Climate Scenario Analysis in Sustainability Reporting

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Background

ASEAN businesses are preparing for climate related disclosure for the first time, but most do not have the tools and resources needed for the complex scenario analysis. This project responds to that gap by developing a practical, **IFRS S2-aligned** guide to climate scenario analysis.

The guide draws on stronger examples from companies listed on the Singapore Exchange and turns their approaches into a simpler process that SMEs can follow. **It is structured around four chapters and two levels**: a "**Basic**" approach for companies starting with qualitative analysis, and an "**Advanced**" approach for companies ready to introduce quantitative estimates.

1 Why CSA Matters for ASEAN

2x — More Hydrological disasters in the past 30 years

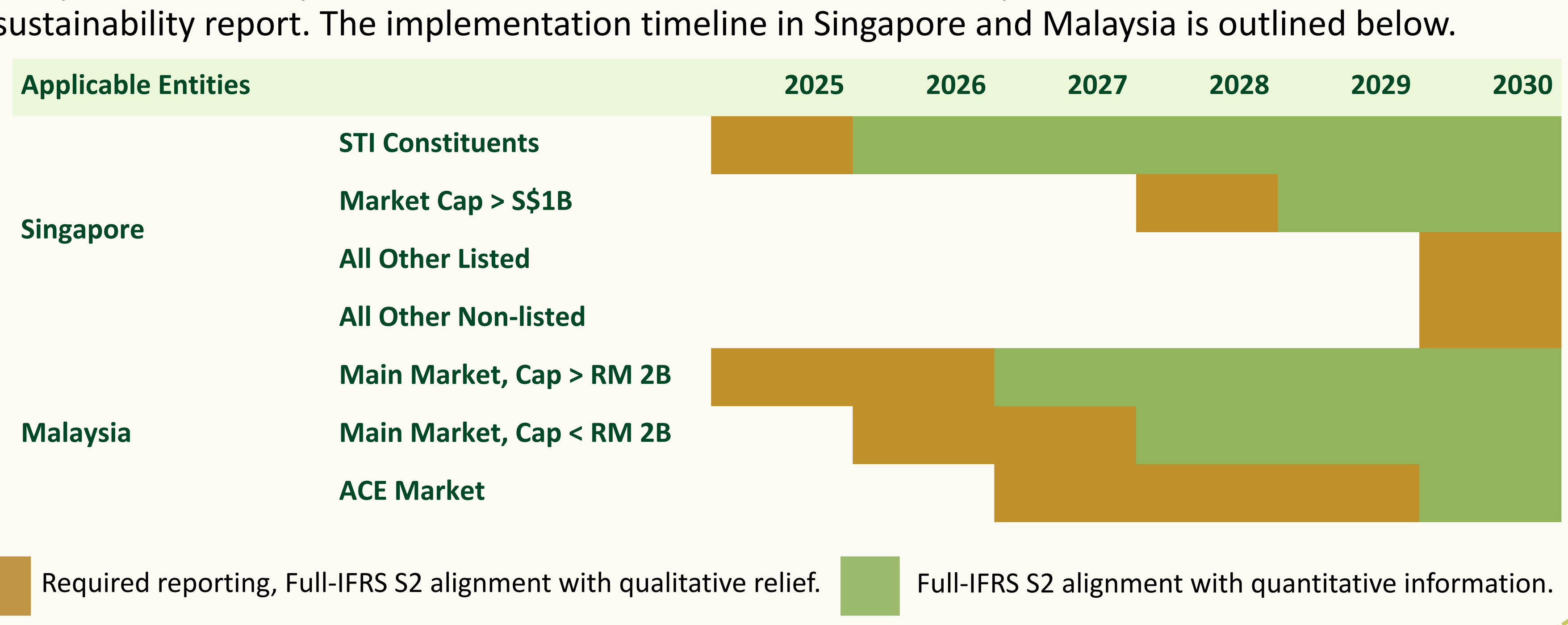
37% — Loss in GDP by 2048 assuming most severe climate scenario

6 — Out of 11 ASEAN countries has clear roadmap for carbon pricing

ASEAN is highly exposed to climate change, which creates increasing risks for ASEAN businesses' daily operations. Therefore, investors expect companies to explain how different climate futures could affect their operations and long-term strategy resilience.

