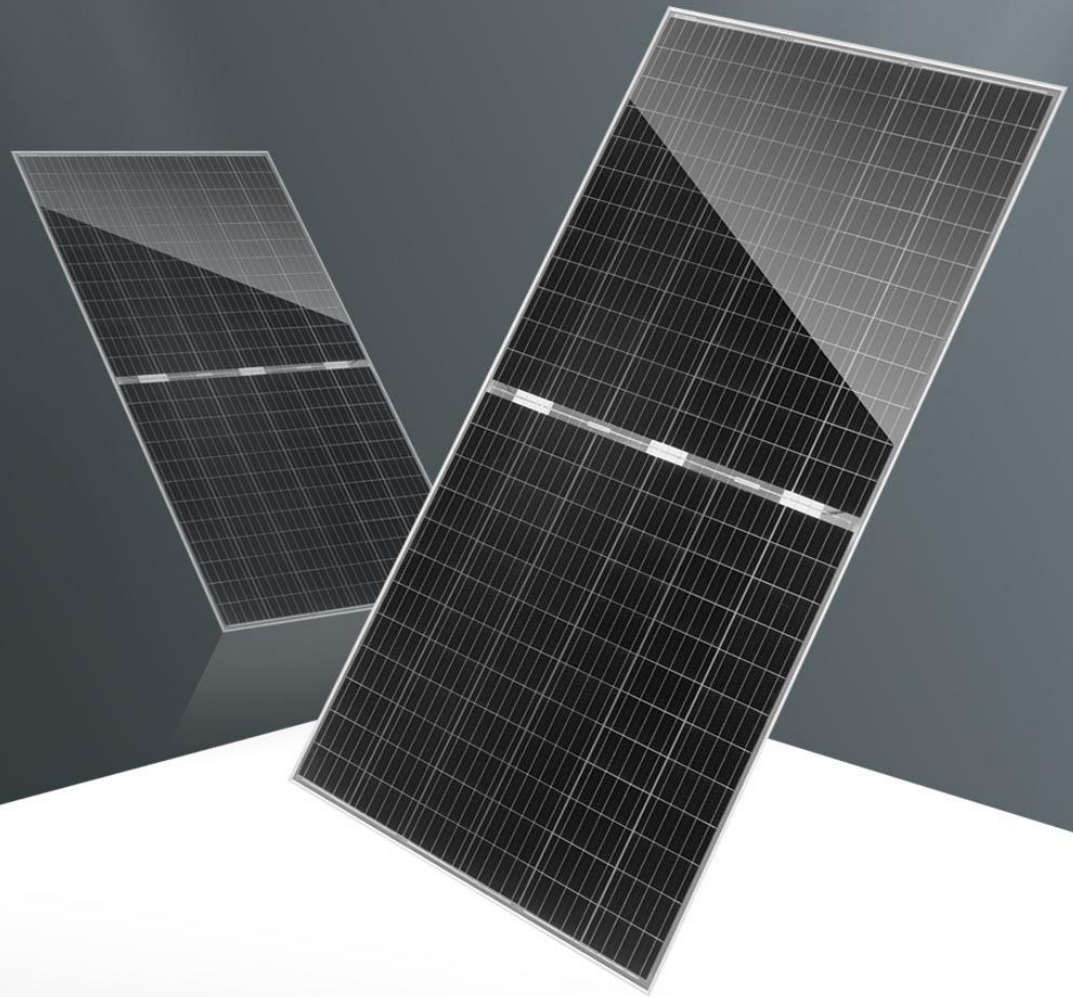
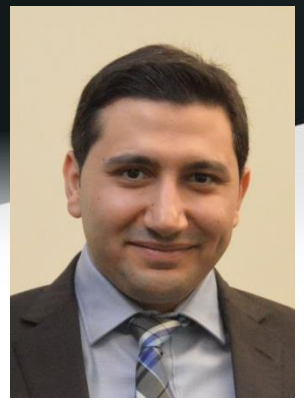
The Impact of Bifacial Modules with Transparent Backsheet on Savings and ROI





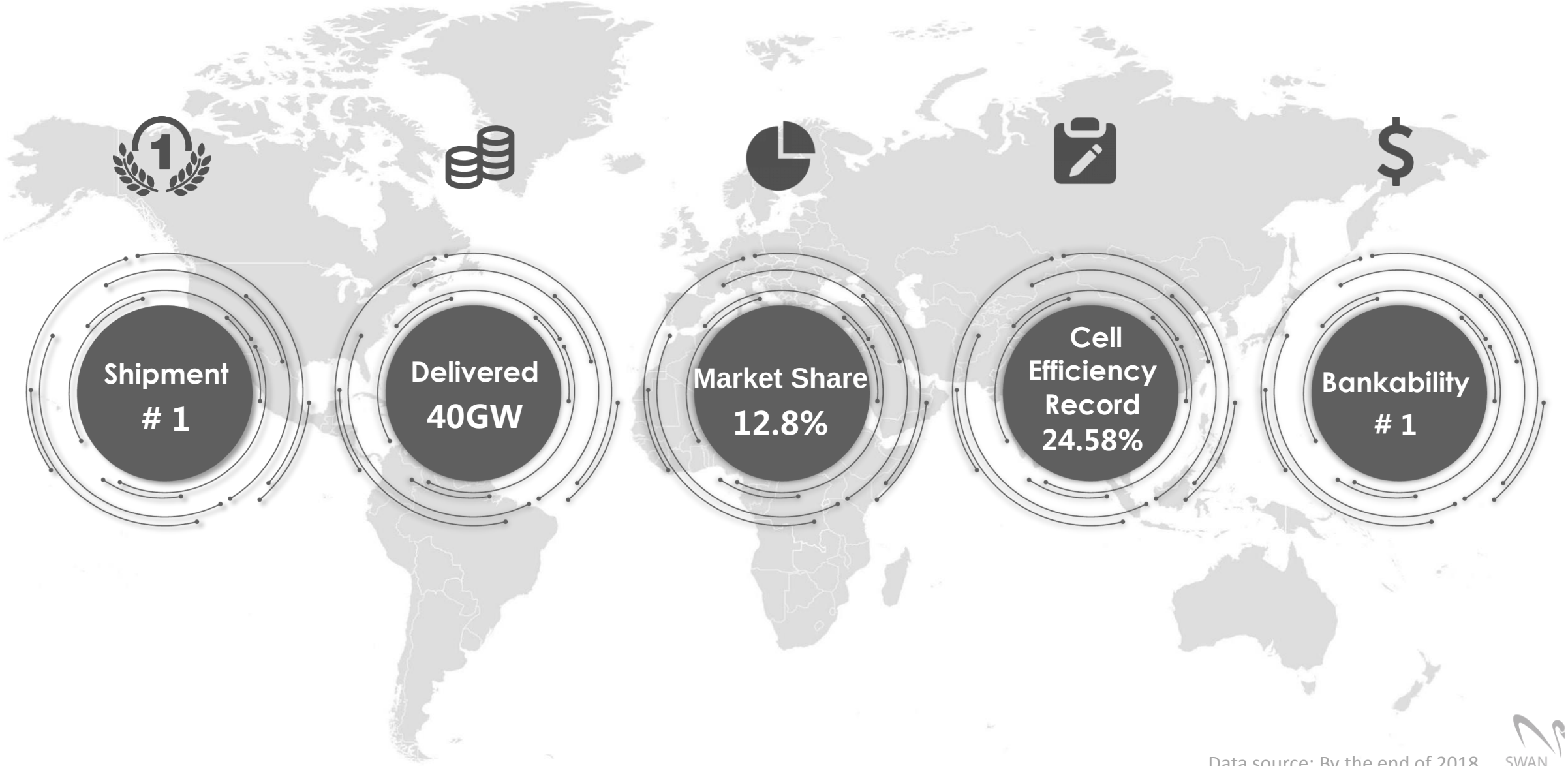
Mohammed Saady Dweik
Technical Services Manager
Middle East and Africa

