MEDIA RELEASE

25 October 2021

12 Projects Awarded $55 Million to Accelerate Decarbonisation in Singapore

Under the Low-Carbon Energy Research Funding Initiative (LCER FI), the Singapore Government has awarded $55 million to support 12 research, development and demonstration projects on low-carbon energy technology solutions. This significant investment in low-carbon energy solutions is part of the Singapore Energy Story [1], and will support our ambitions under the Long-Term Low-Emissions Development Strategy[2] and the Singapore Green Plan[3].

2 On the importance of the LCER FI award, Minister for Trade and Industry Mr Gan Kim Yong said: "As an alternative energy-disadvantaged country, we have to invest early in low-carbon energy technologies such as hydrogen, and carbon capture, utilisation and storage (CCUS), so that we are able to meet emission targets in 2050 and beyond. They will complement decarbonisation efforts such as solar deployment and low-carbon electricity imports into Singapore, which can contribute to emission cuts in the nearer term. The first LCER FI grant call saw the submission of more than 50 strong research proposals across a wide range of emerging hydrogen and CCUS solutions. This is encouraging. It is a testament to Singapore's research and development capabilities, which will play a key role in our collective efforts to build a more sustainable future."

3 Funds awarded are from the $49 million LCER FI announced in October 2020 with additional funding support from the Research, Innovation and Enterprise 2025 (RIE2025) budget. The 12 awarded projects will improve the technical and economic feasibility of implementing low-carbon technologies that support the decarbonisation of Singapore's power and industry sectors, across two key areas:

[1] Details on Advancing Singapore's Energy Transition Towards a More Sustainable Future can be found in Annex B.
[2] Details on Singapore's Long-Term Low-Emissions Development Strategy can be found in Annex C.
[3] Details on the Singapore Green Plan can be found in Annex D.

i. Hydrogen: Hydrogen is a versatile energy carrier that can be used to store and transport energy. It does not emit carbon dioxide when used as fuel and has the potential to diversify Singapore's fuel mix. However, at this point hydrogen is too expensive to be used widely. Projects funded under the LCER FI will go towards reducing costs and increasing efficiencies of hydrogen-related processes. For example, projects will look at developing easier ways to transport hydrogen by using ammonia, and enabling the safe deployment of hydrogen by developing sensors to detect hydrogen leaks. One project will explore reducing the cost of using Liquid Organic Hydrogen Carriers for the transportation of hydrogen.

ii. Carbon capture, utilisation and storage (CCUS): CCUS has the potential to reduce carbon dioxide (CO_2) emissions by capturing and converting CO_2 emissions from power plants and industrial facilities into useful products (e.g. building materials, reclamation sand and synthetic fuels), or for storage underground. Projects will explore using captured CO_2 to make alternatives to sand which can be used for construction purposes. Others include developing CO_2 capture technologies such as novel membranes or novel materials to absorb CO_2 using ashes collected from Singapore's waste-to-energy facilities. One project will also explore the use of captured CO_2 and water to produce important commodity chemicals for industrial processes.

(Details of all awarded projects can be found in Annex A).

4 The LCER FI is a multi-agency initiative involving the Agency for Science, Technology and Research (A*STAR), the Economic Development Board (EDB), the Energy Market Authority (EMA), the National Climate Change Secretariat (NCCS), and the National Research Foundation (NRF). It is co-driven by EDB and EMA to guide private sector consortia on the development and deployment of low-carbon solutions, the development of hydrogen supply chains, and to ensure projects awarded are relevant to the industrial and power sectors. The 12 awarded projects were selected after a grant call was launched in January 2021 by A*STAR, as the implementing agency on behalf of the government.

5 Emerging low-carbon alternatives is one of four switches in the Singapore Energy Story to build a more sustainable energy future. The Government has also conducted two feasibility studies on low-carbon hydrogen and CCUS technologies, from which key findings[4] were used to evaluate proposals received under the LCER

[4] The "Study of Hydrogen Imports and Downstream Applications for Singapore" was jointly commissioned by the National Climate Change Secretariat (NCCS), Singapore Economic Development Board (EDB) and Energy Market Authority (EMA); while the study on "Carbon Capture, Storage, and Utilisation: Decarbonisation Pathways for Singapore's Energy and Chemicals Sectors" was jointly commissioned by NCCS and EDB. Detailed findings of the feasibility studies are available at:

a. https://www.nccs.gov.sg/docs/default-source/default-document-library/hydrogen-study-report.pdf
b. https://www.nccs.gov.sg/docs/default-source/default-document-library/ccus-study-report.pdf

FI grant call. The Singapore Government welcomes more of such partnerships, and opportunities to pilot new technologies in sectors including maritime, aviation, mobility, industry and power sectors.

