Boundless Impact

Assessing Climate Resilience

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Given our exposure to climate-related risks and opportunities, we conducted a climate resilience assessment during the year under review. Building on last year's qualitative analysis, this year's assessment applied multiple climate scenarios across our planning horizons to evaluate directional impacts on key aspects of our business model. The process strengthened the Group's understanding of how climate change could affect operations, enabling more informed strategic decisions, resource allocation, and risk management aligned with long-term resilience and value creation.

METHODOLOGY

Our climate scenario analysis methodology is aligned with the approach adopted by our parent entity Hayleys PLC as well as the principles described in the TCFD framework. The global physical and transition climate scenarios considered in the development of Haycarb's climate scenarios are summarised below.

Physical climate scenarios	Intergovernmental Panel on Climate Change - Sixth assessment report (AR6)	Five potential future physical climate scenarios categorised considering both Representative Concentration Pathways (RCP) and its corresponding Socioeconomic Pathway (SSP).
Transition scenarios	International Energy Agency – World Energy Outlook 2023 transition scenarios	Three scenarios that model pathways exploring the implications of various policy choices, investment and technology trends for the energy sector.

The key assumptions related to each global physical and transition climate scenario considered in the development of Haycarb's climate scenarios is presented below.

Source	Scenario	Key assumptions
IPCC AR 6	C3/SSP 1-2.6	Low emission scenario The increase in global warming is limited to 2°C by 2100. Net zero status is achieved between 2055 and 2060. An almost 65% reduction in GHG emissions is achieved by 2050.
	C6/SSP 2-4.5	Intermediate emission scenario. The increase in global temperatures is projected to be 3°C in 2100 compared to pre-industrial levels.
	C7/SSP 3-7.0	High emission scenario. The increase in global temperatures is projected to be 4°C in 2100 compared to pre-industrial levels.
IEA 2023	Net Zero Emission (NZE) Scenario	A pathway for the energy sector to achieve net zero by 2050 through the deployment of numerous clean energy technologies without offsets from land use while also successfully achieving key energy related SDGs. Resultantly, the rise in global temperatures is limited to 1.5°C.
	Announced Pledges Scenario (APS)	Assumes governments will successfully achieve their announced climate-related commitments fully and on time. These commitments include longer term net zero targets, and pledges in Nationally Determined Contributions (NDC).
	Stated Policies Scenario (STEPS)	Considers the policies and measures currently in place along with the present efforts of governments to achieve their climate targets. A temperature rises of 2.4°C is projected by 2100 (with a probability of 50%)

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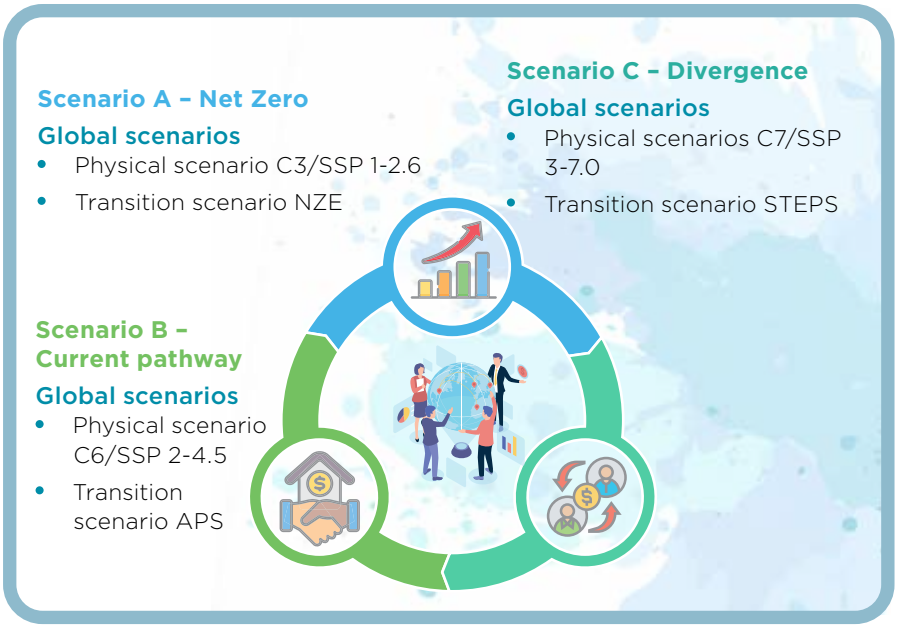
Based on the above, the following three climate scenarios were developed by the Group to assess its climate resilience.



