



Decarbonisation Playbook for IHLs

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OVERVIEW OF THE DECARBONISATION PLAYBOOK FOR IHLS

The Decarbonisation Playbook for Institutes of Higher Learning (IHLs) is jointly developed by KPMG in Singapore and the Singapore Polytechnic (SP). This playbook is an outcome of ongoing collaboration between KPMG and SP to create a comprehensive net-zero strategy, aimed at decarbonising the SP campus.

The playbook underscores the significance and various considerations needed to attain net-zero emissions. By acknowledging and adopting this important objective, it sets the stage for IHLs to refine their strategies towards global climate goals as well as enhance their resilience.

This playbook will explore the challenges, levers, enablers and SP as a case study on the decarbonisation of IHLs.

- 4** categories of decarbonisation levers: **Reduce, Replace, Produce** and **Procure**, enabling IHLs to envision what measures and solutions they can consider for their decarbonisation implementation.
- 5** decarbonisation enablers: sustainable financing, change management, digitalisation, decentralisation, and governance and reporting.
- 1** use case - SP net-zero strategy and roadmap project in collaboration with KPMG outlining the project approach as a guide for other IHLs' to start their net-zero journey.

How this resource can be used:



As a reference guide:

For IHLs looking for information on campus decarbonisation.



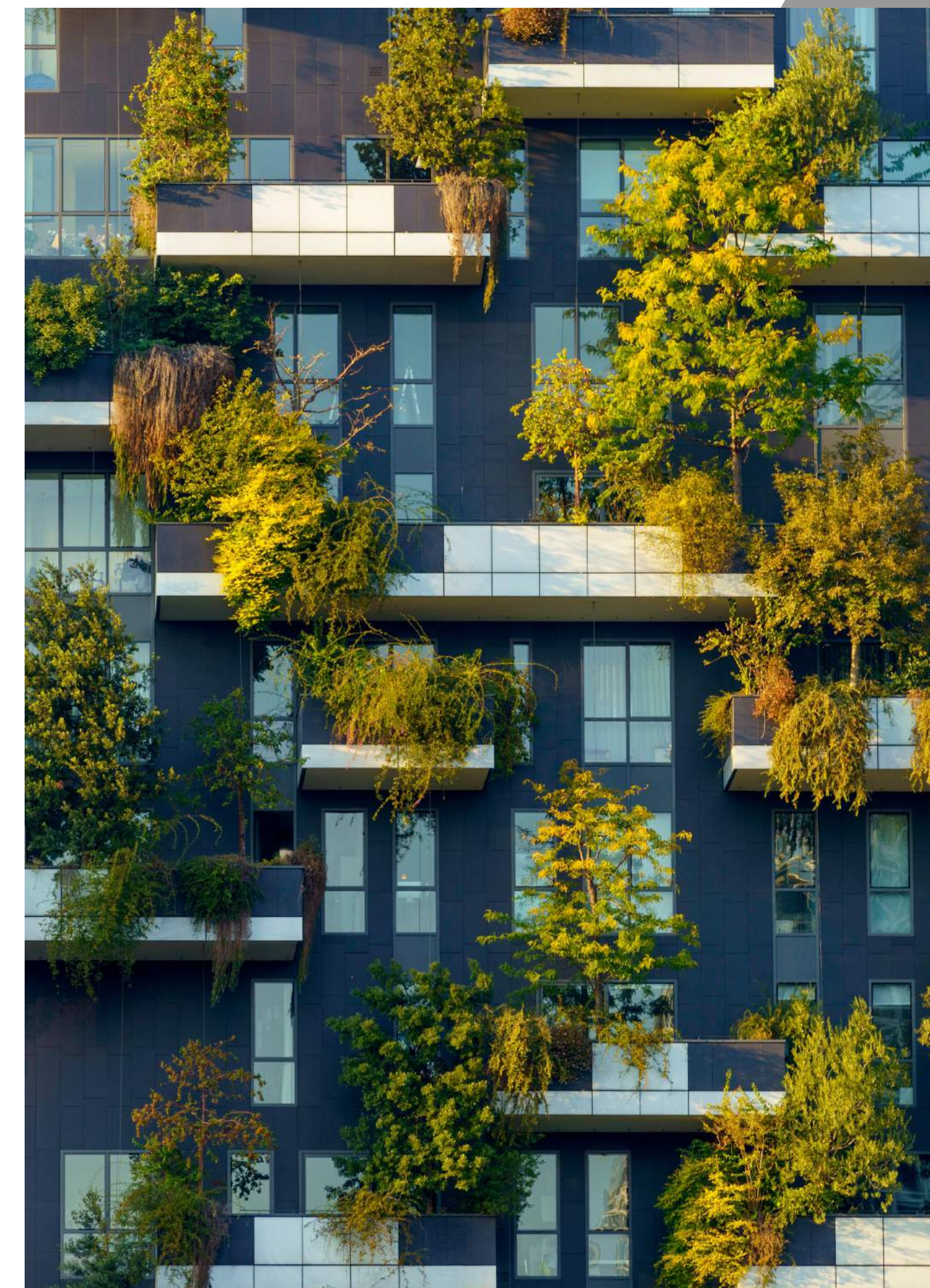
As a roadmap:

As a guide for IHLs that are already on the path to decarbonisation.



As a training tool:

The playbook can help employees in understanding the importance of decarbonisation and how they can contribute to the IHLs' decarbonisation efforts.





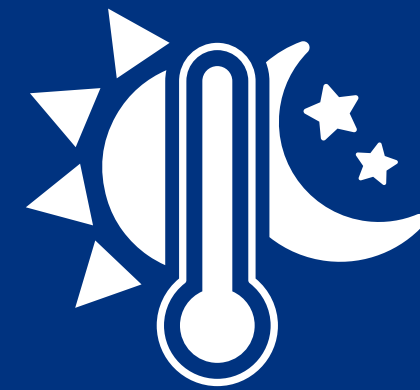
CLIMATE CHANGE AND DECARBONISATION

IMPACTS OF CLIMATE CHANGE ON SINGAPORE

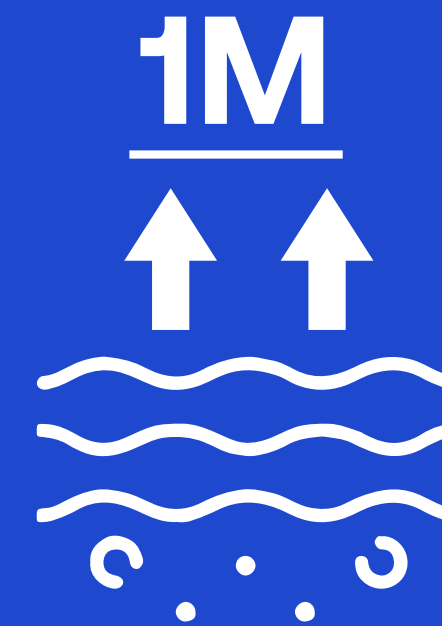
Singapore sits at 1.5 degrees north of the Equator, making the country more vulnerable to the impacts of climate change. Some of these impacts have already resulted in extreme weather events around the world, rising sea levels, and a greater loss of biodiversity.

Warmer days and nights

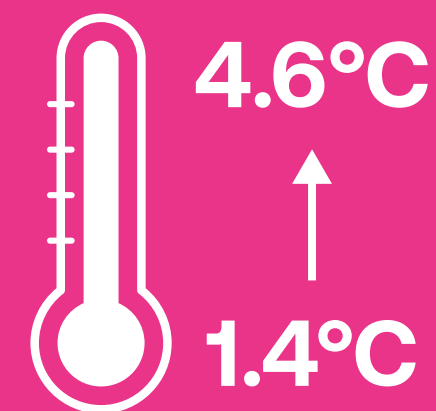
More warm days and warm nights for February to September throughout the 21st century.



Sea levels are projected to rise by up to about one metre.

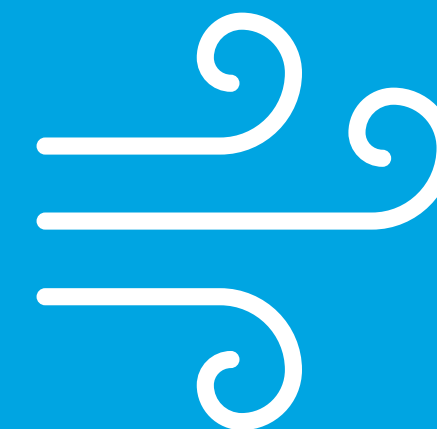


Daily mean temperatures are projected to increase by 1.4°C to 4.6°C.



