Photovoltaic power generation

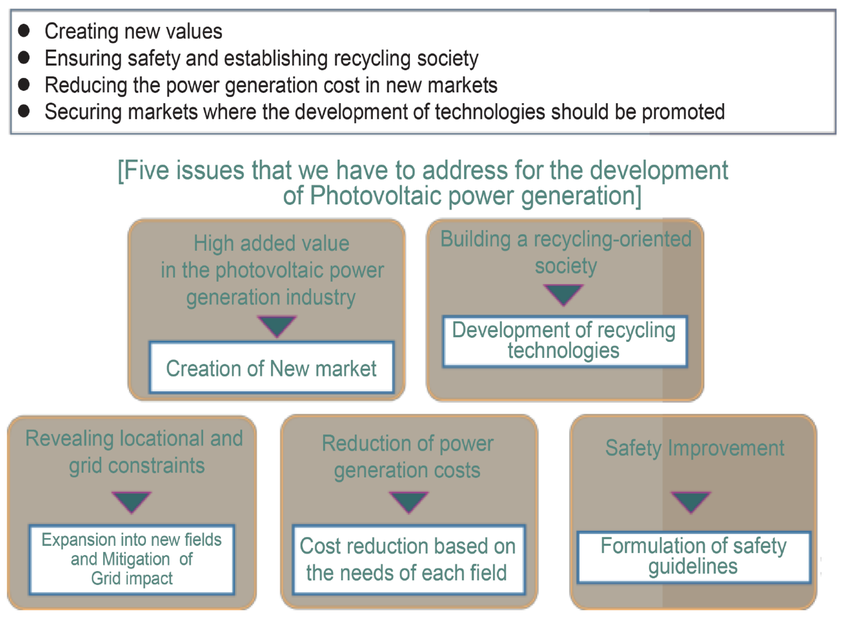
Development of technologies to promote solar power generation as a main power source

Development of module and system technologies, technologies to ensure safety and reliability, module recycling technologies, and common infrastructure technologies for further prevalence of solar power generation

In Japan, solar power generation is rapidly prevailing under the FIT system, which was started in 2012, but various issues have emerged in the realization of society with wide prevalence of solar power generation. In this project, NEDO has been engaging in research and development to solve such
issues and further expand the installed capacity of solar power generation. For example, NEDO developed module and system technologies, which allowed the introduction of solar power generation into new markets where it has not been introduced with conventional technologies, technologies for reliability evaluation and recovery, and recycling technologies for the disposal of solar power generation modules; formulated guidelines to solve issues related to the use of solar power generation as long-term stable power generation; and examined how to overcome system constraints.

- Creating new values
- Ensuring safety and establishing recycling society
- Reducing the power generation cost in new markets
- Securing markets where the development of technologies should be promoted

[Five issues that we have to address for the development of Photovoltaic power generation]



■Issues in the Photovoltaic Power Generation Development Strategy (2020)
Source: NEDO

【Project Summary】
◆Period：FY2020～2024
◆Budget(2024)：32.0 billion yen

【R&D Themes】
(I) Development of PV Power Generation Technologies to Create New Markets

(II) Development of Technologies to Make PV Power Generation a Long-term Stable Power Source

(III) Development of Advanced Common Basic Technologies

(IV) Survey of Trends, etc.

★Strategy (2020)

★Project HP

Development of PV Power Generation Technologies to Create New Markets

NEDO is developing solar cell systems for locations where it has been difficult to install solar power generation using conventional technology. For example, NEDO aims to maximize the amount of solar cells introduced by developing technologies to improve power generation efficiency, reduce weight, follow curved surfaces, and lower costs.

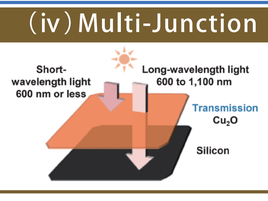
NEDO is developing technologies according to the characteristics of the three areas ((1) Rooftops with weight constraints, (2) Wall, Window (3) Mobility) where the expansion of PV power generation introduction is expected in 2050. In addition, NEDO is developing multi-junction and other types of solar cells that are designed to replace existing solar cells.

(ⅰ) Rooftops with weight constraints

(ⅱ) Wall&Window installed

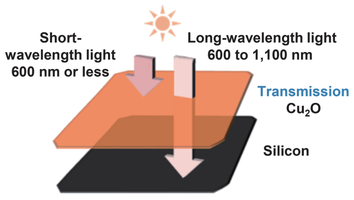
(ⅲ) Mobility Systems

(ⅳ) Multi-Junction

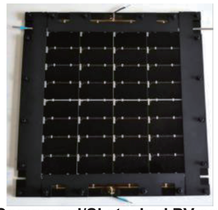


Research and development of modules to create new markets

■Building-integrated PV cell
Source: Kaneka Corporation



■Multijunction PV cells using Cu2O
Source: Toshiba Corporation



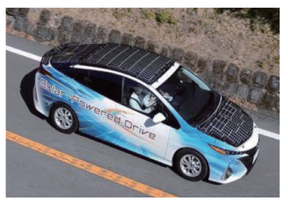
■Compound/Si stacked PV cells
Source: Sharp Corporation

Expanding solar power generation market

Roof	Window/Wall	Moving object

Source: Kaneka Corporation

Source: Taisei Corporation



Source: Toyota Motor Corporation (PRIUS PHV)