

News Release

New Energy and Industrial Technology
Development Organization
Kaneka Corporation

October 27, 2016

World's Highest Conversion Efficiency of 24.37% Achieved in a Crystalline Silicon Solar Cell Module - Represents Significant Progress toward Power Generation Cost Targets -

As part of a NEDO project, Kaneka Corporation has achieved the world's highest conversion efficiency of 24.37% in a crystalline silicon solar cell module. This achievement in silicon solar cell modules, which are the most popular type in the world, represents significant progress towards reaching the power generation cost targets set forth as part of the NEDO project.



Figure 1 The crystalline silicon solar cell module that achieved the world's highest conversion efficiency

1. Summary

Kaneka Corporation (hereafter referred to as "KANEKA") has been developing high-efficiency crystalline silicon photovoltaic technologies to achieve power generation cost goals of 14 yen/kWh (equivalent to the cost of electricity for commercial use) by 2020 and 7 yen/kWh (equivalent to the cost of conventional thermal power generation) by 2030 as part of the NEDO "Development of High-Performance and High-Reliability PV Modules to Reduce the Levelized Cost of Electricity (LCOE)" project. As was announced previously, KANEKA has achieved the world's highest conversion efficiency rating of 26.33% in a crystalline silicon solar cell (heterojunction back contact type) ^{※1} with a practical cell area size (180 cm²) (News release from September 14, 2016^{※2}).

Solar cells are generally used as a module built with inter-connected solar cells and covered by tempered glass on the surface. The solar cell module, built by KANEKA with 108 crystalline silicon solar cells (heterojunction back contact type), has achieved the world's highest^{※3} conversion efficiency^{※4} rating of 24.37% (module area^{※5}: 13,177 cm²) through the use of KANEKA's newly

developed technologies to minimize the resistive loss of inter-cell wirings in the module and to raise the collection efficiency of the sunlight radiated into the module.

By surpassing a 22% module conversion efficiency which is one of the goals that are critical to achieve the power generation targets (14 yen/kWh in 2020) set forth as part of NEDO's solar power generation development strategy (NEDO PV Challenges)^{※6} by using crystalline silicon solar cell modules, which are the most widespread type in the world, this achievement makes a major step towards achieving our power generation cost goals in the future.

2. Future plans

NEDO and KANEKA will continue to develop photovoltaic technologies for improving conversion efficiency, reducing production cost, enhancing reliability, and so on to attain power generation at our cost goal. KANEKA will promote practical development to commercialize high-efficiency solar cells that utilize the results of this project.

【Glossary】

※1 Crystalline silicon solar cell (heterojunction back contact type)

A crystalline silicon solar cell which incorporates heterojunction technology and back-contact technology. Heterojunction technology is technology which binds together multiple kinds of semiconductors with different material properties, such as combining crystalline silicon with amorphous silicon to reduce defects which lower conversion efficiency or combining materials which convert the light energy of different wavelength ranges into electricity to obtain higher conversion efficiency. Back contact technology, which forms electrodes only on the back face of solar cells, can make the light receiving area of the top face larger by concentrating all the electrodes on the back face and as a result enhances conversion efficiency.

※2 The world's highest solar cell convergent efficiency rating of 26.33%

News Release announced by NEDO and KANEKA on September 14, 2016

http://www.nedo.go.jp/english/news/AA5en_100109.html

http://www.kaneka.co.jp/kaneka-e/images/topics/1473811995/1473811995_101.pdf

※3 The world highest

As of October 27, 2016, for crystalline silicon solar cell modules. (Search by KANEKA)

※4 Solar cell module conversion efficiency

Conversion efficiency is the conversion rate of light energy into electric energy measured in a solar cell module, which is one of the important performance indices for solar cell modules. The conversion efficiency was measured with the designated area measurement at the National Institute of Advanced Industrial Science and Technology (one of the institutes around the world that provide certified measurement of conversion efficiency for solar cells and modules).

※5 Module area

The opening area of the mask used for measuring the module conversion efficiency

※6 NEDO PV Challenges

This is the development guideline on photovoltaic technologies announced by NEDO in September 2014. This guideline was developed five years after the "Photovoltaic Generation Roadmap (PV2030+)" was announced in 2009, targeting at the power generation costs of 14 yen/kWh by 2020 and 7 yen/kWh by 2030 for photovoltaic power generation

http://www.nedo.go.jp/library/pv_challenges2014.html

3. For more information, please contact

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