Increase wind speed

Potential increase in wind speed during the northeast monsoon season.



Heavier rainfall

Intensity and frequency of heavy rainfall events are expected to increase as the world gets warmer.





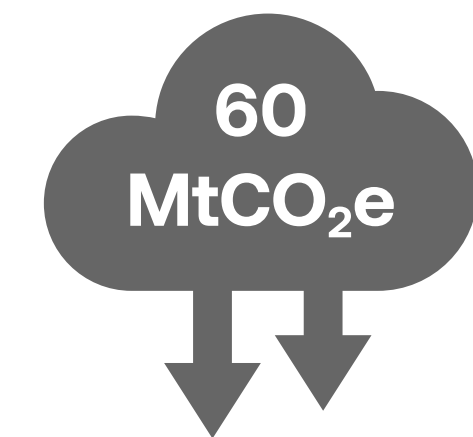
CLIMATE CHANGE LEADING TO A COMMITMENT TO NET ZERO BY 2050



Achieve Net-Zero emission by 2050

Long-Term low-Emissions Development Strategy (LEDS)

- ✓ Catalyse business transformation
- ✓ Pursue effective international cooperation

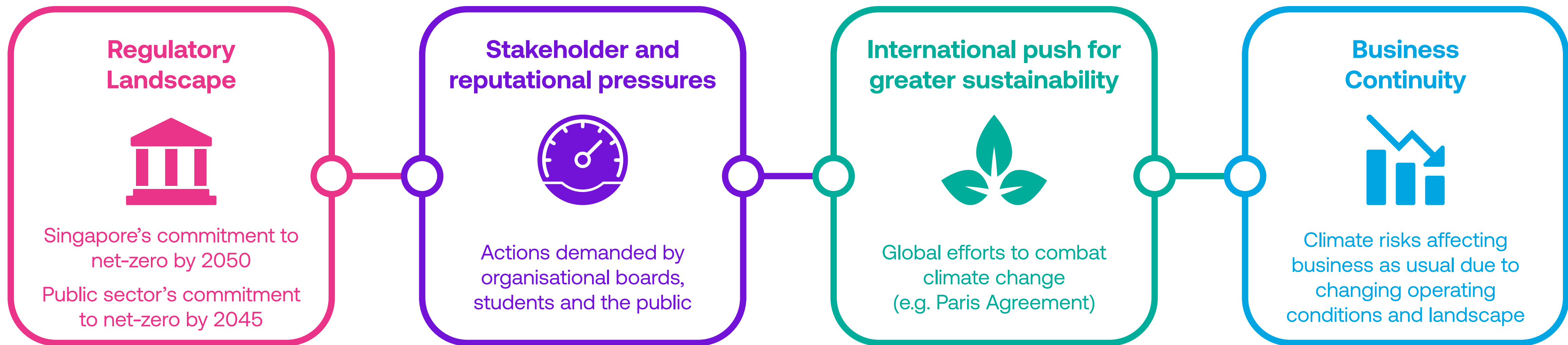


Reduce 2030 emission to 60 MtCO₂e

2030 Nationally Determined Contribution (NDC)

- ✓ Invest in low-carbon technologies
- ✓ Adopt low-carbon practices

ACCELERATING DECARBONISATION AGENDA

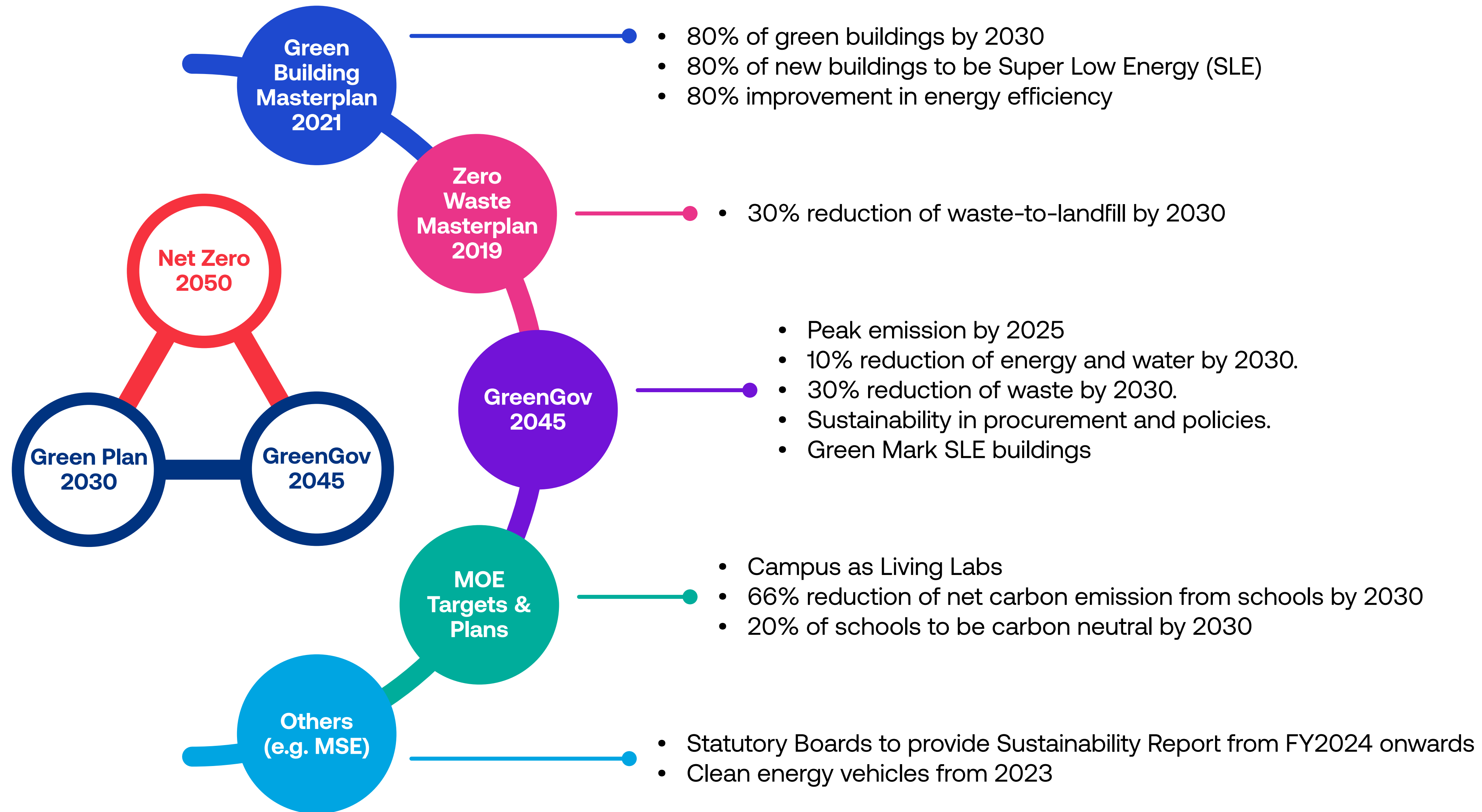


70% of global greenhouse emissions come from the use of infrastructure - the infrastructure we build today will determine our success in achieving net zero.

