

NEWS RELEASE

NTT Anode Energy Corporation
Panasonic Corporation

NTT Anode Energy and Panasonic Complete the Implementation of a Hydrogen Supply Chain Model at the Expo 2025 Site

- Tokyo, Japan – NTT Anode Energy Corporation (President & CEO: Teruyuki Kishimoto; Address: Minato-ku, Tokyo; hereinafter referred to as NTT Anode Energy) and Panasonic Corporation (Representative Director, President, and CEO: Masahiro Shinada; Address: Minato-ku, Tokyo; hereinafter referred to as Panasonic) today announced that they have completed the implementation of a hydrogen supply chain model to promote hydrogen, which is expected to be a next-generation energy source, at the 2025 Japan International Expo (Expo 2025 Osaka, Kansai, Japan, hereinafter referred to as Expo 2025).
<Previous news release: July 20, 2023>
<https://news.panasonic.com/jp/press/jn230720-1> (Japanese-only)
- This initiative is being implemented through co-sponsorship^{*2} of the "Green Expo," part of the Future Society Showcase Projects.^{*1}

Hydrogen supply chain model at the Expo 2025 site

(details in Appendix 1)

The hydrogen supply chain model implemented at the Expo 2025 site generates hydrogen using zero-carbon electric power, including locally produced and consumed electricity through a solar power generation system^{*3} installed in the NTT Pavilion. The hydrogen is then supplied to the Panasonic Group Pavilion, approximately 200 meters away, via an underground pipeline. Both pavilions will use this hydrogen to generate electricity through pure hydrogen fuel cell generators (manufactured by Panasonic), which will power the pavilion facilities and nighttime illumination.

Hydrogen produced by a water electrolyzer in the NTT Pavilion during the day is stored in a hydrogen absorption alloy tank, then transported through an underground pipeline to the 5 kW pure hydrogen fuel cell generator located near the entrance of the Panasonic Group Pavilion. The single pure hydrogen fuel cell generator using this hydrogen will supply the electricity required for LED lighting at night to illuminate the entire pavilion, which has a floor area of 1,546.23 m². Additionally, in

the area where the pure hydrogen fuel cell generator is installed, the hydrogen supply chain model will be explained to visitors in an easy-to-understand manner by using video and AR.

Efforts by both companies to promote the spread and expansion of hydrogen energy

Since hydrogen is a next-generation clean energy source that does not emit carbon dioxide, its demand is expected to grow in the future as a means to achieve a carbon-neutral society. In order for hydrogen energy to become widespread in society, it is important to establish a hydrogen supply chain that produce, stores, transports, and uses hydrogen, linking hydrogen production sites to consumers. In the hydrogen supply chain model implemented this time, hydrogen is transported via an underground pipeline utilizing existing underground infrastructure, such as utility tunnels, cable tunnels, and communication conduits installed nationwide. Hydrogen transportation through pipelines is an innovative method aimed at reducing transportation costs, which has been a challenge in the spread of hydrogen energy. To address this, NTT Anode Energy is advancing the development of technologies and establishing standards for safely transporting hydrogen at low cost.

In terms of using hydrogen, Panasonic's pure hydrogen fuel cell generators can efficiently generate electricity from hydrogen and supply it as an electric power. These generators were developed by applying the core technology of ENE-FARM, the world's first household fuel cell cogeneration system launched by Panasonic in 2009. Multiple generator units can be installed based on power demand, enabling highly efficient and safe electricity supply. The generators have already been installed in factories, office buildings, and condominiums both in Japan and overseas. Furthermore, utilizing Panasonic HX,^{*4} an energy solution that uses pure hydrogen fuel cell generators, is expected to contribute to a sustainable society by enabling net-zero factories and zero-emission buildings.

Through the implementation of the hydrogen supply chain model at the Expo site, NTT Anode Energy and Panasonic will offer visitors a glimpse into a future where hydrogen is widely used as an energy infrastructure integral to daily life, and will work toward the realization of a Sound Material-Cycle Society supported by clean, stable, and distributed energy.

Notes:

*1: The Future Society Showcase Projects refer to a group of initiatives that offer experiences to a wide range of participants and visitors from Japan and abroad. These projects utilize technologies and services aligned with the theme of the Expo 2025, "Designing Future Society for Our Lives." They focus on the development, operation, exhibition, and events at the Expo site, which will serve as a "People's Living Lab," offering both demonstrations that provide a glimpse of the future post-2025 and implementations suitable for the Expo 2025.

<https://www.expo2025.or.jp/en/news/news-20220907-01/>

*2: The sponsorship agreement was concluded between the Japan Association for the 2025 World Exposition, NTT Anode Energy Corporation, and Panasonic Holdings Corporation.

