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**MOST**  
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STARHUB

StarHub Ltd  
Climate Transition Plan  
July 2023

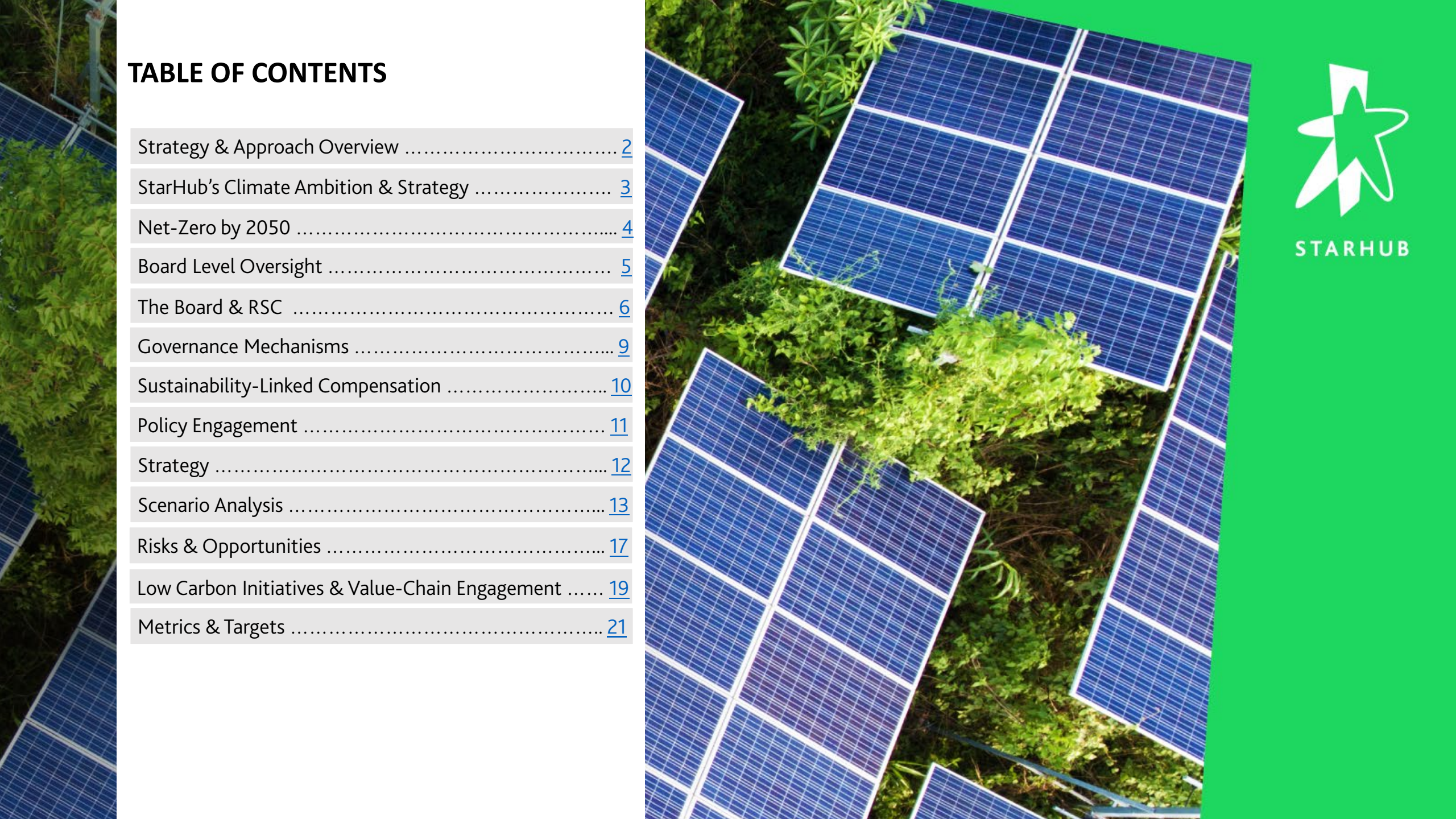




STARHUB

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# Foreword

## About this Report

This Climate Transition Plan, in combination with our Decarbonisation Roadmap and Action Plan, is designed to guide StarHub towards a sustainable and resilient future. The Paris Agreement stands as a testament to the collective global commitment to combatting climate change – limiting global warming to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C. StarHub is a signatory to the Corporate Knight's COP27 Action Declaration on Climate Policy Engagement to align our climate policy engagements with the Paris Agreement. StarHub believes in creating a better world enabled by digital solutions, while also playing our part for our planet and its people.

Our goal of achieving net zero by 2050 signifies our commitment to eliminate greenhouse gas emissions from our operations and value chains. The urgency of addressing climate change cannot be overstated. The consequences of inaction affect not only our company, but also our stakeholders. In developing our Climate Transition Plan, we have outlined a comprehensive roadmap towards decarbonisation, including strategies to minimise our environmental impact through optimising energy consumption, reducing GHG emissions, using eco-friendly materials, minimising waste as well as raising the environmental awareness of our customers, partners and stakeholders. With a key focus on innovation, we are also helping our customers decarbonise their operations through Green Tech solutions. Our newly-revised Environmental Policy further describes our focus areas with regard to energy, climate change, resources, water, waste, biodiversity and the natural ecosystem.

## Scope and Boundary

This report covers StarHub Ltd and our subsidiaries ("StarHub Group"). Operational control is used as the basis for determining data consolidation boundaries across multiple entities.

## Reporting Framework

This report adheres to the CDP Technical Note: Reporting on Climate Transition Plans guidance. StarHub will continue to report in line with the recommendations of the Taskforce on Climate-related Financial Disclosures (TCFD) and participate in the annual CDP disclosure process.

## Feedback

We appreciate your comments and feedback on our Climate Transition Plan to help us progress further on our sustainability journey. Please contact us at: [sustainability@starhub.com](mailto:sustainability@starhub.com).





# Strategy & Approach Overview

Our Climate Transition Plan outlines StarHub's transformative journey towards a sustainable future.



Climate change is a key area of concern that the world is facing today. Although the collective response is accelerating, it is not yet sufficient to keep the average global temperature increase to less than 1.5°C above pre-industrial levels.

Our Climate Transition Plan represents a comprehensive and strategic approach to mitigate climate change. Decarbonising our operations is a critical part of our sustainability strategy. The Board fully supports StarHub's ambition to reduce, by 2030, our Scope 1 and 2 emissions by 50%, and Scope 3 emissions by 25% from the 2021 baseline, and to reach net-zero by 2050.

