European Commission

Technology factsheet:

Competitiveness of clean energy technology – Photovoltaics

December 2023

Key emerging technologies & uses

Photovoltaics are widely used commercially, both to generate power for electricity grids as well as for individual homes and businesses.

tech 1

Technological Readiness Level (TRL) 3-4: Floating photovoltaics for high wave conditions (sea-based)

tech 2

TRL 3-8: Agrivoltaic applications

tech 3

TRL 6-8: Vehicle integrated photovoltaics; Landfill, noise barriers and road roofing integrated photovoltaics; Floating photovoltaics for low wave conditions (sea-based)

tech 4

TRL 4-8: Dikes, crash barrier integrated photovoltaics

Key value chain figures

- **EU turnover:** EUR 28 billion (2021), up from EUR 21 billion in 2020 – Germany, France and the Netherlands accounted for almost half of turnover in 2021.
- **EU employment:** 648 000 (direct & indirect, 2022) of which, 281 000 direct.

Key facts

Fact 1

Current PV applications are based largely on a TRL-9 level mature technology (crystalline silicon), and this technology is evolving rapidly.

Fact 2

Photovoltaics (PV) has been the fastest-growing technology for electricity generation from renewable energies in the past decade. It is an already mature technology, indispensable in achieving the targets set by the European Green Deal (EGD) to tackle climate change and, accomplish the EU's energy transition.

Fact 3

Crystalline silicon technology accounts for 95% (more than 350 GWp in 2022) (gigawatt peak). Thin-film accounts for 5% of global PV module production.

Scan QR code for more information on photovoltaics