Jinko Solar
Building Your Trust in Solar

Contents

About Jinko Solar

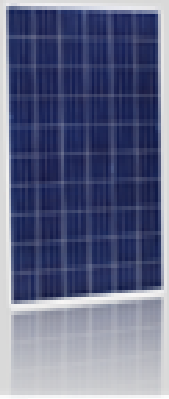
Short Introduction of JKS



Data source: By the end of 2018

Products Development

Standard



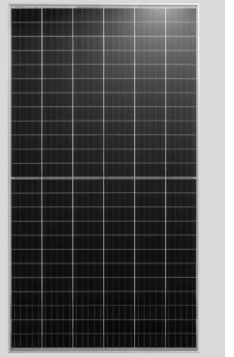
Dual Glass

Smart Module

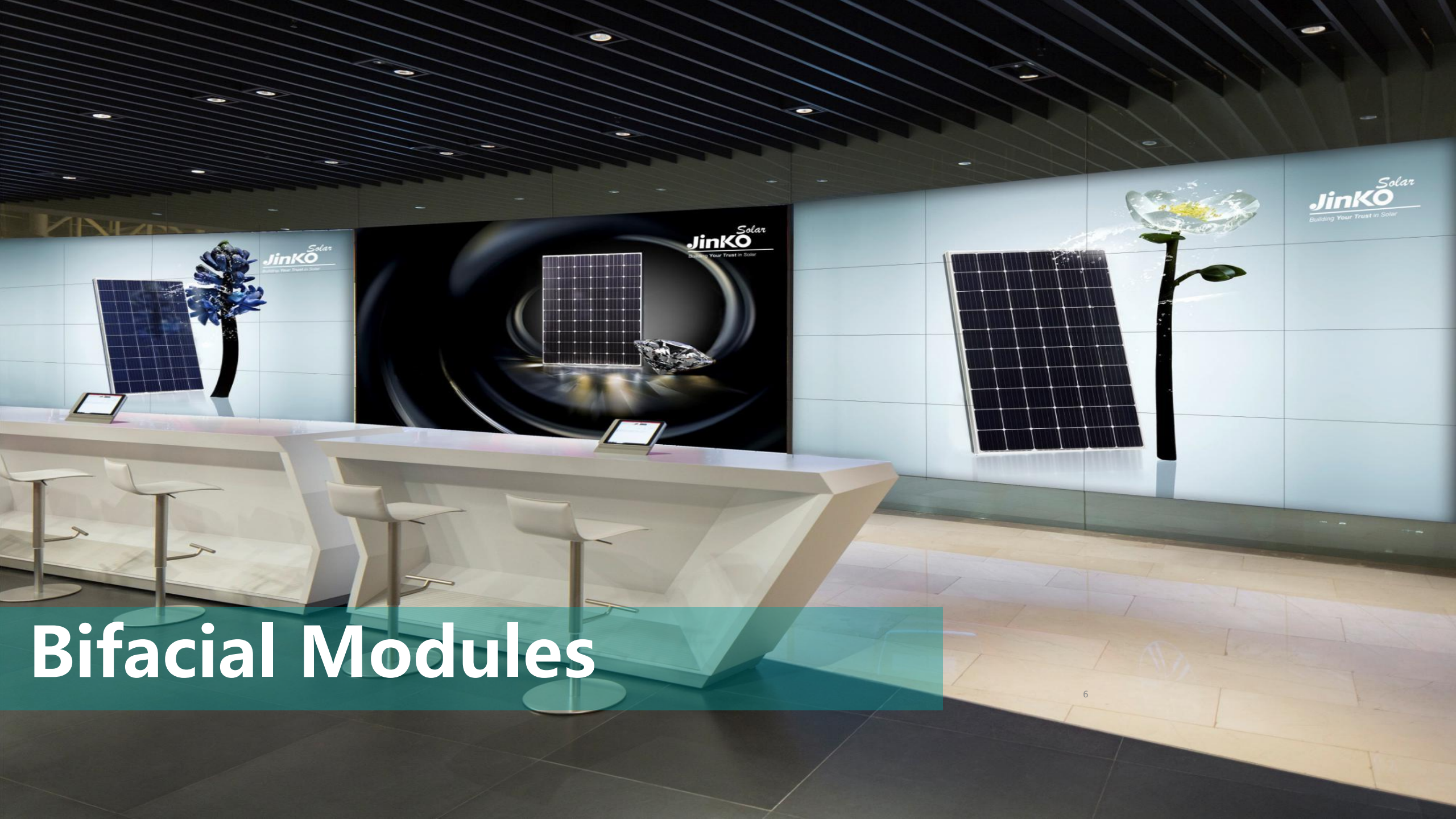
All Black

HIGH OUTPUT MODULES