'Infrastructure can be the pillar upon which we base our growth, development and climate action, or it can crumble beneath us. If we want a prosperous, climate-resilient future, we must invest in sustainable infrastructure; it is the growth story of the future' (World Bank)




SINGAPORE INITIATIVES AND TARGETS




NET-ZERO OVERVIEW

“**Net-zero emissions** are achieved when anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period.” ----- Intergovernmental Panel on Climate Change (IPCC)

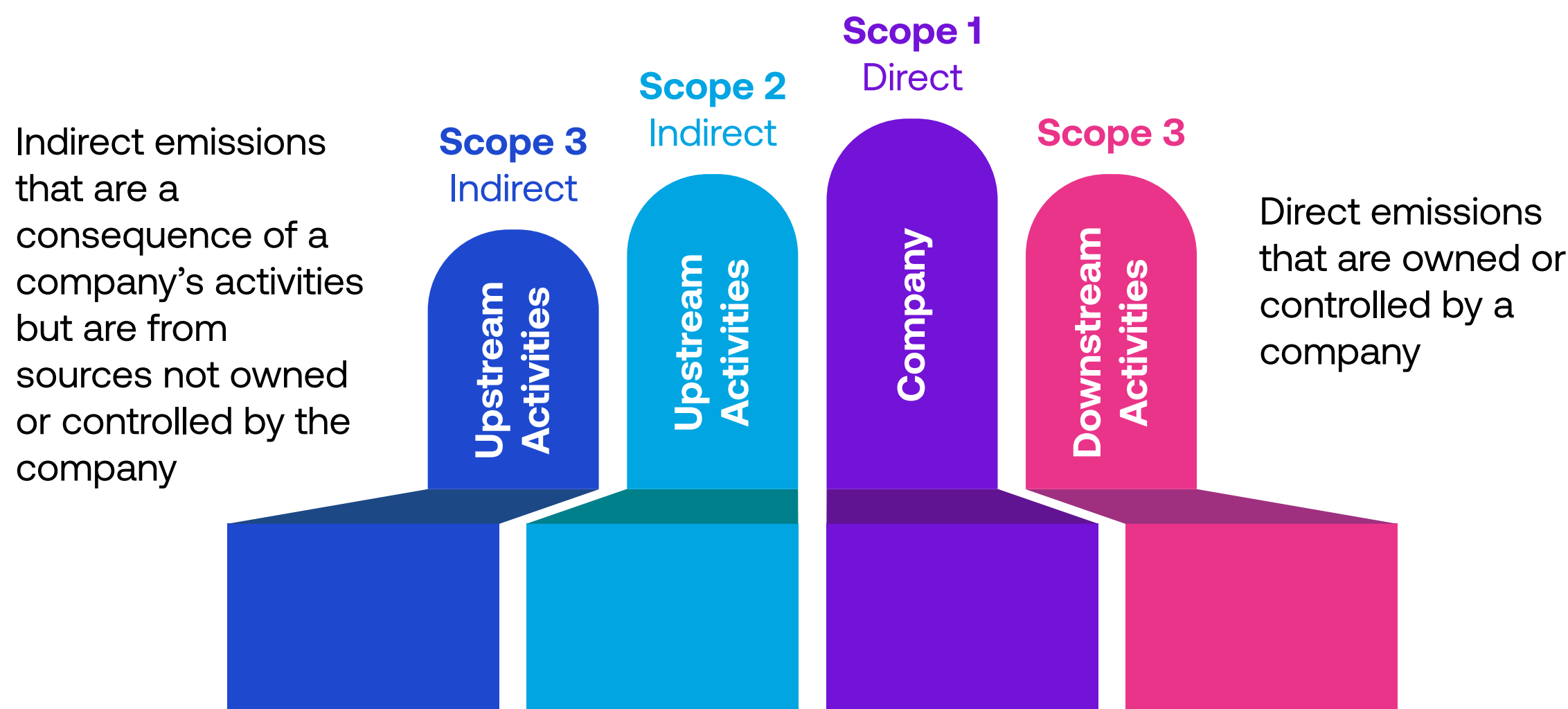


As a starting point, IHLs need to define the boundary and establish the carbon emission baseline. It is encouraged to start from Scope 1 and 2 emissions. Greenhouse Gas (GHG) protocol provides guidance on boundary setting and carbon accounting.

The Science Based Targets Initiative (SBTi) Corporate Net-Zero Standard provides guidance, criteria and recommends setting net-zero targets aligned with climate science. To achieve net-zero emissions, IHLs need to address and reduce emissions across the value chain (Scope 1, 2 and 3)



What are Scope 1, 2 and 3 carbon emissions?



Achieving net-zero emissions through sustainable operations

With the effects of climate change posing a risk to physical infrastructure, supply chains, and operations, investing in resilient and sustainable infrastructure can help universities adapt to changing climate conditions.

For example, taking proactive steps to reduce energy consumption as well as implementing energy-efficient measures can lead to cost savings in the long run.

IHLs achieving net-zero can serve as a role model, showcasing innovative solutions for decarbonisation, sustainable energy, and waste reduction.

IHLs can incorporate their journey to net-zero into their curriculum, offering students the chance to learn about sustainability, climate policy, and environmental sciences. This hands-on learning experience can better prepare students for a world that values sustainability.

DECARBONISATION CHALLENGES FACED BY IHLS

OVERVIEW

Complex Systems

Some IHLs have buildings that have different purposes and operation profiles.

Old Facilities

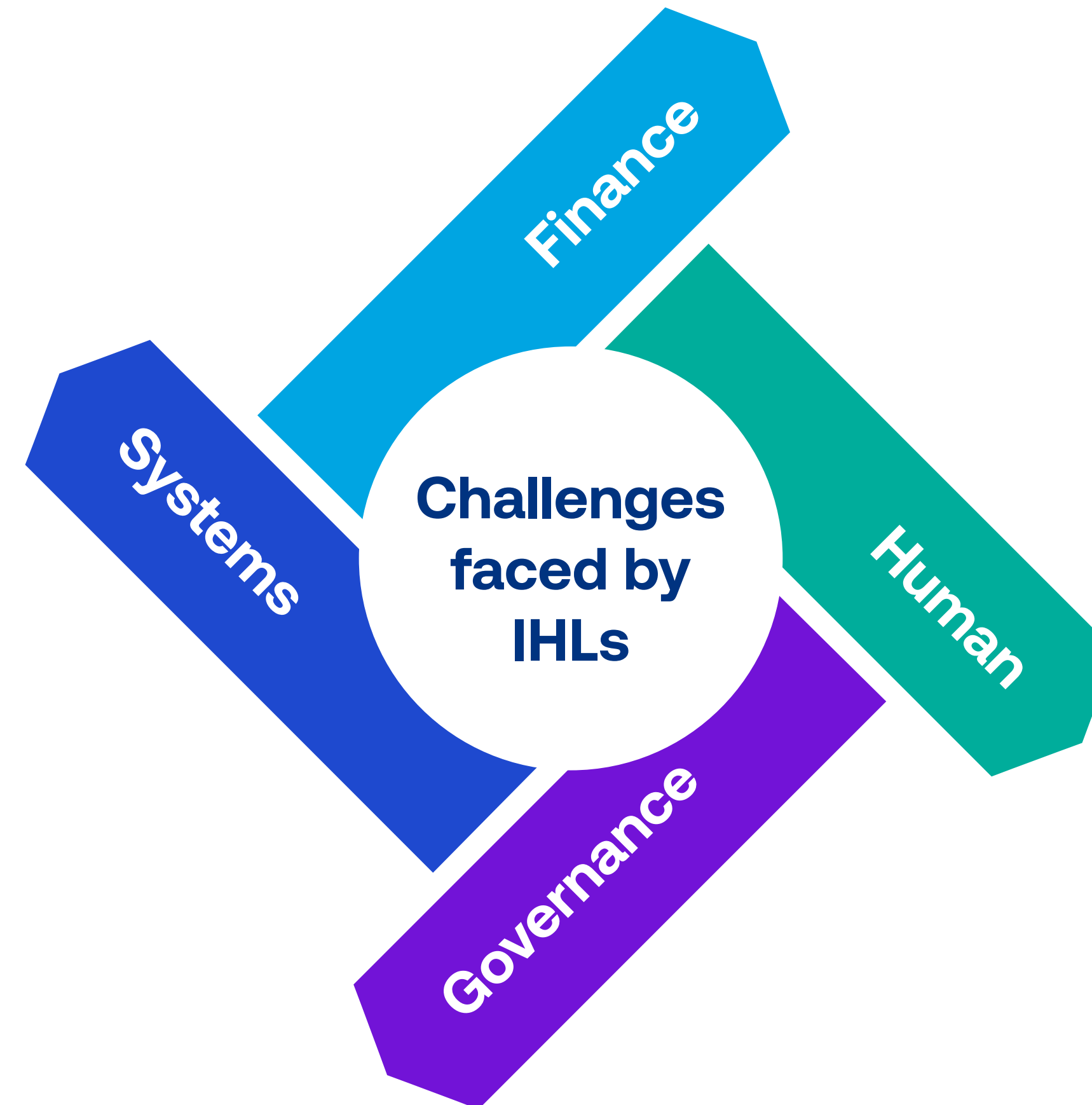
Outdated infrastructure which are not energy efficient. Retrofitting can be costly and complex.

