



BIG SUN

COMPANY PROFILE

May, 2018

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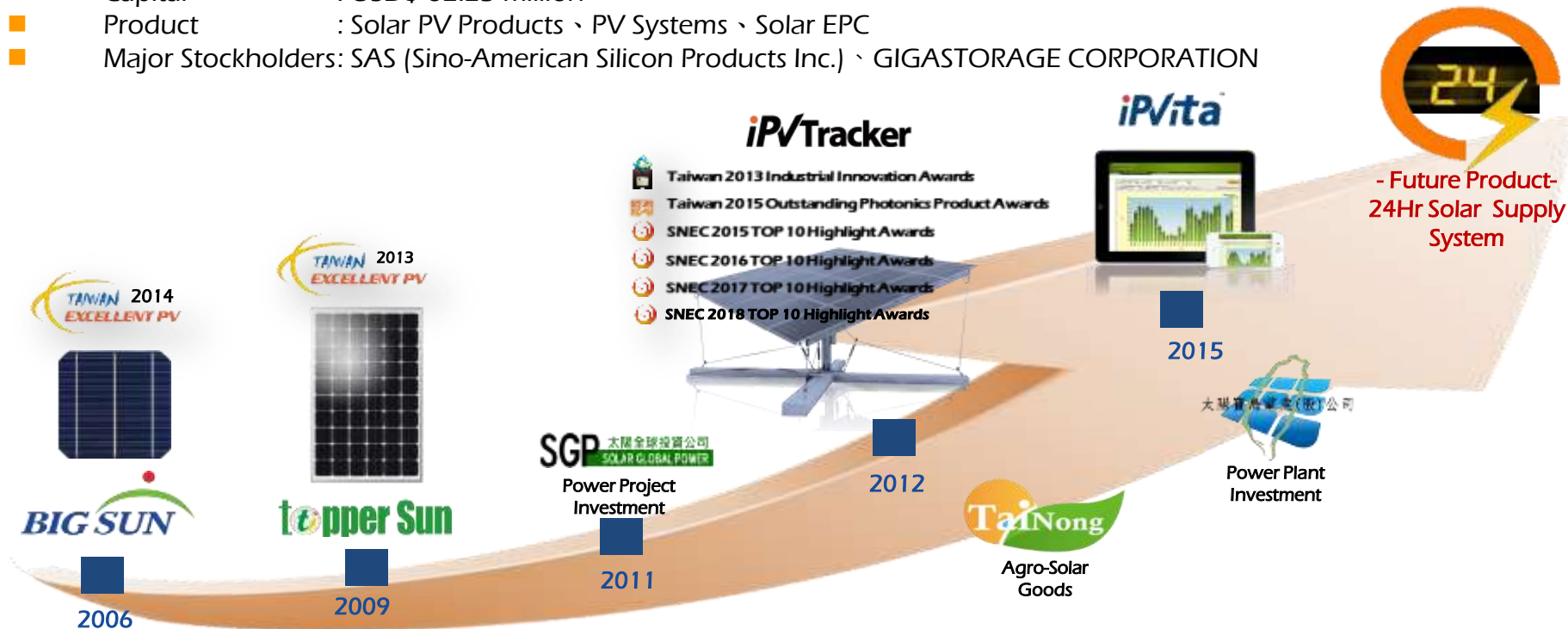
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About BIG SUN



- Date of Est. : 2006/5/19
- Chairman : Mr. Summer Luo
- General Manager : Mr. Fritz Cheng
- Capital : USD\$ 62.23 million
- Product : Solar PV Products 、 PV Systems 、 Solar EPC
- Major Stockholders: SAS (Sino-American Silicon Products Inc.) 、 GIGASTORAGE CORPORATION



Products – High Efficiency Solar Cells / Modules



- 2013 Taiwan Excellent PV (Modules)
- 2014 Taiwan Excellent PV (Cell)
- In 2018, turn-key transfer solar cell production line to **TURKEY**, facilitating the establishment of local PV supply chain aiming at manufacturing **bifacial solar cells**.
- Global solution of integration dual axis tracker with international renowned **High-efficiency & Bifacial Modules** .
- Partners:
SAS 、 GCL 、 LONGi 、 JOLYWOODN 、 NSP

Products – EPC / O&M

Leading EPC and O&M Brand in Taiwan



Global PV installation :

