

# Solar Panel Cleaning

## Dictionary and Industry Nomenclature

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# Summary

The solar panel cleaning industry is in its infancy and we have created a nomenclature to help facilitate communication in the industry. Because the industry is so young, the way things are called has not been defined. Our “Solar Panel Cleaning Nomenclature” is a living document that will evolve as the industry and our knowledge of the industry evolve

## nomenclature

 nō'mən-klā'chər, nō-mĕn'klə-

### noun

1. A system of names used in an art or science.
2. The system or procedure of assigning names to groups of organisms as part of a taxonomic classification.
3. A name.

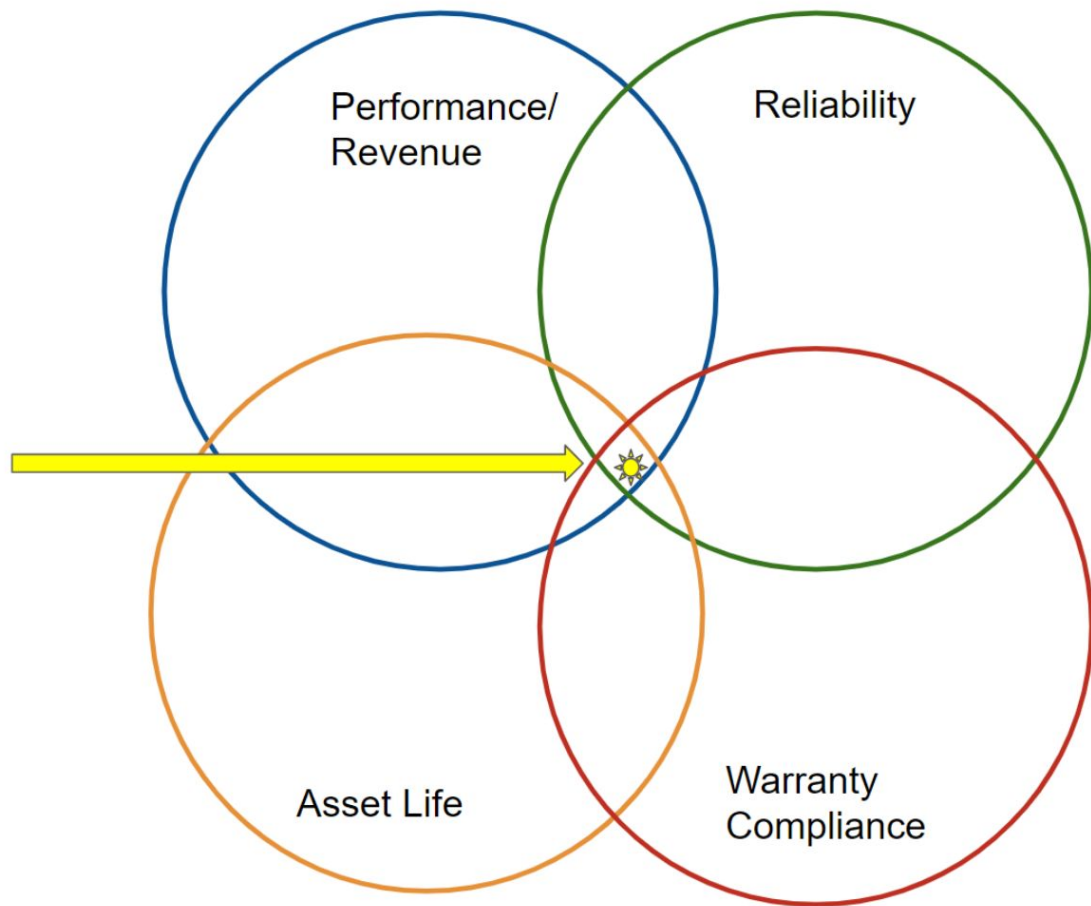
The American Heritage® Dictionary of the English Language, 5th Edition.

 [More at Wordnik](#)








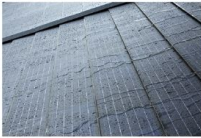



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3. Solar panel cleaning machine & robotics main categories
4. 13 stages in Solar Panel Cleaning process
5. Solar Installation Types

# Drivers for Solar Panel Cleaning



# Solar Panel Cleaning Industry Segmentation

	Traditional Solar Panels	PV Windows	PV Facades	Non-Glass PV Surfaces	New Innovations
<b>Residential</b>					To be seen...
<b>Commercial &amp; Industrial</b>					To be seen...
<b>Solar Farms or Utility Scales</b>				????	To be seen...
<b>New Innovations</b>	To be seen...	To be seen...	To be seen...	To be seen...	To be seen...