Immaturity of Data Collection

Lack the necessary data management systems and tools.

Balancing Priorities

IHLs have multiple priorities, including research, education, and student experience. Balancing these priorities with decarbonisation efforts can be challenging.



Financial Constraints

Perceived high capital investments needed for decarbonisation solutions

Lack of Incentives

Lack of incentives to adopt decarbonisation solutions

Lack of Technical Expertise

Lack of knowledge of suitable tools and solutions

Behaviour Change

Changing behaviour and attitudes towards energy consumption and waste reduction. This cultural shift can be difficult to achieve and will take time.

Resistance to Change (Refer to next page)

DECARBONISATION CHALLENGES FACED BY IHLS

RESISTANCE TO CHANGE



Resistance to change is a common challenge faced by organisations, including institutes of higher learning, when attempting to implement significant transformations like decarbonisation.

Status Quo Bias

People are often comfortable with familiarity and may resist changes that disrupt their routines or established ways of doing things.

Fear of the Unknown

Decarbonisation involves adopting new technologies and approaches. People might resist these changes due to uncertainty about how these operational changes will affect them.

Loss of Disruptions

Changing energy systems or building designs might lead to temporary inconveniences, such as fluctuations in temperature or power availability. This can lead to resistance from stakeholders.

Lack of Awareness

Some stakeholders might not fully understand the urgency or importance of decarbonisation, leading to indifference or resistance.

Perceived Costs

Individuals might focus on the short-term costs of decarbonisation efforts without considering the potential long-term benefits.

Organisational Culture

If an institution's culture does not prioritise sustainability or innovation, it may face more resistance to change.

Lack of Leadership Support

If key decision-makers within the institution are not fully on board with decarbonisation, it can impede progress.

OVERCOMING DECARBONISATION CHALLENGES FOR IHLS





SINGAPORE
POLYTECHNIC



ADMIN

**SP'S JOURNEY
TOWARDS NET-ZERO**

SP'S CULTURE CHANGE JOURNEY

Prior to 2023, SP was already well-known as a champion for sustainability. The polytechnic was awarded the 2010 President's Award for the Environment, the highest accolade in Singapore for the field of environmental sustainability.

To support Singapore's Green Plan 2030 and net-zero goal of 2045, culture change within SP is key. The following steps were taken to drive culture change:

The Philosophy

Singapore Polytechnic is responsible for shaping the minds of around 10% of each birth cohort, and the transformation of the adult workforce. Hence, SP is expected to do more than what is required under the GreenGov.SG initiative.

It is our responsibility, and privilege as an educational institution, to promote sustainability to everyone who participates in our training programmes.

Thus, Singapore Polytechnic will commit to implementing sustainability measures over and beyond what we are required. For instance, we must reach the Net Zero target before 2045.

In January 2023, the directors of all constituent schools and departments in SP, together with PCEO, attended training in Sustainability Reporting/Climate Strategies, Carbon Management & Accounting.

In April 2023, at the annual workplan seminar attended by all SP staff, climate change, sustainability and decarbonisation topics were introduced.

From May to June 2023, the directors of all constituent schools and departments engaged their respective staff to collectively identify behavioural changes towards more sustainable lifestyles. By July 2023, 85% of all SP staff voluntarily pledged their commitment to these changes.

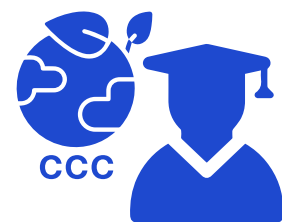
On 5 July 2023, in support of the government's Go Green SG Month, PCEO, backed by the directors of all constituent schools and departments, pledged SP to be a Champion for Sustainability under the Ministry of Sustainability and the Environment (MSE) Green Nation Pledge exercise. The Minister of State for Sustainability and the Environment was in attendance, and about 1100 staff and students participated in the Go Green SP Forum. The goal of getting SP to reach net-zero emissions ahead of the Government's schedule of 2045 was also announced.

From July to September 2023, PCEO engaged 875 ground-level staff in small groups of about 50 on Singapore's sustainability challenges and SP's response.

SP'S ROLES IN SINGAPORE'S DECARBONISATION CHALLENGE

SP must play its role to reduce carbon emissions to help Singapore attain her net-zero target. As an IHL, SP should aim to do so ahead of the Government's timeline of 2045.

List of areas SP should address, beyond just campus net-zero goals:



PET Curriculum

As an IHL, SP has a critical role in equipping students with the values and job skills for a future driven by the sustainability. It must update its curriculum continually towards this end. Thus, in 2023, all SP students undergo a Common Core Curriculum where it is compulsory to undertake a sustainability innovation project. Students can take their interest further through the Minor in Sustainability programme.



Student Behavioural Change

Beyond curriculum, SP also must mobilise students to adopt more sustainable lifestyles and imbue a sustainability mindset among the students. Within the array of student co-curricular activities, SP has an Environment Club. This dedicated group played a pivotal role in supporting the Go Green SP Forum on 5 July 2023. The event was aligned with the nationwide Go Green SG initiative. Additionally, SP has students committed towards NParks' Green Rangers programme, dedicated to supporting tree planting in the community.



Staff Behavioural Change

SP staff must also 'walk the talk' and mobilised to change their behaviour towards more sustainable lifestyles. There was extensive engagement with staff for culture change to take place.



Industry Outreach

In its role to help industries transform and stay competitive, SP must infuse sustainability in its various domains and disciplines. In particular, SP can leverage its 38 hectares of campus as a living lab to showcase sustainability technologies and strategies for Singapore firms and also within the region. SP's Centre for Environmental Sustainability and Energy Efficiency (ESEE) will support and streamline the green transition journey for large companies and SMEs by offering a comprehensive suite of carbon emissions and carbon management consultancy services and solutions to industry partners.



CET Curriculum

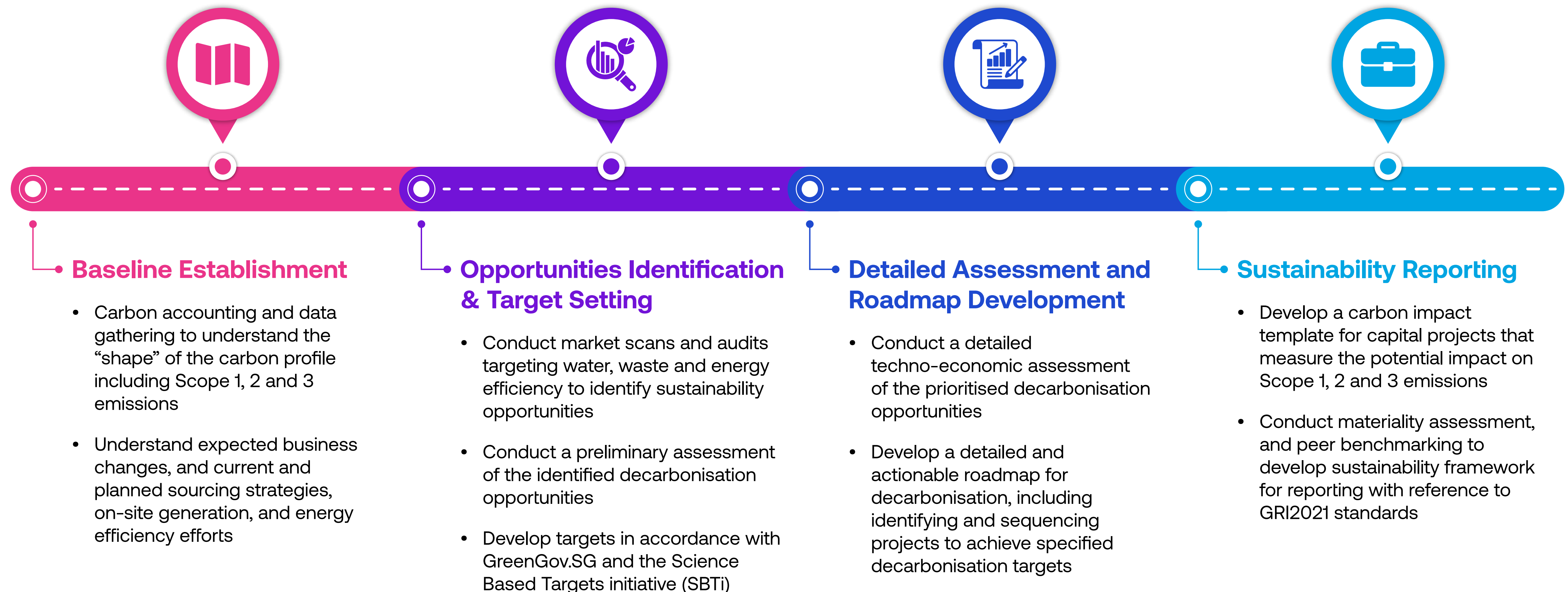
SP also has the role in equipping the adult workforce for the changes anticipated as Singapore and the world pivot towards sustainability. It must continually update its curriculum for this role.