Annex A: Details of Awarded Projects
Annex B: Factsheet on Advancing Singapore's Energy Transition Towards a More Sustainable Future
Annex C: Factsheet for Singapore's Long-Term Low-Emissions Development Strategy
Annex D: Factsheet for the Singapore Green Plan

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About the Agency for Science, Technology and Research

The Agency for Science, Technology and Research (A*STAR) is Singapore's lead public sector R&D agency. Through open innovation, we collaborate with our partners in both the public and private sectors to benefit the economy and society. As a Science and Technology Organisation, A*STAR bridges the gap between academia and industry. Our research creates economic growth and jobs for Singapore, and enhances lives by improving societal outcomes in healthcare, urban living, and sustainability. A*STAR plays a key role in nurturing scientific talent and leaders for the wider research community and industry. A*STAR's R&D activities span biomedical sciences to physical sciences and engineering, with research entities primarily located in Biopolis and Fusionopolis. For ongoing news, visit www.a-star.edu.sg.

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About the Singapore Economic Development Board

The Singapore Economic Development Board (EDB), a government agency under the Ministry of Trade and Industry, is responsible for strategies that enhance Singapore's position as a global centre for business, innovation, and talent. We undertake investment promotion and industry development, and work with international businesses, both foreign and local, by providing information, connection to partners and access to government incentives for their investments. Our mission is to create sustainable economic growth, with vibrant business and good job opportunities for Singapore.

For more information on EDB, please visit www.edb.gov.sg.

About the Energy Market Authority

The Energy Market Authority (EMA) is a statutory board under the Singapore Ministry of Trade and Industry. Through our work, we seek to forge a progressive energy landscape for sustained growth. We aim to ensure a reliable and secure energy supply, promote effective competition in the energy market and develop a dynamic energy sector in Singapore. Visit www.ema.gov.sg for more information.

Instagram: @EMA_Singapore | Facebook: facebook.com/EnergyMarketAuthority | Twitter: @EMA_sg | LinkedIn: linkedin.com/company/energy-market-authority-ema-/

About the National Climate Change Secretariat

The National Climate Change Secretariat (NCCS) is part of the Strategy Group under the Prime Minister's Office, which develops and implements Singapore's domestic and international policies and strategies to tackle climate change. NCCS achieves this by adopting a Whole-of-Government approach and working with the people and private sectors to mitigate carbon emissions in all sectors, helping Singapore adapt to the effects of climate change, harnessing economic and green growth opportunities arising from climate change, and encouraging public awareness and action on climate change. For more information, please visit www.nccs.gov.sg.

About the National Research Foundation Singapore

The National Research Foundation (NRF) is a department within the Prime Minister's Office. NRF sets the national direction for research and development (R&D) by developing policies, plans and strategies for research, innovation and enterprise. It also funds strategic initiatives and builds up R&D capabilities by nurturing research talent. The NRF aims to transform Singapore into a vibrant R&D hub that contributes towards a knowledge-intensive, innovative and entrepreneurial economy; and make Singapore a magnet for excellence in science and innovation.

ANNEX A

DETAILS OF AWARDED PROJECTS

SN	Research Theme	Proposal Title	Proposal Description	Project Investigator (PI) Team
1.	Hydrogen (H_2)	Ammonia Cracking: New Catalyst Development, Reaction Engineering and System Design	Project aim: To develop more efficient processes to release H_2 from ammonia, by examining the development of robust and efficient ammonia cracking technologies suitable for use in Singapore. Potential benefits: H_2 is difficult to transport in its native state, which requires high pressures and extremely cold temperatures to compress. One way to make it easier to transport is to convert the H_2 into a carrier such as ammonia. However, releasing H_2 from ammonia is an energy intensive process. An improved and more efficient process will reduce the energy penalty of transporting H_2 in the form of ammonia and reduce the cost of H_2 adoption in Singapore.	PI Institute: National University of Singapore (NUS) Lead Project Investigator: Assoc Prof Yan Ning, NUS Project Team: Prof Chan Siew Hwa, NTU and Asst Prof He Qian, NUS; Academic/Industry Collaborator(s): Surbana Jurong Infrastructure Pte Ltd and NUS

