

# Solving Japan's Smart Gas Metering Challenges

## At a Glance

**Situation:** Following the 2011 Great East Japan Earthquake, the Japanese government mandated that 100 million buildings and households be fitted with smart meters by 2020.

**Challenges:** To develop a solution that enables continuous network availability and remote access, while allowing smart gas meters to maintain over 10 years of battery life in the field.

**Solution:** Meter design based on Sony's Altair highly integrated LTE-M/NB-IoT ALT1250 chipset

**Results:** The Sony Altair chipsets now provide continuous LTE-M connectivity for all cellular-connected gas meters in Japan.



## Situation

Introduced in Japan in 1983, smart gas meters are on course to achieve 37% penetration by 2024. A government-initiated programme, involving all Japan's telecoms operators, seeks to encourage more efficient energy usage and lower carbon emissions by providing customers with information on their consumption. Following the 2011 Great East Japan Earthquake, the government mandated that up to 100 million buildings and households be connected with smart utility meters by 2020.

## Challenges

Traditional gas meters were unable to handle more than one update a day and sustain a long battery life. Smart gas meters need continuous network availability and real-time remote access, while maintaining battery life of 10 years or more in the field. Each meter includes a valve that needs to be remotely controlled via the cellular connection to shut down the gas supply in case of an earthquake or tsunami. Other requirements included reverse-flow measurements, bi-directional information supply and enhanced security protocols.

The key was to develop a solution capable of eDRX (extended discontinuous reception) paging mode, which would enable constant network accessibility, data transfers a few times per day, and provide firmware upgrades every couple of years – without compromising on battery life. Simply adding more batteries to existing devices was not an option, due to the prohibitive cost of batteries used in smart utility meters.

## Solution

The Japanese smart gas metering market consists of two parallel projects – metropolitan gas meters covering 29 million households and liquefied petroleum (LP) gas meters, servicing gas tanks, which consist of 24 million units.

As existing solutions were unable to provide 10 years of battery life, Sony teamed up with multiple partners and module vendors to develop a cellular solution. Sony's Altair integrated LTE-M/NB-IoT chipset was subsequently selected to provide LTE-M connectivity for LP gas meters

As there are major costs in recalling devices after deployment, a gradual testing process was required, encompassing hundreds of thousands of systems by the end of the year-long assessment period. To ensure that devices would still operate even in adverse weather conditions, lab testing quickly progressed to active field tests. Network fluctuations were also taken into account, to ensure devices were sufficiently robust, so that batteries did not drain in instances of exceptionally high or low network coverage.

## Results

Sony's chipsets, connecting existing metropolitan gas meters utilizing the ALT1160 & dual-mode LTE-M/NB-IoT ALT1250. The next generation, ultra-low power, highly optimized ALT1350 chipset will continue providing connectivity for the new LP gas meters. Sony's chipset portfolio provides cellular connectivity for all the cellular-connected smart gas metering projects in Japan, enabling technical progress and optimized connectivity of these critical infrastructure solutions.