For more information, visit the webpage of Professional & Adult Continuing Education (PACE) Academy Continuing Education and Training (CET) programmes: [PACE Course Overview \(sp.edu.sg\)](https://sp.edu.sg/pace-course-overview)

For further information, kindly visit SP Sustainability webpage: [Sustainability Matters \(sp.edu.sg\)](https://sp.edu.sg/sustainability-matters)

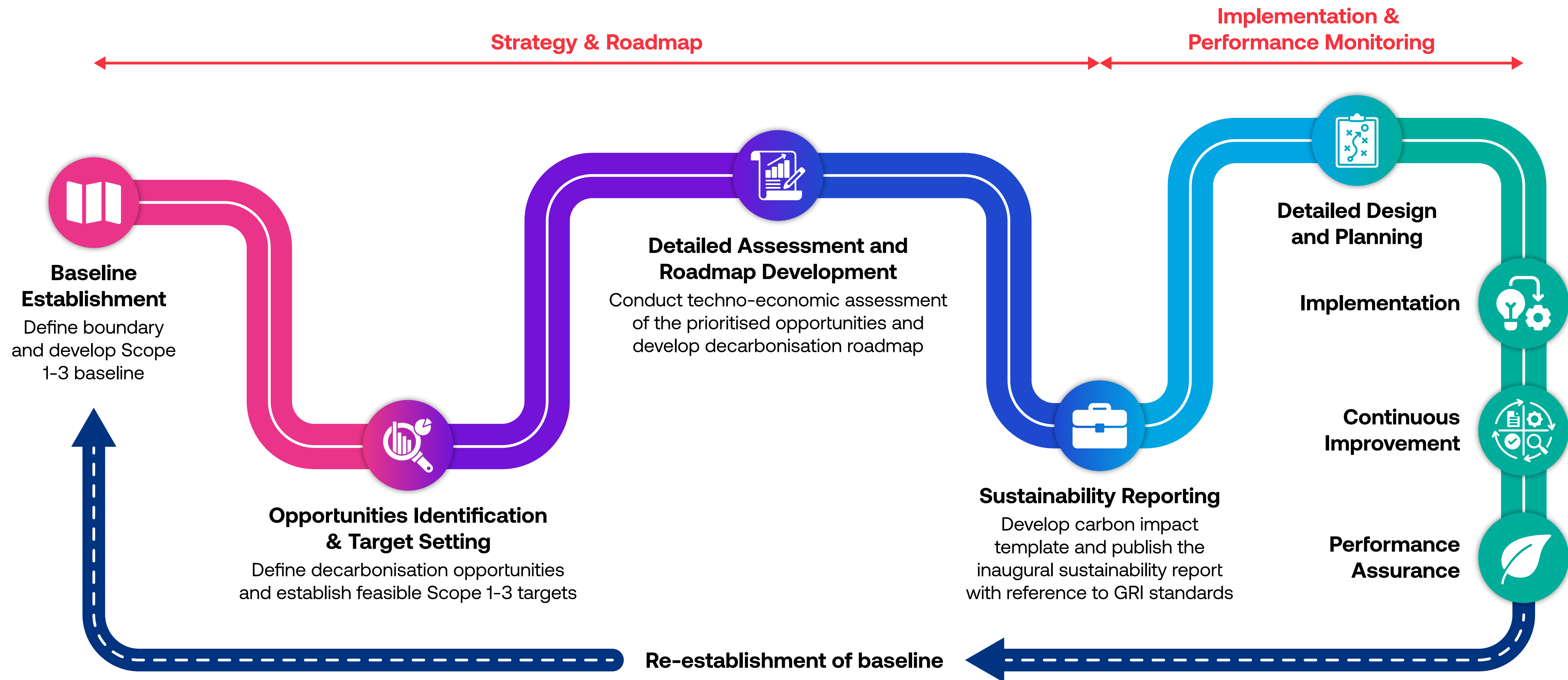
ENGAGING KPMG IN SINGAPORE AS CONSULTANTS: SP'S DETAILED APPROACH FOR NET-ZERO STRATEGY AND ROADMAP

In June 2023, KPMG was appointed as consultants for **SP's net-zero strategies and roadmap** after a tender exercise. In scoping the study, it was recognised that a comprehensive 4-phase approach was needed. The report is due in Q1 2024.



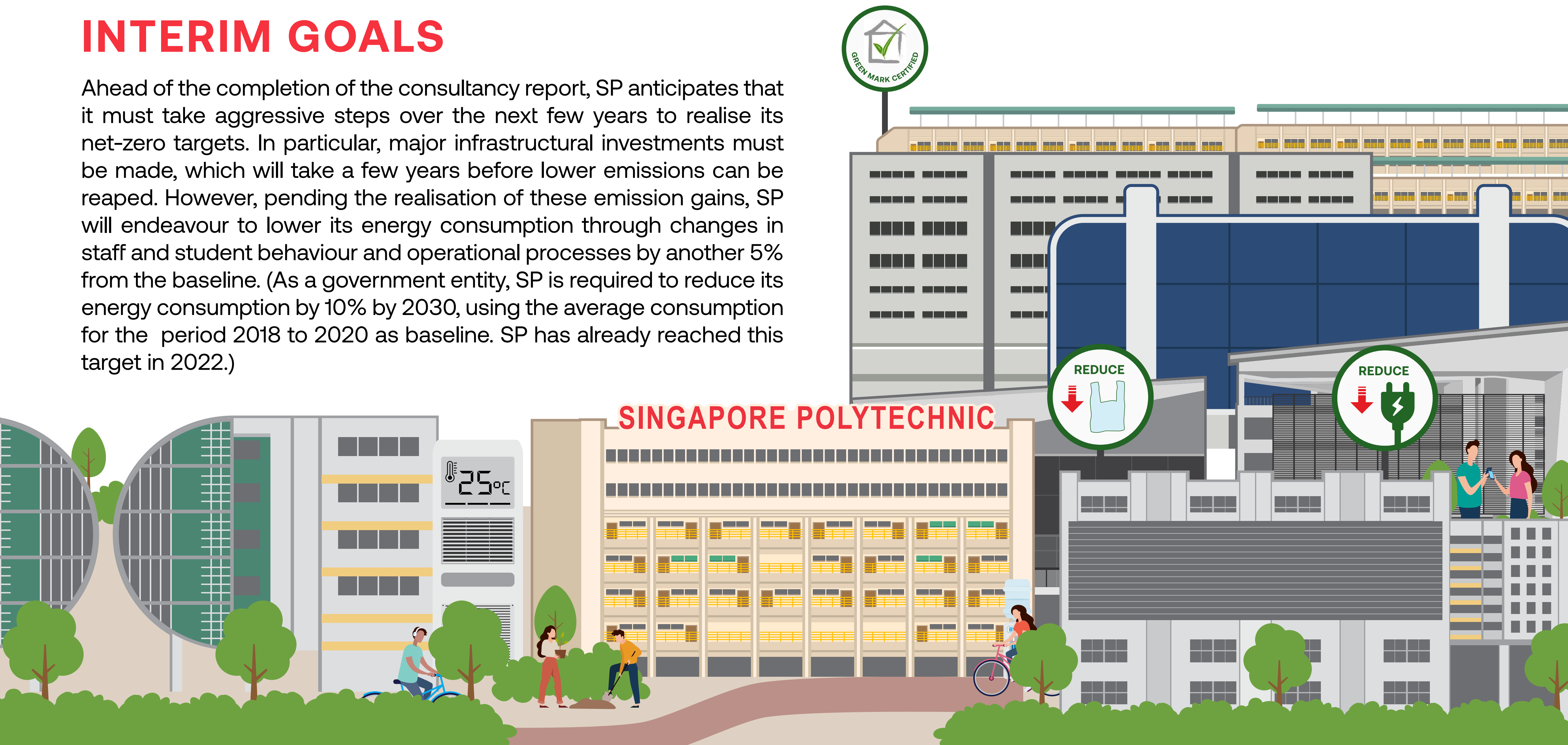
SP'S NET-ZERO APPROACH

Beyond the initial consultancy study, there will be a process of continual improvement as SP strives towards its net-zero targets.