2.	H_2	Miniature H_2 leakage and purity sensors for downstream H_2 use	Project aim: To develop two types of H_2 sensors, a hydrogen purity sensor and a hydrogen leakage sensor, with small form factor, high selectivity minimal interferences and immunity to poisoning for downstream use. Standards will also be created for H2 sensors evaluation and quality. Potential benefits: Improve the safety of H_2 use, allow deployment of sensors economically to enable trading and safety and increase confidence towards adoption of H2 for downstream uses.	PI Institute: Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR) Lead Project Investigator: Dr. Doris Ng Keh Ting, A*STAR's IME Project Team: Dr Cai Hong, A*STAR's IME; Dr Kai Fuu Ming, National Metrology Centre (NMC), Agency for Science, Technology and Research (A*STAR); Assoc Prof Zhao Dan,NUS; Dr Liu Jihang, A*STAR's IME; and Dr Subhranu Samanta, A*STAR's IME Academic/Industry Collaborator(s): Hydrogen and Fuel Cell Association of Singapore (TAC)
3.	H_2	Methane Pyrolysis for H_2 and Carbon Nanotube Production via Novel Catalytic Membrane Reactor System	Project aim: To develop an improved process for methane pyrolysis, i.e. catalytic cracking and separating natural gas/methane into H_2 gas and solid carbon. It examines development of a novel bi-functional catalytic membrane reactor (CMR) process, where ultra-pure H_2 and highly-ordered carbon nanotubes (CNTs) are co-produced via methane (natural gas) pyrolysis process with zero carbon dioxide (CO_2) emission.	PI Institute: NUS Lead Project Investigator: Assoc Prof Sibudjing Kawi, NUS Project Team: Prof Wang Chi-Hwa, NUS; Assoc Prof Yang Wenming, NUS; and Dr Chang Jie, Institute of Chemical and Engineering Sciences (ICES), Agency for Science, Technology and Research (A*STAR)

			Potential benefits: Methane pyrolysis is a potential pathway to producing low-carbon H_2 in Singapore. The process is currently costly and energy intensive. If successful, this can reduce the cost of H_2 production in Singapore whilst producing valuable carbon products at the same time.	Academic/Industry Collaborator(s): Dyna Mac Engineering Services; Sembcorp Industries Ltd; University of California@Davis; Curtin University; Université de Toulouse-Centre RAPSODEE-CNRS and A*STAR's ICES,
4.	H_2	Liquid Organic Hydrogen Carriers (LOHCs) Technology for Singapore	Project aim: To develop new catalysts and systems to reduce the costs of extracting hydrogen from methylcyclohexane (MCH) as an LOHC technology and to design a minimum-cost hydrogen supply chain network for Singapore. Project benefits: MCH can be transported in liquid state at ambient conditions using the existing petroleum infrastructures, but the process to extract hydrogen from the MCH molecule requires high-performance and cost-effective catalyst and is energy intensive. This proposal could improve the performance and reduce the cost of existing SPERA catalyst from Chiyoda and design new reactors of better heat transfer, therefore reducing the cost of importing hydrogen using this carrier. A comprehensive financial model to access	PI Institute: NTU Lead Project Investigator: Prof Xu Rong, NTU Project Team: Asst Prof Tej Choksi, NTU; Assoc Prof Raymond Lau Wai Man, NTU; Asst Prof Paul Liu, NTU; Assoc Prof Alessandro Romagnoli, NTU; Prof Iftekhar A. Karimi, NUS; Prof Farooq Shamsuzzaman, NUS Academic/Industry Collaborator(s): Chiyoda Corporation; PSA Corporation Limited; Sembcorp Industries Ltd; City Gas Pte Ltd; Jurong Port Pte Ltd; Singapore LNG Corporation and Mitsubishi Corporation;

