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Japan Science and Technology Agency (JST)

JST is to fund six research projects for the e-ASIA Joint Research Program in the fields of “Alternative Energy” and “Disaster Risk Reduction and Management”

The Japan Science and Technology Agency (JST) decided to start new projects within the framework of the e-ASIA Joint Research Program (e-ASIA JRP)[*1].

JST and seven funding agencies from seven countries (Appendix 1) jointly opened the call for research projects in the fields of “Alternative Energy” and “Disaster Risk Reduction and Management”.

A total of 95 proposals, 49 in the field of “Alternative Energy” and 46 in the field of “Disaster Risk Reduction and Management” were submitted in response to the joint call. Based on an expert evaluation conducted in each country (Appendix 2), JST and the other funding agencies jointly decided to support six projects, three in the field of “Alternative Energy” and three in the field of “Disaster Risk Reduction and Management” (Appendix 3, 4).

The research period is scheduled to be three years (36 months).

*1 e-ASIA Joint Research Program (e-ASIA JRP)
Through the acceleration of science and technology research exchange and collaboration in the Pacific Rim countries and ASEAN countries, etc., the e-ASIA Joint Research Program (e-ASIA JRP) aims to strengthen research and development capabilities towards resolution of shared challenges across the region, including those associated with materials, alternative energy, agriculture, health research, disaster risk reduction and management, advanced interdisciplinary research towards innovation, and environment.
As part of that objective, e-ASIA JRP is intended to support collaborative research implemented among three or more of its member countries. Through the implementation of joint research among participating countries in agreed fields of research, it is the goal of the e-ASIA JRP to contribute to economic and human resource development, as well as the resolution of various challenges in the region.
URL: https://www.the-easia.org/jrp/

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Appendix 1: Participating funding agencies

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"Empowering Science, Inspiring Futures"

Our world faces unprecedented global challenges — such as climate change, energy crises, and emerging infectious diseases — that demand innovative solutions. JST will rise to these challenges through "Science and Technology," as a national research and development agency that plays a central role in implementing Japan's science, technology, and innovation policy. We support fundamental research and startups to create new value, develop R&D strategies, foster the next generation of talent, disseminate vital information, and manage the Japan University Fund. Like a compass guiding ships through turbulent waters, JST will chart the way towards a vibrant and secure future by empowering science through a multifaceted approach.

Appendix 1

Participating funding agencies

Alternative Energy

Country Name	Funding Agency Name
Japan	Japan Science and Technology Agency (JST)
China	National Natural Science Foundation of China (NSFC)
Indonesia	National Research and Innovation Agency (BRIN)
The Philippines	Department of Science and Technology Philippine Council for Industry, Energy and Emerging Technology Research and Development (DOST-PCIEERD)
Singapore	Agency for Science, Technology and Research (A*STAR)
Thailand	National Research Council of Thailand (NRCT)

Disaster Risk Reduction and Management

Country Name	Funding Agency Name
Japan	Japan Science and Technology Agency (JST)
China	National Natural Science Foundation of China (NSFC)
Indonesia	National Research and Innovation Agency (BRIN)
Malaysia	Academy of Sciences Malaysia (ASM)
The Philippines	Department of Science and Technology Philippine Council for Industry, Energy and Emerging Technology Research and Development (DOST-PCIEERD)
Singapore	Agency for Science, Technology and Research (A*STAR)
Vietnam	Ministry of Science and Technology (MOST)

Appendix 2

Experts for the Evaluation (JST)