## StarHub's Sustainability Framework

StarHub's Climate Transition Plan focuses on one of StarHub's four sustainability framework pillars, **Driving Sustainable Growth**. This pillar is part of StarHub's overall sustainability strategy and includes the three key climate-related areas:

- Energy and Climate Change
- Circularity
- Green Tech Solutions

## Four Key Decarbonisation Approaches

We are in the process of refining our decarbonisation roadmap with clear milestones to achieve our targets. The roadmap will take into account the results from the scenario analyses we have conducted as part of our TCFD reporting. Our decarbonisation and climate change management strategies consist of the following four key approaches:

- Energy optimisation and decarbonisation of operations
- Green products and services
- Climate resilient network
- Sustainable financing

For additional details regarding StarHub's Sustainability Framework pillars please refer to [StarHub Sustainability Report 2022 \(SR2022\)](#).



# StarHub's Climate Ambition & Strategy

Aligned with our support for the Paris Agreement, StarHub has taken a leap to substantively strengthen our decarbonisation commitments in 2022. We have committed to set near- and long-term company-wide emission reductions targets in line with science-based Net-Zero Standard with the Science Based Target initiative (SBTi). We have also made our maiden purchase of carbon credits to achieve carbon neutrality for our corporate office and four main retail shops.

## Greenhouse Gas (GHG) Emissions & Energy Achievements in 2022:

- + Achieved 8.0%\* reduction in Scope 1 and 2 GHG emissions from 2021, putting us on track for our 2030 target
- + Achieved interim target of 12%\* energy use from renewable sources
- + Achieved target of monthly average Power Usage Effectiveness (PUE) ratio of 1.70 for our data centres
- + Achieved carbon neutrality for our corporate office and four main retail shops

\* Emissions reduction values differs from figures disclosed in SR2022 as the full data inclusive of all subsidiaries under StarHub's operational control were not available at the time of the report publication in March 2023.

## Key Climate Targets for FY2023 and beyond

Reach net-zero by 2050

Reduce 50% in Scope 1 and 2 GHG emissions by 2030 (against 2021 baseline)

Reduce 25% in Scope 3 GHG emissions by 2030 (against 2021 baseline)

Increase energy use from renewable sources to 30% by 2030

Achieve Green Mark certification for our data centres –  
RCG by 2024, NC CO1 by 2025 and SG CO2 by 2026

Maintain carbon neutrality for our corporate office and four main retail shops in 2023



# Net-Zero by 2050

At the forefront of sustainability practices, StarHub is committed to achieving **net-zero emissions by 2050**. We are currently in the process of receiving SBTi validation over the near- and long-term target. Recognising the evolving nature of the climate crisis, we understand the importance of regular reassessment and adaptation. StarHub will revisit and adjust these targets every five years, ensuring that our actions remain aligned with the latest regulations and global efforts to combat climate change.

## Board-Approved Targets

Near-term	Scope 1 & 2: 50% emissions reduction from 2021 baseline (ahead of SBT (42%) and aligned with StarHub and Temasek public targets)	Scope 3: 25% emissions reduction from 2021 baseline	
Long-term	Scope 1, 2 and 3: net-zero 2050: 90% reduction from 2021 baseline		
Key Decarbonisation Aspects	<p style="text-align: center;"><b>Scope 1</b></p> <ul style="list-style-type: none"> <li>• Switch to renewable fuels</li> <li>• Transition to hybrid and/or electric vehicles (EV)</li> <li>• Transition to low GWP refrigerants</li> </ul>	<p style="text-align: center;"><b>Scope 2</b></p> <ul style="list-style-type: none"> <li>• Decommission legacy network and systems</li> <li>• Improve operational energy efficiency</li> <li>• Increase share of low-carbon&amp; renewable energy</li> </ul>	<p style="text-align: center;"><b>Scope 3</b></p> <ul style="list-style-type: none"> <li>• Engage suppliers and customers on emissions reporting and decarb targets</li> <li>• Refine procurement and investment policy</li> <li>• Engage investees on decarb strategies</li> </ul>

We are delighted to be named the World’s Most Sustainable Telco and one of the top 100 sustainable companies in the world in the 2023 Corporate Knights Global 100 ranking. On the back of this recognition, we will intensify our decarbonisation efforts and commit to a new Scope 3 reduction target aligned with a science-based approach, and to achieve net-zero by 2050. Achieving the Scope 3 reduction targets will require close cooperation with our suppliers and vendors. It is also a key imperative for us to step up our efforts to partner, empower and enable our customers to adopt more responsible green practices with our suite of innovative Green Tech solutions. The Board of Directors continue to oversee StarHub’s overall sustainability efforts, including determination of material ESG factors and integration of the material sustainability issues into the Group’s overall strategy. The Board has renewed its commitment to sustainability with an updated Risk and Sustainability Committee (“RSC”) Terms of Reference, which describes the RSC’s purpose, functions and responsibilities, amongst others. The RSC is supported by the Management in its efforts to manage and monitor the material ESG issues to StarHub as well as to implement the integration of our sustainability strategy into StarHub’s operations.



# Board Level Oversight

## Board level oversight of climate-related issues

**The Board and the Risk & Sustainability Committee (RSC) are responsible for climate-related issues.** The Board provides the oversight with support primarily from the RSC for climate-related issues such as decarbonisation roadmap, target settings and performance tracking, scenario analysis and TCFD reporting, ESG material issues, public policy engagement and external verification. The Audit Committee (AC), the Executive Remuneration and Compensation Committee (ERCC), and the Nominating and Governance Committee (NGC) support in areas such as internal audit, sustainability-linked compensation framework and governance framework. The RSC reviews StarHub's sustainability and climate management matters reported by the Management Risk Committee (MRC) via at least three scheduled RSC meetings yearly, with additional ad-hoc meetings and periodic email updates. Additionally, the RSC monitors the decarbonisation roadmap to ensure the action plans are suitable, adequate and effective. Board level guidance and communications with our Chief Executive Officer (CEO), Chief Corporate & Sustainability Officer (CCSO), Chief Financial Officer (CFO) and Chief Technology Officer (CTO) on decarbonisation plans, goals and progress also take place whenever required.

Sustainability-related topics such as our TCFD compliance and decarbonisation roadmap as well as the sustainability-linked financing framework are deliberated by the Board. The Board continues to oversee the overall sustainability strategy in alignment with Management's planning and execution of the same. This includes the integration of material sustainability issues as part of StarHub Group's overall strategy, as well as monitoring and management of our ESG risks and impacts.