Cheetah



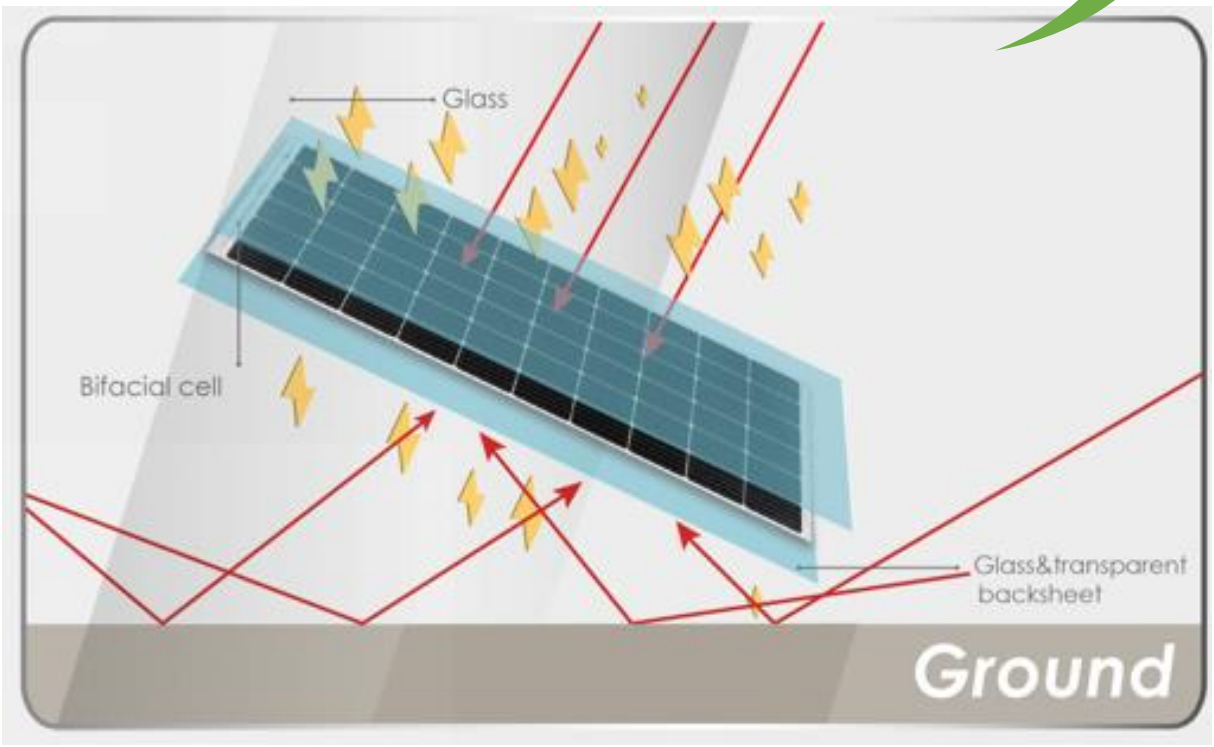
Swan



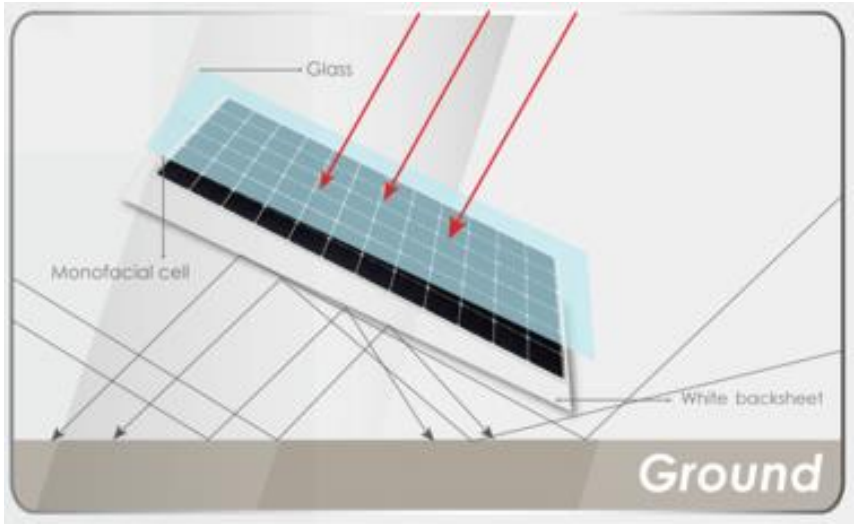
Bifacial Modules

Bifacial Introduction

Power generation gain up to
25%

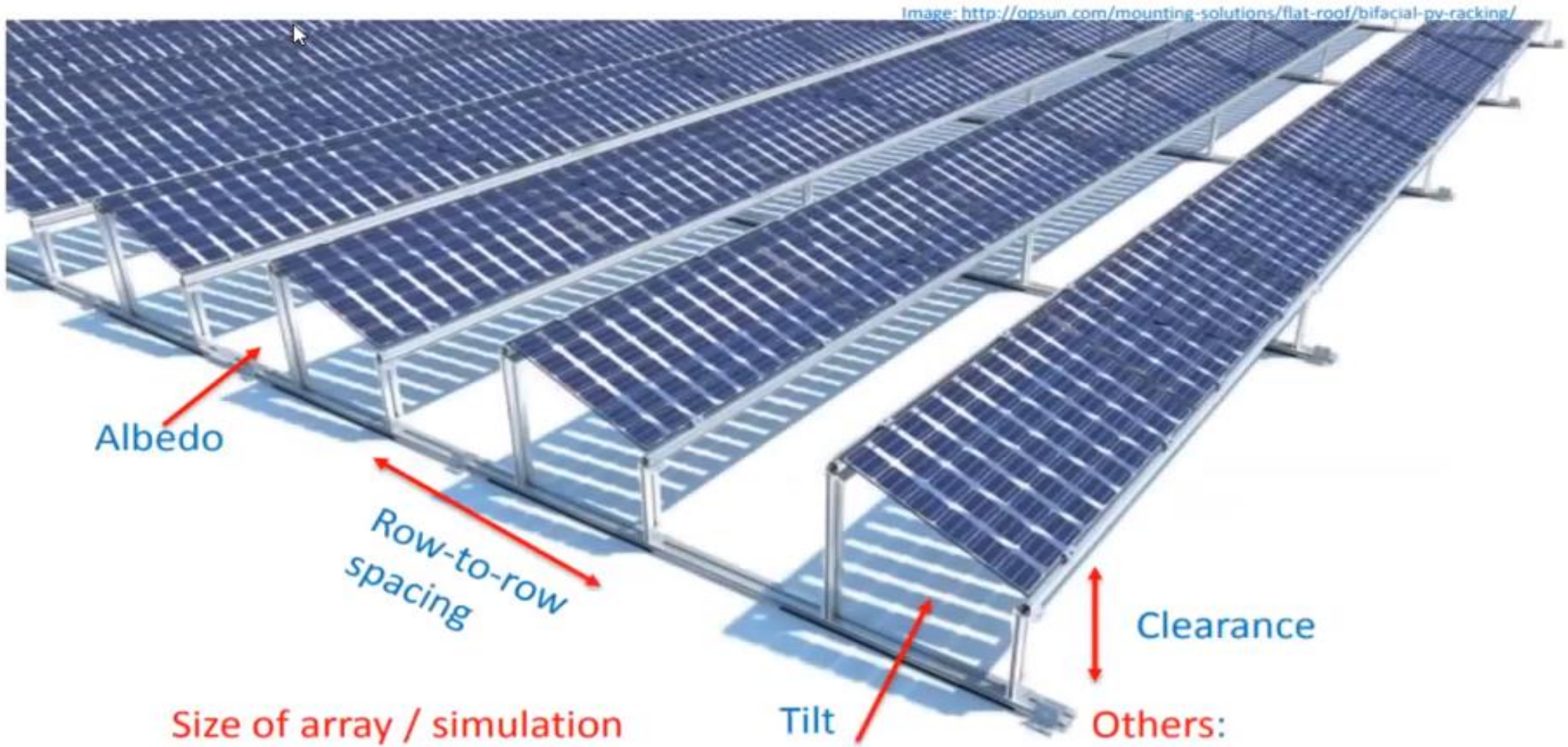


Bifacial: Double power generation



Monofacial: Single power

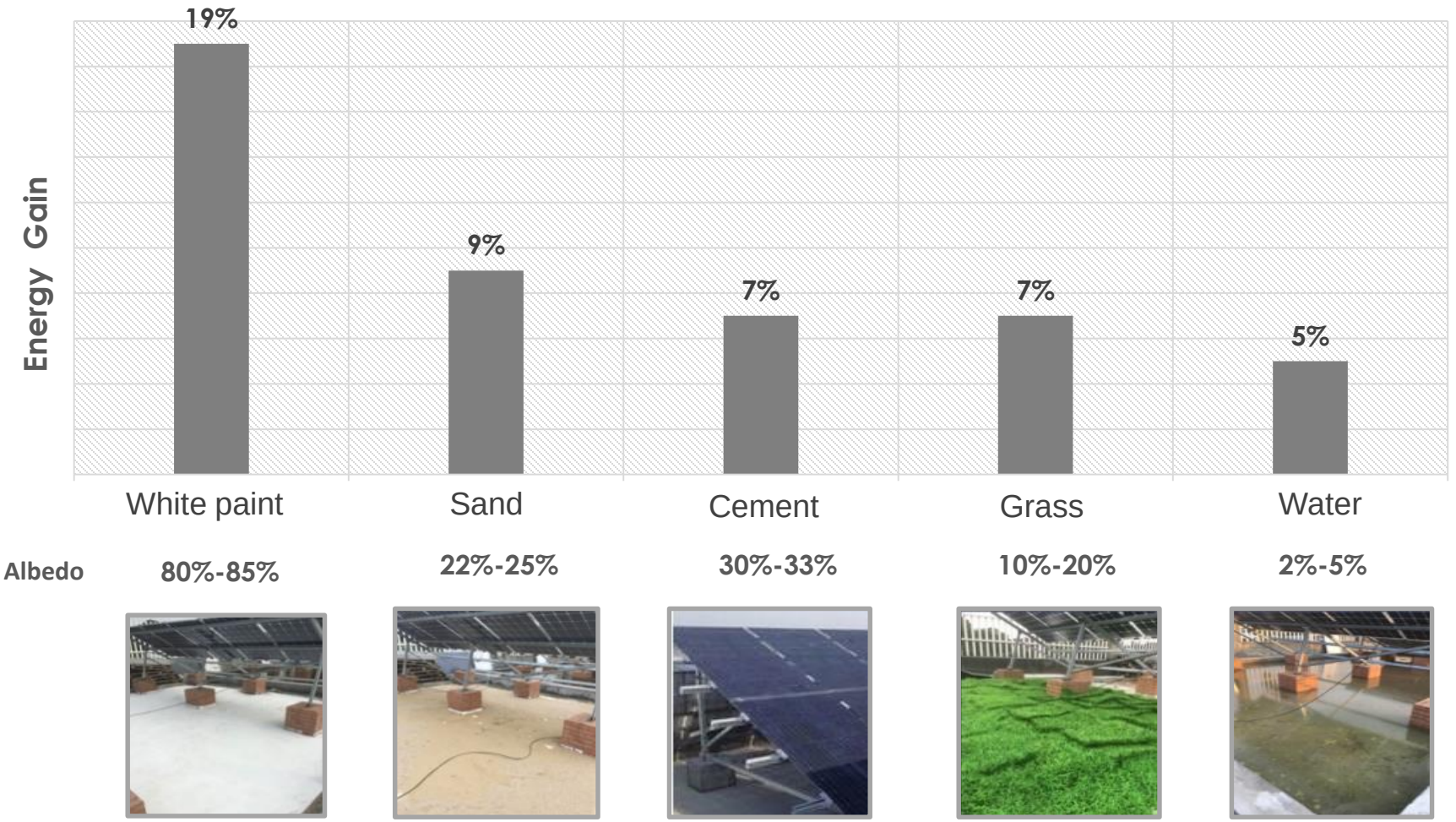
Bifacial Introduction



Size of array / simulation
Location
Weather
Sky Diffuse Model

Others:
Spacing between cells
Shade obstructions

Real Energy Generation Gain



Address：Jinko factory, Haining，30.3° N/ 120.4° E

Fixed Tilt angle：30 °, close to the latitude；

Mounting height：distance from lower edge to ground is 1.2m；

Capacity：1.5kW/array.