Alternative Energy

Name	Title and Affiliation	Role
ISHIHARA Tatsumi	Professor, Graduate School of Engineering, Kyushu University	Program Officer
IDA Shintaro	Professor, Institute of Industrial Nanomaterials, Kumamoto University	Advisor
OTOMO Junichiro	Professor, School of Environment and Society, Institute of Science Tokyo	Advisor
OGURA Masaru	Professor, Institute of Industrial Science, The University of Tokyo	Advisor
KAWADA Tatsuya	Professor, Graduate School of Environmental Studies, Tohoku University	Advisor
GOKON Nobuyuki	Associate Professor, Institute of Science and Technology, Niigata University	Advisor
TAKAGAKI Atsushi	Professor, Faculty of Engineering, Yokohama National University	Advisor
TAKADA Kazunori	Fellow, National Institute for Materials Science (NIMS)	Advisor
TSUBAKI Noritatsu	Professor, Faculty of Engineering, University of Toyama	Advisor
NISHIYAMA Norikazu	Professor, Graduate School of Engineering Science, The University of Osaka	Advisor
YAMAZAKI Yoshihiro	Professor, Platform of Inter-/Transdisciplinary Energy Research (Q-PIT), Kyushu University	Advisor
YOSHIDA Tomoko	Professor, Graduate School of Engineering, Nagoya University	Advisor

* Advisors are listed in Japanese syllabary order.

** Title and Affiliation is as of the time of end of evaluation

Disaster Risk Reduction and Management

Name	Title and Affiliation	Role
SATAKE Kenji	Professor Emeritus, The University of Tokyo	Program Officer
INOUE Hiroshi	Part-time Researcher, Disaster Prevention Research Institute, Kyoto University	Advisor
KUSUNOKI Koichi	Professor, Earthquake Research Institute, The University of Tokyo	Advisor
KOSHIMURA Shunichi	Professor, International Research Institute of Disaster Science, Tohoku University	Advisor
TAKAHASHI Yukihiro	Professor, Faculty of Science, Hokkaido University	Advisor
TSUJIMOTO Kumiko	Associate Professor, Faculty of Environmental, Life, Natural Science and Technology, Okayama University	Advisor
TODA Yuji	Professor, Graduate School of Engineering, Nagoya University	Advisor
HIRABAYASHI Yukiko	Professor, College of Engineering, Shibaura Institute of Technology	Advisor
MATSUNO Fumitoshi	Specially Appointed Professor, Faculty of Engineering, Osaka Institute of Technology	Advisor
YANO Shinichiro	Professor, Graduate School of Engineering, Kyushu University	Advisor
WAKAI Akihiko	Professor, Graduate School of Science and Technology, Gunma University	Advisor

* Advisors are listed in Japanese syllabary order.

** Title and Affiliation is as of the time of end of evaluation

Appendix 3

Abstracts of the new projects – Alternative Energy

	Project Title	Principal Investigators	Project Outline
1	Catalyst and Process Design for Green Selective Oxidation of Renewable Methane to Methanol	OHKUBO Kei Professor, Institute for Open and Transdisciplinary Research Initiatives The University of Osaka (Japan)	This cooperative research project aims to selectively oxidize renewable methane (gas) into green methanol (liquid) via photocatalysis under mild conditions, providing a clean and practical technology for low-quality and dispersed methane utilization. We integrate high performance catalysts, the mechanisms study of C-H activation and product desorption, the tail gas treatment process, and optimization of process to improve conversion efficiency and selectivity in gas-solid phase methane conversion. This approach offers a decentralized and distributed solution for renewable methane utilization.
		<u>Wenting Wu</u> Professor, College of Chemistry and Chemical Engineering, China University of Petroleum (China)	
		Renanto Handogo Professor, Department of Chemical Engineering, Sepuluh Nopember Institute of Technology (Indonesia)	

