thailand's Rating of Energy and Environmental Sustainability
VAT	Value-added tax
WorldGBC	World Green Building Council

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