The Board fully supports StarHub's ambition and approved the following targets included within this transition plan:

- Reduce Scope 1 & 2 by 50%, and Scope 3 by 25% from 2021 baseline, by 2030; and
- Reach net zero by 2050

## StarHub's governance process to achieve decarbonisation



StarHub has engaged with external consultants to develop a comprehensive decarbonisation plan. StarHub is fully committed to achieving the milestones outlined in this plan. The next steps in our journey to decarbonisation is quantifying all climate-related risks and opportunities and aligning our financial planning with the decarbonisation plan.



# The Board & RSC

## Board Diversity and Climate-Specific Skills

The Board consists of Directors who are business leaders and professionals of high calibre and integrity, with a broad range of core competencies and experience in enterprise and banking, accounting and finance, investment, risk management, legal, regulatory, technology, cybersecurity, business and industry knowledge, management and strategic planning experience, sustainability as well as customer-based experience and knowledge. Collectively, the Board constantly seeks to identify areas of focus and maintain an optimal mix of expertise, experience (both local, regional and international), knowledge and diversity of gender, age, background, geography and ethnicity. In this regard, the Nominating and Governance Committee (NGC) has developed a skills matrix as one criterion for Director appointments, which is reviewed by the Board on an annual basis. The skills matrix covers areas of expertise considered to be optimal for the Board given the evolving business landscape in which the Group operates. The current composition of the Board reflects StarHub's firm belief that a well-balanced, diverse and inclusive Board will contribute positively in overseeing the delivery of the Group's strategy, bringing fresh perspectives and providing constructive challenges to Management.

To ensure the Board RSC is qualified to oversee climate-related issues, StarHub assesses board competency based on previous work experience in GHG management, decarbonisation, and scenario planning. Within our Board, we have four Board members (corresponding to 36% of current total Board member strength) with deep understanding of macro sustainability and ESG trends (including ethical supply chains, fair employment practices and, age and gender diversity) and experience integrating sustainability into broader business practices and corporate strategy.

### The Board

- Reviews and considers sustainability and climate-related issues as part of its strategic formulation, performance objective and target-setting, including StarHub's existing sustainability performance in managing its impacts and exposure to ESG risks (such as climate risks and opportunities)
- Reviews and approves StarHub's material topics and sustainability report

### The Board RSC

- Comprises members of the Board and the CEO who are tasked with specific oversight of the Group's sustainability and climate-related matters
- Oversees and reviews the management of the Group's impact on the economy, environment and people through identification, assessment and monitoring of material sustainability topics, risks and opportunities
- Reviews the development and implementation of our sustainability framework, commitments, strategies, targets, opportunities, initiatives and policies, and recommends necessary updates

### MRC

- Comprises cross-functional members of the Senior Leadership Team (SLT), with the sustainability agenda headed by the CCSO
- Assists the Board RSC in developing management policies, strategies and frameworks for monitoring and mitigating our impacts as well as climate-related risks and opportunities
- Identifies new initiatives and establishes priorities and targets for the short, medium and long term, based on input from working level staff and stakeholder feedback
- Reports performance against goals and targets to the Board RSC

### Sustainability Advocate

- Working level committee responsible for developing, implementing and coordinating programmes and initiatives with the support of cross-functional representatives



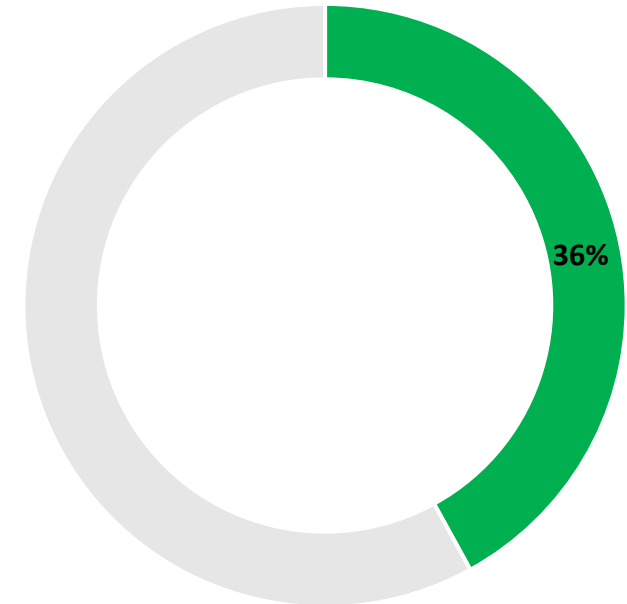


# The Board & RSC

## Board of Directors

Olivier Lim	Independent Non-Executive Chairman	Nominating and Governance Committee Chairperson
Nikhil Eapen	Chief Executive and Executive Director	Risk and Sustainability Committee
Paul Ma	Independent Director	Audit Committee Chairperson, Risk and Sustainability Committee
<b>Nayantara Bali</b>	<b>Independent Director</b>	<b>Risk and Sustainability Committee Chairperson</b>
Michelle Guthrie	Independent Director	Executive Resource and Compensation Committee Chairperson
Ng Shin Ein	Independent Director	Audit Committee
Lionel Yeo	Independent Director	Nominating and Governance Committee, Executive Resource and Compensation Committee
Teo Ek Tor	Non-Executive Director	Audit Committee
Stephen Miller	Non-Executive Director	Nominating and Governance Committee, Executive Resource and Compensation Committee
Naoki Wakai	Non-Executive Director	
Ahmad Al- Neama	Non-Executive Director	

Board Members with Sustainability-Related Skills





# The Board & RSC

## Board diversity and climate-specific skills

The Board recognises that ongoing professional development is important for the Directors to serve effectively and contribute to the Board. The Directors are encouraged to continually develop and refresh their professional knowledge and skills, and to keep themselves abreast of relevant developments in the Group's business, and the regulatory and industry-specific environments in which the Group operates. To this end, internal briefings as well as external seminars are arranged for the Directors. In addition, the Company Secretaries and members of Management also provide regular updates to the Directors during Board meetings, as well as through emails and the Board Portal, on key industry, technology, legal, regulatory, accounting and sustainability updates which affect the Group. These include updates from the management of subsidiaries such as Ensign, Strateq Group and JOS Group.

In FY2022, the Directors attended various sustainability-related professional development programmes. All Directors have completed the mandatory sustainability training as required by the enhanced SGX-ST sustainability reporting rules. In this regard, Directors each attended one of the following approved courses:

- + Sustainability Education Online Programme (by Cambridge and Earth-on-Board)
- + Environmental, Social and Governance Essentials (by Singapore Institute of Directors)
- + Sustainability In-Person Director Programme (by Cambridge and Earth-on-Board)

In addition to the mandatory training, some Directors also attended other sustainability-related courses such as the Climate Implications for the Board seminar by Climate Governance Singapore.

