

## Demonstration of Peer to Peer Power Transactions Among Residents in NEXT21

March 15, 2019  
Osaka Gas Co., Ltd.

Osaka Gas Co., Ltd. (President: Takehiro Honjo; hereinafter, Osaka Gas) announced that it has begun peer to peer power transactions demonstration among residents in the Osaka Gas Experimental Housing “NEXT21” in March this year.

In response to the need to develop a sustainable society, fuel cells, photovoltaic power generation, storage battery systems and other distributed energy systems are expected to be widely used in residential facilities. Osaka gas will also sell these systems to realize comfortable lives for customers, reduce environmental burdens and improve energy security.

Currently, surplus power generated by distributed energy systems is supposed to be sold to electricity retailers. In the future, customers who own distributed energy systems centered on renewable energy power generation are possibly to be allowed to sell and buy generated power freely. For the effective management of these transactions, blockchain technology<sup>\*1</sup> is expected to be used.

Osaka Gas has begun an demonstration using the actual living environments of residents in the experimental residential complex “NEXT21” to verify the effectiveness of blockchain technology for peer to peer power transactions. If peer to peer power transactions are achieved, new value can be provided according to the customers’ needs, such as buyers and sellers who want to choose power with low environmental burdens can be directly connected.

Furthermore, in this demonstration, an area (a micro grid) is built where the VSG function<sup>\*2</sup> is adopted to use a small distributed power generation system in preparation for a blackout of the power grid, thereby continuing the power supply. This also verifies whether interchange power records among customers can be controlled by blockchain technology during a power outage just like under normal conditions.

The Daigas Group declares in the long-term management vision “Going Forward Beyond Borders 2030” that it will introduce advanced technology and the latest methods, thereby continuing to provide products and services beyond customers’ expectations. In addition to its initiatives, the Daigas Group will enhance alliances with partner companies to establish new business models and offer various services, thus serving to customers’ lives and businesses.

\*1: Blockchain technology is a technology that allows the management of transaction records on distributed servers. It is highly resistant to falsifications and failures, and is also expected to be used to achieve automatic transactions.

\*2: VSG is an abbreviation of Virtual Synchronous Generator. In this demonstration, the technology is used to operate multiple distributed power generation systems in the micro grid at the same time. VSG does not need to assign a generator as a commander. If a generator acting as a commander loses power under the conventional method, the entire micro grid would lose power. Therefore, the risk of the entire micro grid losing power is smaller.

The Daigas Group's technology and global business activities are introduced on the website "ENTERPRISE FUTURE".

For PCs: [http://www.osakagas.co.jp/company/enterprise\\_future/](http://www.osakagas.co.jp/company/enterprise_future/)

For smart phones: [http://www.osakagas.co.jp/sp/company/enterprise\\_future/](http://www.osakagas.co.jp/sp/company/enterprise_future/)

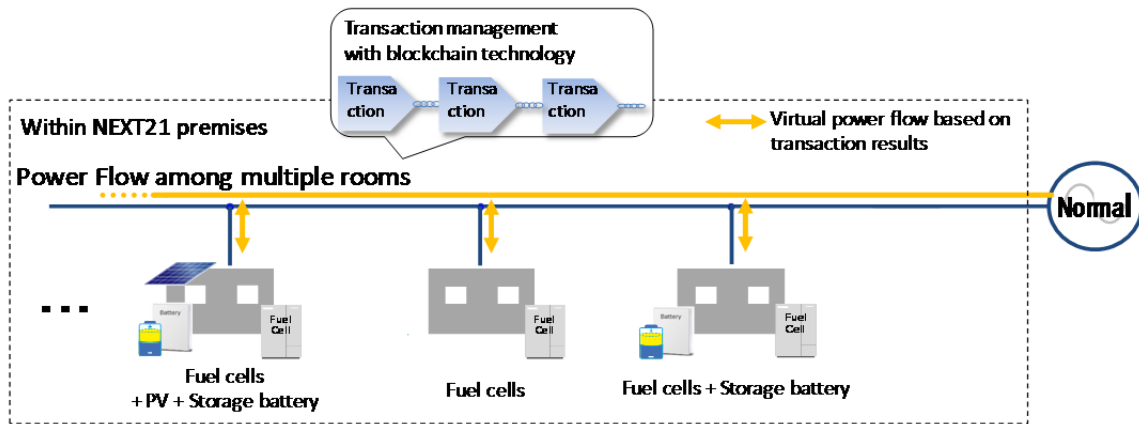
(Attached Sheet)

