



## **CALL FOR PROPOSAL : PRODUCTION OF SOLID STATE HYDROGEN**

### **BACKGROUND**

Malaysia as a Party to the United Nations Framework Convention on Climate Change (UNFCCC) ratified the Kyoto Protocol in 2002 and the Paris Agreement in 2016. Under the Paris Agreement, Malaysia communicated the country's Nationally Determined Contributions (NDC) intending to reduce 45% GDP emissions intensity by 2030 relative to the emissions intensity from its base year 2005. This consists of a 35% reduction on an unconditional basis and a further 10% conditional upon receipt of climate finance, technology transfer and capacity building from developed countries.

International Energy Agency reported that global energy-related CO<sub>2</sub> emissions reached a significant high of 33.1 Gt CO<sub>2</sub> in 2018. Robust economic growth resulted to increased energy consumption which leads to significant CO<sub>2</sub> emissions mainly from fossil fuel combustion such as coal, oil and natural gas.

As reported in IEA CO<sub>2</sub> Emissions from Fuel Combustion, OECD/Paris, 2018, Malaysia's total CO<sub>2</sub> Emissions recorded at 216.8 Million tonne in 2016, the third highest among ASEAN countries after Indonesia and Thailand. The country also ranked the second highest emissions per capita (6.93 Tonne CO<sub>2</sub> per capita) among ASEAN countries. The National Grid Electricity emission factor for Peninsular Malaysia is 0.585 tonnes CO<sub>2</sub>/MWh in 2017. The Government of Malaysia has made announcement of 20% renewable energy target by 2025. From 2025 onwards, Malaysia will experience strong growth of Renewable Energy (5.6% CAGR) with Hydrogen to complement RE as alternative energy carrier.

Accelerating development of sustainable energy technologies and promoting the adoption of low carbon technologies in conventional power plant as well as diversifying alternative energy fuels in all economic sectors shall be the main agenda in strengthening MGTC portfolio in addressing climate change strategies. Malaysia is developing the New Energy Policy which includes hydrogen as alternative fuel. Asia Pacific Energy Research Centre (APEREC) 2019 study reported that Malaysia will shift from being a net energy exporter to net energy importer in 2026 in response to rising domestic energy demand and net natural importer by 2046 as demand outstrip the production.

Hydrogen has been widely considered as a clean energy carrier that bridges the energy producers and energy consumers in an efficient and safe way for a sustainable society. Importing economies from East Asia (China; Japan; Korea, Hong Kong and Chinese Taipei) and South East Asia (Singapore, Philippines, Brunei) that does not produce hydrogen domestically or insufficient potential to economically produce hydrogen domestically offer potential demand for clean hydrogen energy. Advancement of efficient and cost-effective hydrogen storage technologies is crucial to ensure reliability for solving energy intermittency issues and transport of hydrogen energy.



## **INTRODUCTION**

Malaysian Green Technology & Climate Change Centre (MGTC) is a government agency under the purview of the Ministry of Environment and Water (KASA). MGTC portfolio includes strategizing climate actions, leading inter-ministerial collaborations, promoting uptake of green technology innovations across industries and raising awareness among the general public on sustainability development and climate change. The sustainable energy department is pursuing collaboration with various local government agencies, institute of higher learnings, research institutions, industry players, trade missions and investors to further embark on hydrogen energy production, storage and application in key economic sectors including electricity, industry and transportation sub-sectors.

## **REQUEST FOR PROPOSAL**

Malaysia Green Technology and Climate Change Centre, is seeking proposal from institutions of higher learning, research institutions, industry players, trade missions and investors both from local and international organization, in the area of production of solid state hydrogen. The proposal should address the following priority areas of interest:

- 1) Storing hydrogen in solid-state hydrides (compact and safe)
- 2) Storage materials for absorbing and desorbing hydrogen reversibly
- 3) Solid state hydrogen materials design and industrial applications

This request for proposal is to increase Federal and State government agencies, local authorities, private organization, institute of higher learnings, industry players, trade missions and investors in accelerating hydrogen economy in Malaysia through investment and active participation in cooperative research, development and commercialization projects with MGTC. There is no limit in the maximum number of proposal submission.

Proposal should be no more than six pages in length (using this template), and must include the following:

- 1) Proposed System and System Major Components
- 2) Proposed Site and Logistic
- 3) Capital Budget (RM)
- 4) Operating Budget (RM)
- 5) Project Team Organization and Function
- 6) Potential Project Partners
- 7) Potential Hydrogen Capacity (tonnes of Hydrogen)
- 8) Energy Requirement for Hydrogen Compression, Liquefaction and Storage and Solid-state formation



## GENERAL PROVISION

1. All submitted proposals by various entities shall be treated as strictly confidential
2. The interested parties may send more than one proposal for MGTC consideration
3. MGTC shall form an Internal Committee to evaluate each proposal based on priority of the projects and compliance of criteria to the government related policies on green technology and climate change and sustainable development goals. Potential spill over impacts to the economy sectors value chain, carbon emission reduction and green jobs creation shall also be considered as evaluation criteria
4. Maximum five successful proposals would be invited to submit full techno-economic and environmental feasibility study report and detailed project costing
5. MGTC shall have no obligation on financial or otherwise to all submissions. However, those successful proposals may receive partial grants from relevant agencies for full proposals development
6. MGTC shall recommend on binding agreement or signing of MoU on collaboration with the successful parties for joint submission of proposals for local or international funding

## DEADLINE FOR SUBMISSION

Proposals are due by Friday, 30<sup>th</sup> October, 2020, at 5 p.m. Malaysia Time.

**Malaysian Green Technology & Climate Change Centre**

(formerly known as Malaysian Green Technology Corporation) (462237-T)

No.2, Jalan 9/10, Persiaran Usahawan, Seksyen 9, 43650 Bandar Baru Bangi, Selangor Darul Ehsan, MALAYSIA

T: +603 8921 0800

F: +603 8921 0801

More information can be found at [www.greentechmalaysia.my](http://www.greentechmalaysia.my). The proposal and any technical inquiries should be directed to [hydrogeneconomy@greentechmalaysia.my](mailto:hydrogeneconomy@greentechmalaysia.my)