			the cost of the hydrogen supply chain in Singapore will also be developed by collaborating with our industrial partners.	
5.	Carbon Capture, Utilisation and Storage (CCUS)	Alternative Sand from Carbon Dioxide and Waste Materials	Project aim: To examine the processes for the capture and mineralisation of CO_2 into alternative sand that can be used for building and construction purposes. Project benefits: Captured CO_2 can be used to make useful products such as construction material in this case.	PI Institute: A*STAR's ICES Lead Project Investigator: Dr. Bu Jie, A*STAR's ICES Project Team: Asst Prof Liu Wen, NTU; Assoc Prof Pang Sze Dai, NUS; and Mr Yeo Tze Yuen, A*STAR's ICES Academic/Industry Collaborator(s): Samwoh Innovation Centre Pte Ltd and EnGro Corporation Ltd
6.	CCUS	Capturing waste with waste: Continuous carbon capture using highly efficient sorbents derived from	Project Aim: To develop a carbon capture process (calcium looping) by using novel sorbents derived from calcium-rich incineration ashes, collected from Singapore's waste-to-energy facilities. Potential benefit: This will enable the use of incineration ash, which is a waste material, for CO_2 capture. Both waste streams: incineration ashes and CO_2, can be	PI Institute: Nanyang Technological University (NTU) Lead Project Investigator: Asst Prof Liu Wen Paul, NTU Project Team: Prof Simon Redfern, NTU; Snr Scientist Dr Bu Jie, A*STAR's ICES; Asst Prof Grzegorz Lisak, NTU; Prof Lim Teik Thye, NTU; Snr Research Fellow Dr Andrei

		incineration ashes	subsequently turned to sustainable construction materials after carbon capture.	Veksha, NTU and Snr Research Fellow Dr Chan Wei Ping, NTU Academic/Industry Collaborator(s): Surbana Jurong Infrastructure Pte Ltd; Mursun Pte Ltd; Tsinghua University; and Kunming University of Science and Technology
7.	Carbon Capture, Utilisation and Storage (CCUS)	Towards Energy Efficient Electrochemical CO_2 Reduction to Synthetic Chemicals: A Paradigm Shift in Sustainable Chemical Production	Project aim: To examine the development of a sustainable technology to produce important commodity chemicals for Singapore (e.g., ethylene and propanol), using only CO_2 and water as feedstock. Thus, reduce the energy intensity of producing chemicals from CO_2. Potential benefits: Converting CO_2 to fuels/chemicals is a potential utilisation pathway for captured CO_2. Reducing the energy requirement for such processes will improve the economic viability of such CO_2 utilisation pathways.	PI Institute: NUS Lead Project Investigator: Prof Chen Wei, NUS Project team: Prof Xu Zhichuan, NTU; Dr Zhang Jia, Institute of High Performance Computing (IHPC), A*STAR; Asst Prof Lum Yanwei, Institute of Materials Research and Engineering (IMRE), A*STAR/NUS; Asst Prof Wang Lei, NUS; and Asst Prof Hou Yi, NUS Academic/Industry Collaborator(s): NUS; Stanford University; Tsinghua University and ExxonMobil.
8.	CCUS	Development and module scale validation of novel hollow	Project Aim: To develop more efficient ways to capture CO_2 from exhaust streams. It aims to develop and validate hollow fiber membranes for efficient carbon capture via novel chemistry and machine learning. The	PI Institute: NUS Lead Project Investigator: Asst Prof Zhang Sui, NUS

		fiber membranes for CO_2 capture	performance of the developed and scaled membranes will be validated through in-house pilot testing under simulated conditions as well as field-testing on larger pilot under real-world conditions. Potential benefits: To improve the capture efficiency of CO_2 from existing exhaust/flue gas which is the first step in CCUS.	Project Team: Provost Chair Prof Neal Chung Tai-Sheng, NUS and Dr Gudipathi Chakravarty, START, NTUitive Academic/Industry Collaborator(s): Chevron Singapore Pte Ltd; Surbana Jurong Infrastructure Pte Ltd and NUS
9.	CCUS	Stable and long term carbon dioxide hydrate based storage (CO_2-HyStore) in deep ocean sediments	Project aim: To demonstrate a proof-of-concept requiring design, build and validation of potential of CO_2 storage in deep-ocean sediments as gas hydrates. It will help to validate the possibility of storing CO_2 in deep ocean sediments (as opposed to conventional sites which require specific geological formations) Potential benefits: This may open possibilities for long term storage of captured CO_2.	PI Institute: NUS Lead Project Investigator: Prof. Praveen Linga, NUS Academic/Industry Collaborator(s): ExxonMobil; NUS; Purdue University and Lawrence Berkeley National Laboratory
10.	CCUS	Process Systems Engineering for Guiding R&D on Low-Carbon Technologies	Project aim: This project proposes a new paradigm in which materials research is conducted under the continuous of Process Systems Engineering (PSE) in order to keep focus on the KPIs right from the start of research.	PI Institute: NUS Lead Project Investigator: Prof Iftekhar A Karimi. NUS Project Team: Prof Shamsuzzaman Farooq, NUS

