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The National Science Foundation's Tokyo Regional Office periodically reports on developments in Japan that are related to the Foundation's mission. It also provides occasional reports on developments in other East Asian countries.

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Report Memorandum #11-03

Advanced Low Carbon Technology Research and Development Program (ALCA)

The project titles in this report memorandum on ALCA are unofficial translations.

An exchange rate of ¥80/$ is used in this report memorandum.

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Japan Science and Technology Agency (JST) announced the awardees of its new funding program, Advanced Low Carbon Technology R&D Program (ALCA) on February 10, 2011. Launched in JFY2010 (April 2010-March 2011) under the Government-wide Green Initiative, ALCA had a budget of roughly ¥2.5 billion ($31 million) to support R&D that is expected to lead to break-throughs in reducing green house gas emission. The 54 projects as below were selected from 686 applications under four specific themes - Solar cells and solar energy-use system; Superconducting systems; Storage devices; Heat-resistant materials/steel-recycled highly functional materials - as well as a general unspecified category.

ALCA requirements included

- Focus on technologies expected to be
    - Commercializable within 10 years and

    - More efficient, economical, and environment-friendly than the technologies that would likely be available in 10 years without the proposed research
- Participation of researchers from diverse fields
- Participation of young researchers on the project team

Each project will be funded between Yen 10-100 million ($0.13-1.25 million) in direct costs[1] per year for 2-5 years. Projects that are evaluated positively after the initial funding period may be extended for another five years for a total of ten years funding.

JST plans to run the ALCA program again in the fiscal year that begins April 1, 2011. The JFY2011 ALCA budget is expected to be roughly ¥4.2 billion ($52 million). A bio-fuels thematic area may be added to the current four focal themes.

JST has an ALCA program website at http://www.jst.go.jp/alca/. Currently the site has limited information at the English language link, but JST has indicated its intention to make more information available in English by later this spring. Most ALCA PIs have their own websites which can be accessed by their names and affiliations. Most, but not all, sites are available in English as well as Japanese.

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[1] - Indirect costs, allowable at the fixed rate of 30%, will additionally be funded from the same budget account.

Solar batteries and solar energy-used systems

PI	Affiliation	Project
IMAHORI, Hiroshi	Kyoto University	Highly-efficient and low-cost dye sensitized solar cells
SHIMODA, Tatsuya	Japan Advanced Institute of Science and Technology (JAIST)	Highly-functional solar battery with liquid silicon coating
KADOYA, Masatomo	National Institute of Materials Science (NIMS)	Concentrated solar cells using III-V nitride thin films
FUKUZUMI, Shunichi	Osaka University	Artificial photosynthesis hybrid systems
HORI, Masaru	Nagoya University	Hybrid nano-carbon solar cells
YAMADA, Akira	Tokyo Institute of Technology (Tokyo Tech)	Future chemical compound thin film solar cells by non-vacuum approach
YEH, Wenchang	Shimane University	Development of novel Si/Ge-Ge structure solar cells
YOSHIKAWA, Akihiko	Chiba University	Smart innovation of nitride semiconductor tandem solar cells – approach with superstructure magic alloys fabricated at raised temperature
YOSHIDA, Hiroshi	Osaka University	Ultra-efficient energy converting spinodal nanotechnology

Superconducting systems

KUMAKURA, Hiroaki	National Institute of Materials Science (NIMS)	Development of high performance and low-cost wires of MgB_2
SHIRAI, Yasuyuki	Kyoto University	Liquid hydrogen-cooled superconducting devices for new energy infrastructure
HAMASHIMA, Kotaro	Tohoku University	Advanced superconducting electric conversion system to make use of natural energy
MATSUMOTO, Kaname	Kyushu Institute of Technology	Development of 120K-level superconducting wires by atomic-level control

Storage devices

ISHIHARA, Tatsumi	Kyushu University	Innovative metal by use of hyperbaric oxygen ion conducting nano thin film – air rechargeable battery
IMANISHI, Nobuyuki	Mie University	Development of innovative high energy storage system
OZAKI, Junichi	Gunma University	Development and evaluation of carbon alloy that possesses fuel cell electrode catalytic activity
KAJIYAMA, Hiroshi	Hiroshima University	Basic technology development for non-rare earth semiconductor battery
KANAMURA, Seishi	Tokyo Metropolitan University	Basic research on bipolar-type all solid lithium ion battery
SUGIMOTO, Wataru	Shinshu University	Research on next-generation hybrid capacitance