## Process and Criteria for New Board Appointment and Re-election

In proposing candidates for appointment or re-election as Directors, the NGC considers several factors, including (a) the composition, the diversity and the need for progressive renewal of the Board, (b) each candidate's competencies, commitment, contribution and performance (including attendance, preparedness, participation and candour) and (c) potential conflicts of interest.

This ensures that the Board composition reflects an appropriate mix having regard to skills, experience, expertise, diversity and independence, which enables the Board to stay engaged and agile in meeting the needs of the Group. External consultants can be engaged to assist with the selection process if necessary. All new appointments to the Board are also subject to the approval of StarHub's industry regulator, the Infocomm Media Development Authority (MDA) of Singapore.



# Governance Mechanisms

## StarHub's mechanisms for stakeholder feedback

StarHub regularly engages with our key stakeholders through both formal and informal channels. Key stakeholders have been identified based on their potential impact on our business as well as the potential impact of our business activities, products and services on them. Ongoing communication with our stakeholders is essential to allowing us to identify and address their concerns, in addition to obtaining their feedback on our sustainability measures and performance.

We have a two-year materiality assessment cycle and during that period of time, we carry out extensive engagement with our employees, key customers and suppliers, regulators, investors, as well as NGOs and media representatives via survey, dialogues and other means. We seek their input on our material topics and targets, which include our GHG targets and decarbonisation strategies and approaches. Our next materiality assessment will take place in 2024, and this transition plan will be a key focus.

On an on-going basis, we solicit comments and views from all stakeholders during meetings, townhalls, seminars and conferences. As we communicate our strategies and targets, we also seek out to understand their concerns and expectations on our sustainability performance, so that we can take these feedback into account as we continually fine tune our transition plan. We also have a dedicated email - [sustainability@starhub.com](mailto:sustainability@starhub.com), for the general public who may wish to give their feedback on our sustainability performance.

In our decarbonisation strategy for 2023-2030, StarHub has committed to:



Ongoing engagement and encouragement of suppliers to report their emissions footprint and set decarbonisation targets, through frequent touchpoints and channels



Engage key suppliers and customers on decarbonisation strategies and roadmaps

StarHub's sustainability report details the stakeholder groups, engagement methods and frequency, ESG issues or impacts raised, as well as StarHub's responses. For additional context on StarHub's stakeholder engagement, please see [StarHub Sustainability Report 2022](#) (SR2022).





# Sustainability-linked Compensation

## Sustainability-linked Compensation

StarHub understands the importance of incentivising senior leadership to prioritise climate-related issues and strategies. As a result, StarHub links achievement in climate-related areas, including the development of the decarbonisation plan to relevant senior management and executives' compensation. Climate-related incentives are in line with our sustainability commitments, decarbonisation and climate change management strategies (including GHG targets) published in our Sustainability Report. StarHub's short term incentive plan includes monetary rewards (bonus, promotion and salary increase) as well as the non-monetary reward including public recognition for achieving climate-related goals. Incentives or rewards are dependent on the performance or achievement of the relevant targets or implementation of those targets. On a wider basis, the Board Executive Resource and Compensation Committee (ERCC) is reviewing and working with management to put in place sustainability-linked remuneration.

Chief Executive Officer (CEO)	Chief Corporate Sustainability Officer (CCSO)	Sustainability Manager	Facilities & Process Operation Manager
<ul style="list-style-type: none"> <li>• Board approval of Climate Transition Plan &amp; Achievement of Climate Transition Plan KPI</li> <li>• Progress towards and achievement of climate-related targets</li> </ul>	<ul style="list-style-type: none"> <li>• Board approval of Climate Transition Plan &amp; Achievement of Climate Transition Plan KPI</li> <li>• Progress towards and achievement of climate-related targets</li> <li>• Company performance against a climate-related sustainability index</li> <li>• Implementation of employee awareness campaign or training program on climate-related issues</li> </ul>	<ul style="list-style-type: none"> <li>• Achievement of Climate Transition Plan KPI</li> <li>• Progress towards and achievement of climate-related targets</li> <li>• Company performance against a climate-related sustainability index</li> <li>• Implementation of employee awareness campaign or training program on climate-related issues</li> </ul>	<ul style="list-style-type: none"> <li>• Achievement of Climate Transition Plan KPI</li> <li>• Progress towards and achievement of climate-related targets</li> <li>• Reduction in absolute emissions and total energy consumption</li> <li>• Implementation of an emissions reduction initiative</li> <li>• Energy efficiency improvement</li> <li>• Increased share of renewable energy in total energy consumption</li> </ul>



# Policy Engagement



## StarHub's Partnerships

- Launched StarHub's Green Tech solutions to help enterprise customers achieve sustainability outcomes through customised solutions
- Rolled out Singapore's first 100% solar-powered outdoor campus WiFi over StarHub 5G in partnership with the National University of Singapore (NUS)
- Worked with Hydroinformatics Institute (H2i), a water technology scale-up, to utilize StarHub's ubiquitous network of mobile base stations as "opportunistic" rainfall sensors in a Public Utilities Board (PUB) pilot project to develop a cost-effective rainfall monitoring system, enabling better management of storm water and flash flood

## Our industry and trade associations memberships and climate policy engagement

StarHub regularly engages with the Singapore Exchange (SGX) on climate related policies and consultations, such as the introduction of SGX Core ESG metrics and internal review, and the development of REC guidance paper.

In November 2022, in conjunction with the Sharm el-Sheikh Climate Change Conference (COP27), StarHub became a signatory of the Action Declaration on Climate Policy Engagement\*, an initiative by Corporate Knights and the Global 100 Council. We commit to support alignment with the Paris Agreement when engaging with policymakers, industry and trade associations.

StarHub is also an active member of the Global Compact Network Singapore (GCNS), the local chapter of the United Nations Global Compact (UNGC). Our CCSO serves as the Honorary Treasurer of the Management Committee since 2021. We support the Carbon Pricing Leadership Coalition (CPLC), jointly launched by GCNS and the World Bank's CPLC, and participate in the LowCarbonSG, a capability-building programme for local businesses to start measuring and monitoring their carbon footprints.

StarHub is also one of the founding member of the National Sustainable Procurement Roundtable (NSPR), established in 2019. The NSPR is a nationwide movement to promote sustainable procurement, with the objective of building an innovative and sustainable supply chain that efficiently meets sustainability objectives.

