



## 14th Minister of the Environment GSC Award

# Development of Photovoltaic Protective Film for high durability and low environmental impact

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Photovoltaic power generation system has an advantage that greenhouse gases and air pollutants are not generated, compared to conventional thermal power generation systems.

Life improvement of solar cells is largely expected in order to reduce consumption of resources (such as fossil resources and rare metals) and amount of waste materials, in the life cycle.

The functions of a photovoltaic protective film is to protect solar cells against wind, rain, and UV light from backside of a photovoltaic module. So, high durability and high reliability are needed for long-time use in severe usage environments. Conventional bonding type protective films have been commonly used. Whereas, a fluororesin film (PVF film) is bonded to a PET film by an adhesive. There is a risk of cracking due to the degradation of the PET film associated with a long-term usage, and a risk of delamination due to the degradation of the adhesive.

FUJIFILM has developed a highly durable photovoltaic protective film. This protective film is composed of the highly durable PET substrate, and the water-based functional layer (weather-resistant layer and adhesive layer) coated on the PET substrate.

This protective film is capable of ensuring long durability of the solar cell. Its lifetime is about 1.5 times long as that using conventional protective films, and enable the reduction of the environmental impact (greenhouse gas emissions, air pollution, resource consumption, landfill waste) to about 2/3 per unit power generation amount in the life cycle.

This protective film is the mono-sheet coating type manufactured by water-based coating process, so that there is no generation of organic solvent waste and its exhaust gas in the manufacturing process. Besides, the energy and resource consumption in manufacturing process of this protective film is less than that of conventional bonding type protective films. Therefore, this protective film itself enables the reduction of the environmental impact, about 1/4 in terms of CO<sub>2</sub> emissions compared with the conventional protective films.

