



# SOLAR CELL MODULE SEPARATION METHOD FOR RECYCLING

**Affiliation :** Korea university      **Type of Partnership :** Open for negotiation      **Cost :** Open for negotiation

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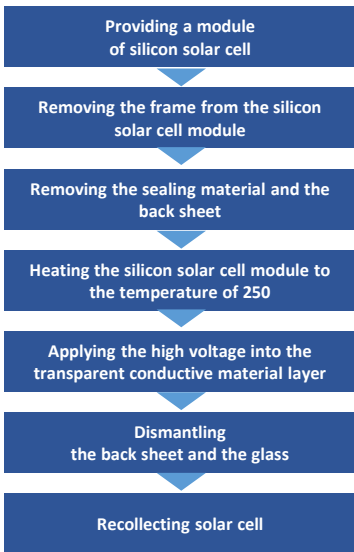
## Abstract

It is related to a new structure and a method for the recycling of the solar cell module. More specifically, it is a technique to make the manufacturing process of the solar cell module forming the transparent conductive layer between the glass and the sealing material, using this module, after the transparent conductive layer end of life of the module to facilitate recycling.

## Problems with Existing Technology

According to the rapidly growing solar photovoltaic market system, used or recycled solar modules is increased.

- In the case of domestic market, the solar supply grew rapidly between 2004 and 2005. Therefore, it is expected to increase significantly around 2020 and needed to develop the technology of recycling the solar module which is used.
- It needs to make an effort to reduce manufacturing costs of the solar cell and waste disposal costs, through developing the technology which is related to solar cell modules coming from the used modules.



<A view for explaining a process of dissolution of the silicon solar cell module>

## Technology Readiness Level

TRL 2 : Technology Concept formulated

TRL1	TRL2	TRL3	TRL4	TRL5	TRL6	TRL7	TRL8	TRL9
Basic Technology Research	Technology Concept formulated	Experimental Proof of Concept	Technology validated in lab	Technology validated in relevant environment	Technology demonstrated in relevant environment	System Prototype in operational environment	System complete & qualified	Full commercial application

## Differentiation and Effect

### Differentiation

**It can be used in the damp and heating environment**

- It comprises the step of heating up to 250 Celsius degrees to 150 Celsius
- The humidity environment can be a relative humidity of 50 percent to 100 percent
- The transparent conductive material layer is applied with a negative voltage, and the other surface is a positive voltage is applied to the glass, the high voltage may be 100 V to 1000 V.

### Effect of Technology

**When dismantling a silicon solar cell module, it can collect the glass and silicon solar cell device with circular form**

- Without crushing the silicon solar cell module, it can separate the glass and solar cell device
- It can reduce the crushing process and purification process and it is economic.
- The invention does not cause the damage in the solar cell during the glass isolation process because it does not use the high temperature process.

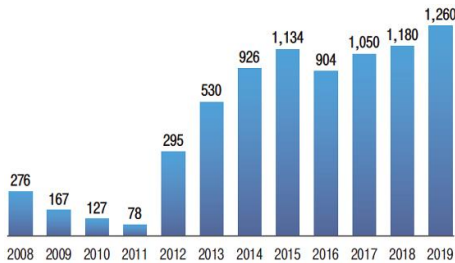
## Solar Cell Module Separation Method For Recycling

### Technology Application Field

It can be used in various fields such as solar power market



### Market Trends



KEMCO, 2017

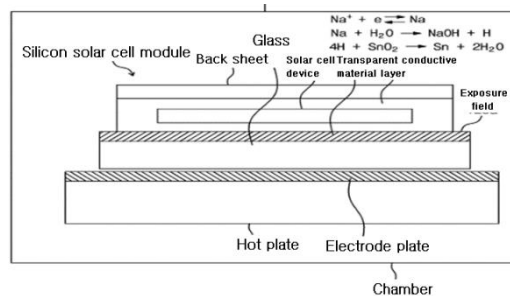
<Global market of energy storage market, million USD>

- The domestic solar market is estimated to be 1,050MW in 2017, up to 10% from the previous year.
- It is estimated to increase the demand for solar energy, as the target for the mandatory supply ratio of renewable energy will increase from 4.5% to 5% in 2018.

### Technology Implementation

#### Solar cell module separation method for recycling

- The transparent conductive material layer is used a coating structure on a surface of glass, through modifying the structure of a conventional solar cell module.
- The transparent conductive material layer is peeled off and modified by a high voltage applied between the other surface of the transparent conductive material layer and the glass during disassembly.



<A view for explaining a process of dissolution of the silicon solar cell module>

### List of related patents

No.	Title of Invention	Patent No./ Application No.
1	METHOD FOR DISMANTLING SOLAR CELL MODULE TO BE RECYCLED	PCT/KR2018/000371
2	FRONT ELECTRODE OF SOLAR CELL	PCT/KR2017/01257
3	CORROSION-RESISTANT PHOTOVOLTAIC MODULE	US 13/818,084
4	SOLAR CELL AND METHOD FOR MANUFACTURING THE SAME	US 13/004,635