\* For more information about Action Declaration on Climate Policy Engagement, refer to <https://www.corporateknights.com/action-declaration/>

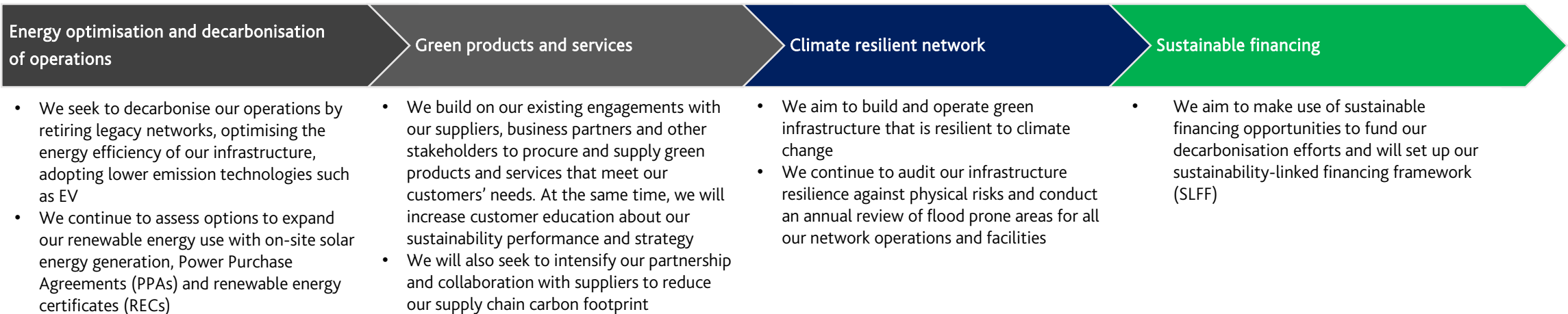


# Strategy

## Driving Sustainable Growth

Decarbonising our operations is a critical part of our sustainability strategy. We recognise that we have a responsibility to minimise the carbon footprint of our operations. Key milestones were achieved in FY2022 with our inaugural quantitative climate change scenario analysis and our new decarbonisation goals. We have also completed the review of our Scope 3 inventories and the assessment of all Scope 1, 2 and 3 baseline emissions for FY2021. Based on the assessment, we concluded that our Scope 3 emissions contribute around 79% of our total carbon footprint. We went on to establish business-as-usual (BAU) emission projections and identified decarbonisation levers that will enable us to prioritise actions required to meet near- and long-term targets, and align with a 1.5° C world. Following the review, we have set new and ambitious decarbonisation targets, which now becomes a critical part of our business strategy.

### StarHub's approaches to decarbonisation:







# Scenario Analysis

StarHub engaged an external consultant to perform our first climate change scenario analysis to identify:

1. The cost of climate inaction for StarHub if no additional mitigation and adaptation measures are taken to offset the climate-related risk impacts.
2. The dominant climate-related risks for StarHub that should be prioritised for action.

Parameters	Scope	Remarks
<b>Climate Scenario</b>	<ul style="list-style-type: none"> <li>• 1.5°C warming<sup>1</sup></li> <li>• 2.1-3°C (&lt;3°C)</li> <li>• warming<sup>2</sup></li> </ul>	1.5°C warming scenario is aligned with global goals to limit temperature rise (i.e., Paris Agreement), and corresponds to a more stringent low-carbon transition scenario. A higher temperature scenario assesses the effects of higher physical risks to StarHub.
<b>Timeframe</b>	<ul style="list-style-type: none"> <li>• Short-term: 2025</li> <li>• Medium-term: 2030</li> <li>• Long-term: 2050</li> </ul>	<p>For medium and long-term timeframes, year 2030 and year 2050 timeframes are aligned with Singapore’s national decarbonisation goals, which is consistent with TCFD (2020) recommendations.<sup>3</sup> Singapore has committed to reduce its year 2030 emissions to 60MtCO<sub>2</sub>e (after peaking emissions earlier) and to achieve net-zero emissions by 2050.</p> <p>For the short-term, the analysis focuses on transition risks that will have a substantial change by FY2025 (e.g., Singapore carbon price). Physical risks are not expected to change much in the short term and will be considered qualitatively.</p>
<b>Baseline Year</b>	FY2021	The baseline year data is used as an anchor to quantify changes to StarHub’s revenue and costs due to climate change. It is proposed to use the latest available data from FY2021 as the baseline year given the observed shift in StarHub’s revenue mix over the last five years. <sup>4</sup>
<b>Coverage<sup>5</sup></b>	Company-wide activities under StarHub’s operational control in Singapore	Subsidiaries, associates, and joint venture energy use are excluded. Screening results based on subsidiaries’ energy use provided by StarHub suggest that subsidiaries’ Scope 2 greenhouse gas (GHG) emissions is only a small percentage (~3%) of StarHub’s GHG emissions. <sup>5</sup>

1. 1.5°C temperature increase (by 2050) to be informed by IEA NZE 2050 / SSP1- 2.6 scenarios. The IEA NZE 2050 refers to Net Zero Emissions by 2050 scenario.

2. <3°C temperature increase (by 2050) to be informed by IEA STEPS / SSP5- 8.5 scenarios. The IEA STEPS refers to Stated Policies Scenario, corresponding to current policy settings that are in place and those that have been announced by government internationally.

3. TCFD (2020) recommends consideration of "time horizons that are compatible with the company’s (1) capital planning and investment horizons and (2) the useful life of major company assets and time horizons that are harmonised or anchored with those of national and international climate policy communities (e.g., 2030 and 2050)."

4. Based on review of StarHub’s revenue trend over the last five years, there is an observed trend of decrease in mobile, broadband and equipment sale revenue with corresponding increase in enterprise business revenue, which is expected to continue with the addition of JOS and MyRepublic.

5. The scenario analysis was completed before StarHub commenced our GHG inventory and science-based target setting exercise, therefore, the Scenario Analysis conducted did not cover non-wholly owned subsidiaries.



# Scenario Analysis

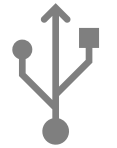
## StarHub's Sustainability Framework

The key **material** climate-related risks and opportunities identified through our scenario analysis informs our key material topics.



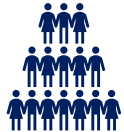
### Driving Sustainable Growth

- Energy & Climate Change
- Circularity
- Green Tech Solutions



### Enabling a Digital Society

- Product & Service Quality
- Data Privacy & Cybersecurity
- Online Safety
- Digital Inclusions



### Caring for our People and our Communities

- Health, Safety & Well-being
- Talent Management



### Responsible Business and Value Chain

- Business Conduct & Ethics
- Responsible Selling
- Supply Chain Management

For additional details regarding StarHub's Sustainability Framework pillars and decarbonisation approaches, please see [StarHub Sustainability Report 2022](#) (SR2022).