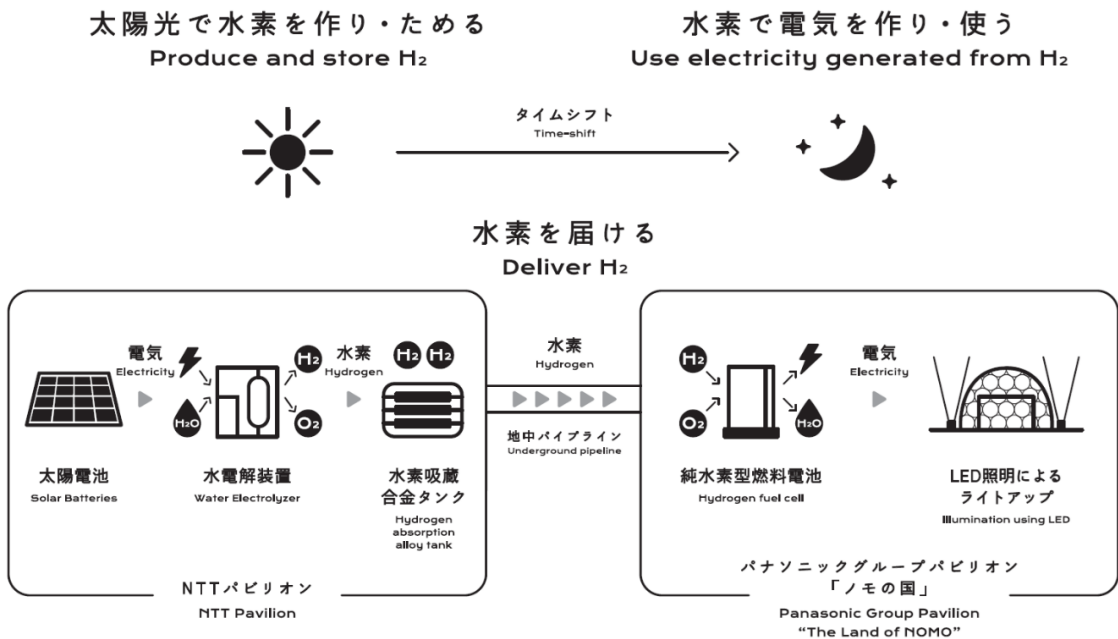
*3: The film-based perovskite solar cells installed on the roof of the NTT Pavilion at the Expo 2025 site are provided by Toshiba Energy Systems & Solutions Corporation.

*4: This energy solution utilizes hydrogen by combining pure hydrogen fuel cell generators, which can be flexibly connected to meet electricity demands and installation locations, with multiple energy sources such as photovoltaic generators and storage batteries. By incorporating Panasonic's proprietary EMS (Energy Management System) integrated with AI for coordinated control, the solution minimizes power generation waste and ensures a stable supply of renewable energy.

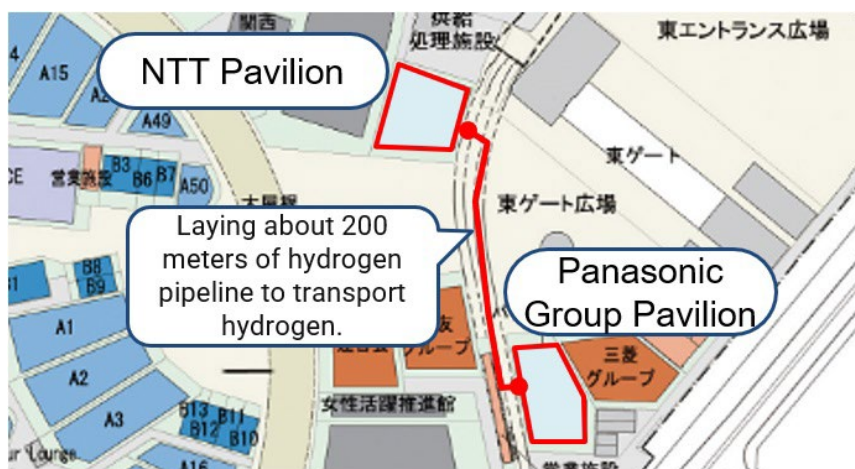
<https://news.panasonic.com/global/press/en241203-3>

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Appendix 1



Hydrogen supply chain model implemented at the Expo 2025 site

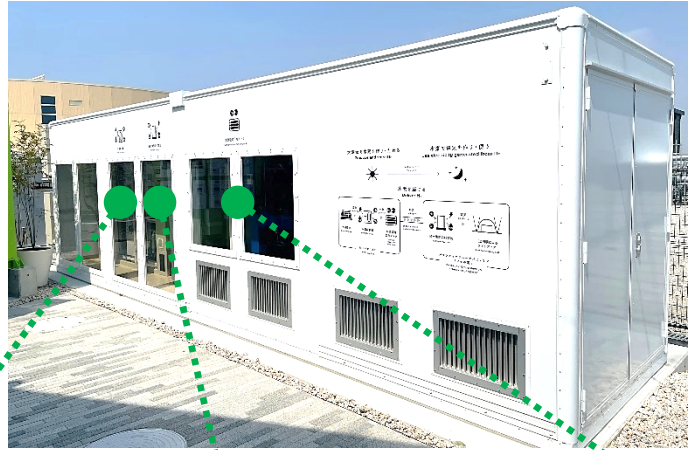


Hydrogen pipeline route connecting the NTT Pavilion and Panasonic Group Pavilion

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NTT Anode Energy and Panasonic are developing a hydrogen supply chain model at the Osaka-Kansai Expo to popularize hydrogen, which is expected to be the next-generation energy source. This video shows NTT Anode Energy and Panasonic hydrogen supply chain demonstration.

NTT Pavilion



Containerized hydrogen production/storage/power generation equipment



Water electrolyzer



Pure hydrogen fuel cell generator
(NTT Pavilion)



Hydrogen absorption alloy tank



Underground hydrogen pipeline
(NTT Pavilion - Panasonic Group Pavilion)

Panasonic Group Pavilion



Pure hydrogen fuel cell generator and exhibition panel



Nighttime pavilion illumination and pure hydrogen fuel cell generator



Explanatory video and AR of the hydrogen supply chain model viewable on smartphones (Panasonic Group Pavilion)

The pure hydrogen fuel cell generator at the Panasonic Group Pavilion is installed in a publicly accessible area, where the hydrogen supply chain model is explained in an easy-to-understand manner through video and AR by scanning the 2D barcode on the exhibition panel with your smartphone.