# THERMOELECTRIC DEVICE FOR ENERGY PRODUCTION IN LARGE-SCALE APPLICATIONS

## INVENTION DESCRIPTION

The modules used commercially nowadays for cooling are the Peltier modules. The use of these devices for large surface applications is completely unfeasible due to its high cost. There are also some prototypes using p/n-type junctions type organic semiconductors, arranged alternately. However, many of these devices have serious drawbacks, such as their low efficiency and low viability in scaling to large surfaces.

There are also other flexible thermoelectric conversion devices but they need dissipate heat on the cold side to maintain acceptable temperature difference, so much efficiency is lost. Furthermore, these thermoelectric materials are prepared by mechanical coating methods, they need many manufacturing steps thus increasing the cost of the device.

Researchers at the University of Valencia have developed a novel device for energy production for large-scale applications. This device is completely flexible. It can be adhered to large surfaces such as windows and facades of buildings or at the back of solar panels converting thermal energy into electricity. The thermoelectric device is organic and it is based on thermoelectric junctions of semiconductors. The device has high energy efficiency. It has a financial large-scale manufacturing, because of its planar geometry and the simultaneous manufacture of thermoelectric legs.

Notably, the new flexible thermoelectric device improves the efficiency of conventional devices in large areas. It allows to maintain sufficiently separated the cold and hot sides avoiding the need to dissipate heat from the cold side. Therefore it is suitable for large-scale applications.

## BUSINESS APPLICATION SECTORS

The thermoelectric device of the invention is very interesting for applications in various sectors of energy and electronics. Energy production from heat. Cooling. Build intelligent building.

## TECHNICAL ADVANTAGES AND BENEFITS

The main advantages provided by the invention are:

- Large-scale applications (windows of buildings, walls, energy supplementation on solar panels, etc.).
- It allows the manufacturing of multiple geometries.
- Absence of toxicity.
- Due to its flexibility, it allows easy implementation in its final application.

## DEVELOPMENT STATUS OF TECHNOLOGY

The technology has been validated in laboratory, and currently the research group is working on its development.

## INTELLECTUAL PROPERTY RIGHTS

The technology is protected through the following patents:

Spanish patent application P201430641, titled “Dispositivo termoeléctrico orgánico, sistema termoeléctrico, método para la fabricación del dispositivo, revestimiento para cerramiento, cerramiento y sistema híbrido solar termoeléctrico”.

## COLLABORATION SOUGHT

- License agreement, manufacturing or marketing.
- R & D project to complete the development or apply to other sectors.
- Subcontracting agreement with another company.
- Possible spin-off (looking for partners)

## RELATED IMAGES

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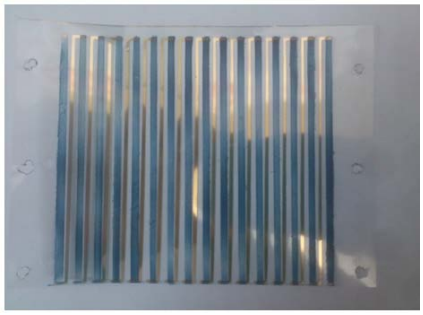

Image 1: Thermoelectric device

Image 2: Flexibility of the thermoelectric device


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