# Scenario Analysis- Identified Risks & Opportunities

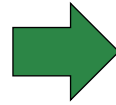
The key **material** climate-related risks identified are as follows:

## Physical risk drivers



### Rising Average temperature

- Increased frequency and severity of heatwaves
- Rising average temperatures



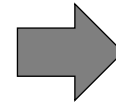
## Impact to StarHub

- Increased energy cost from increased year-round cooling requirement for equipment in data centres and cable landing station



### Increased extreme precipitation and storms

- Increased extreme precipitation resulting in rain shading (rainfall attenuation of wireless signals)
- Increased storm frequency and/or intensity

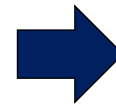


- Increased risk of reduced or no transmission of wireless signal during heavy rain, which may effect quality of StarHub services
- Increased energy cost from higher transmission power requirement during heavy rain
- Increased repair and maintenance cost due to electrical/electrostatic/wind damage to base transceiver stations
- Partial or full service disruption resulting from the base transceiver station damage
- Increased storm risk may also lead to increased insurance premium



### Increased flood risk

- Increased flash flood risk with increased extreme precipitation



- Increased repair and maintenance cost due to physical asset damage from flooding (especially for low-lying ground-level or underground infrastructure)
- Partial or full service disruption from asset damage or staff being unable to reach work sites to perform necessary operation, maintenance, or repair
- Increased flood risk may also lead to increased insurance premium





# Scenario Analysis- Identified Risks & Opportunities

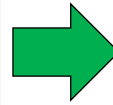
The key **material** climate-related risks identified are as follows:

## Transition risk & opportunity drivers



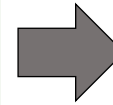
### Increasing stakeholder expectation and reporting requirement

- Poor ESG rating or ESG-related incidence
- Enhanced climate-related disclosures requirements (e.g. SGX requires companies to report climate-related disclosures on a "comply or explain" basis from FY2022)



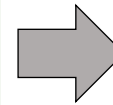
### Carbon Taxes

- Carbon tax costs that are passed on by StarHub's electricity provider to StarHub
- Carbon prices will increase over the years (e.g. S\$80 by 2030)



### Change in Consumer Preferences

- Shift in enterprise customer preferences to low-carbon products and services
- Increased digitalisation of products, services, and business operations, leading to data volume growth, also enabled by 5G



## Impact to StarHub

- Higher financing or tighter cash flows for sustainability and decarbonisation investments
- Reputational damage
- Cost of regulatory non-compliance
- Higher operational cost from capacity building and additional staff to meet more stringent disclosure requirement

- Increased energy costs from increased carbon tax
- Opportunity to reduce energy cost by adopting renewable energy
- Higher upfront capital requirement for asset replacement to more energy efficient equipment
- Network reconfiguration and asset retirement cost (for consolidation of data centres and shift to cloud services)
- New financing opportunities from green credentials

- Increased revenue from increased market share due to green credentials
- Higher upfront capital requirement for asset replacement to more energy efficient equipment
- Network reconfiguration of and asset retirement cost (for consolidation of data centres and shift to cloud services)
- Increased energy costs (with data volume growth)

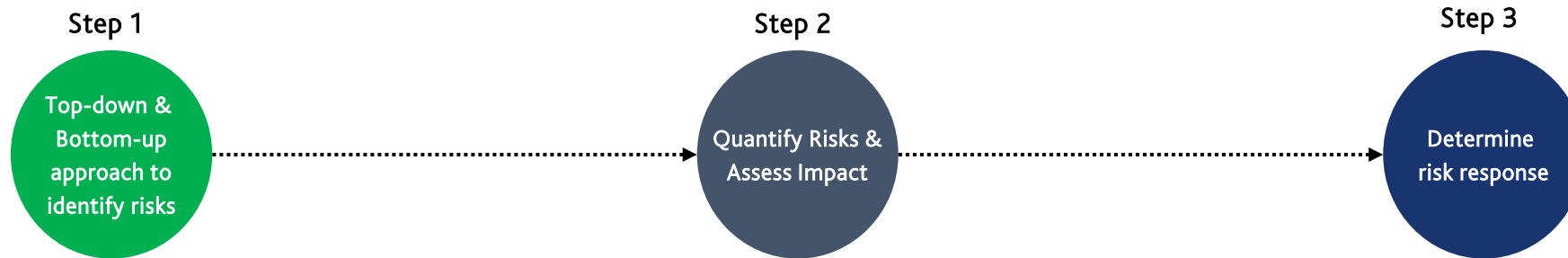


# Risk & Opportunities- Risk Management

## Climate Risk Framework

To help streamline our risk response process, we have a Climate Risk Framework, integrated within our Enterprise Risk Management (ERM) framework, which assesses the impact of climate change on our business. The objective of the framework is to enable identification of the risk response that will best protect and enhance the resilience of our infrastructure, products and services as well as intensify our efforts on climate action to future-proof our business in preparation for a changing climate.

We seek to embed the principles of risk management in our key corporate and decision-making processes across all levels of the organisation, including climate-related risks and opportunities. This ERM framework is used to identify risks and/or opportunities that could have a substantive financial or strategic impact on the operations. The process is dynamic and embedded with flexibility and are constantly evolving to ensure that we are capable to address today's challenges in the business landscape. It is made multi-disciplinary with the inclusion of multiple-professional perspectives from our diverse Board composition and cross-functional teams.



- Use of both **top-down** and **bottom-up approach** to identify and prioritise risks for further assessment.
- Top-down, the Management Risk Committee (MRC) assess future risks and opportunities.
- Bottom-up risk assessments conducted at the business level to ensure all risk information is effectively captured.

- Relevant risks and opportunities are then **quantified** as part of **climate change scenario analysis and business level risk assessment** to determine whether they result in a **substantive or strategic impact**.
- Climate risks and opportunities that are estimated to result in actual and/or potential financial loss/ damages with business impact of more than \$300,000 are categorised as substantive.
- Any climate risks or opportunities that potentially lower StarHub's infrastructure resilience are flagged as having a potential strategic impact.

- The climate risks and opportunities that have been assessed as having substantive **financial or strategic impact** are discussed during the **MRC meeting** to determine the appropriate risk response, who in turn reports to the Board Risk and Sustainability Committee (RSC).
- The risks and opportunities are prioritised according to impact and likelihood to determine whether the response should be to **Accept, Avoid, Transfer, Reduce, and/or Exploit**.
- This includes an assessment of existing mitigation controls and their adequacy and effectiveness; determining additional risk treatment action plans for risk improvement with clear ownership and specific timelines; and using risk identification models to evaluate and prioritise the risk factors. These risks are aligned with the company's strategic priorities, in consultation with the Board and other Board committees.