# Machine and Robotics Main Categories



## Wet Cleaning

What are my equipment options?

### Rotary Brush



### Lift & Shift



### Tractor Brush



### Robot



### Innovation in Progress



## Dry Cleaning

What are my equipment options?

### Brush



### Lift & Shift



### Tractor Brush



### Robot



### Rumba Robot



### Fixed Slider with Docking Station



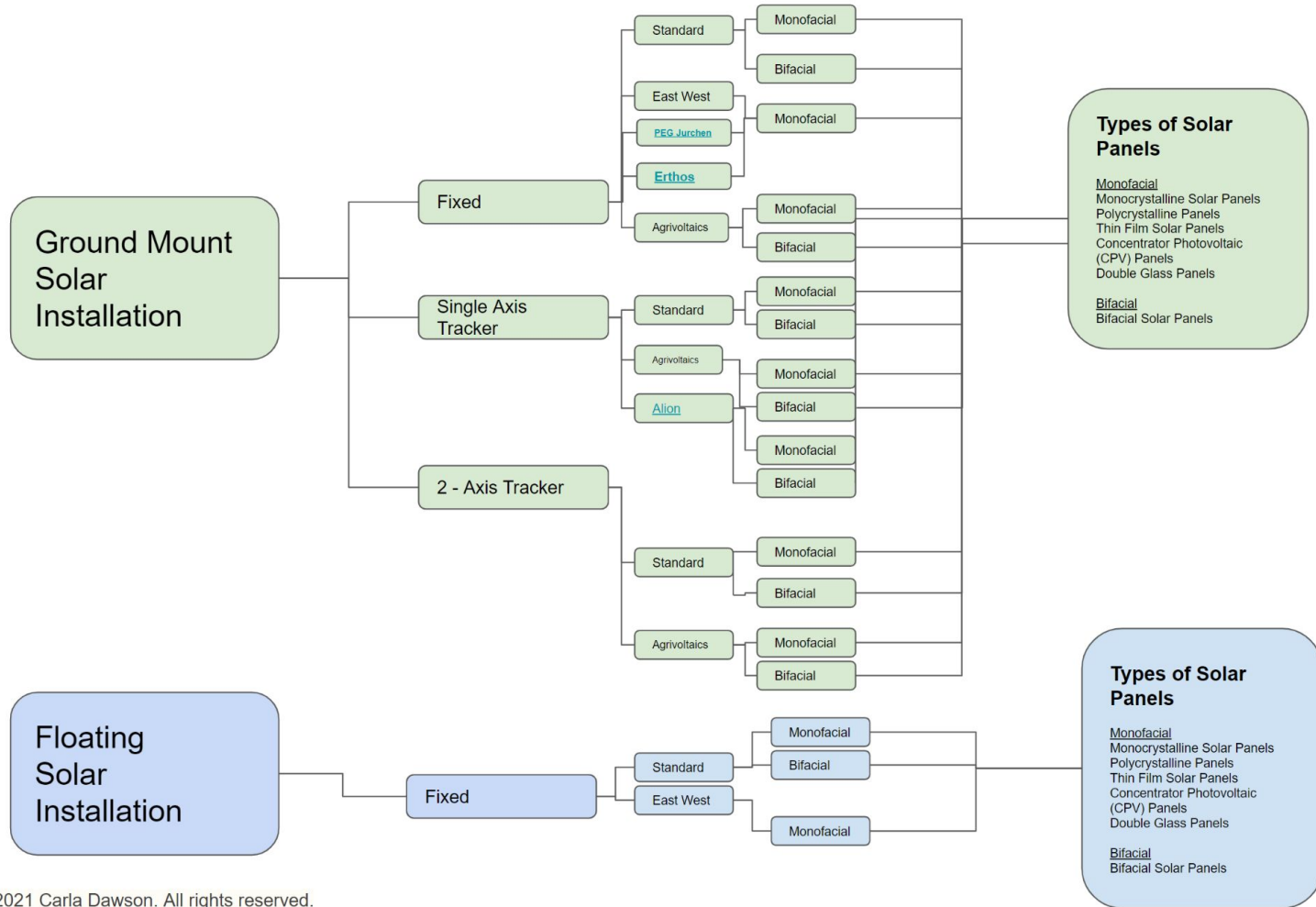
### Innovation in Progress



# 13 Standard Stages in Solar Panel Cleaning

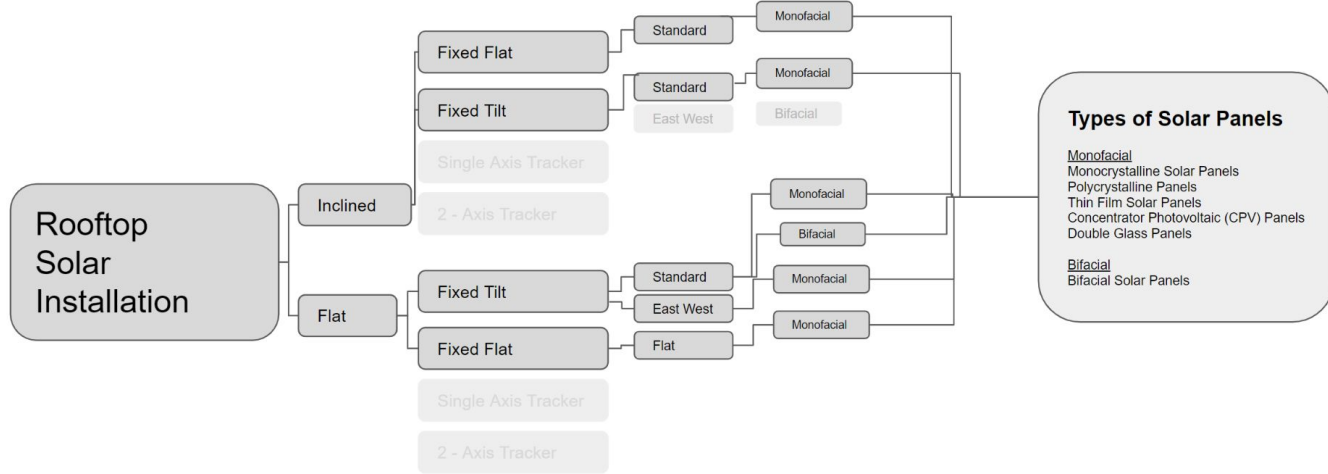
- **Safety** - Before we get started, how can we ensure operator and bystander safety? Let's be "safe-centric".
- **PV Site Damage Control** - Before we get started, how can we ensure that we will not damage the PV site?
- **Transportation** - How do we move the equipment from the company warehouse or homebase to the jobsite and vice versa?
- **Arrival / Setup** - Once we arrive at the the jobsite with our equipment, how do we get setup? What resources do we need to get to work?
- **Water Treatment** - How do we treat our water? Do we do this at the job site or do we do it at a company warehouse and then transport the treated water?
- **Water Management** - How do we get the water from the source to the machinery and solar panels? How do we handle the long hoses and what tools can we use to make this handling easier and more efficient? Do we need to refill the source?
