Keywords A to Z — Vol.3

Keyword ## Demand Response

Demand response is a method of balancing the supply and demand for electricity by adjusting consumer usage according to the amount of power available, instead of the conventional method of adjusting power generation to consumer demand.

Encouraging users to save power during peak hours

Electricity is an essential energy of our everyday lives. The demand for electric power varies greatly even in a single day. Utility companies need to have sufficient generating capacity to prevent power shortages during peak demand periods. If several tens of peak-demand hours per year could be shifted to off-peak hours, utility companies could reduce investment costs for expanding facilities to meet peak demand.

In order to take a balance of supply and demand electricity, giving consumers incentives to adjust their usage of electricity at times such as peak hours is called "demand response."

Four typical methods of adjusting power consumption using demand response are:
1. "TOU (time-of-use) pricing," in which rates are higher in peak seasons or peak hours to induce users to use power when rates are lower.
2. "CPP (critical peak pricing)," a system that is employed in an emergency in order to significantly raise rates and restrain power use at critical peak times.
3. "RTP (real-time pricing)," in which power rates vary hour by hour and day by day according to the actual cost of power procurement as determined by market transactions. Each day's power rates are determined by demand projections made on the previous day, so users are aware of the current day's rates as they make decisions about the amount of power to use.
4. "PTR (peak-time rebate)," a system in which a part of the power rates is refunded to consumers who reduce power consumption during peak times.

Demand response, applicable also with renewable energy

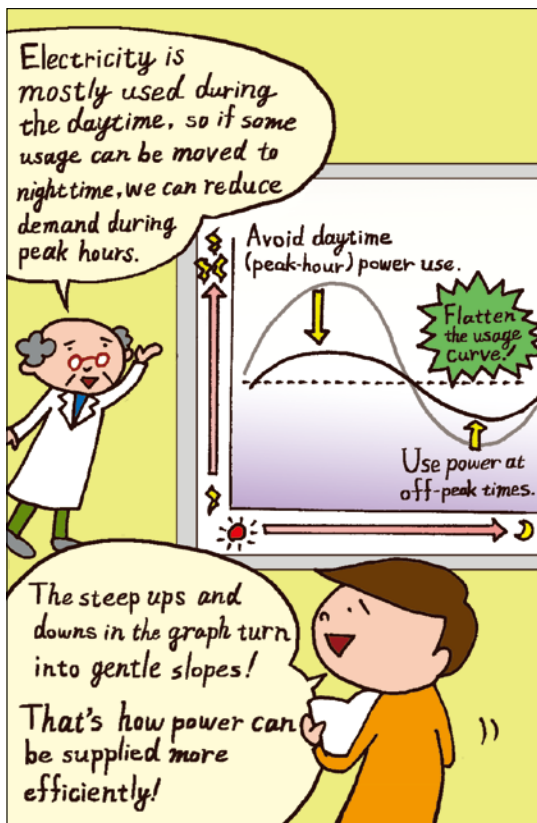Demand response is also expected to make contributions in the area of renewable energy. For instance, solar power generation has the difficulty to provide the continuous availability of electricity due to changes in the amount of sunshine. A demand response system would make it possible to adjust demand according to the amount of power generated.

Aggregator companies, which play the role of "coordinator," helping to adjust the peak demand by commercial facility or office building, are also important for a demand response system. An aggregator company is a business operator providing a full range of services from introduction of a system utilizing IT to the actual operation of the system. Utility companies and others are proceeding with proof-of-concept testing of demand response in collaboration with aggregator companies.

Demand response can be regarded as an investment in restraining consumer demand for power, rather than making investments in increasing power generation capacity, in order to deal with peak-time power requirements. As society's awareness of efficient use of electricity grows, there will be more opportunities for the practical application of demand response.

Electricity is mostly used during the daytime, so if some usage can be moved to nighttime, we can reduce demand during peak hours.

Avoid daytime (peak-hour) power use.

Flatten the usage curve!

Use power at off-peak times.

The steep ups and downs in the graph turn into gentle slopes!

That's how power can be supplied more efficiently!

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