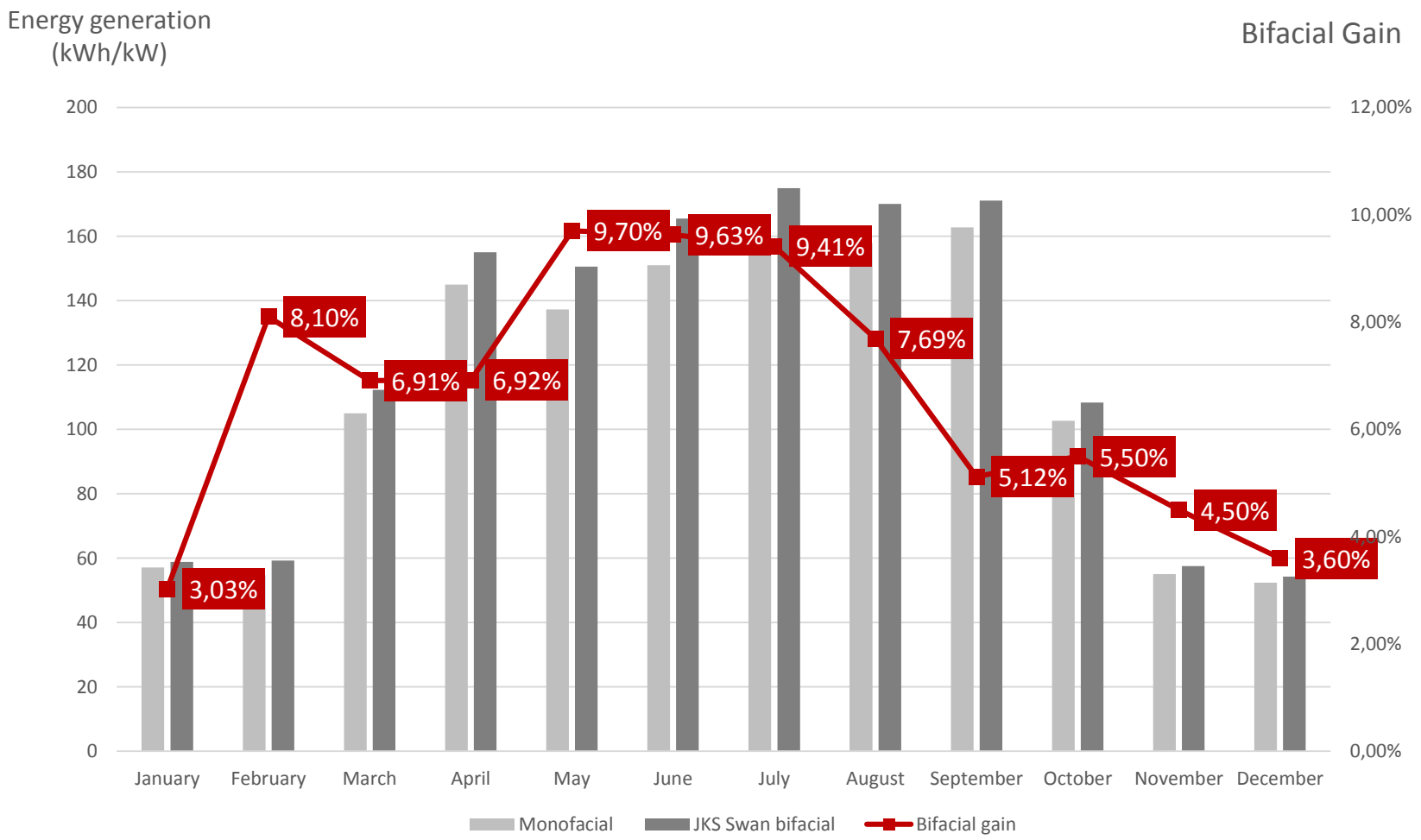
Energy gain： Compared with mono-facial module in same condition

*Note: The PR of sand is higher than cement, because the yellow light reflected by sand is better for the energy gain.
Bifacial modules with transparent backsheet have almost the same bifacial factor as bifacial with dual glass.

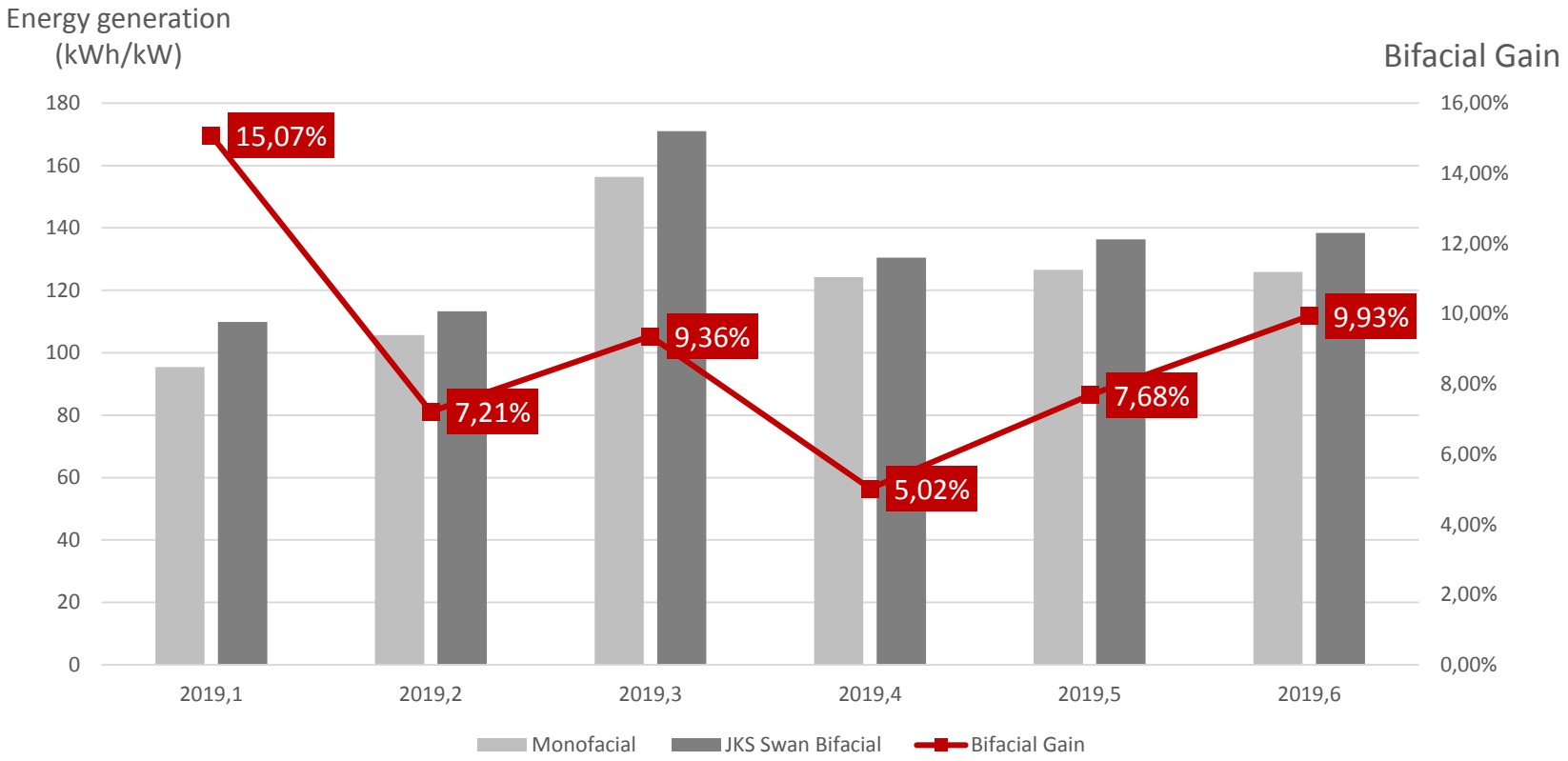
Bifacial Gains Simulated : Marina Romea , Italy

- **System information**
- System capacity:10 MW
- Installation Height: 1.5m
- Ground Type: Grass
- Albedo:0.22~0.26
- Fix installed

- Simulation program : PVsyst



Case Study ： Lv Liang Grass Fixed Mounting System



Address: Lv Liang, ShanXi Province

Installation Height: 0.3m-1.2m above from the ground

Ground Type: Grass/Soil

Testing Date:2019.1~2019.6

The result of electricity yields from January to June shows that the energy gain of bifacial modules is **9.05%** compared with monofacial modules.