TANAKA, Hirohisa	Daihatsu Motor Co., Ltd.	Platinum-free fuel cell automobile with liquid fuel catalyst
NISHIHARA, Hirotomo	Tohoku University	Li-Si based nanocomposites for rechargeable lithium-ion battery anodes
HAYASHI, Akitoshi	Osaka Prefecture University	All solid state Natrium – sulfur molecules for high capacity battery applications
MAEKAWA, Hideki	Tohoku University	Development of all solid battery element materials that enable super high-speed charge/discharge
SEONG-HO, Yoon	Kyushu University	Innovative metal anode for secondary battery using nanogate theory
WATANABE, Masayoshi	Yokohama National University	Green innovation of battery device using ionic liquid

Heat-resistant materials/Steel-recycled highly functional materials

INUI, Haruyuki	Kyoto University	Development of ultra heat-resistant $MoSi_2$-based multi-phase single-crystal alloys through combining brittle phases on the basis of interface functionalization
KOSEKI, Toshihiko	University of Tokyo	Layer-integrated steels and metals that enables both high function of steels & metals and low carbon
TAKEYAMA, Masao	Tokyo Institute of Technology (Tokyo Tech)	Design of super heat-resistant steel for innovative 800°C-level thermal power generating plant

Topics not specified

ISHII, Masaharu	University of Tokyo	Low carbon by high-performance metabolism of autotroph
INAMURA, Tomonari	Tokyo Institute of Technology (Tokyo Tech)	Development of solid engine materials with high efficiency and longevity run by retained heat
IWAMOTO, Masakazu	Tokyo Institute of Technology (Tokyo Tech)	Creation of catalytic biomass-refinery without glycation or fermentation
UDA, Tetsuya	Kyoto University	New continuous titanium production process for utilization as light vehicle and high corrosion resistant materials
EGUCHI, Koichi	Kyoto University	Development of materials/energy conversion devices to make ammonia a hydrogen carrier
OHTOMO, Akira	Tokyo Institute of Technology (Tokyo Tech)	Development of universal substrates based on transparent conducting oxides
OGASAWARA, Naotake	Nara Institute of Science and Technology (NAIST)	Generic production of highly-efficient bio processing cell
KATO, Junichi	Hiroshima University	Development of innovative use of microorganisms to realize bio chemical engineering processes to enable low carbon manufacturing
KANEMO, Tatsuo	Japan Advanced Institute of Science and Technology (JAIST)	Creation of super engineering plastic using microorganism biomass
KAWARADA, Hiroshi	Waseda University	Basic technology for green inverter by large size diameter diamond board

KINOSHITA, Toshinori	Nagoya University	Promotion of the activation of plant photosynthesis and production volume by controlling stoma opening and shutting
KOSHIBA, Mamiko	Tokyo University of Agriculture and Technology	Low carbon without intention; technologies to control creative space
SAKA, Shiro	Kyoto University	Highly efficient ethanol production from lignocellulose obtained from acetic acid fermentation
TAKARADA, Takayuki	Gunma University	Development of power generation system by ultra low-temperature catalytic gasification of biomass
TERASAKI, Ichiro	Nagoya University	Development of thermoelectric conversion materials by use of light
DOMEN, Kazunari	University of Tokyo	Development of solar hydrogen light catalyst system for large-scale development
NAKASHIMA, Yasuhiko	Nara Institute of Science and Technology (NAIST)	Computer architecture to stabilize next-generation low electric power devices
NAKANISHI, Kazuki	Kyoto University	Development of multi-purpose heat-insulating materials based on organic-inorganic hybrid aerogel
NISHIZAWA, Naoko	Ishikawa Prefectural University	Plant molecular breeding for expanding biomass production on poor soil
NODA, Suguru	University of Tokyo	Super resource-saving nanotube flexible electronics
NOHARA, Minoru	Okayama University	Development of highly efficient heat conversion materials by flat band mechanism
NOMURA, Nobuhiko	Tsukuba University	Development of innovative bio film control method for advanced green energy production technology
BIWA, Tetsushi	Tohoku University	Research on environmentally-friendly low-temperature remaining energy collection technology using natural engine
FUJITA, Yuichi	Nagoya University	“Nitrogen Innovation” by introducing nitrogen fixation to effective photosynthetic organisms
YAMADA, Katsushige	Toray Industries, Inc.	R&D on innovative manufacturing process for polymer materials from cellulose biomass
YOKOTA, Akiho	Nara Institute of Science and Technology (NAIST)	Sustainable low carbon life by “Potato Innovation”