

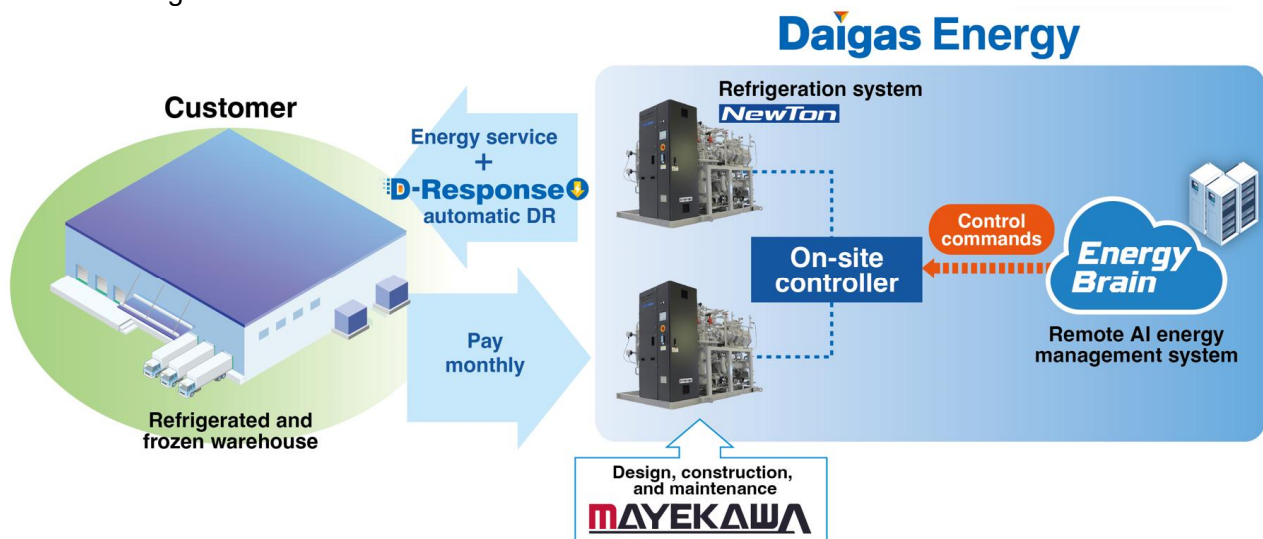
**Successful Demonstration of Automatic Demand Response Control of an Industrial Refrigerator without Complete Shutdown Using a Remote AI Energy Management System
Proposal of a “Natural refrigerant refrigerator energy service with automatic demand response”**

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Osaka Gas Co., Ltd.
Daigas Energy Co., Ltd.
Mayekawa Mfg. Co., Ltd.

Daigas Energy Co., Ltd. (President: Hiroyoshi Fukutani, hereinafter referred to as “Daigas Energy”), a wholly-owned subsidiary of Osaka Gas Co., Ltd. (President: Masataka Fujiwara), in collaboration with Mayekawa Mfg. Co., Ltd. (President and CEO: Shin Maekawa, hereinafter, “Mayekawa Mfg.”), has successfully demonstrated automatic demand response (hereinafter, “DR”) control in a refrigerated and frozen warehouse without complete shutdown, by linking Mayekawa Mfg.’s high-efficiency natural refrigerant refrigeration system “NewTon” with the Daigas Group’s remote AI energy management system “Energy Brain.”

Going forward, the two companies will develop a scheme (see diagram below) to provide a suite of energy services, including automatic DR and equipment maintenance, as one of the proposals to customers installing NewTon in refrigerated and frozen warehouses, and will begin proposing this in fiscal 2024.

<Scheme Diagram>



In recent years, with the expansion of renewable energy adoption, there has been growing demand for adjustment capabilities to compensate for the instability of renewable energy. The importance of DR, which requires the demand side to change consumption patterns in line with the power supply, is increasing.

Since industrial refrigerators in refrigerated and frozen warehouses are constantly in operation, if DR could be supported throughout the year, they could be expected to serve as a significant DR resource. However, temperature control is extremely important, in order to maintain the quality of the stored products. Since simple DR that shuts off and restarts the power of the refrigerators is unable to control temperature precisely and can cause disruptions to operations, DR has not been adopted significantly until now.

The two companies conducted demonstrations in July and November 2024 at the refrigerated and frozen warehouses located at the Maishima Cold Storage Facility and the Kobe Distribution Center of Toyo Suisan Kaisha, Ltd., where NewTon has been installed. Assuming that a preliminary DR request had been notified by a general electricity transmission and distribution company, the demonstrations confirmed that Energy Brain was able to send control commands to NewTon, and that the refrigerators’ control mode was automatically switched to respond to the DR command without any effort on the part

of the customer. We successfully controlled the refrigerators without completely shutting them down by linking the local controller^{*2} of NewTon with Energy Brain, achieving both operation of a refrigerated and frozen warehouse and automatic DR.

The Daigas Group has provided a variety of value-added services as an aggregator in the capacity market,^{*1} including the DR service D-Response, which allows customers to control their power load systems or privately own electrical power units and receive rewards by curbing power demand, as well as automatic DR and remote automatic energy management using Energy Brain.

Mayekawa Mfg.'s NewTon is a highly efficient natural refrigerant refrigeration system equipped with the latest control system that supports DR and enables precise temperature setting.

By combining the expertise of both companies, we will in the future offer customers with refrigerated and frozen warehouses a comprehensive suite of energy services, including automatic DR and equipment maintenance. This will enable our customers' equipment to become fluorocarbon-free without incurring any initial costs and achieve DR that does not require manual operation by the customers.

Daigas Energy provides solutions to achieve decarbonization by leveraging its strengths as an energy company, featuring the D-Lineup^{*3} service centered on the three Ds of decarbonization, decentralization, and digitalization.

The Daigas Group, under the "Energy Transition 2050" initiative announced in February 2025, remains committed to developing technologies and services that contribute to a decarbonized society and solving social issues, including climate change, in order to become a corporate group that helps customers both on the livelihood and business fronts for their "further evolution."

Mayekawa Mfg. has long been dedicated to the development and manufacturing of products that use natural refrigerants. Natural refrigerants not only have zero ozone depletion potential (ODP), but also have a very low global warming potential (GWP) compared to alternative refrigerants, making them environmentally friendly options. They hope to continue providing their customers with highly efficient equipment that uses natural refrigerants, thereby creating a sustainable social system and contributing to the protection of the global environment.

*1: The capacity market is a market for efficiently securing overall supply capacity (kW) in Japan into the future.

*2: The controller bundles multiple NewTon systems installed in a refrigerated and frozen warehouse to provide precise temperature control, etc.

*3: In response to various business challenges for companies, D-Lineup provides safe, dependable energy and offers solutions that meet a wide range of needs by utilizing the Daigas Group's experience and knowledge acquired through its wide range of businesses. ([Click here for the webpage.](#))