As bifacial modules can perform better than monofacial modules in low-irradiance environments, the energy gain reached **15.07%** in January with many overcast days.

Transparent Backsheet

Bifacial Introduction

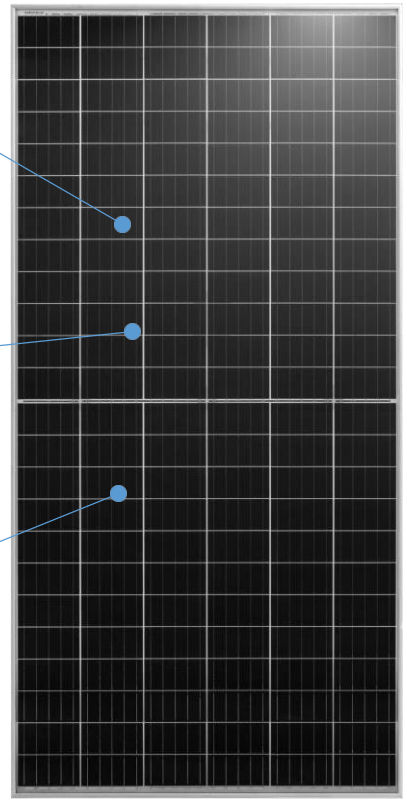
Dual Glass Bifacial

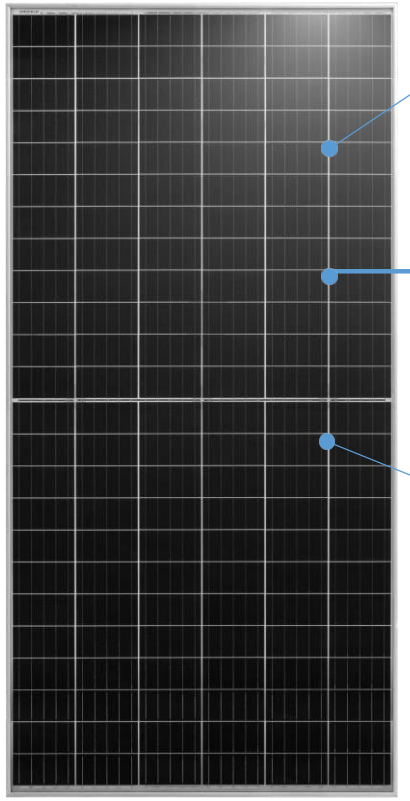
Transparent Back Sheet Bifacial

Advanced 158.75 square cell to achieve higher power and efficiency

Combining with HC to low risk of hot spot because of higher current

Gain 5-20% more energy to improve IRR





Also Gain 5-20% more energy