# Risk & Opportunities- Strategic Impact

StarHub's identified risks and opportunities continue to influence our overall business strategy. Key impacts for each business area are outlined below:

## Products and services

- Increased interest from Enterprise clients seeking innovative ideas and solutions to further their sustainability journey.
- Our Green Tech Managed Services brings together enabler technologies such as 5G, IoT, Machine Learning and Big Data to enhance resource efficiency and limit GHG emissions in areas such as smart hygiene, smart facilities, smart connectivity and smart logistics.
- We have garnered early momentum for Green Tech Managed Services, counting NUS as an early adopter of our solution. In 2022, we implemented Singapore's first solar-powered outdoor 5G WiFi at NUS's smart campus, minimising cost, labour and resource. We also piloted a cloud-based Internet of Things ("IoT") platform for NUS that aids in the monitoring, tracking and analysis of real-time data. Leveraging a customised dashboard built to NUS' specifications, the facilities management team is able to identify, analyse, and resolve issues in the piloted restrooms deployed with IoT sensors within its campus and integrated with a complementary Smart Hygiene solution. This has also uplifted the user experience and optimised cleaning resources.
- Demand for these solutions is fast growing in other sectors, and we are now extending our services to integrated and residential buildings in Singapore.

## Supply chain and/or value chain

- The potential risk of a decrease in the perceived value of StarHub's products and services from a customer perspective, which could lead to a reduction in revenue, has affected StarHub's long-term strategy in the management of our value chain.
- To mitigate this impact, StarHub has continued to develop our supplier engagement programme. We updated our Supplier Code of Conduct (Supplier Code), outlining the standards of practice we require of our suppliers in the areas of human rights, labour, environment and anti-corruption.
- With the Supplier Code included in the Terms and Conditions that we issue to our suppliers, suppliers agree to adhere to the standards set out in our Supplier Code by accepting our purchase order.

## Investment in R&D

- Since 2021, StarHub continues to prioritise R&D by developing rainfall sensors together with Hydroinformatics Institute (H2i) in a Public Utilities Board (PUB) pilot project. With this new technology, it helps in enhancing our network signal strength therefore provides accurate and dynamic rainfall data and forecast for effective flood management solutions, offsetting expenditure that clients would otherwise need to incur on costly rainfall measurement infrastructure. This demonstrates StarHub's ability to design a green and sustainable solution that does not require additional infrastructure or investments, using existing signal attenuation data for a meaningful purpose.
- We further progressed in the development of Green Tech solutions in 2022 by implementing Singapore's first solar-powered outdoor 5G WiFi at NUS smart campus.

## Operations

- We seek to decarbonise our operations by reducing energy consumption, adopting lower emission technologies and optimising the energy efficiency of our infrastructure, such as retiring legacy systems, consolidating sites, and optimising operating temperature.
- We continue to expand our renewable energy use with Power Purchase Agreements (PPAs), RECs and on-site solar energy.
- We secured a Virtual PPA with Terrenus Energy in 2022 for long-term renewable energy generation from its 13.2MWp solar farm on Jurong Island over the next 13 years.
- In recognition of the need to reduce energy use, we aim to achieve Green Mark certification for our data centres in the near term.



# Low Carbon Initiatives & Value-Chain Engagement

## Decarbonising StarHub's business operations and value chain

StarHub's decarbonisation roadmap and action plan, which includes clear milestones to achieve our targets is fully approved by the Board. The roadmap takes into account the results from the scenario analyses we have conducted as part of our TCFD reporting. In FY2022, our decarbonisation measures have resulted in a 0.6% reduction in our total electricity consumption and a 3.8% reduction in fuel use from FY2021. Combined with our purchases of solar RECs, this translates to a reduction of 8.0% (5,163tCO<sub>2</sub>e) in our Scope 1 and 2 emissions from our base year of FY2021. The following table depicts key decarbonisation actions with high feasibility, viability, visibility and emissions reduction impact:

	Key Initiative	Key Emissions Reduction Action	Target by 2030
<b>Scope 1</b>	Transition to EV's and hybrids	<ul style="list-style-type: none"> <li>Execute EV and hybrid transition plan</li> </ul>	<ul style="list-style-type: none"> <li>100% transition to EVs</li> </ul>
<b>Scope 2</b>	Decommissioning and Improving energy efficiency	<ul style="list-style-type: none"> <li>Decommission legacy network and systems, consolidate sites and equipment, increase supply temperature to 25°C or more, cyclical replacement of M&amp;E equipment with better efficiency models, achieve Green Mark certifications for data centres, migrate IS applications to cloud</li> </ul>	<ul style="list-style-type: none"> <li>Achieve Green Mark certification for our data centres – RCG by 2024, NC CO1 by 2025 and SH CO2 by 2026</li> </ul>
	Increase share of renewable energy	<ul style="list-style-type: none"> <li>Secure long-term RE PPA while monitoring REC markets for unbundled supply</li> </ul>	<ul style="list-style-type: none"> <li>Increase energy use from renewable sources to 30% by 2030</li> </ul>
<b>Scope 3</b>	Supplier & Customer engagement	<ul style="list-style-type: none"> <li>Ongoing engagement and encouragement of suppliers to report their emissions footprint and set decarbonisation targets, through frequent touchpoints and channels</li> <li>Engage key customers on decarbonisation strategies and targets, via dialogues and surveys</li> </ul>	<ul style="list-style-type: none"> <li>Key suppliers achieve committed reduction</li> <li>Key customers are aligned and supportive of StarHub's decarbonisation ambition</li> <li>Effective implementation of green procurement policy</li> </ul>
	Investee Engagement	<ul style="list-style-type: none"> <li>Ongoing engagement and encouragement of investees to report their emissions footprint and set decarbonisation targets, through frequent touchpoints and channels</li> </ul>	<ul style="list-style-type: none"> <li>Alignment of investees's ambition with StarHub's net-zero targets</li> </ul>