			Potential benefits: It develops digital toolkits that predict the system-level performances of several CCUS and H_2 projects, helping to guide them to faster and successful scale-up.	Academic/Industry Collaborator(s): ExxonMobil and NUS
11.	CCUS	Adsorptive Carbon Capture Using Framework Materials	Project Aim: To develop more efficient ways to capture CO_2 from exhaust streams. This project enhances CO_2 capture by using state-of-the-art framework sorbents engineered for high CO_2 selectivity, high intrinsic stability, and facile regenerability from moisture. Potential benefits: Improve the capture rate of CO_2 from existing exhaust/flue gas which is the first step in CCUS.	PI Institute: NUS Lead Project Investigator: Assoc Prof Zhao Dan, NUS Project Team: Assoc Prof Jiang Jianwen, NUS; Prof Shamsuzzaman Farooq, NUS; Prof Jiang Donglin, NUS; and Asst Prof Grzegorz Lisak, NTU Academic/Industry Collaborator(s): ExxonMobil; NUS; and Northwestern University
12.	CCUS	Nanostructured Catalysts for Direct CO_2 Hydrogenation to Higher Alcohols and Fuels	Project aim: To reduce the energy intensity of producing higher alcohols and fuels from CO_2. It examines development of nanostructured catalysts and computational capability in catalyst design and reaction modelling, including process optimisation. Potential benefits: CO_2 to fuels/chemicals is a potential utilisation pathway for captured	PI Institute: NUS Lead Project Investigator: Prof Zeng Hua Chun, NUS Project Team: Asst Prof Paul Wen Liu, NTU; Scientist Dr Kelvin M.Y. Kwok, A*STAR's ICES; Asst Prof

			CO_2. Reducing the energy requirement for such processes will improve the economic viability of such CO_2 utilisation pathways.	He Qian, NUS; Assst Prof Sergey Kozlov, NUS; and Assoc Prof Jiang Jianwen, NUS Academic/Industry Collaborator(s): NuStar Technologies and NUS

ANNEX B

FACTSHEET ON ADVANCING SINGAPORE'S ENERGY TRANSITION TOWARDS A MORE SUSTAINABLE FUTURE

Climate change is a global existential threat and Singapore is doing its part to reduce emissions for a more sustainable future. Our Long-Term Low-Emissions Development Strategy (LEDS) aspires to halve emissions from its peak to 33 MtCO2e (metric tonnes of carbon dioxide equivalent) by 2050, with a view to achieving net zero as soon as viable in the second half of the century.

2 The power sector has a key part to play as it accounts for about 40% of Singapore's carbon emissions[5]. We need to significantly reduce the power sector's emissions, while ensuring that the power system remains secure, reliable and sustainable. Singapore is therefore harnessing four Switches – natural gas, solar, regional power grids and low-carbon alternatives – to transform its energy supply, while promoting energy efficiency to reduce demand.

Four Supply Switches for Power Sector Decarbonisation

A. Natural Gas

3 As Singapore transitions towards cleaner energy sources, reliable and sufficient energy sources are needed to ensure supply reliability. Natural gas will continue to be a dominant fuel for Singapore's electricity generation even as we scale up the other 3 Switches. EMA will continue to diversify our natural gas sources and work with the power generation companies to improve the efficiency of their power plants.

