Different technical solutions in production of photovoltaic energy

Erilaiset tekniset ratkaisut aurinkosähkön tuotannossa

Jemina Mäntymäki, 1B

The fundamental of photovoltaic cells

Picture:
currentsofchange.net

The most popular substance in cells is mono- and polycrystalline silicon.

Over 90% of cells are crystalline silicon.

Efficient is mostly 15-17%

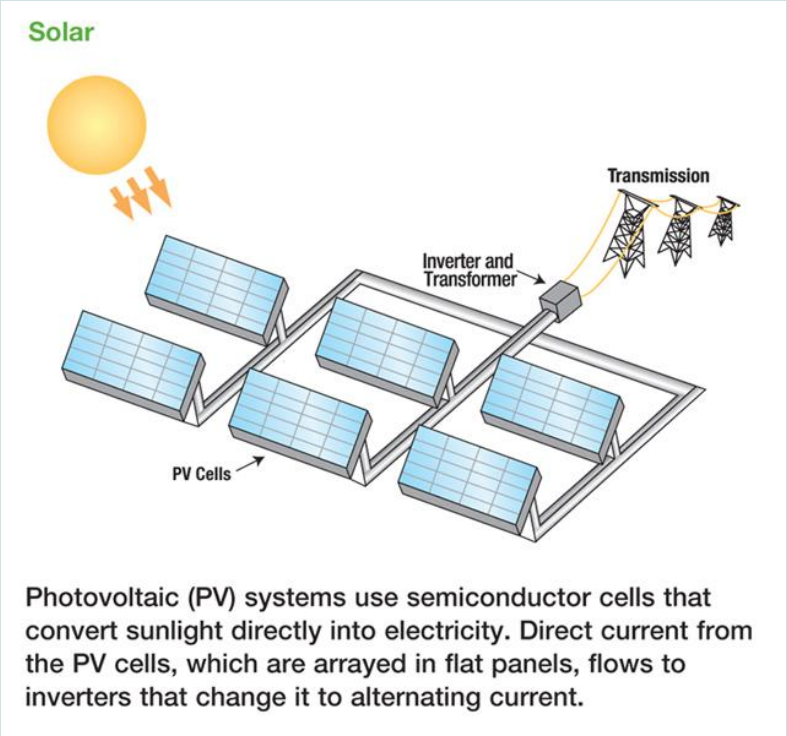
Amorphous silicon

Generally low efficiency, but more friendly for environment -> no toxic heavy-metals

Thin film:

Cadmium telluride

Copper indium gallium selenide



Photovoltaic (PV) systems use semiconductor cells that convert sunlight directly into electricity. Direct current from the PV cells, which are arrayed in flat panels, flows to inverters that change it to alternating current.

Mono- and polycrystalline silicon and amorphous silicon, the first generation

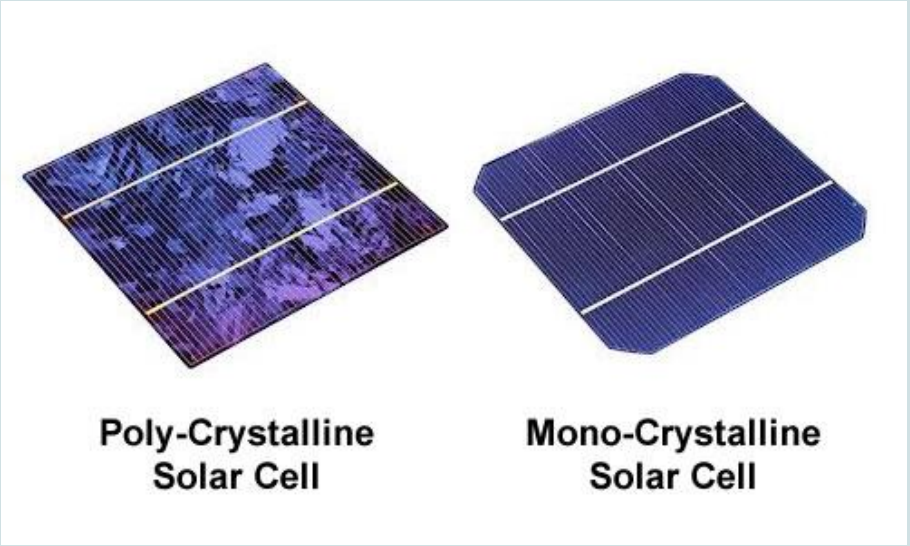
Picture: siliconsolar.com

Semiconductors: three different types, mono, poly and amorphous

Qualities like crystallines size and structure depends on type

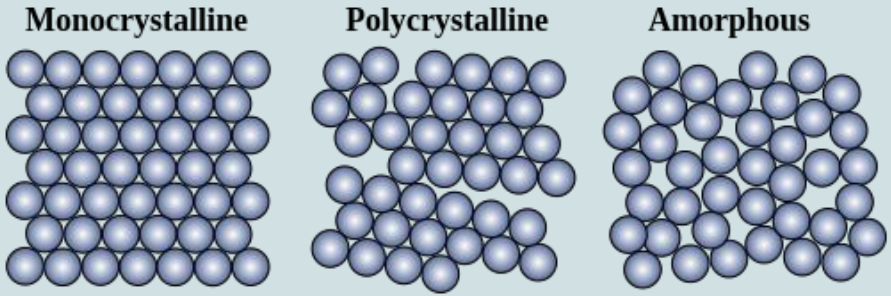
Works like basic cell, with n-type and p-type.

Commercial



Monocrystalline silicon makes over 10 cm crystallines with cyclic structures

Others aren’t that cyclic because crystallines are smaller and there are other forces which effect on them.



Thin film

fractions of a nanometer (monolayer) to several micrometers in thickness.

A stable crystalline compound formed from cadmium and tellurium.

OR

Semiconductor material composed of copper, indium, gallium, and selenium.

Reducing the cost of solar cells.