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## **Professor Kwanghee Lee proposes national challenge for the "Development of Transparent Window Film-Type Solar Cells for Zero Energy Buildings"**

- Transparent solar cells produced by the printing process can be attached as films to building windows as well as to car windows, raising expectations as a future (next generation) energy source that can efficiently produce electricity without limitation on the installation site.
- Gwangju Institute of Science and Technology (GIST, President Kiseon Kim) School of Material Science and Engineering Professor Kwanghee Lee will develop window film-type transparent solar cell devices and modules for zero energy buildings.
  - Research on film-type transparent solar cells, one of the challenges in the field of next-generation solar cells designated by Korea, is focused only on achieving high transmittance in the visible light range with high efficiency and translucence.
  - However, if window film functions are added to existing film-type transparent solar cells and applied to buildings or automotive glass windows, it is expected that not only energy-supporting functions but also UV protection and insulation will be able to increase competitiveness of film-type solar cells.
- This research project aims to develop innovative future eco-friendly energy materials that did not exist before that can satisfy the function of transparent

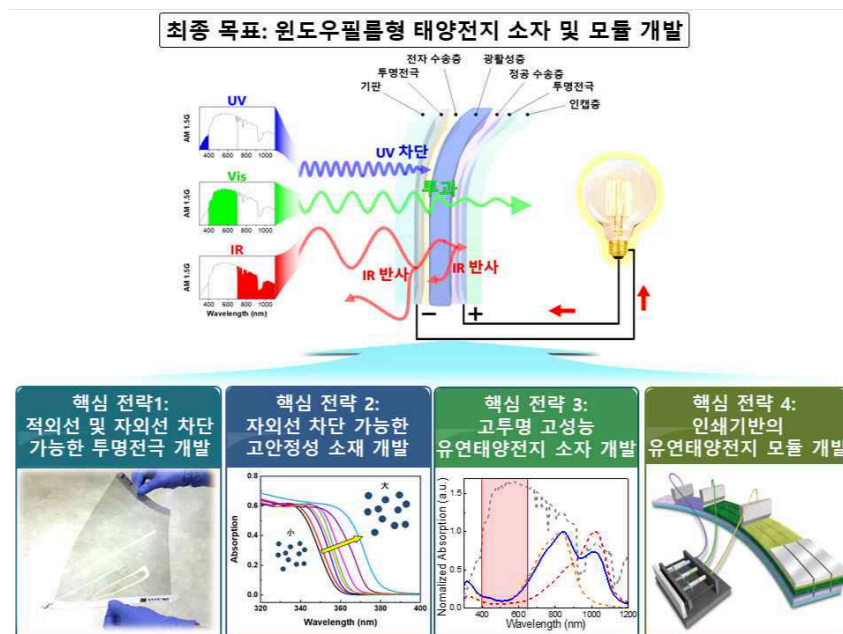
solar cells capable of photovoltaic power generation and the function of a window (or tinting) film that can save on cooling and heating power consumption.

- The researchers also plan to develop a 100cm<sup>2</sup> sized module through a low-cost printing process based on flexible transparent electrodes and organic materials capable of solution process and will conduct fundamental research on the transparent solar cell structure of window thin-films, including top and bottom transparent electrodes and components.

□ The "development of windows-film-type solar cell devices and modules" project proposed GIST Professor Kwanghee Lee is considered a national challenge, so help from industries with core materials and large-area printing process technologies and experience is essential.

- Therefore, the plan is to conduct joint industrial and industrial research with MSWAY, which has specialized technologies in this field, in particular, to jointly develop a large area printing process technology, which is a necessary core material, as well as a large-scale flexible transparent electrode board function.

- This research project was selected to receive support for the mid-sized (type 2) sector of the National Research Foundation of Korea and will be implemented over the next five years from March 2020 to February 2025.



<Four key technology development strategies to achieve the final goal of this study>