

# TECHNOLOGY AND INNOVATION

»» Amidst a fast-changing environment, technology and innovation are key enablers for Keppel to achieve its Vision 2030 plans.

Technology and innovation efforts are driven both at the Group and business unit (BU) levels.

Keppel Technology & Innovation (KTI), which was established in 2018, serves as the Group's platform to sharpen its focus on innovation, provide technology foresight in a rapidly evolving environment, and identify long gestation opportunities in collaboration with BUs. BUs also have dedicated innovation teams that, working in collaboration with KTI, identify, scope and pursue ideas and projects within their respective segments, such as Keppel Infrastructure's Keppel Energy Transition Centre (KETC) or Keppel Land's Innovation Agile Team (IAT).

Beyond in-house capabilities, the Group also has a Keppel Technology Advisory Panel, comprising eminent business leaders and industry experts from across the world, which guides the Group's innovation journey and provides technology foresight.

With effect from 1 March 2022, Keppel has appointed a Chief Digital Officer (CDO), and also established a Group Digital Office – a newly created department to drive digital transformation, as well as a Digital Transformation Steering Committee, which will be chaired by the CDO.

## TECHNOLOGY & INNOVATION MANAGEMENT

Keppel looks at technology and innovation across three lenses: business segments, time horizon and key technologies.

### BUSINESS SEGMENTS

**Energy & Environment:** We are collaborating with upstream, midstream and downstream partners to develop decarbonisation solutions and new energy systems. We are leveraging Keppel's energy systems engineering expertise to develop new infrastructure, power systems and carbon capture technologies.

**Urban Development:** We are focusing on smart, sustainable buildings and cities, new services to enhance the live-work-play experience, as well as innovative climate-resilient nearshore urban developments, which can help to mitigate the impact of climate change and rising sea levels.

**Connectivity:** We are focused on delivering new generations of energy-efficient and green data centres, including energy-efficient floating data centre parks, to meet the global IT demand sustainably. We are also rolling out M1's 5G Standalone network and developing the world's first subsea cable system that directly connects Singapore to the west coast of North America via Indonesia.

**Asset Management:** We are building the digital foundation to connect our assets around the world, enabling more streamlined operations and optimised decision making.

### TIME HORIZONS

We are exploring opportunities across three time horizons:

- **Engine 1: Current businesses**  
Our focus is on driving efficiencies and continued expansion through digitalisation and advanced analytics, to reduce cost, deepen customer engagement and centrality and accelerate growth.
- **Engine 2: Existing or new businesses that we are scaling up**  
We seek to unlock applications for new and disruptive technologies through an ecosystem approach involving in-house as well as external expertise from industry, research centres and academia.
- **Engine 3: Longer term opportunities**  
These are high-potential opportunities which we are exploring for the long term, but with limited impact expected within the next three years.

### KEY TECHNOLOGIES

**Digitalisation & Automation:** We are driving digitalisation across the Group to streamline operations and create new products and services for our customers. These solutions can be applied across Keppel's different facilities.

**Advanced Analytics:** We are investing to build an integrated digital backbone across the Group, aimed at better leveraging the abundant data that our businesses continuously generate, with the objective to enhance our operations and decision making, as well as build new platforms such as a B2C ecosystem.

**New Energy Systems:** Amidst the energy transition, we are researching and developing the technologies required to enable new energy value chains. Hydrogen is expected to be a critical energy vector and we are exploring solutions for multiple carrier forms. We are also building new energy systems and creating new business models such as Energy-as-a-Service to meet our customers' needs.

**Smart Engineering:** We are building on our engineering capabilities and collaborating with partners on the newest design, engineering and manufacturing technologies. We aim to increase energy efficiency, reduce time to market, cost to build and operate, and the environmental footprint of our projects.

**5G & IoT:** With the world seeing a multitude of applications of 5G and IoT applied to smart buildings and cities, autonomous vehicles, advanced robotics etc., we continue to build connectivity, IoT, analytics, cloud and edge computing solutions to meet future demands.

### Energy & Environment

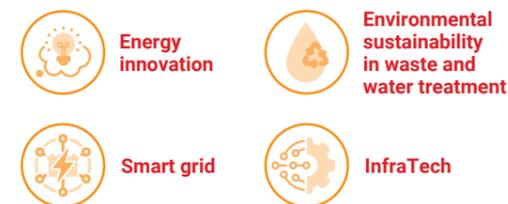
## Keppel Energy Transition Centre



We are building new energy systems and creating new business models such as Energy-as-a-Service to meet our customers' needs.

In 2021, Keppel Infrastructure (KI) established the KETC as its technology and innovation arm. KETC aims to harness technological foresight and accelerate innovation and technology development with the goal of positioning KI at the forefront of the energy transition to capture opportunities presented by this macrotrend.

### Core focus areas



KETC will collaborate with multiple parties, including technology providers, start-ups, institutes of research and higher learning, interest groups and funding agencies. It aims to facilitate global ecosystem partnerships, promote open innovation and co-creation, including low-carbon living labs and new digital business models, leveraging Keppel's global business footprint.

KETC supports KI's aim to be a leading player for innovative large-scale decarbonisation, low-carbon energy and environmental solutions, which will help industries and stakeholders overcome climate-related challenges and enhance energy and water resilience.

### Urban Development

## Keppel Land's Business Model Innovation



Keppel Land is reinventing the way it delivers value to its customers, leveraging the latest technologies.

As Keppel Land transforms from a brick-and-mortar developer into an asset-light solutions provider for urban spaces, it is also reinventing the way it delivers value to its customers.

An IAT has been established to focus on business model innovation for urban spaces. IAT comprises key representatives across departments globally, including those involved in digitalisation & technology, customer centrality, innovation investments, business development and operations.

### Key thrusts

- Facilitating ideation, validation and incubation of new business ideas.
- Promoting innovation-related best practices through focused workshops and training sessions.
- Engaging proptech venture capital and the start-up ecosystem, in collaboration with government agencies.
- Taking strategic stakes in promising proptech-related venture capital funds and start-ups.