- According to the IPCC, the precipitation change will demonstrate significant regional differences and seasonal contrasts as global average of near surface air temperature increase. Precipitation is projected to very likely increase over tropical oceans and likely increase in large parts of monsoon regions. Inter-annual variability is also projected to increase.
- The IPCC also states that while near term monsoon precipitation changes are uncertain, over the long term (2081-2100) monsoon rainfall will feature a north-south asymmetry and an east-west asymmetry, Therefore, a greater increase in projected in the northern hemisphere than in the southern hemisphere and in the Asian African monsoon regions as opposed to the North American monsoon regions.
- Based on our climate related risks and opportunities assessment, we have chosen to assess the physical risks of temperature and precipitation and the transition risk of technology against the climate scenarios identified above.
- Given the reliance on an agricultural input as our key raw material, optimum climate conditions for coconut growth and yields as determined by the Central Plantation Crops Research Institute in India is given alongside.

Optimal climate conditions for coconut growth and yield

Mean temperature	27+/- 5^{0}C
Relative humidity	>60%
Rainfall (well-distributed)	2000 mm/year

*In areas of uneven distribution of rainfall, irrigation is required.

*Coconut is tolerant of a wide range in intensity and distribution of rainfall.

Source: ICAR-Central Plantation Crops Research Institute – India

Mean annual temperature and rainfall in our input sourcing and manufacturing countries

Country	Mean Annual Temperature	Mean Annual Rainfall	Meteorological Department/Government Data
Sri Lanka	27-28^{0}C [4]	2000 mm [5]	Temp: varies from 27°C in the coastal lowlands to 16°C at Nuwara Eliya central highlands Rain: varies from under 900 mm in the driest parts to over 5000mm in the wettest parts [5]
Thailand	26.3°C, with a seasonal temperature variation of 5.7°C [3]	1,542 mm [3], [10]	No direct information [9]
Indonesia	25°C–26°C [2]	1800 mm – 6000 mm [2]	No direct information [8]

Due to our reliance on water as an input to our operations, we consider water stress as an important aspect that has to be monitored and managed.

Country	Province/Town	Company Name	Water stress	
Sri Lanka	Madampe	Haycarb PLC	High	3-4
	Badalgama	Haycarb PLC	High	3-4
Indonesia	Central Sulawesi	PT Haycarb Palu Mitra	High	3-4
	Bitung	PT Mapalus Makawanua Charcoal Industry	High	3-4
Thailand	Chonburi	Carbokarn Co. Ltd	Extremely High	4-5
	Ratchaburi	Shizuka Co. Ltd	Medium to High	2-3

The key assumptions considered under each Haycarb climate scenario is given below.

<table>
<tr><th>Scenario</th><th>Description and assumptions</th><th>Reference global scenarios</th></tr>
<tr><td>Scenario A – Net Zero</td><td>

An orderly global transition to a low carbon economy by reducing emissions and rapidly deploying clean energy technologies and driving energy efficiency.
A steep reduction in emissions driven by a significant decline in the demand for fossil fuels and pricing strategies for fuel.
The increase in global temperature is limited to 2^{0}C.
Fair and effective global co-operation with advanced economies taking the lead and achieving net zero earlier than emerging market and developing economies.
Global access to electricity and clean cooking by 2030 in alignment with energy related SDGs.
Extensive investments in mitigating climate implications.
The IPCC projects a likely increase of 0.0-6.6% in the annual global land precipitation by 2081-2100 relative to 1995-2014 levels. Near-term projections are uncertain.

