


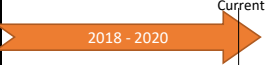



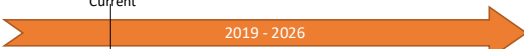



Country	Institute	Category	Related programs (with short summary)	Target / Goal Outcome	Lead person / Organization	Partnership (if any)	Related information
Japan	NIMS	General	NIMS operating subsidy project "Basic Research on Energy-Conversion & Storage" / Research on materials maximizing energy efficiency in the new energy value chain [2016-2022] Current 	Development of materials for next-generation, low-cost and high-efficiency solar cells; H <sub>2</sub> production; electrochemical energy storage; and thermoelectric conversion.	Dr. Kazunori Takada / NIMS		<a href="https://www.nims.go.jp/eng/research/energy-environment/index.html">https://www.nims.go.jp/eng/research/energy-environment/index.html</a>
		Transportation/ Carrier	Innovative hydrogen liquefaction technologies desired in future society / Development of advanced hydrogen liquefaction system by using magnetic refrigeration technology [2018-2027] Current 	Development of a high efficient hydrogen liquefier to achieve a liquefaction capacity of 100 kg/day with FOM = 0.5 and a small and energy saving re-condensation refrigerator to realize zero boil-off in the liquid hydrogen storage	Dr. Nobuyuki Nishimiya / NIMS	(Domestic) JST, NIMS, Kanazawa University, NIT Oshima College, Kyoto University, Kyushu University, Mayekawa MFG., Nippon Yttrium, CHUBU Electric Power, Sumitomo Heavy Industries, Iwatani	<a href="https://www.nims.go.jp/eng/research/cryogenic-hydrogen-and-materials/index.html">https://www.nims.go.jp/eng/research/cryogenic-hydrogen-and-materials/index.html</a>

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Japan	NIMS	Generation / Capture	Advanced Low Carbon Technology Research (ALCA) / Development of next generation solar cells based on the combination of perovskite and silicon photovoltaic technologies [2016-2018]. 	Development of next generation photovoltaic materials with over 30% efficiencies.	Dr. Takeshi Noda / NIMS	(Domestic) JST	<a href="https://www.jst.go.jp/alca/en/end_detail.html#end_2017">https://www.jst.go.jp/alca/en/end_detail.html#end_2017</a>
			Autonomous Power Supply for IoT Devices using Small Temperature Difference Project / Research and development of low-cost and non-toxic Fe-Al-Si-based thermoelectric materials and modules for driving IoT wireless sensors based on power generation technology that uses small temperature difference [2018-2020]. 	Development of a compact system that will function up to 200°C and power sensors in environments with small temperature difference (required power output is ~100μW/cm <sup>2</sup> with ΔT=5K).	Dr. Yoshiki Takagiwa / NIMS	(Domestic) NEDO, Ibaraki Univ. Aisin Seiki Co., Ltd.	<a href="https://www.nedo.go.jp/news/press/A5_101177.html">https://www.nedo.go.jp/news/press/A5_101177.html</a>
		Storage	Advanced Low Carbon Technology Research and Development Program - Specially Promoted Research for Innovative Next Generation Batteries (ALCA-SPRING) / Acceleration of R&D of the next generation of the existing lithium-ion batteries [2013-2022]. 	Development of all-solid-state, lithium-sulfur, metal-air, and magnesium metal batteries	Prof. Kohei Uosaki / NIMS	(Domestic) JST, Participation from more than 40 universities and institutes	<a href="https://www.jst.go.jp/alca/alca-spring/en/index.html">https://www.jst.go.jp/alca/alca-spring/en/index.html</a>
			SOLID-EV project / Development of all-solid-state lithium-ion batteries for electric vehicles [2018-2022]. 	Development of all-solid-state lithium-ion batteries with sulfide solid electrolytes Energy density of battery pack: 600 Wh/L	Dr. Yasuo Ishiguro / LIBTEC	(Domestic) NEDO, 23 private companies including Toyota, Nissan, Honda, and Yamaha, 15 universities and institutes	
			Element Strategy Initiative for Catalysts and Batteries / Developing high-performance automotive catalysts and secondary batteries through the interplay between experimental and theoretical studies [2012-2021]. 	Development of metal nano particles and Na-ion batteries composed of ubiquitous elements	Prof. Tsunehiro Tanaka / Kyoto Univ.	Univ. Tokyo, Kyushu Univ., Tokyo Univ. Sci., Yokohama Nat. Univ., NIMS, etc.	<a href="http://www.esicb.kyoto-u.ac.jp/">http://www.esicb.kyoto-u.ac.jp/</a>
			Materealize Project / Establishment of process science for realizing all-solid-state batteries [2019-2026]. 	Establishment of process science for realizing all-solid-state batteries	Dr. Kazunori Takada / NIMS	Japan Fine Ceramics Center, Sumitomo Chemical, Mitsubishi Chemical, Tokyo Tech	
			Material Open Platform for All Solid State Batteries / Development of oxide-type all-solid-state batteries[2020-]. 	Development of oxide-type all-solid-state batteries	Dr. Kazunori Takada / NIMS	10 private companies	