INTERIM GOALS

Ahead of the completion of the consultancy report, SP anticipates that it must take aggressive steps over the next few years to realise its net-zero targets. In particular, major infrastructural investments must be made, which will take a few years before lower emissions can be reaped. However, pending the realisation of these emission gains, SP will endeavour to lower its energy consumption through changes in staff and student behaviour and operational processes by another 5% from the baseline. (As a government entity, SP is required to reduce its energy consumption by 10% by 2030, using the average consumption for the period 2018 to 2020 as baseline. SP has already reached this target in 2022.)

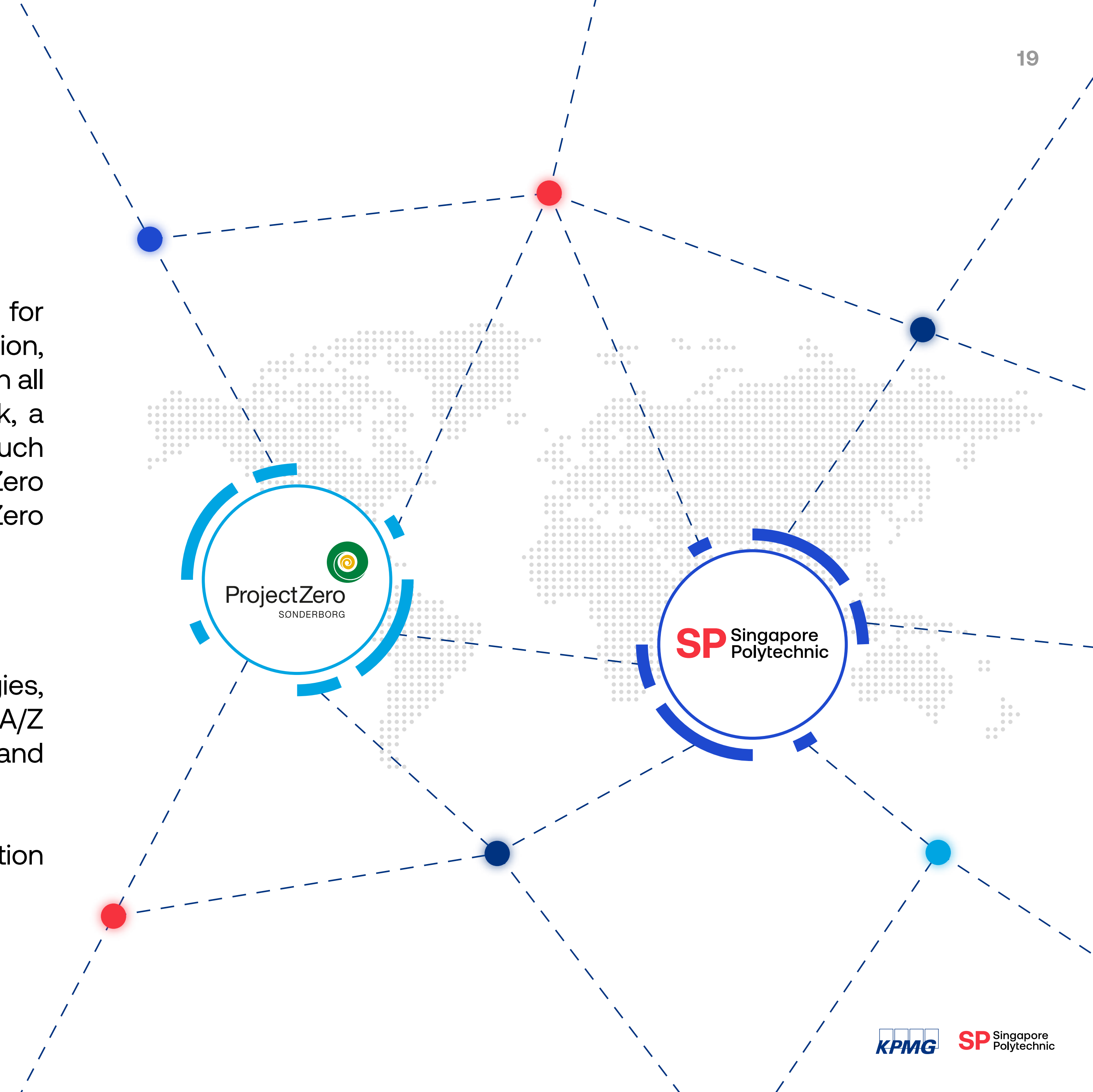


PROJECTZERO NETWORK

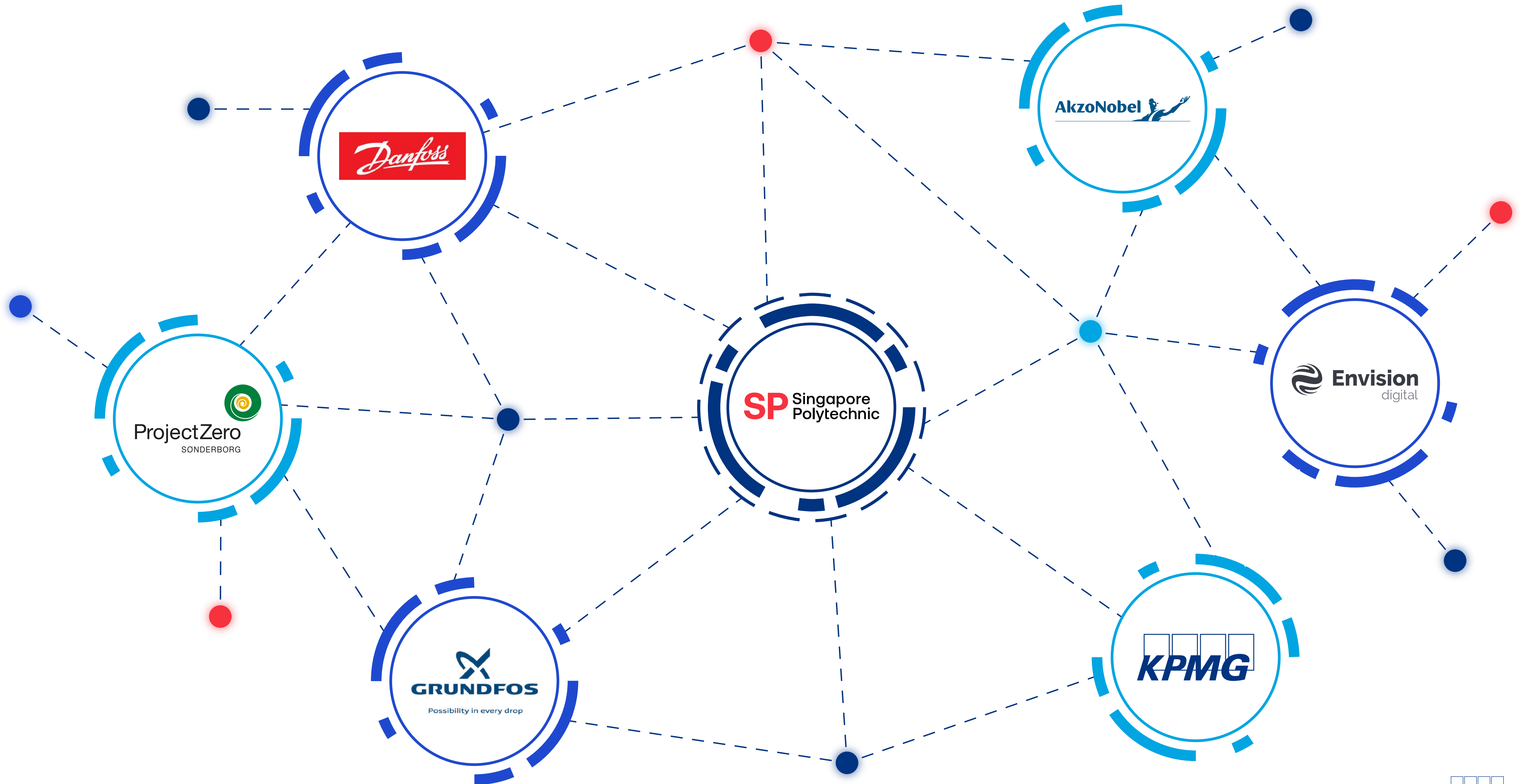
SP regards climate change as an existential challenge for Singapore and the world. Thus, we pursue collaboration, knowledge sharing and benchmarking of best practices with all entities in all areas relevant to sustainability. This Playbook, a collaboration between KPMG in Singapore and SP, is one such example. Going further, SP has partnered with the ProjectZero Office of the City of Sonderborg, Denmark in the ProjectZero Network.