Underlined: Lead Principal Investigator

Project Title		Principal Investigators	Project Outline
2	Empowering Next-Generation Batteries: A Data-Driven Approach to High-Performance Composite Solid Electrolyte Design	KAKINUMA Hiroshi Assistant Professor, Institute for Materials Research, Tohoku University (Japan)	This collaborative research aims to develop next-generation all-solid-state batteries (ASSBs) by optimizing solid polymer electrolytes (SPEs) and surface-engineered high-voltage cathodes to enhance ionic conductivity, electrochemical stability, and solid/liquid interface transport efficiency. The Japanese team will lead solid electrolyte preparation, in-situ interface characterization, and computational simulations. The Chinese team will optimize high moisture-resistant solid electrolyte synthesis and lithium-ion migration behavior. The Singaporean team will conduct advanced theoretical simulations to model ion transport and interface stability. The Indonesian team will study multi-ion coupling at solid/liquid interfaces and support resource recovery from spent batteries. Through this collaboration, the project aims to achieve 5 mS/cm ionic conductivity, a 4.8 V stability window, and practical Li-metal pouch cells, while also developing sustainable battery recycling strategies, contributing to Asia's carbon neutrality and next-generation energy storage technologies.
		Jie Zhao Associate Professor, Department of Materials Chemistry, Fudan University (China)	
		Pengfei Ou Assistant Professor, Faculty of Science, National University of Singapore (Singapore)	
		Sudaryanto Research Professor, Research Organization of Nano Technology and Materials, National Research and Innovation Agency (BRIN) (Indonesia)	

Underlined: Lead Principal Investigator

Project Title		Principal Investigators	Project Outline
3	A novel integrated Biomass Gasification and electrochemical process to produce high-purity, carbon-negative and cost-effective hydrogen	FURUKAWA Shinya Professor, Graduate School of Engineering, The University of Osaka (Japan)	This collaborative research creates an innovative biomass conversion system that enables cost-effective, high-purity, and carbon-negative hydrogen production by designing a novel system that integrates membrane reactors and electrochemical cells having innovative catalysts that have been optimized using AI. Specifically, the Japanese team will develop novel catalysts based on high-entropy alloys and perform structural characterization; the Thai team will develop hierarchical zeolite catalysts and CO_2-free electrochemical CO conversion systems; the Chinese team will develop a cost-effective biomass gasification system using membrane reactors having the developed catalysts, integrating them with the electrochemical system; and the Singaporean team will accelerate the development of optimal catalysts through catalyst exploration using machine learning. Through the joint research by the teams from the four countries, the development of highly innovative technologies that far surpass conventional technologies and truly effective hydrogen production processes is expected.
		Chularat Wattanakit Associate Professor, School of Energy Science and Engineering, Vidyasirimedhi Institute of Science and Technology (Thailand)	
		Huanhao Chen Professor, State Key Laboratory of Materials-oriented Chemical Engineering, Nanjing Tech University (China)	
		Haobo Li Assistant Professor, School of Chemistry, Chemical Engineering and Biotechnology, Nanyang Technological University (Singapore)	

Underlined: Lead Principal Investigator

Appendix 4

Abstracts of the new projects – Disaster Risk Reduction and Management

	Project Title	Principal Investigators	Project Outline
1	Risk reduction research of marine environmental disasters associated with extreme anomalous climate events in the eastern Asian seas	TOZUKA Tomoki Associate Professor, Graduate School of Science, The University of Tokyo (Japan) <u>Dongliang Yuan</u> Full Professor, Key Lab of Marine Science and Numerical Modelling, First Institute of Oceanography/MNR (China) Augy Syahailatu Research Professor, Research Centre for Oceanography, National Research and Innovation Agency (BRIN) (Indonesia)	The marine environment of the East Asia Summit (EAS) countries is strongly influenced by various climate variability phenomena, including El Niño. As a result, marine heatwaves, storm surges, and other hazards occur frequently, causing serious impacts on local communities and economies. This project aims to enhance disaster monitoring and risk reduction across EAS countries by leveraging advanced satellite remote sensing, AI techniques, and underwater gliders. Through this collaborative research of three countries, expected outcomes include improved early warning systems for marine disasters such as sea level surges and marine heatwaves, alongside more accurate climate predictions. The integration of historical disaster analysis and contingency planning will strengthen preparedness, safeguarding infrastructure and economies. In addition, international collaboration will foster data-sharing and technological advancements, with the Chinese team leading monitoring efforts, the Japanese team advancing AI-driven predictions, and the Indonesian team facilitating maritime observations for improved forecasting and risk management.