B. Solar

4 Solar remains the most promising renewable energy source in the near term for Singapore. Today, over 500 megawatt-peak (MWp) of solar has been installed[6] and we are on track to achieving our solar panel deployment target of at least 2 gigawatt-peak (GWp) by 2030 (equivalent to powering 350,000 households a year). Conventional rooftop solar has been complemented with innovative ways of deploying solar photovoltaic systems on spaces such as water bodies, temporary vacant land or sheltered walkways, making Singapore one of the most solar dense cities in the world. To manage the intermittent nature of solar and ensure grid resilience, we are planning to deploy at least 200 megawatts (MW) of energy storage systems (ESS) beyond 2025.

[5] Source: National Climate Change Secretariat

[6] Figure accurate as of Q2 2021.

5 Nonetheless, there are still limitations to the amount of solar energy that we can harness due to Singapore's limited land area. Even as we work towards achieving our 2030 solar target of 2GWp, it will constitute only around 3% of the country's total electricity demand in 2030.

C. Regional Power Grids

6 To overcome our land constraints, Singapore is tapping on regional power grids to access cleaner energy sources beyond its borders. Regional power grids can help accelerate the development of renewable energy projects in the region, bringing economic growth and increasing access to renewable energy. Electricity imports will also help us to diversify our energy sources away from natural gas and improve our energy resilience.

7 Singapore is planning to import up to 4 gigawatts (GW) of low-carbon electricity by 2035, which is expected to make up around 30% of Singapore's electricity supply in 2035. This will be done through a competitive Request for Proposal (RFP) process. Steps will also be taken to maintain our energy security, such as diversifying our import sources and ensuring back-up supply is in place to mitigate supply disruptions.

8 To pave the way for these electricity imports, EMA has been working with various partners on electricity import trials. These trials will allow us to assess and refine the technical and regulatory frameworks for importing electricity. They include a trial to import 100MW of electricity from Peninsula Malaysia, as well as a pilot to import 100MW of solar-generated electricity from Pulau Bulan, Indonesia. Singapore is also a part of the Lao PDR-Thailand-Malaysia-Singapore Power Integration Project (LTMS-PIP), which facilitates cross-border power trade among the four countries.

D. Emerging Low-Carbon Technologies

9 Singapore is exploring emerging low-carbon technologies such as hydrogen and carbon capture, utilisation and storage (CCUS) that can help reduce Singapore's carbon footprint in the longer term. While such technologies are nascent, EMA is taking active steps including investing in R&D through the Low-Carbon Energy Research (LCER) Funding Initiative to improve the technical and economic viability of implementing low-carbon technologies such as hydrogen and CCUS.

10 Advances in geothermal technology have also opened up the opportunity for us to consider the prospect of tapping on this energy source for power generation. For instance, EMA is working closely with Nanyang Technological University, and various ministries and agencies including the Ministry of Trade and Industry and the National Climate Change Secretariat to conduct studies to determine the geothermal resource potential in Singapore.

Promoting Energy Efficiency to Manage Demand

11 Besides transforming the way we produce energy, managing our energy demand is also key to achieving a more sustainable future. With the economy recovering from the pandemic and as energy demand grows with increasing electrification, demand management will be a key pillar in supporting the energy transition. EMA will continue to encourage energy efficiency in the industry and households, and is concurrently developing other demand management initiatives. Together, everyone will have to play their part by conserving energy and supporting the greener energy transition for a more sustainable future.

ANNEX C

FACTSHEET FOR SINGAPORE'S LONG-TERM LOW-EMISSIONS DEVELOPMENT STRATEGY

1 On 31 March 2020, Singapore submitted its Long-Term Low-Emissions Development Strategy (LEDS) to the United Nations Framework Convention on Climate Change (UNFCCC).