<table>
<tr><th colspan="4">Key country specific assumptions</th></tr>
<tr><td></td><td>Short term</td><td>Medium term</td><td>Long term</td></tr>
<tr><td>Sri Lanka</td><td>Temp ↑ +0.3°C
Rainfall stable at ~2000 mm/year (optimal) [1][4]</td><td>Temp ↑ +0.8°C
Rainfall ↓ ~5% → still within optimal coconut range [1][4]</td><td>Temp ↑ +1.5°C
Rainfall ↓ ~10% → approaching upper optimal limits [1][4]</td></tr>
<tr><td>Thailand</td><td>Temp ↑ +0.3°C
Rainfall ↓ ~2% (from 1,542 mm baseline) [1][3]</td><td>Temp ↑ +0.8°C
Rainfall ↓ ~5% → marginally dry [1][3]</td><td>Temp ↑ +1.3°C
Rainfall ↓ ~10% → increasing dryness
Yield ↓ [3][6]</td></tr>
<tr><td>Indonesia</td><td>Temp ↑ +0.3°C
Rainfall ↓ ~5% from high baseline [1][2]</td><td>Temp ↑ +0.7°C
Rainfall ↓ ~10% → mostly optimal, minor stress in dry zones [1][2]</td><td>Temp ↑ +1.2°C
Rainfall ↓ ~15%
Yield ↓ in East Java/Sulawesi, Indonesia [2][6]</td></tr>
</table>
</td><td>C3/SSP 1-2.6 [1]
NZE [6]</td></tr>
</table>

Scenario	Description and assumptions	Reference global scenarios	
Scenario B – Current pathway	• Limited external investments in technology and funding to drive the transition to a low carbon economy. • Average temperatures expected to increase by approximately 2.5^{0}C. • The IPCC projects a likely increase of 1.5-8.3% in the annual global land precipitation by • 2081-2100 relative to 1995-2014 levels. Near-term projections are uncertain.	C6/SSP 2-4.5 [1]	APS [6]

Key country specific assumptions			
	Short term	Medium term	Long term
Sri Lanka	Temp ↑ +0.6°C Rainfall ↓ ~5% → still tolerable [1][4]	Temp ↑ +1.2°C Rainfall ↓ ~10% Yield ↓ [1][4][6]	Temp ↑ +2.0°C Rainfall ↓ ~15–20% Yield ↓ [1][4][6]
Thailand	Temp ↑ +0.6°C Rainfall ↓ ~5% [1][3]	Temp ↑ +1.3°C Rainfall ↓ ~10% → moderate stress Yield ↓ [3][6]	Temp ↑ +2.0°C Rainfall ↓ ~20% Yield ↓ [3][6][7]
Indonesia	Temp ↑ +0.6°C Rainfall ↓ ~10% [1][2]	Temp ↑ +1.3°C Rainfall ↓ ~15% → higher impact in East Java Indonesia [2][6]	Temp ↑ +2.0°C Rainfall ↓ ~20% Yield ↓ in dry provinces [2][6][7]

Scenario	Description and assumptions	Reference global scenarios	
Scenario C – Divergence	• Global deviation from decarbonisation goals resulting in significant weather-related impacts on businesses and communities. • No specific climate-related interventions. • Represents a continuation of the current trajectory. • Average temperatures expected to increase by approximately 4^{0}C. • The IPCC projects a likely increase of 0.5-9.6% in the annual global land precipitation by • 2081-2100 relative to 1995-2014 levels. Near-term projections are uncertain.	C7/SSP 3-7.0 [1]	STEPS [6]

Key country specific assumptions			
	Short term	Medium term	Long term
Sri Lanka	Temp ↑ +1.0°C Rainfall ↓ ~10% [1][4]	Temp ↑ +2.0°C Rainfall ↓ ~20% Yield ↓ [1][4][6]	Temp ↑ +2.5–3.0°C Rainfall ↓ 25–30% Yield ↓ [1][4][6][7]
Thailand	Temp ↑ +1.0°C Rainfall ↓ ~10% [1][3]	Temp ↑ +2.0°C Rainfall ↓ ~20% Yield ↓ [3][6]	Temp ↑ +2.7°C Rainfall ↓ ~25% → severe drought Yield ↓ [3][6][7]
Indonesia	Temp ↑ +1.0°C Rainfall ↓ ~10% [1][2]	Temp ↑ +2.0°C Rainfall ↓ ~20% Yield ↓ in Sulawesi Indonesia [2][6]	Temp ↑ +2.5–3.0°C Rainfall ↓ ~25–30% Yield ↓ in East Java Indonesia [2][6][7]