- **Array (Row) Cleaning** - Once we get the equipment setup and the machinery is on the array, how well do we perform the cleaning?
- **Gap Management** - It is common that solar installations have gaps within the array or row. How does the solar panel cleaning equipment cross that gap and will it be a problem? Gaps can be problematic and there are workarounds.
- **Row to Row (Moving from one array to another)** - How do we move the machinery from one row to the next? Rows/arrays are constant in every solar panel cleaning job and each installation requires that you solve the problem in a tailored way.
- **Equipment Power Management** - How is our equipment powered and how can we ensure constant and efficient power so we do not have to stop working?
- **Departure** (Basically the same as Arrival / Setup) but not always the same.
- **Equipment Maintenance Moment**
- **Transportation** - Time to go home or to the next jobsite!

# Solar Installation Types





# Solar Installation Types

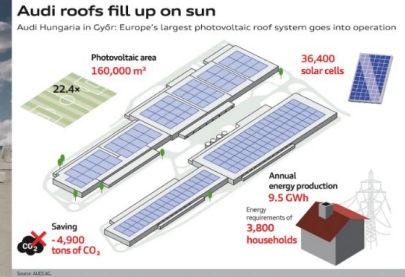


**Types of Solar Panels**

Monofacial  
 Monocrystalline Solar Panels  
 Polycrystalline Panels  
 Thin Film Solar Panels  
 Concentrator Photovoltaic (CPV) Panels  
 Double Glass Panels

Bifacial  
 Bifacial Solar Panels

Example of a utility scale rooftop installation



# PV Soiling Mitigation

STARTS.....IN THE DESIGN PHASE