

# RENEWABLE ENERGY DEVELOPMENT AND EXPECTATIONS OF ELECTRICITY SYSTEM - PART 1



As each nation around the world makes preparations for reaching an international agreement on climate action at the upcoming 21st session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 21), to be held December 2015, the Japanese government has indicated commitment to a lower greenhouse gas (GHS) emissions reduction target compared with European countries. Since further introduction of renewable energy is indispensable for reducing GHG emissions, Japan for Sustainability (JFS) introduces the following report provided, in two parts, by Hironao Matsubara, Institute for Sustainable Energy Policies (authorized non-profit group), regarding the current challenges facing the introduction of renewable energy and expectations of power system reforms.

Japanese power companies, which have a monopoly in their respective regions, are increasingly restricting the introduction of large amounts of renewable energy sources such as solar (PV) and wind into their power grid systems, citing various infrastructural limitations.

These power companies have long considered renewable energy sources such as solar and wind inconvenient for operating a power grid, because these energy sources cannot supply electricity in a sustained manner.

Power companies in Spain, Germany, and other European countries, on the other hand, have prioritized the introduction of domestic wind and solar energy to their grids. Their systems flexibly adjust supply and demand using electricity from thermal power plants, which can adjust their output on demand, and from hydropower, through a power market covering a wide geographical area.

In these countries, annual electricity generation from renewables already accounts for more than 20 percent of all electricity generated domestically. In fact, in certain seasons and time periods, more than 70 percent of the total power demand is met by renewable energy.

In Europe, it is already considered that renewable energy sources should, as common rules, be given priority both when establishing new grid connections and when feeding power to the grid.

Japan's Feed-In Tariff (FIT) scheme obliges power companies to connect renewable energy systems to the grid and to give priority to renewables when sourcing power, but regrettably it does not oblige them to give priority to renewables at the connection stage, a rule implemented in Europe. Under Japan's Basic Energy Plan decided by the Cabinet in April 2014, nuclear and coal-fired power generation are regarded as base-load sources, and power companies adjust supply and demand only within their own service areas. As a result, the grid connection capacity for solar and wind is set for each power company.

Last April the Japanese government revealed draft targets for the country's energy mix (the amount of energy generated by each source as a percentage of all energy generated) in 2030, indicating a target ratio for renewable energy of around 24 percent. This ratio is much lower than those of European countries, which have set their target ratios for 2020--a decade earlier--at least 30 percent. Japan is confronted with the question of whether it can't set its renewable energy target any higher.

Within this context, the Organization for Cross-Regional Coordination of Transmission Operators started operations in April 2015 as the first step toward reforming the electric power system in Japan. The organization is expected to play a role in increasing the ability of power markets nationwide to adjust supply and demand, establishing rules to use inter-regional grid connections, and formulating

plans to improve energy transmission and distribution grids for deploying power sources across larger areas. The organization is now disclosing information on power systems and developing a cross-regional institutional system.

To promote the use of renewable energy, it will be important to operate power grid systems across broader geographical areas and to build the inter-regional infrastructure needed for future electric supply systems. As it stands now, for instance, transmission of power outside a power company's service area through grid interconnections is rarely done other than in emergencies. It will also be important to establish rules that allow grid interconnections to be used to transmit renewables-derived electricity at all times--in addition other benefits, such as minimizing Japan's dependence on nuclear power, and harnessing the potential of pumped-storage hydroelectric for adjusting the output of thermal power plants, which is crucial for providing renewables with priority access to the grid.

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