Country specific assumptions were sourced from;

1. IPCC Sixth Assessment Report (AR6)
https://www.ipcc.ch/ar6-syr

2. World Bank Climate Risk Country Profile: Indonesia
https://climateknowledgeportal.worldbank.org

3. World Bank Climate Risk Country Profile: Thailand
https://climateknowledgeportal.worldbank.org

4. World Bank Climate Risk Country Profile: Sri Lanka
https://climateknowledgeportal.worldbank.org

5. Department of Meteorology – Sri Lanka
https://www.meteo.gov.lk

6. IEA World Energy Outlook 2023
https://www.iea.org/reports/world-energy-outlook-2023

7. World Resources Institute – Aqueduct Water Risk Atlas
https://www.wri.org/aqueduct

8. Meteorology, Climatology and Geophysics Agency, Indonesia
https://www.bmkg.go.id/

9. The Meteorological Department Thailand
https://www.tmd.go.th/en

10. Statistical Abstract 2019, Department of Census and Statistics
https://www.statistics.gov.lk/abstract2019/CHAP1

RESULTS OF OUR CLIMATE SCENARIO ANALYSIS

Due to limitations in climate-financial modelling data, particularly in linking climate variables to crop yield outcomes, a full quantification of financial impacts was not feasible. However, the scenario-based analysis enhanced the Group's understanding of potential implications of climate change, supporting more informed strategic planning, resource allocation, and risk management aligned with long-term resilience and value creation.

Climate Scenario Analysis
We carried out a scenario-based climate resilience assessment using group-defined climate assumptions evaluated across short, medium, and long-term periods aligned with IPCC AR6.

Yes

Key Risks and Opportunities
Physical/Chronic risks and transition risks/opportunities were mapped.

Yes

Sufficient Climate Impact Data
Data to reliably link temperature and rainfall changes to financial variables were not available.

No

Qualitative Analysis
Robust climate-financial modelling was not feasible - we only assessed whether each risk/opportunity would likely increase or decrease over time but did not quantify financial impact, due to the above data gaps.

Assessing Climate Resilience

Risk/ opportunity	Outputs	Financial metric	Impact			Our response
			Short term	Medium term	Long term	
Scenario A – Net Zero						
Transition Risk – Technology	Orderly low-carbon transition will increase clean energy policies and regulations. Higher compliance costs and capital expenditure needed for clean technology adoption, especially in short-to-medium term. Possible coconut charcoal supply constraints and input price hikes due to global demand.	Revenue Cost	⊖ ↑	⊖ ↑	⊖ ↓	Accelerate adoption of clean technologies and improve energy efficiency.vest in R&D to enhance energy storage carbon products. Strengthen business development to enter global energy storage carbon supply chains. Seek new sources for raw material supply. Implement sustainable water management: monitor/reduce usage, manage withdrawals in stressed areas, conduct audits, invest in water-saving technologies, and plan for emergencies.
Transition Opportunity – Technology	Greater access to concessionary funding may lower financing costs. Strong growth in energy storage carbon product demand, especially short-to-medium term.	Revenue Cost	⊖ ⊖	↑ ⊖	↑ ⊖	
Chronic Physical Risk – Temperature	2°C increase keeps mean annual temperatures within optimal range for coconut growth. Lowest temperature increases among scenarios; Warming may reach coconut stress thresholds in Thailand and parts of Indonesia by long term.	Revenue Cost	⊖ ⊖	⊖ ⊖	↓ ⊖	
Chronic Physical Risk – Precipitation	Lowest projected long-term precipitation increases. Coconuts resilient to varied rainfall; Rainfall reduction (especially in Thailand) could reduce yield and increase resilience costs.	Revenue Cost	⊖ ⊖	⊖ ↑	↓ ↑	
Chronic Physical Risk – Water Availability	Industrial/domestic water sourced from surface, ground, and rainwater may be affected. Long-term droughts may lower water tables or dry water bodies; heavy rains/floods may degrade usable sources. Under Net Zero scenario, such impacts expected to be minimal or nonexistent in short and medium term.	Revenue Cost	⊖ ⊖	⊖ ↑	⊖ ↑	

