**16 Low-**

**Emerging Technology Grant Call (ETGC)**

5. The ETGC supports nascent yet promising low-carbon energy R&D areas at lower technological readiness levels (TRLs 1-2) such as hydrogen, carbon capture utilisation and storage (CCUS) and other low-carbon energy areas that have the potential to open up more options for abating the emissions of the power and industry sectors.

6. Around $12 million will be awarded to support ten projects[4] under the ETGC to fund R&D in low concentration carbon capture, advanced catalysts for ammonia cracking, and coatings for hydrogen pipeline.

**-END-**

**Annex A: Details of Awarded DHP projects**
**Annex B: Details of Awarded ETGC projects**

[4] Details on the ten ETGC projects can be found at Annex B.

**ANNEX A**

**Details of Awarded DHP Projects**

| SN | Value Chain | Proposal Title | Proposal Description | Project Investigator (PI) Team |
|---|---|---|---|---|
| 1. | Safety and Regulatory Standards | Post-Release Impact Mitigation Evaluation | | |

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|---|---|---|---|---|
| | | | 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. | and Dr Ye Shaochun,<br><br>Academic/Industry Collaborator(s):<br>Fudan University; Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences; Malayan Daching Co Pte Ltd; Kellogg Brown & Root Asia Pacific Pte Ltd; BNF Engineering Pte Ltd; Richz Holdings Pte Ltd; Vnergy Pte Ltd; CADFEM SEA; Measurement Advanced Engineering Pte Ltd; Fraction Technologies Pte Ltd; ST Engineering; Linde Gas Singapore Pte Ltd; KoolLogix Pte Ltd; Orient Technology Pte Ltd |
| 3. | Ammonia Cracking | Development of on-site, on-demand ammonia-to-hydrogen e-cracking bench-top chemical mini-factory | Project aim:<br><br>Potential benefits: Releasing $H_2$ from ammonia is an energy intensive process. An | Lead PI Institute: Nanyang Technological University (NTU)<br><br>Lead PI:<br>Prof Xu Zhichuan Jason, NTU<br><br>Project Team:<br>Prof Chen Wei, |

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| | | | 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. | Research and Education in Singapore (CARES); Dr Kamal Elouarzaki, NTU; Dr Chen Luwei ISCE$^2$; Asst Prof He Qian, NUS<br><br>Academic/Industry Collaborator(s):<br>NTU; University at Buffalo; AGC Asia Pacific Pte Ltd; Surbana Jurong Pte Ltd; Sydrogen Energy Pte Ltd; iSEACO Shipmanagement Pte Ltd; Synfuels China Technology Co. Ltd; China Hydrogen Energy Technology Co. Ltd; Jiangsu Mesocatalysis Materials Technology Co. Ltd |
| 4. | Ammonia | | | |

Potential benefits: Integrating ammonia cracking with a gas turbine and recycling the waste heat from the turbine for use in the cracking process will not only increa

**ANNEX B**

**Details of Awarded Projects Under the ETGC**

| SN | Research Theme / Value Chain | Proposal Title | Proposal Description | Project Investigator (PI) Team |
|---|---|---|---|---|
| 1. | CCUS / Capture | High-throughput screening of redox-active adsorbents for electrochemically mediated carbon capture | Project aim: This proposal develops an energy efficient and space efficient carbon capture technology that can capture $CO_2$ from low-concentration sources, using electrochemically mediated carbon capture (EMCC) concepts.<br><br>Potential benefits: Promote a solution to capture diluted flue gas from power generation facilities. | Lead PI Institute: National University of Singapore (NUS)<br><br>Lead PI:<br>Asst Prof Mao Xianwen, NUS<br><br>Academic/Industry Collaborator(s):<br>NUS; Massachusetts Institute of Technology; Altara Infrastructure Services Pte Ltd |
| 2. | CCUS / Capture | A New Class of Two-Dimensional Covalent Organic Framework-Based Membranes for Competitive Carbon Capture | Project aim: This proposal develops an energy efficient and space efficient carbon capture technology that can capture $CO_2$ from various sources with versatility, using covalent organic framework (COF)-based membranes concepts. | Lead PI Institute: Nanyang Technological University (NTU)<br><br>Lead PI:<br>Prof Wang Rong, NTU<br><br>Project Team: |

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| | | | Potentially scalable, as plastic waste is the fourth largest solid waste stream currently.<br><br>Potential benefits: Valorising two waste products, carbon dioxide and plastics, towards a circular economy. | Project Team:<br>Dr Jason Lim Yuan Chong,<br><br>Wu Jie, NUS |
| 5. | CCUS / Utilisation | Enzymatic CO2 utilization: towards efficient biocatalytic carboxylation of aromatics to produce useful chemicals | Project aim: This proposal aims to engineer enzymes that turns carbon dioxide into useful acids/chemicals with enhanced activity and stability.<br><br>Potential benefits: Potential to produce useful chemicals in a carbon-negative process, as well as environmentally friendly way (i.e. no need high temperature/pressure). | Lead PI Institute: NUS<br><br>Lead |

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| | | | Potential benefits: A possible solution to obtain hydrogen as a by-product, which can be used for other purposes (i.e. power generation). | Prof Chen Wei, NUS<br><br>Academic/Industry Collaborator(s):<br>Huazhong University of Science and Technology |
| 7. | H2 / Ammonia Cracking | Development of decentralized, on-demand ammonia-to-hydrogen e- | | |

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| 10. | Others / Energy Harvesting | Plug flow pattern for harvesting rain energy via solid-liquid charge separation | Project aim: This proposal proposes the harvesting of electricity from rain droplets using advanced types of materials.<br><br>Potential benefits: This can be applicable for tropical settings due to the heavy rainfall and be an alternative way for Singapore to generate renewable electricity. | Lead PI Institute: NUS<br><br>Lead PI:<br>Assoc Prof Soh Siow Ling, NUS<br><br>Project Team:<br>Assoc Prof Zhao Dan, NUS |