To meet this objective, IFRS S2 is developed as the main reference point for climate-related disclosure and is adopted by ASEAN countries. This framework requires companies to use climate scenario analysis when assessing the resilience of their strategy and business model.

Companies may begin with a qualitative assessment and build capacity towards quantitative analysis. Exchanges generally allows for one to three years of such relief. As capabilities improve, companies are expected to disclose more detailed and quantitative information in their sustainability report. The implementation timeline in Singapore and Malaysia is outlined below.



Current Disclosure Gaps 2

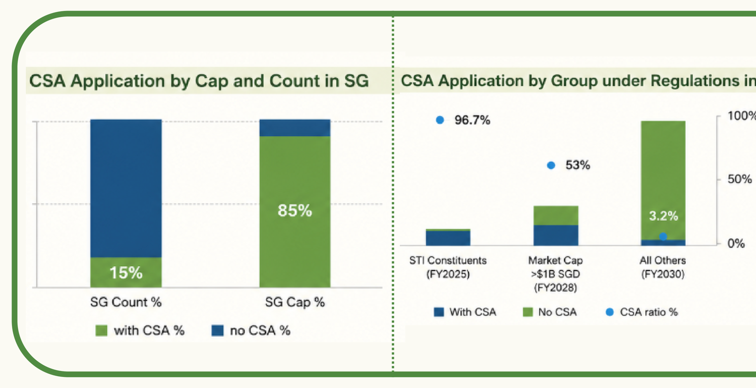
Research Process

Market Scan → **Quality Scoring** → **Operating Insights**

Market Scan
- CSA application concentrates on large cap firms while small firms lag.

Quality Scoring
- Designed IFRS S2-aligned matrix to evaluate disclosure quality.
- Analyzed 69 sustainability reports.

Operating Insights
- Companies do well in disclosing CSA process, not analysis results.
- CSA remains complex and not yet embedded in business practice.

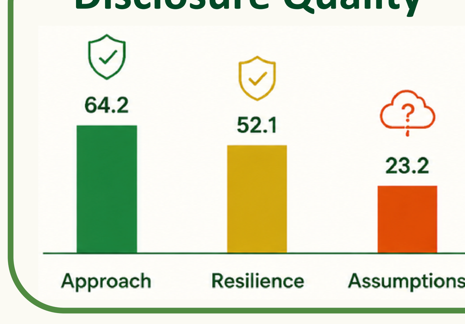


Participation Gap

- 15% largest firms covering 85% marketCap adopted CSA.
- Almost all small companies not cover at least 1 scenario.
- SMEs has large disclosure gap in CSA, meaning high growth potential in the future.
- CSA disclosure rate in Singapore Exchange:

Tier 1 (STI) 96.7%, Tier 2 53%, Tier3 3.2%

Disclosure Quality



Quality Gap

- Our CSA quality scoring matrix includes 3 segments: **Resilience** (5 items), **Approach** (7 items), and **Assumptions** (5 items), based on IFRS S2 items.
- Most firms using CSA adopted complete approach according to the models
- Assumptions is necessary for quantitative analysis but were neglected

Approach ⬆ | **Reselience** ⬄ | **Assumptions** ⬇

Capability Gap

- We interviewed **an experienced corporate sustainability practitioner with 10-year+ experience.**
- Insights:
  - CSA remains challenging as the forward-looking analysis heavily relies on **assumptions** and **scenarios selection**, creating significant **uncertainty in the analysis outcome**.
  - Over time, companies will build capacity in **data and methodologies** in conducting CSA, which allows the process to become more robust and decision-useful.

Findings Matter

Further market participation will bring more specialized service providers, higher-quality methodologies, and more supporting products that are needed to improve the effectiveness of CSA implementation.

Wide Gap in SMEs → A Guidebook for the starting points of CSA

3 Building a Practical Framework

Scenario analysis is not a standalone exercise.
It becomes useful when the four TCFD pillars work together.