Risk/ opportunity	Outputs	Financial metric	Impact			Our response
			Short term	Medium term	Long term	
Scenario B – Current pathway						
Transition Risk – Technology	Fewer transition-supportive policies expected; moderate demand for clean tech. Global demand for coconut charcoal remains uncertain, driven by multiple applications beyond energy-related products.	Revenue Cost	⊖ ↑	⊖ ↑	⊖ ↑	Continue R&D for energy storage carbons while exploring other applications. Strengthen supply chain resilience by diversifying raw material sourcing regions. Moderate focus on improving business energy resilience. Implement sustainable water management: monitor/reduce usage, manage withdrawals in stressed areas, conduct audits, invest in water-saving technologies, and plan for emergencies with a focused approach.
Transition Opportunity – Technology	Slower adoption pace; lower capital and compliance costs than Scenario A. Growth in energy storage carbon products continues, but less than in Scenario A.	Revenue Cost	⊖ ⊖	↑ ⊖	↑ ⊖	
Chronic Physical Risk – Temperature	Warming reaches ~2°C by 2040s, causing moderate coconut yield stress in Sri Lanka and Thailand.	Revenue Cost	⊖ ↑	↓ ↑	↓ ↑	
Chronic Physical Risk – Precipitation	Higher long-term precipitation increases than Scenario A. Coconut's resilience reduces expected yield impact, though uneven rainfall distribution could affect yield specifically dry zones of Thailand and eastern Indonesia. Operational impacts from extreme precipitation expected to be moderate.	Revenue Cost	↓ ↑	↓ ↑	↓ ↑	
Chronic Physical Risk – Water Availability	Water sources (surface, ground, rain) may be affected by climate change. Long-term droughts could lower groundwater and dry surface sources.	Revenue Cost	⊖ ↑	↓ ↑	↓ ↑	

Assessing Climate Resilience

Risk/ opportunity	Outputs	Financial metric	Impact			Our response
			Short term	Medium term	Long term	
Scenario C - Divergence						
Transition Risk – Technology	Slower clean tech development and adoption due to lack of incentives; abrupt policy changes possible later with higher compliance burdens.	Revenue Cost	↓ ⊖	↓ ↑	↓ ↑	Diversify activated product portfolio across various applications. Diversify supply chains to reduce risks from lower coconut yields and extreme precipitation. Geographically diversify manufacturing locations to minimise operational disruptions. Implement measures to mitigate financial losses and property damage from extreme weather.
Transition Opportunity – Technology	No specific climate actions taken; clean tech adoption depends on financial feasibility.	Revenue Cost	⊖ ⊖	⊖ ⊖	⊖ ⊖	
Chronic Physical Risk – Temperature	2.5°C rise will exceed optimal temperature for coconut growth in most countries. Likely negative impact on yields, leading to supply shortages and higher input prices.	Revenue Cost	↓ ↑	↓ ↑	↓ ↑	
Chronic Physical Risk – Precipitation	Highest projected long-term precipitation increases. Major stress on yield in all sourcing countries, especially in dry zones. Operational disruption risk from extreme precipitation is highest under this scenario.	Revenue Cost	↓ ↑	↓ ↑	↓ ↑	
Chronic Physical Risk – Water Availability	Water availability and quality will be affected, extremely at Chonburi - Thailand, Madampe - Sri Lanka and Sulawesi - Indonesia, threatening operational continuity. Worst-case scenario may impact washing operations.	Revenue Cost	↓ ↑	↓ ↑	↓ ↑	