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Japan selects first round of recipients for green innovation fund

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Introduction

The New Energy and Industrial Technology Development Organisation (NEDO) has selected the initial group of 11 recipients for funding under Japan's Y2 trillion green innovation fund, which was established by the Ministry of Economy, Trade and Industry (METI) in March 2021. The selected projects fall into two categories relating to hydrogen:

- the construction of a large-scale hydrogen supply chain; and
- the production of hydrogen through water electrolysis using electricity derived from renewable energy and other sources.

Green innovation fund outline

On 25 December 2020 METI released the Green Growth Strategy Through Achieving Carbon Neutrality in 2050 (the Green Growth Strategy) as part of the effort announced by Prime Minister Suga for Japan to achieve carbon neutrality by 2050. In March 2021 METI established the Y2 trillion green innovation fund to support entities engaged in research and development aiming to further the green innovation fund's policy goals.

Notably, hydrogen was the focus of three of the 18 fields identified by NEDO as targets for the green innovation fund (for further details please see "METI green innovation fund") – namely:

- large-scale hydrogen supply chain construction;
- hydrogen production by water electrolysis using electricity derived from renewable energy and other sources; and
- hydrogen use in steelmaking processes.

The Green Growth Strategy identifies hydrogen as a key industrial field (for further details please see "Recent regulatory developments in hydrogen energy use"), and proposes the use of hydrogen and ammonia to cover approximately 10% of the power supply by 2050. In addition, METI's draft sixth Basic Energy Plan, which was released on 21 June 2021, proposes that hydrogen and ammonia contribute 1% of the power supply by 2030. This is the first time that hydrogen has appeared on a Basic Energy Plan.

Green innovation fund's first round of projects

On 18 May 2021 NEDO began accepting proposals under the following categories:

- large-scale hydrogen supply chain construction; and
- hydrogen production through water electrolysis using electricity derived from renewable energy and other sources.

NEDO has allocated Y300 billion and Y70 billion to these categories, respectively. The aim of these projects is to reduce the supply cost of hydrogen to Y30 per normal cubic metre by 2030, and Y20 per normal cubic metre by 2050. Projects are to be carried out over a period of between five and 10 years. Projects are subject to annual evaluations and may be discontinued based on the results of those evaluations.

NEDO selected three projects relating to hydrogen production by water electrolysis using electricity derived from renewable energy and other sources for funding. The projects involve:

- demonstration of a large-scale, alkaline-based water electrolysis system and "green" chemical plant;
- demonstration of a large-scale, polymer electrolyte membrane-based water electrolysis system; and
- creation of a global standard for evaluating the performance of water electrolysis equipment by establishing a process consisting of:
 - accelerated deterioration testing of large-scale (500 kilowatt class) water electrolysis stacks;
 - testing water electrolysis stacks (50 kilowatt class) under high pressure (more than 1 megapascal); and
 - testing large-scale (megawatt class) water electrolysis equipment under electricity conditions that simulate those found overseas.

In addition, NEDO selected eight projects for funding that relate to large-scale hydrogen supply chain construction. The projects involve:

- demonstrating a large-scale methylcyclohexane (MCH) supply chain;⁽¹⁾
- demonstrating commercialisation of a liquid hydrogen supply chain;
- establishing standards for equipment used in manufacturing, transporting, storing and using liquid hydrogen suitable for extreme low temperatures;



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- developing technology for direct electrolysis of MCH;
- developing technology for more efficient liquefaction of hydrogen;
- testing technology for co-firing hydrogen in gas turbines;
- demonstrating co-firing hydrogen (up to 30%) and mono-firing hydrogen in existing gas turbines; and
- demonstrating CO₂-free electricity generation from hydrogen.

NEDO will cover between two-thirds and half of the costs for each of these projects, with additional incentive payments available.

Additional projects under green innovation fund

On 19 July 2021 NEDO began accepting submissions for projects in two additional categories:

- developing next-generation aircraft; and
- developing next-generation ships.

NEDO has also opened pre-registrations for projects in the following categories:

- lowering the cost of offshore wind power;
- developing next-generation solar cells;
- using hydrogen in steelmaking processes;
- constructing a fuel ammonia supply chain;
- developing technology to produce plastic materials using CO₂ and similar substances;
- developing technology to manufacture concrete and other materials using CO₂;
- developing next-generation storage batteries and motors; and
- developing next-generation digital infrastructure.

NEDO is expected to begin accepting proposals for projects in the above categories soon.

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Endnotes

(1) MCH is produced from toluene and hydrogen, and can be stored and transported in a liquid state at ambient temperatures and pressures.