Demonstration of Peer to Peer Power Transactions:

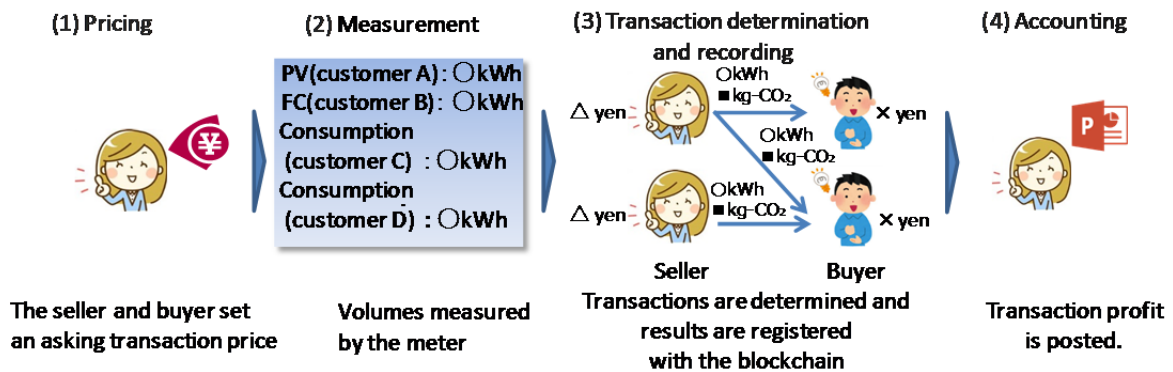
In this demonstration, fuel cells and photovoltaic power generation are used to interchange power among residents in NEXT21. Each household can set its own asking price. And the transaction volume and other information are recorded with blockchain technology, which is also used for accounting. The transaction trail management with blockchain technology can connect buyers and sellers, thereby possibly offering a wider range of options to customers, including the transaction of power with low environmental burdens and the purchase of power from a specified seller.

The developed system can be used not only by customers in complexes but also by customers in detached houses and business entities.

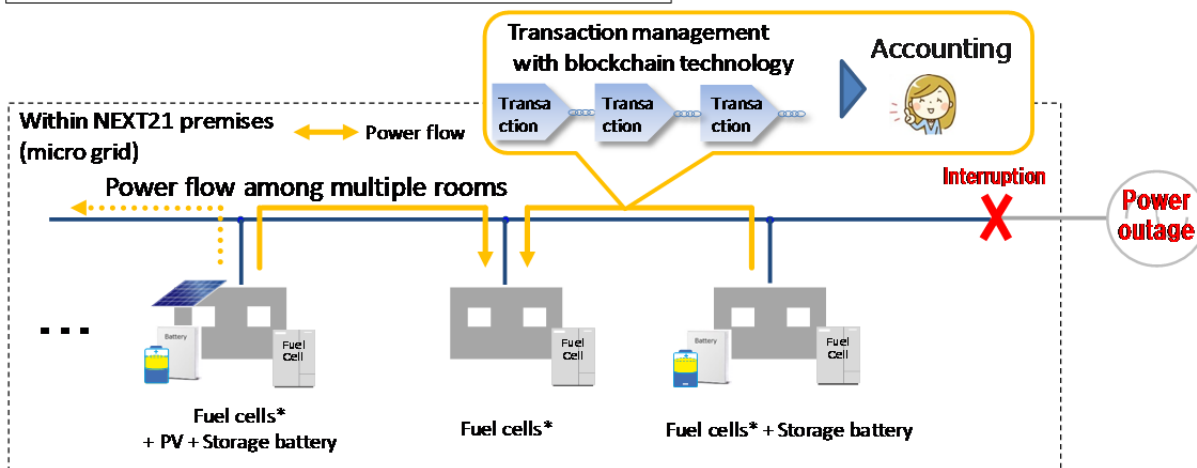
**Schematic Diagram of Peer to Peer Transaction Demonstration**



**Flow of Transactions in Demonstration**



Schematic Diagram of Demonstration During Power Outage



\*The fuel cells model with a grid independent operation function (sold as products) can continue power generation even in case of a power outage. Therefore, electricity can be used from a tap for exclusive use.