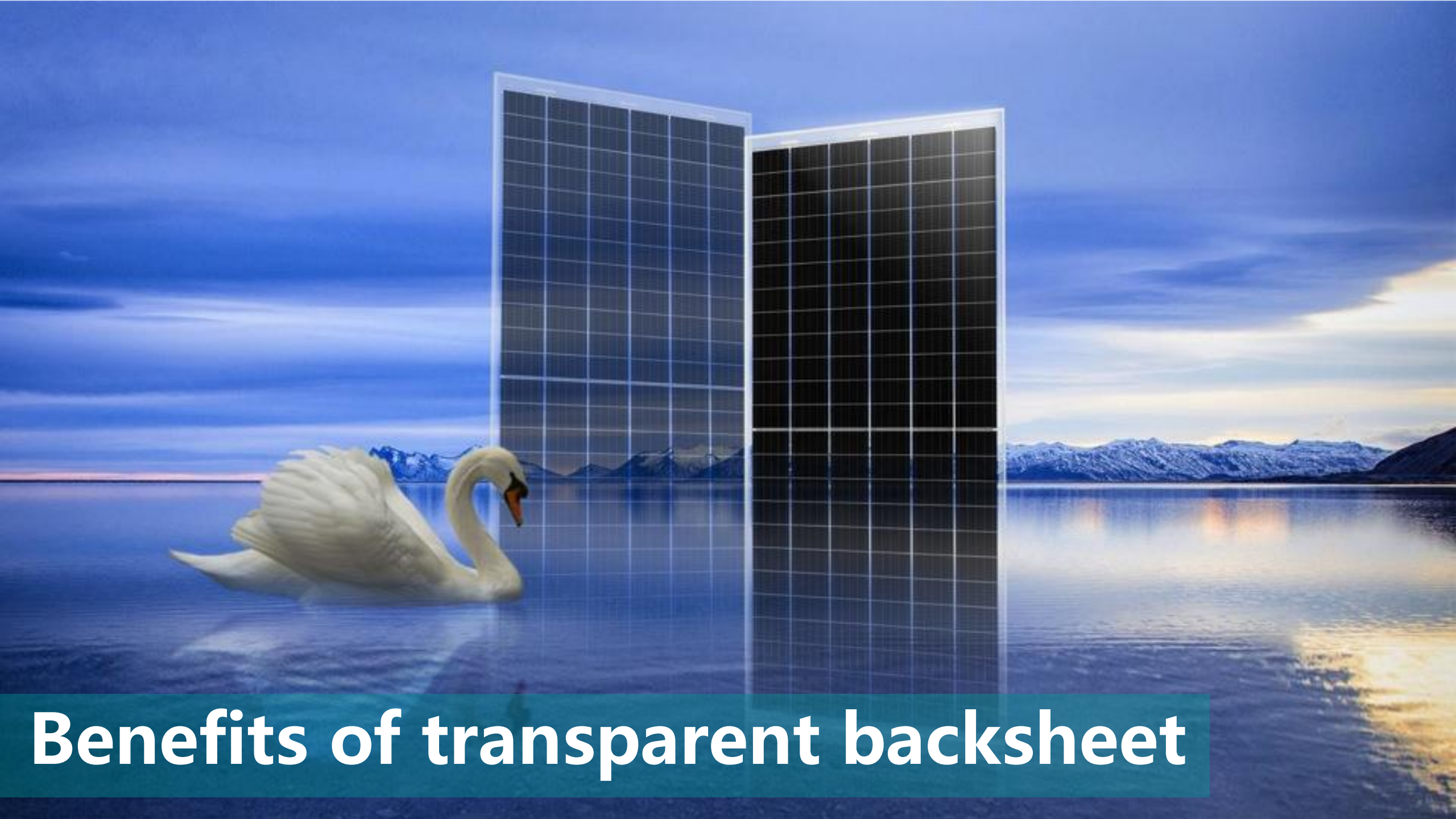
Keep same weight with normal module

Reliable and easy to clean with Tedlar film

Innovative Technology

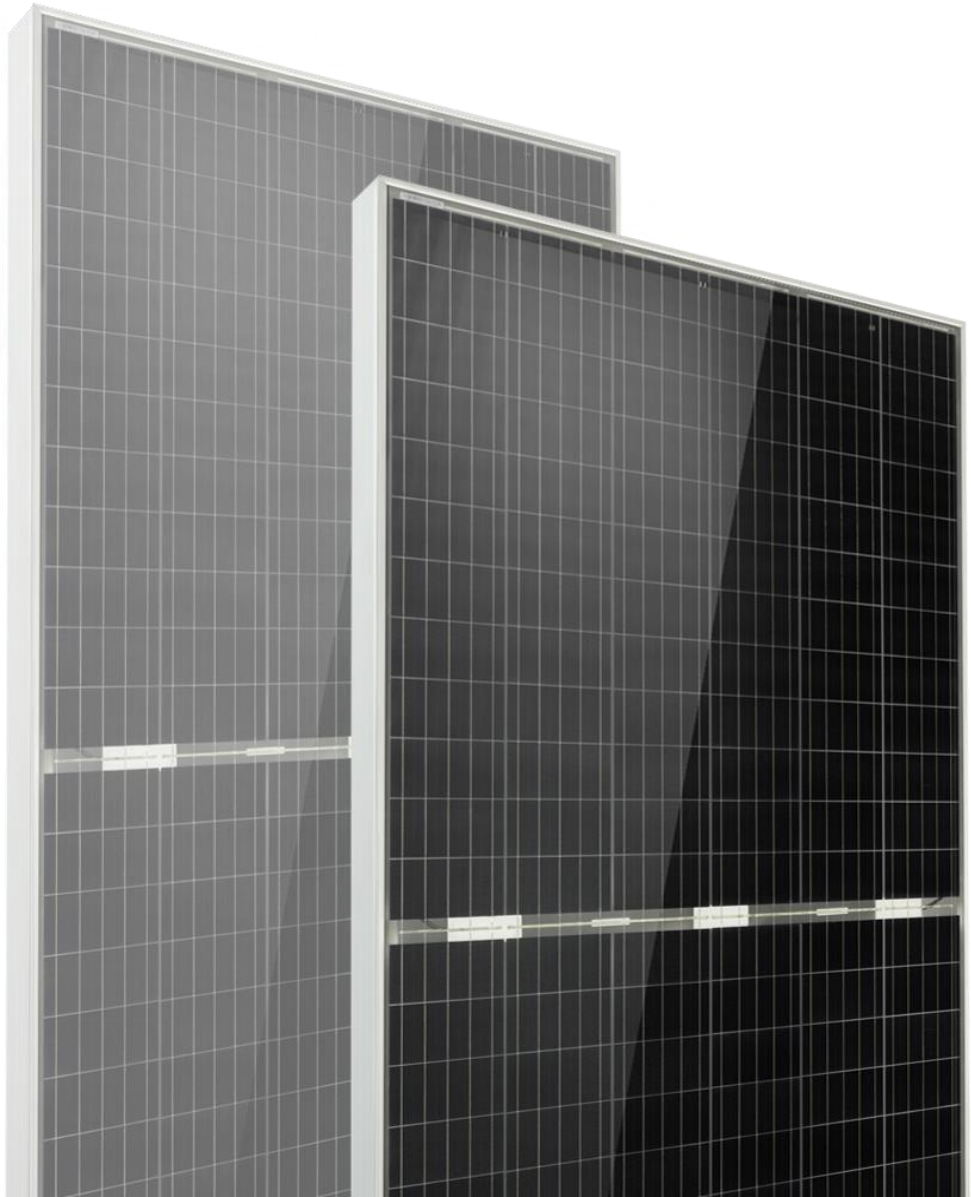
JinkoSolar Wins Intersolar Award 2019 for its Swan Bifacial Module

MUNICH, May 17, 2019 — JinkoSolar Holding Co., Ltd. (the "Company," or "JinkoSolar") (NYSE: JKS), one of the largest and most innovative solar module manufacturers in the world, today announced that it won the Intersolar Award 2019 in the Photovoltaics category for its Swan bifacial module with transparent backsheet from DuPont.