The ProjectZero Network seeks:

- To share best concepts, practices, knowledge, technologies, including those implemented by ProjectZero A/Z Sonderborg, to advance sustainability, decarbonisation and net-zero emissions agenda; and
- To grow an international network of partners for collaboration towards the agenda



SP'S ECOSYSTEM & PARTNERSHIPS

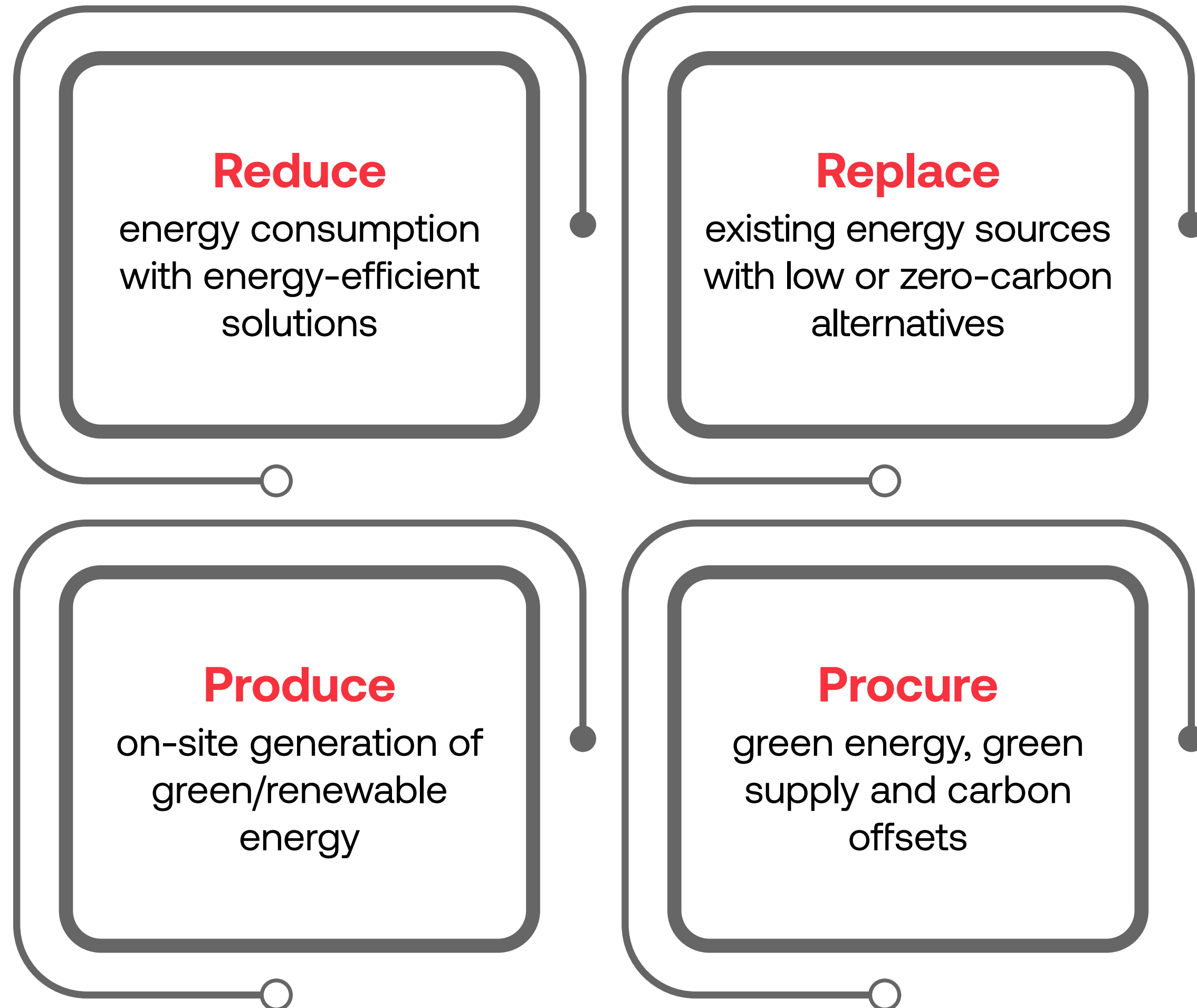




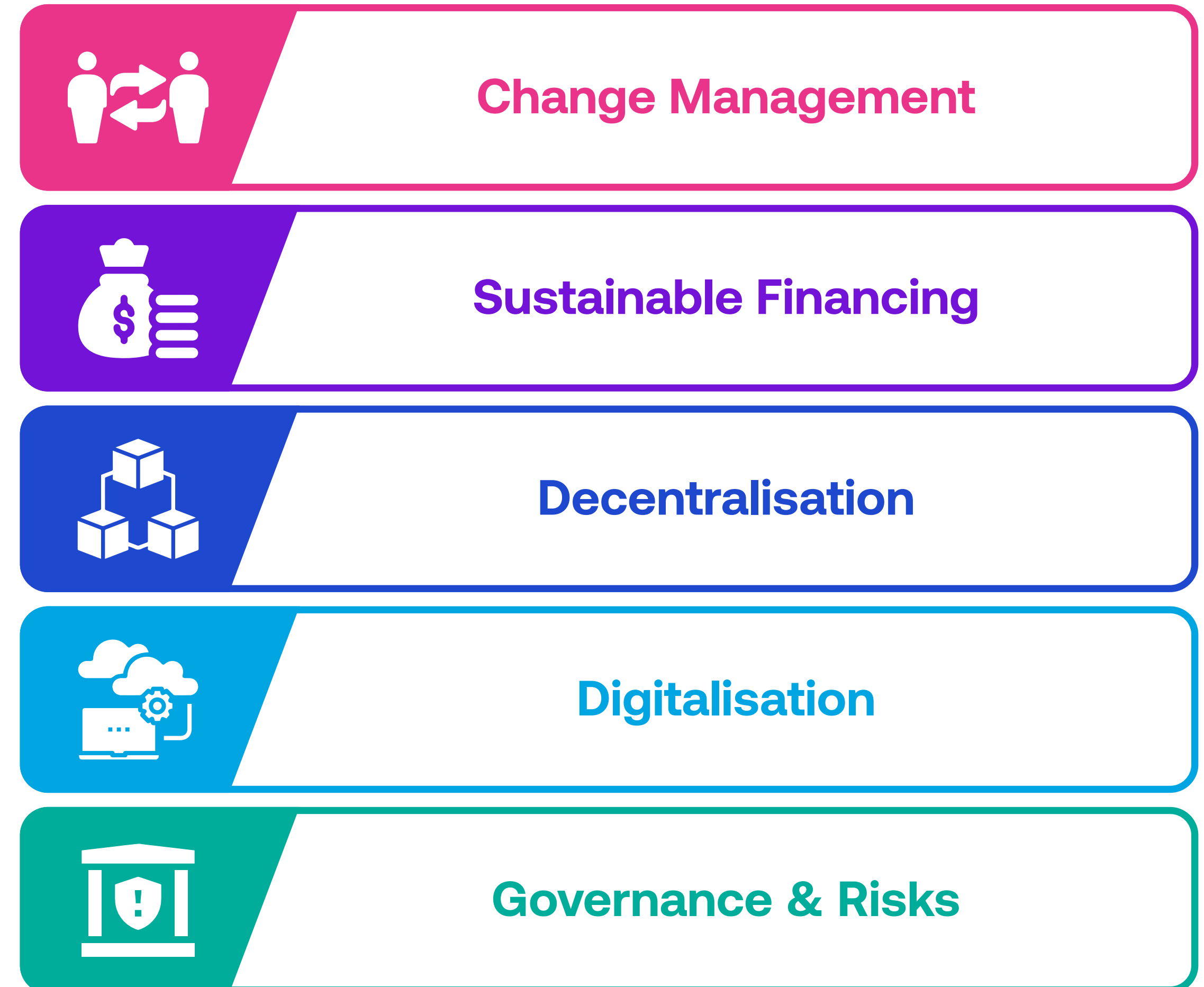
DECARBONISATION TECHNICAL GUIDE

NET-ZERO FRAMEWORK

Decarbonisation Levers

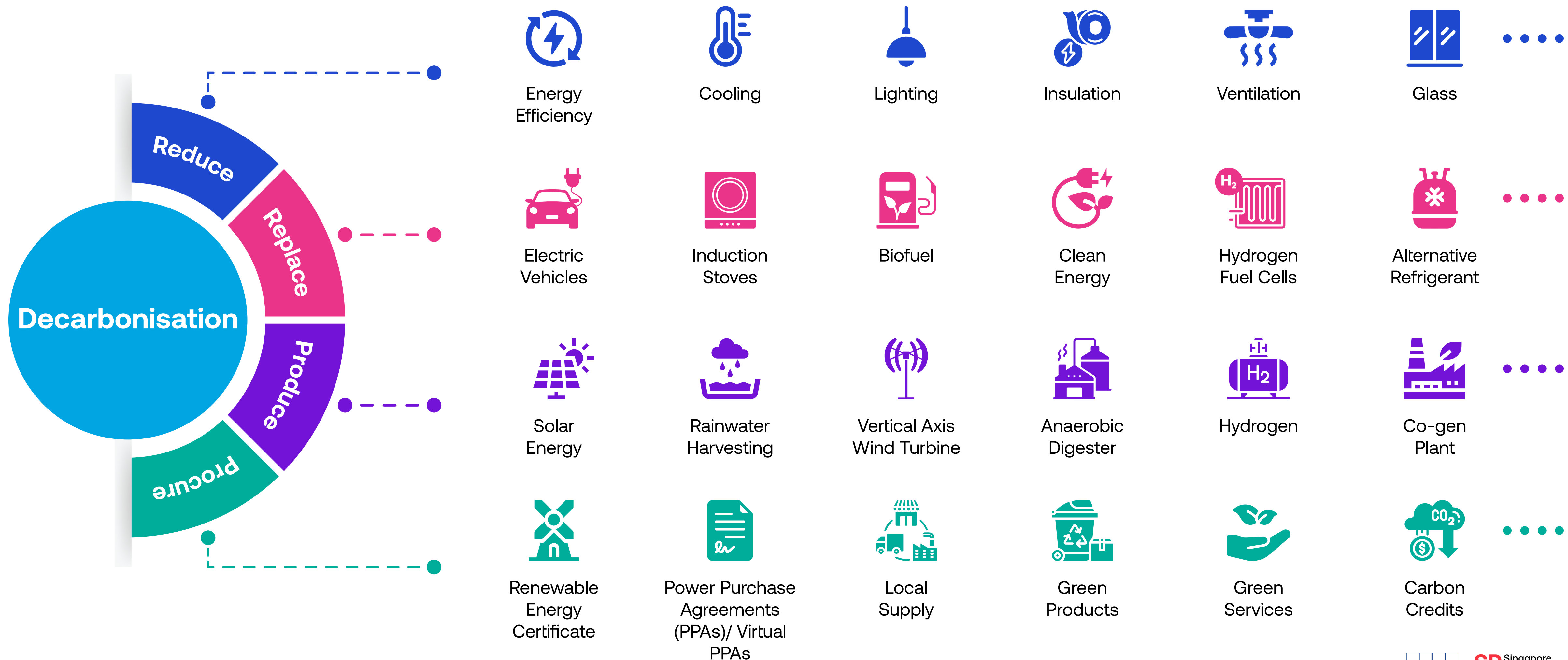


Decarbonisation Enablers



DECARBONISATION LEVERS

IHLs are investing in resources, innovation, and infrastructure to accelerate the shift to a low-emissions future. Proactive planning and timely action are crucial in reducing the costs involved in industrial decarbonisation and ensuring a smooth transition.

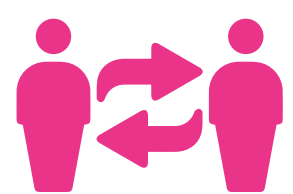


DECARBONISATION ENABLERS

Each IHL has unique characteristics which necessitate a blend of financial, digital, communication, and change management measures as they chart their decarbonisation pathway.

Change Management

Decarbonisation is not only about adopting technologies. Behaviour matters and affects the decarbonisation progress. IHLs could focus on adopting a change management approach centred around people to cultivate a collective vision for the Net-Zero transition, communicate and engage stakeholders in both top-down and bottom-up approaches, facilitate change, and embrace a fresh sustainable mindset.



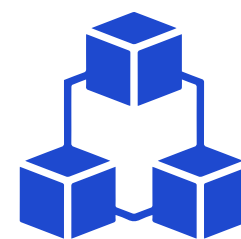
Sustainable Financing

Sustainable financing can provide IHLs with the means to make meaningful investments in decarbonisation efforts, and advance environmental sustainability. By aligning financial resources with sustainability goals, IHLs can drive positive change in their campuses.



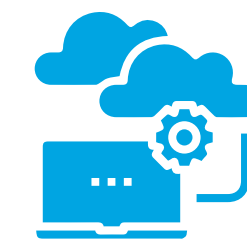
Decentralisation

Smart grids are pivotal in enhancing the efficiency of electricity transmission and distribution networks, facilitating the smooth incorporation of renewable energy sources and distributed resources. Decentralisation aids the decarbonisation efforts by through integrating with clean energy generation onsite.