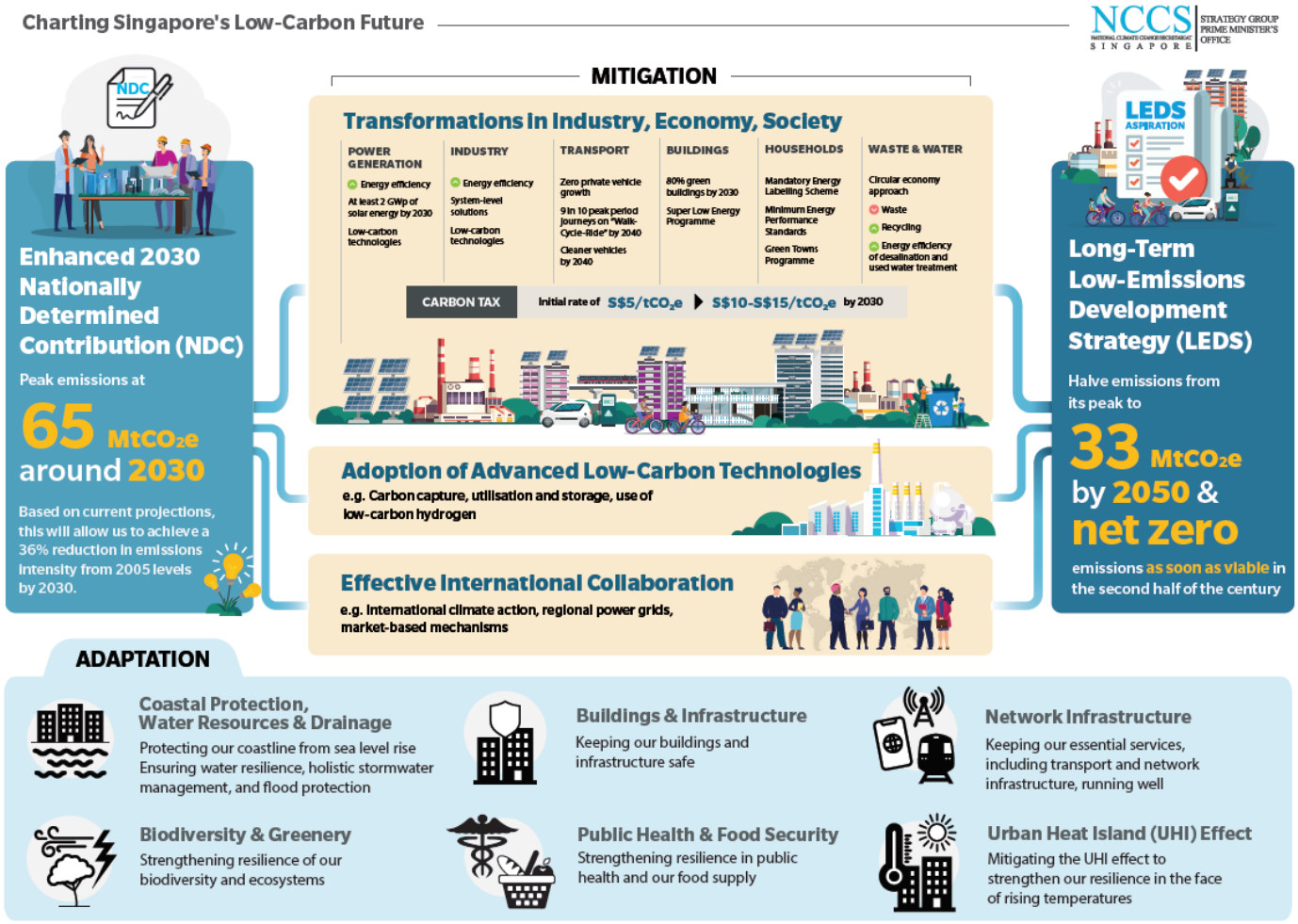
2 Singapore's LEDS sets out our aspiration to halve our emissions from its peak to 33MtCO_2e by 2050, with a view to achieving net zero emissions as soon as viable in the second half of the century.

3 Singapore will take concrete actions across all sectors to facilitate the low-carbon transition, building on our long-standing emphasis on sustainable development. The Government's strategy to achieve our LEDS aspiration will have three thrusts.

a. Transformations in industry, economy and society, e.g. more renewable energy, greater energy efficiency, reducing energy consumption;
b. Adoption of advanced low-carbon technologies, e.g. carbon capture, utilisation and storage (CCUS), use of low-carbon hydrogen; and
c. Effective international collaboration, e.g. international climate action, regional power grids, market-based mechanisms.

4 The funding initiative for Low-Carbon Energy Research will support the second thrust in particular, by accelerating the adoption of such technologies in Singapore, and enabling our low-carbon transition.

Infographic: Charting Singapore's Low-Carbon Future



For more details on Singapore's LEDS, please refer to this link (https://www.nccs.gov.sg/media/press-release/submission-of-singapores-enhanced-nationally-determined-contribution-and-long-term-low-emissions-development-strategy).

ANNEX D

SINGAPORE GREEN PLAN 2030