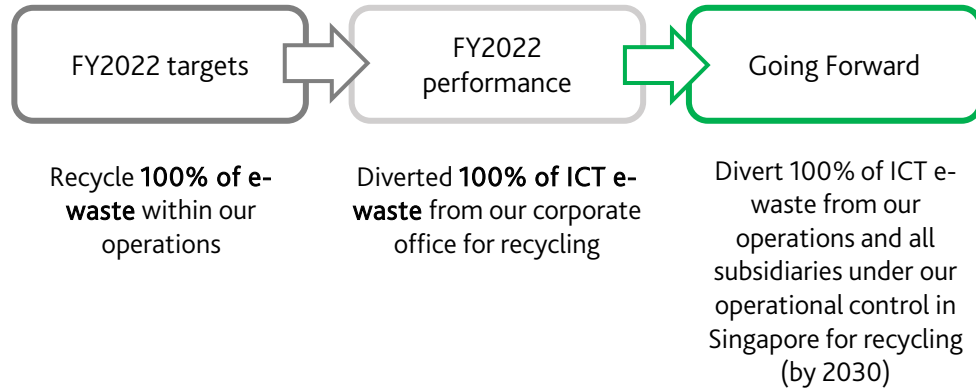




# Low Carbon Initiatives & Value-Chain Engagement

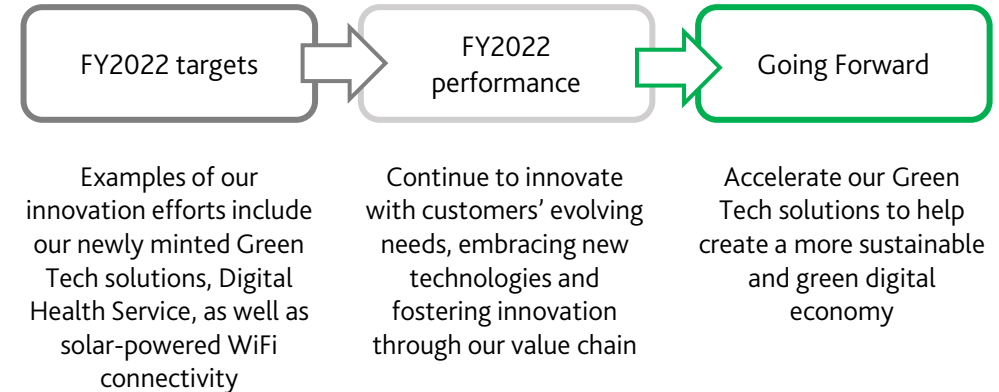
## Waste Reduction and Material Circularity

In line with our Environmental Policy and as part of our environmental stewardship, StarHub aims to reduce our resource use and adopt circularity by promoting reuse, repair and recycling practices throughout our value chain.



## Green Tech Solutions

As a provider of 5G network and enterprise digital solutions, StarHub’s products and services can help enable a more sustainable and green economy, creating potential benefits for the wider economy, environment and society. By leveraging 5G, IoT, data analytics and multi-cloud strategies, StarHub continues to innovate with our business partners, while responding to our customers’ evolving needs and embracing smart technologies throughout our value chain.



For additional details on StarHub’s waste reduction initiatives and Green Tech Solutions please see our [StarHub Sustainability Report 2022](#) (SR2022).



# Metrics & Targets

## Our Emissions Targets

50% reduction of Scope 1 & 2 by 2030 (baseline 2021)  
25% reduction of Scope 3 by 2030 (baseline 2021)

StarHub Scope 1 + 2 (Mkt-based)	2021	2022	2023	2025	2030
Current status (tCO <sub>2e</sub> )	64,895	59,732			
% of target required relative to 2021		-5.6%	-11.1%	-22.2%	-50.0%
Current status - % target achieved relative to 2021		-8.0%			

StarHub Scope 3	2021	2022	2023	2025	2030
Current status - Emissions (tCO <sub>2e</sub> )	241,243	252,063			
% of target required relative to 2021		-2.8%	-5.6%	-11.1%	-25.0%
Current status - % target achieved relative to 2021		4.5%			



# GHG Emissions Scoreboard

Scope 1 (tCO <sub>2e</sub> )	FY 2022 (1 Jan – 31 Dec)	FY 2021 (1 Jan – 31 Dec)
Stationary combustion	50	47
Mobile combustion	255	269
Fugitive emissions – refrigerant gases	882	1,040
<b>Total Scope 1 (tCO<sub>2e</sub>)</b>	<b>1,187</b>	<b>1,356</b>
Scope 2 (tCO <sub>2e</sub> )	FY 2022	FY 2021
Purchased electricity (Location-based)	67,777	67,148
Purchased electricity (Market-based)	58,545	63,539
<b>Total Scope 1 + 2 (Market Based) (tCO<sub>2e</sub>)</b>	<b>59,732</b>	<b>64,895</b>
Scope 3 (tCO <sub>2e</sub> )	FY 2022	FY 2021
Category 1: Purchased goods and services	158,938	135,736
Category 2: Capital goods	7,576	7,882
Category 3: Fuel and energy-related emissions	11,549	11,410
Cat 4 & 9 Upstream & downstream transportation & distribution	7,097	1,705
Category 5: Waste generated in operations	14	4
Category 6: Employee business travel	356	123
Category 7: Employee commuting	463	243
Category 8: Upstream leased assets	4,686	5,291
Category 11: Use of sold products	35,825	35,821
Category 12: End-of-life of sold products	41	65
Category 13: Downstream leased assets	18,875	35,076
Category 14: Franchises	85	131
Category 15: Investments	6,558	7,757
<b>Total Scope 3 (tCO<sub>2e</sub>)</b>	<b>252,063</b>	<b>241,243</b>
<b>GHG Emissions Intensity (tCO<sub>2e</sub> per \$million revenue)</b>	<b>25.67</b>	<b>31.77</b>

Note: Category 10: Processing of sold products were not relevant to StarHub.

Our GHG emissions inventory for FY2021 (baseline) and FY2022 is shown here. Emissions values differ from figures disclosed in SR2022 as the full data inclusive of all subsidiaries under StarHub's operational control were not available at the time of the report publication in March 2023. The values disclosed here are inclusive of all subsidiaries under StarHub's operational control.



## Review and external assurance

StarHub had engaged KPMG LLP to provide independent assurance of selected ESG metrics for our SR2022\*.

Our independent assurance practice is conducted annually to ensure credibility and to obtain a true and fair view of our selected sustainability information. StarHub plans to receive independent assurance over our selected ESG metrics for the year ended 31 December 2023 to be included in our SR2023.

The Board is responsible for reviewing our ESG assurance report and disclosures, overseeing our ESG assurance progress and managing the ESG-related risks. Pending completion of our internal review, StarHub has included sustainability reporting disclosures as part of our upcoming internal audit plan.

\*The emissions data assured in the SR2022 did not include all subsidiaries under StarHub's operational control as the full data was not available at the time.



**Thank You**