



# AUTONOMOUS SOLAR PANEL CLEANING – FROM GROUND CASE STUDY

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# Utilizing Technology Scouting to Refine Autonomous Cleaning Methods for Solar Panels: A Thorough Examination of Patent Bibliographic Details and Taxonomic Analysis



## Business Objective

Centered on innovation, quality, and market leadership, our client sought to investigate autonomous methods for cleaning solar panels, specifically washing device or the apparatus which is present on ground for autonomous cleaning of solar panels. The primary objective was to identify key players and analyze the infrastructure of solar panel cleaning methods. This included understanding cleaning components, types of sensors, detector positions, and the geographic presence of companies and universities.



## Project Breakthroughs

Our rigorous research process was underpinned by secondary research. We scoured patent databases like Orbit to obtain relevant patent results, aiding our client in thoroughly exploring autonomous methods for cleaning solar panels. Wissen Research's strategic insights addressed crucial questions, encompassing:

- In a bibliographic examination of patents, the analysis addressed the following questions:
  - a) Top 10 assignees
  - b) Filing trends(assignee by year, publication country by year, publication countries including family members)
  - c) Legal status of patents filed (pending,granted,dead)
- Taxonomic analysis based on autonomous solar panel cleaning answered following questions:
  - a) Autonomous technology used (e.g., lot , cloud or software)
  - b) Vehicle type used for cleaning
  - c) Cleaning component structure (e.g., robotic arm, frame, telescopic rod etc.)
  - d) Type of cleaning obtained (wet or dry)
  - e) Different sensors used

## Secondary Research

### Patent Analysis

#### Bibliographic Patent Analysis

- **Korea Marine Equipment Research Institute** have maximum patent filings in the autonomous solar panel cleaning domain
- **China** leads in the number of patent filings, whereas Spain has the lowest number of publications

Patent bibliographic analysis assisted the client by revealing key players, tracking technological trends, and offering competitive intelligence. It guided innovation strategies, assessed legal status, and identified market expansion opportunities while mitigating potential risks in the dynamic landscape of patent filings.

#### Taxonomy Based Analysis

- Automation technology patents for solar panel cleaning predominantly focus on **software**.
- Sensors used in automated solar panel cleaning components include GPS, Rotating Speed Pass, Temperature, Obliquity, Imaging, and Inclination Sensors.

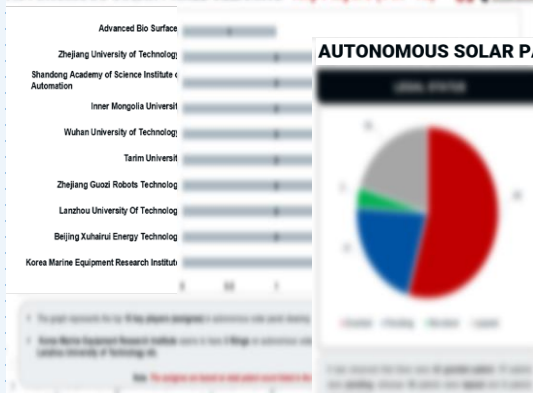
Conducting a taxonomic analysis during a patent search aided the client in categorizing and classifying patents based on a predefined taxonomy. This approach was advantageous for identifying trends and patterns, tracing technology evolution, pinpointing unexplored areas, and supporting well-informed decision-making.

Service Provided

What Questions it Answered?

How it helped the client ?

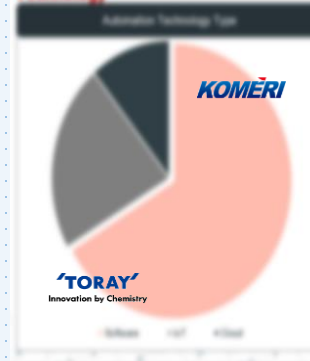
AUTONOMOUS SOLAR PANEL CLEANING- Key Players (TOP 10)



AUTONOMOUS SOLAR PANEL CLEANING- Legal Status



AUTONOMOUS SOLAR PANEL CLEANING- Automation Technology



AUTONOMOUS SOLAR PANEL CLEANING- Location/Position Detector





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