Underlined: Lead Principal Investigator

Project Title		Principal Investigators	Project Outline
2	Regional Infrastructure Seismic Resilience Enhancement through a Spatial-Temporal Data-Driven Approach	NISHIO Mayuko Associate Professor, Institute of Systems and Information Engineering, University of Tsukuba (Japan)	This collaborative research aims to show a system to strengthen earthquake resilience of critical infrastructures in regional scale with generalization performances to apply various environment and situations by sharing and coordinating various real-world data among earthquake-prone Asian countries. To achieve this, various data from satellites, UAVs, structural monitoring, and structural engineering analysis and knowledge will be integrated spatially and temporally through AI to develop data-driven technologies that comprehensively enhance risk assessment and preventive maintenance under normal conditions to rapid damage assessment and functional restoration after a disaster. The Japanese team will develop technologies for rapid assessment of damage and impact on infrastructure functions by integrating spatial information through satellite and point clouds, and constructing AI. The Chinese and Singaporean teams will develop technologies for condition monitoring and rapid post-disaster assessment through structural sensing and digital twin. The Indonesian team will develop technologies of seismic reinforcement and rapid repair technologies of infrastructure.
		Hua-Ping Wan Professor, College of Civil Engineering and Architecture, Zhejiang University (China)	
		Made Suarjana Professor, Faculty of Civil and Environmental Engineering, Institut Teknologi Bandung (Indonesia)	
		Yuguang Fu Assistant Professor, Civil and Environmental Engineering, Nanyang Technological University (Singapore)	

Underlined: Lead Principal Investigator

Project Title		Principal Investigators	Project Outline
3	AI-science of deformation anomaly detection for forecasts and early warnings of volcanic eruptions and earthquakes	<u>FUKUSHIMA Yo</u> Associate Professor, International Research Institute of Disaster Science, Tohoku University (Japan)	This collaborative research aims to develop AI-based methods that automatically detect and interpret subtle anomaly signals in crustal deformation data, which can serve as the core of the next-generation forecast and early warning systems for volcanoes and earthquakes in the Philippines, Indonesia, and Japan. The Japanese team will lead the method development as well as providing training and mentoring. The Filipino and Indonesian teams will mainly contribute to the applications on fault slip and volcano anomaly signals, respectively. The methods will be tested on archived and new data for validation, and the detected signals will be investigated in relation to eruption/earthquake trigger mechanisms. The research outputs are expected to contribute to significantly improving the ability to forecast and issue early warnings, which enables effective measures in the society for disaster prevention or minimization. It also contributes to building long-standing partnerships for talent development and collaborative research.
		John Dale Dianala Assistant Professor, College of Science, University of the Philippines (The Philippines)	
		Herlan Darmawan Assistant Professor, Mathematics and Natural Sciences, Universitas Gadjah Mada (Indonesia)	

Underlined: Lead Principal Investigator

Annex

Abstract of the joint call for proposals

1. Proposal field application requirements (Japan side):
   In addition to the Japanese team, the project consortium must include members from a minimum of two different countries listed as participating in the call.

2. Applicant eligibility (Japan side):
   Any independent researcher personally affiliated with and actively conducting research at a domestic Japanese research institution, regardless of nationality, is eligible to apply.

3. Research period:
   3 years (36 months)

4. Amount of funding (JST):
   Up to 35.1 million Japanese yen from JST to the researchers (Japan-based team) per project over three years, inclusive of overhead costs (30 percent of direct costs).

5. Evaluation method:
   Based on evaluation by experts from the countries which held the joint call, including Japan, and discussion by JST and other funding agencies.

6. Evaluation criteria (JST):
   The following were among the general criteria considered in the evaluation process:
   1) Conformity with e-ASIA JRP aims such as regional relevance and designated research fields
   2) Capability of the research leaders and relevance of their current research activities
   3) Effectiveness and synergistic mutual benefit of the joint research activities
   4) Validity of the research plan
   5) Effectiveness and continuity of exchange
   6) Validity of the exchange plan