Benefits of transparent backsheet

30 Years Linear Power Warranty

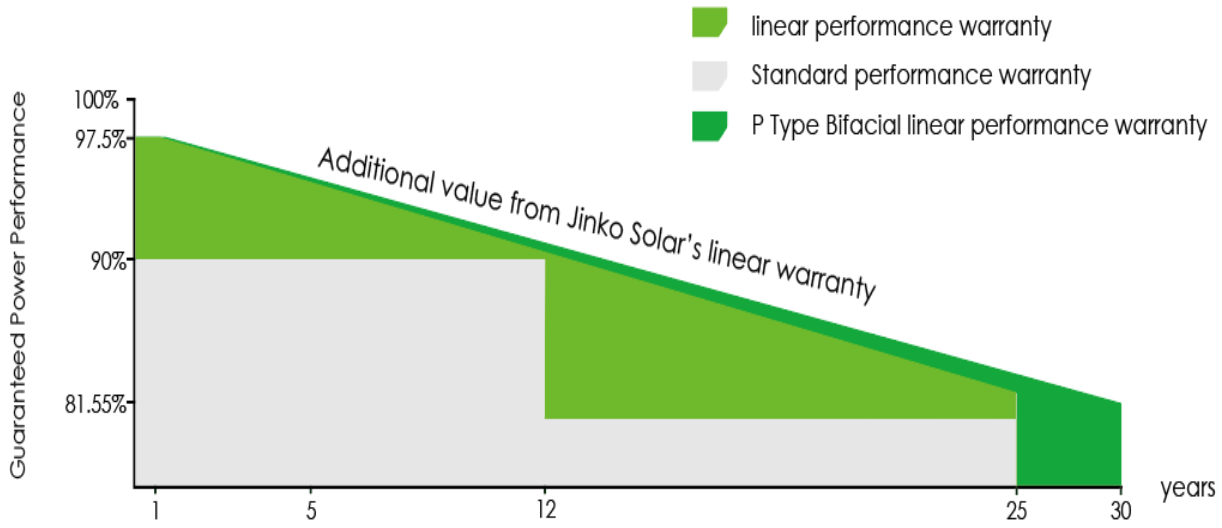


10 ⇨ 12 Years Product Warranty

25 ⇨ 30 Years Linear Warranty

3% ⇨ 2.5% First Year Degradation

0.60% ⇨ 0.55% Annual Degradation



Benefits of Transparent Backsheet

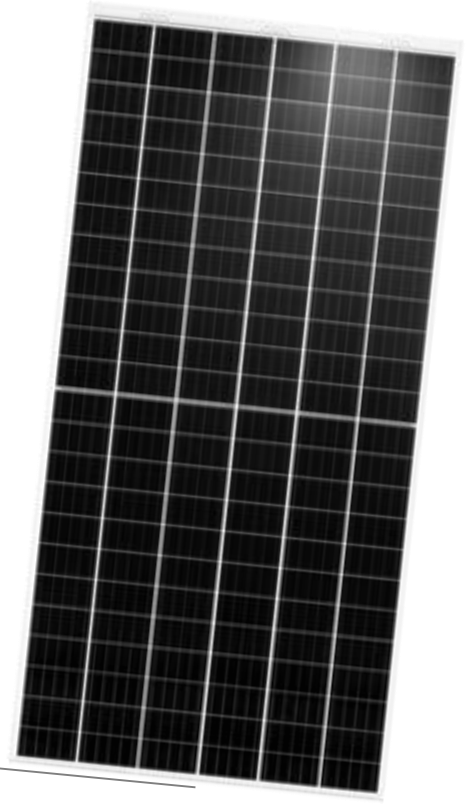
Weight *Lighter*

Installation *Standardized*

BOS Cost *Cheaper*

Energy Gain *Equal*

Warranty *30-year lifetime*



Bifacial with Transparent backsheet	Bifacial with Dual glass
2031×1008×40mm	2031×1008×40mm
23.3kg	**31.8 Kg**

Installation System Design

Bifacial with transparent backsheet

✓**Fewer** supporting structures

✓Compatible with the system of monofacial modules

↓ **15%** mounting construction cost

Bifacial with dual glass

✓**More** supporting structures

✓Incompatible with the system of monofacial

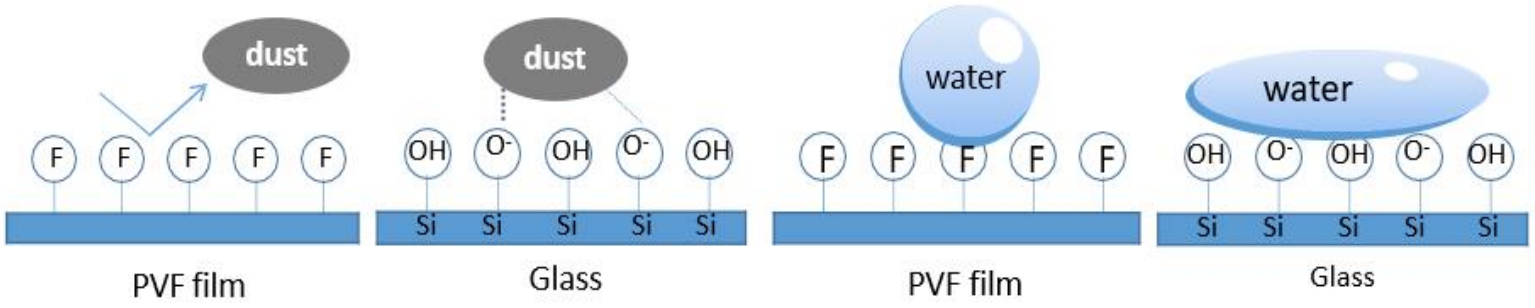
Modules Stronger load-bearing structure is requested

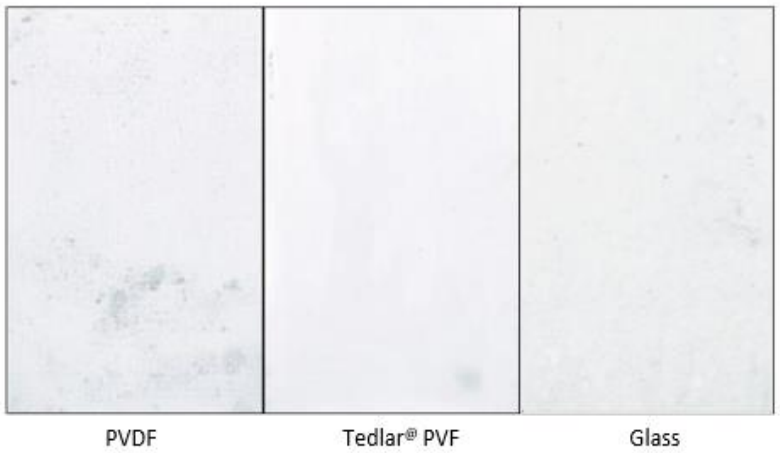
Lower BOS Cost

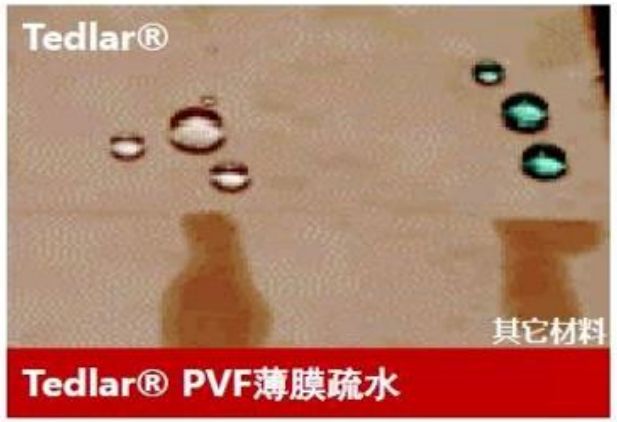
	Dual Glass Bifacial	Swan Bifacial TB
Module Output (Wp)	320	320
Warranty Years	30	30
Temperature Coefficient (%/C)	-0.36	-0.36
Land Area (m^2)	1,739,410	1,739,410
BOS (US cent/W)	35	33 ↓3%
LCOE (US cent/kWh)	3.6	3.5
IRR	9.68%	10.23%
Annual Yield (MWh)	146,548	146,856

Data calculation is based on the 2018 shanxi weinan 100MW project

Benefits of Transparent Backsheet







↓ 5%
O&M Cost

The stain-resistance of transparent back sheet makes the rear side of bifacial modules easier to clean and maintain than glass.

Benefits of Transparent Backsheet

BOS Cost

Mounts Cost

Module Installation Labor Cost

O&M Cost

Benefits of Transparent Backsheet

Location: Amsterdam, Nederland

System size: 6.228 kWp

Completion time
2000 (19 years service life)

Location: California, USA

System size: 1.25 kWp

Completion time
1996 (23 years service life)

- ✓ More than 15 years in services
- ✓ No signs of degradation of Tedler backsheet
- ✓ No yellowness
- ✓ Stain resistance
- ✓ Excellent antiaging properties

Thanks