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Resonac's Technology for Directly Recycling Mixed Plastic Wastes into Basic Chemicals Selected for NEDO's Green Innovation Fund

~This technology is aimed at expanding and promoting the effective recycling of used plastics while switching the raw materials and manufacturing processes of basic chemicals, which are primarily derived from fossil resources~

Resonac Corporation (President: Hidehito Takahashi) has been selected for the New Energy and Industrial Technology Development Organization's "Green Innovation Fund Project / Development of Plastic Raw Material Manufacturing Technology Using CO₂, etc.*1" with its proposal for "The Development of Chemical Recycling Technology to Produce Basic Chemicals from Mixed Plastic Wastes". This proposal aims to respond to the Green Innovation Fund's additional public invitation for projects to establish technology for producing raw materials for plastics without relying on fossil resources, contributing to a significant reduction in CO₂ emissions*1. Today, we announce that the New Energy and Industrial Technology Development Organization (hereinafter "NEDO") has publicly disclosed the acceptance of Resonac's proposal (hereinafter "the project").

NEDO's Green Innovation Fund Project (hereinafter "the GI Fund") was established as a project of NEDO by the Ministry of Economy, Trade and Industry in 2021, with a total budget of 2 trillion yen, to significantly accelerate innovations necessary for the structural transformation and bold investments in the energy and industrial sectors to achieve the Japanese government's goal of "carbon neutrality by 2050."

The Project is expected to run for a maximum of nine years from FY2024 to FY2032. It aims to establish chemical recycling technology that directly converts and recycles used plastics, which are typically disposed of in a mixed state (such as packaging), into basic chemicals such as ethylene, propylene, and benzene without the need for advanced sorting. This will further expand and promote the effective utilization of valuable carbon resources in used plastics, while also switching the raw materials and manufacturing processes of basic chemicals, which are currently derived mainly from fossil resources, thereby contributing to the realization of a resource-circulating society and achieving carbon neutrality by 2050.

[About the project]**■ Research and development subject**

Development of technology for manufacturing chemicals from used plastics and rubber;
Development of technology for producing basic chemicals from mixed plastics.

■ Background

In the recycling of used plastics, existing methods have primarily focused on recycling separated or single-type plastics, which account for 1.77 million tons, or 21% of the total amount of used plastics disposed of in 2021. The remaining mixed plastics have mainly undergone thermal recycling. The separation of plastics incurs high costs, and many plastics are difficult to separate, making it highly desirable to establish technologies for recycling mixed plastics without separation to reduce greenhouse gas (GHG) emissions.

■ Research and development overview

The project aims to develop pyrolysis technology that directly converts mixed plastics, which make up a significant portion of used plastics, into valuable basic chemicals such as lower olefins*² and benzene with a yield of over 60%, while keeping CO₂ emissions during production below 0.8 kg-CO₂/kg-olefin. The project will utilize, for example, microwave heating and conduct pyrolysis at a demonstration scale of several thousand tons per year, aiming to establish technology that can handle a variety of used plastics. Initial work will involve selecting decomposition processes and reactor types at laboratory and bench scales (small amount trial production), followed by pilot (medium amount trial production) and large-scale demonstration phases to optimize operation conditions. Additionally, potential challenges arising during future commercialization will be identified and addressed concurrently.

■ Project scale (scheduled)

Total: Approximately 11.8 billion yen

Support provided by the GI Fund: Approximately 8 billion yen

■ Project duration (scheduled)

FY2024 to FY2032

For more details, please refer to the materials released by NEDO (Japanese).

https://www.nedo.go.jp/news/press/AA5_101804.html

*1: Announced by NEDO on September 12, 2024 (Japanese)

Regarding the additional public invitation for the "Green Innovation Fund Project / Development of Plastic Raw Material Manufacturing Technology Using CO₂, etc."

https://www.nedo.go.jp/koubo/EF2_100220.html

*2: Hydrocarbon compounds that consist of ca. 2 to 4 carbon atoms connected together and contain double bonds within the molecule, such as ethylene and propylene, which are used as raw materials for plastics.

[About Resonac Group]

The Resonac Group is a group of chemical companies that produces and sells products related to semiconductor and electronic materials, mobility, innovation enabling materials, chemicals, etc. The Group has a wide variety of materials and advanced material technologies applicable to midstream to downstream of supply chains of various products. In January 2023, the Showa Denko Group and the Showa Denko Materials Group (former Hitachi Chemical Group) merged into the Resonac Group and made a start as a new corporate group.

We position promoting and expanding chemical recycling as one of our key initiatives. Since 2003, we have been engaged in a chemical recycling business at our Kawasaki Plant, where we decompose used plastics to produce clean hydrogen and ammonia.

The new trade name "RESONAC" was created as a combination of two English words, namely, the word of "RESONATE" and "C" as the first letter of CHEMISTRY. As a "co-creative chemical company," Resonac aims to continue growing and enhance its corporate value through co-creation.

For detail, please refer to our website.

Resonac Holdings Corporation: [https:// www.resonac.com/](https://www.resonac.com/)

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