# Project Title : International collaboration on CIS-based tandem PVs （2021〜2024）
Entrusted Party : National Institute of Advanced Industrial Science and Technology

ⁿ)NEDO

Outline of the Project

For significant reductions in CO_2-emissions through large-scale usage of renewable energy particularly photovoltaic solar cells (PVs), this project focuses on the R&D of fundamental technologies in CIS-based tandem solar cells to demonstrate a lightweight flexible high-performance PV (efficiency 30%) in 2030. This project includes R&D of new materials for top cell, low-temperature growth of narrow band-gap CIS thin-films, and tandem cell fabrication process technologies as well as fundamental studies using single-crystalline CIS-based films.
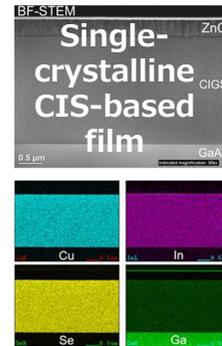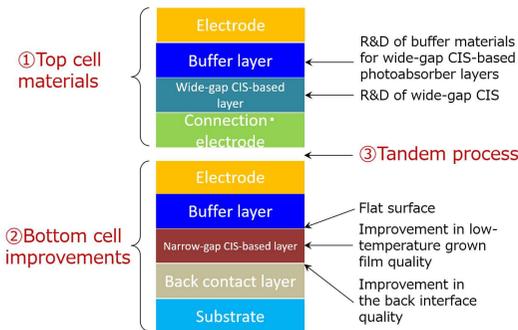

Focused subjects are that R&D of ① CIS-based top cell materials and ② low temperature growth of narrow band-gap CIS-based thin-films for bottom cell applications mainly, R&D using single crystalline epitaxial CIS-based thin-films and R&D of tandem cell fabrication processes

Significance of International R&D

・ HZB, which is one of renowned national research institutes in Germany, is world widely known of their high-level physical structural analysis and skills about CIS-based films and devices. The collaboration is expected to obtain new and important insights into the development of CIS-based PV technologies.
・ AIST will mainly prepare CIS-based films and devices and HZB will analyze them using electron probe, x-ray, and/or a wide variety of measurement techniques.

Project Scheme

NEDO
(New Energy and Industrial Technology Development Organization)

Funding

AIST
(National Institute of Advanced Industrial Science and Technology)

Joint R&D contract

Germany HZB
(Helmholtz-Zentrum Berlin für Materialien und Energie)
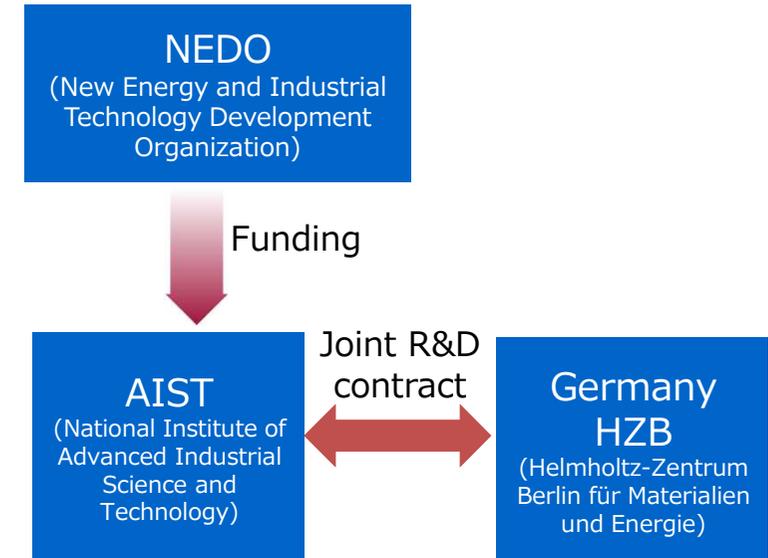
Expected Outcomes

・ Achievements of low-cost and high-efficiency CIS-based lightweight and flexible tandem PVs are expected to lead to large-scale usage of PVs in society.
・ PV installation 25GW/year is expected to lead to a reduction in CO_2-emission of approximately 16.7 million ton-CO_2／year.
・ A market scale of ¥100-billion/year is expected, where module price ¥45/W and PV installation 25GW are assumed.