The development of solar cells

How did solar cells come to be?

To help you better understand how solar cells came to be,we've provided a timeline of the discoveries and inventions that led to their creation. French scientist Edmond Becquerel first discovered the photovoltaic effectin 1839. This process occurs when light is absorbed by a material and creates electrical voltage.

When were solar cells invented?

In 1877,Adams and Day observed the PV effect in solidified selenium and in 1904,Hallwachs made a semiconductor-junction solar cell with copper and copper oxide. However,this period was just a discovery period without any real understanding of the science behind the operation of these first PV devices.

What is a solar cell & how does it work?

Solar cell,any device that directly converts the energy of light into electrical energy through the photovoltaic effect. The majority of solar cells are fabricated from silicon--with increasing efficiency and lowering cost as the materials range from amorphous to polycrystalline to crystalline silicon forms.

When did photovoltaic cells start?

It has now been 184 years since 1839when Alexandre Edmond Becquerel observed the photovoltaic (PV) effect via an electrode in a conductive solution exposed to light . It is instructive to look at the history of PV cells since that time because there are lessons to be learned that can provide guidance for the future development of PV cells.

When did solar cells start converting sunlight into energy?

In 1994,the National Renewable Energy Laboratory developed a new solar cell from gallium indium phosphide and gallium arsenide that exceeded 30% conversion efficiency. By the end of the century,the laboratory created thin-film solar cells that converted 32% of the sunlight it collected into usable energy.

Why are solar cells important?

In the 19th century, it was observed that the sunlight striking certain materials generates detectable electric current - the photoelectric effect. This discovery laid the foundation for solar cells. Solar cells have gone on to be used in many applications.

However, persistent efforts in research and development led to the creation of thin-film solar cells in the 1970s and further innovations in the 1980s and beyond, paving the way for today"s widespread solar use.

It has been 175 years since 1839 when Alexandre Edmond Becquerel observed the photovoltaic (PV) effect via an electrode in a conductive solution exposed to light [1]. It is instructive to look at the history of PV cells [2] since that time because there are lessons to be learned that can provide guidance for the future development of PV cells.

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In the 1980s the first polymers (including poly (sulphur nitride) and polyacetylene) were investigated in PV cells. However, simple PV devices based on dyes or polymers yield limited power conversion efficiencies (PCE), typically well below 0.1%.

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Silicon solar cells can convert a physical maximum of 29.4 percent of sunlight into electricity. Today the silicon photovoltaic industry has come very close to reaching this theoretical limit. In order to continue making increases in solar cell efficiency, solar researchers around the world are now turning to tandem photovoltaics. In this ...

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Organic/inorganic metal halide perovskites attract substantial attention as key materials for next-generation photovoltaic technologies due to their potential for low cost, high performance, and ...

After a brief overview of the global energetic scenario and a short historical evolution of solar cells, in this chapter we give a description of the main solar technologies, ...

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