Digitalisation

Data granularity is the foundation of any decarbonisation plan. A campus-level, scalable and open architecture digitalisation strategy will help IHLs to optimise, automate and continuously improve infrastructure management. The strategy should take into consideration metering/sensors for electricity, gas, water, waste, sound, lux, IAQ, occupancy, movement, and so on. IHLs should also be encouraged to explore IoT devices and 5G opportunities to make the most of enterprise digitalisation.



Governance & Risks

Governance and internal sustainability policies help to embed sustainability into the organisational culture, which facilitates the achievement of decarbonisation targets. Understanding the risks imposed by climate change, including both physical and transition risks, will also help IHLs to accelerate their decarbonisation journey and commit to decarbonisation targets that are both ambitious and feasible.



PLAN AND IMPLEMENT DECARBONISATION ROADMAP

IHLs should focus on building a resilient future by crafting a strategic decarbonisation roadmap to achieve ambitious sustainability targets and drive organisational success.

Strategise & Plan

- Establish baseline and identify goals
- Formulate a plan to measure, and monitor data across the value chain

Execute

- Conduct project kick-off meetings with key stakeholders
- Initiate and manage timeline and deliverables, and track progress of ongoing project management activities
- Understand stakeholders' involvement in meeting ESG reporting requirements
- Communicate changes to stakeholders

Report & Optimise

- Create a process to document, identify, categorise, and track risks
- Assess decisions for potential impacts and escalate to the appropriate stakeholders
- Document and manage requests for changes
- Provide data model-based analysis for better informed decision making

Governance

- Establish governance framework with management oversight and clear accountability structures
- Institutionalise adaptability in reporting mechanisms with regular reviews of critical assumptions

The playbook serves as a guide for IHLs embarking on their decarbonisation journey, providing insights, strategies, and actionable steps for a net-zero future.