Governance — Oversight Layer
Reviews assumptions, methodology, responsibilities and management response.
Low Relevance

Strategy — Core
Tests whether the business model and strategy remain resilient under different climate scenarios.
High Relevance

Climate Scenario Analysis
Strategy resilience test

Risk Management — Assessment Layer
Identifies, assesses and priorities climate-related risks to determine what should be tested.
High Relevance

Metrics & Targets — Translation Layer
Tiurns scenario outputs into financial effects, targets, resources and indicators
Moderate Relevance

Design Logic for SMEs

0 Setup → 1 Scope → 2 R&O → 3 Analysis → 4 Resilience

Prepare Inputs
Reuse your **GHG inventory** and operational facts, name an owner, and pick scenarios.
Solves *the "where do I start?" barrier; reuse data.*
RELIEF
No inventory yet? Start **Qualitative** and fill it in next cycle.

Method, Governance & Scope
Why you test, **who** is responsible, the scope covered, and exclusions of business line/units.
Sets *a defensible boundary before working on numbers.*
RELIEF
A **proportionality statement** legitimises a light effort

Risks, Opportunity & Responses
List **transition**, **physical risks** and **opportunity** items, state mechanism and response.
Turns *worry into a shortlist ties to your value chain.*
RELIEF
A plain **qualitative register** is enough; scoring is optional.

Scenarios, Assumptions & Impact
Name **≥ 1 transition** and **≥ 1 physical** scenario (incl. a **≤1.5°C Paris-aligned** case) → financial effects.
Forms *assumptions → driver → financial chain.*
RELIEF
No model needed; use free datasets, quantify it later.

Resillience & Next Step
Reach a **resilience verdict** of business strategy, then state limitations and the next-cycle plan.
Makes *the CSA decision-useful and improving.*
RELIEF
Conclusions may be **directional**; disclose limits openly.

Recommendation: Guidebook 4

STEP 0 Prepare data → CH 1 Method & scope → CH 2 Risks & responses → CH 3 Scenarios & impact → CH 4 Resilience → RESULT Compliant IFRS S2 + TCFD

Ch 1 Methodology, Governance & Scope | IFRS S2 22 · B2–B7

Inputs: Site / asset register (scope & sites); Operating markets (geographies); Governance & tools (who ran it); GHG inventory (emissions coverage)

1 State objective & purpose → 2 Define scope & entities → 3 Record who, when, governance → 4 State method & proportionality → **Methodology & scope → Ch 2**

Basic: narrative + method & boundary table.

Advanced: coverage % of revenue / GHG / assets; tool & version.

Ch 2 Risks, Opportunities & Responses | IFRS S2 9–14, 25

Inputs: SASB sector (risk universe); Business & value chain (exposures); Asset register (geolocation); Materiality (prior flags)

1 List transition, physical & opp. → 2 Locate business impact → 3 Assign response action → 4 Rank by materiality → **Shortlisted R/O → Ch 3**

Basic: categorised transition / physical / opportunity list.

Advanced: magnitude × likelihood scoring, IDs, heatmap.

Ch 3 Scenarios, Assumptions & Financial Impact | IFRS S2 15-21, 22(b)(i)(ii) · B8–B15

Inputs: Shortlisted risks (what to test); IEA WEO · NGFS (transition pathways); IPCC AR6 · CRREM (physical hazards); Emissions & sites (exposure)

1 Select ≥1 transition + ≥1 physical → 2 Set assumptions by scenario → 3 Trace to revenue, cost, assets → 4 Split current / anticipated → **Financial effects → Ch 4**

Basic: impact direction in words, named line items

Advanced: value-at-risk by scenario & horizon.

Ch 4 Resilience & Next Step | IFRS S2 22(a), 22(b)(iii) · B16–B18

Inputs: Scenario outputs (evidence); Strategy & plan (options); Investments / capex (adaptive capacity); Governance & review (ownership)

1 State resilience verdict → 2 Name uncertainties & vulnerabilities → 3 Show capacity to adapt → 4 Log limits & next cycle → **Compliant IFRS S2 + TCFD**

Basic: resilience verdict in words.

Advanced: per-scenario dashboard; TCFD page index.

Sources: ISSB IFRS S2 (2023) · TCFD (2017) · SGX RegCo (2024) · IEA WEO (2025) · NGFS (2024) · IPCC AR6 (2021) · CRREM (2023) · SASB (2023) · PCAF (2022) · Bloomberg (2026) · MSCI (2026) · LSEG (2025) · Refinitiv (2026)
Benchmarked: CDL (2026) · DBS (2025) · Mapletree (2025) · Singtel (2024) · Keppel (2024)