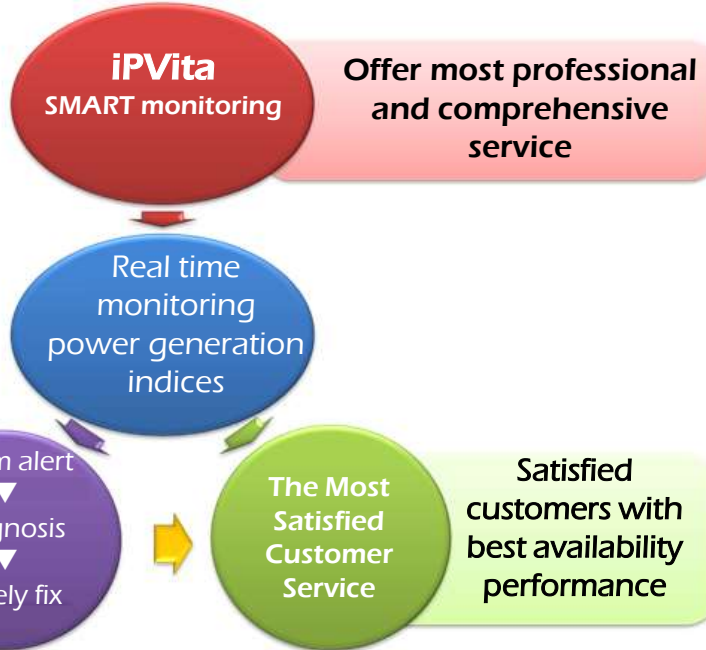
More than **550** worldwide (440 in Taiwan)



Products – iPVita SMART PV Monitoring System

TOP 2
in
TAIWAN

Self-developed, cloud-based smart PV monitoring system
Managing > **2,000 PV sites (300MW)**
450MW by year end



Products – iPV Tracker DAT (Dual Axis Tracker)



Simple & Affordable

Easy installation, operation, and low maintenance costs.



Accurate

Preprogrammed algorithm. 360° horizontal tracking. 0° - 40° tilt angle.



High-efficiency

30% ~50%* more annual power generation power generation against the fixed-type system.



Durable & Reliable

Wind Resistant

Dust Removal

Snow Removal

Corrosion Resistant

Back-tracking

Flood Avoidance

Light Pollution Reduction



Terrain Friendly

Various foundations transcending landform limitation avoid extensive land grading, concrete paving and curing time.



Intelligent

iPVita™ Anytime/Anywhere/Accurate

*PV Site and solar irradiance dependent

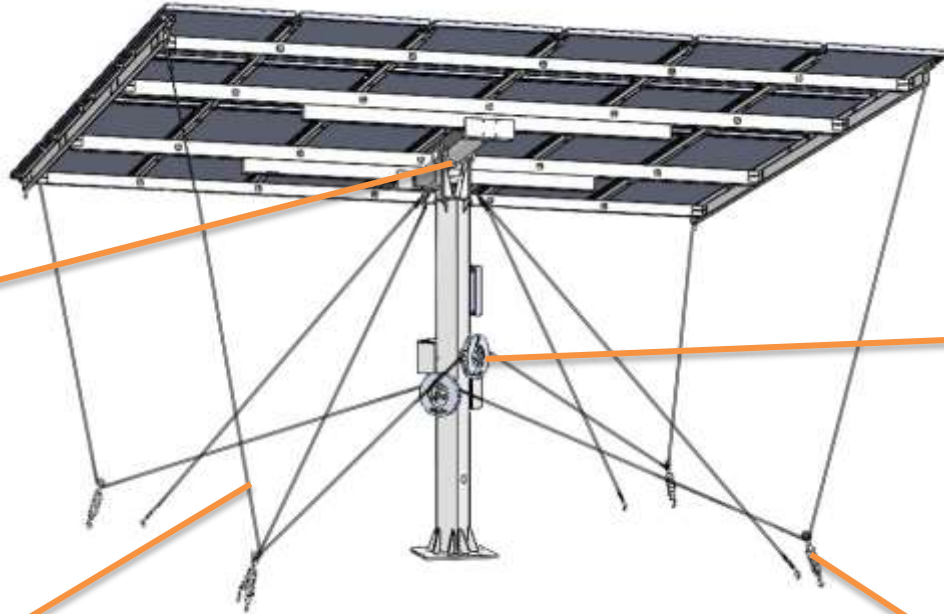
Products – iPV Tracker Patented driving mechanism



The
universal
joint



The steel
cables



The cord
reels



The
springs

Patented cable drawn driving structure
can accommodate all types of modules,
foundations and applications

Products – iPV Tracker Global Patent Presence



- ◆ **Unique & Irreplaceable**
- ◆ **Competitive Patent Edge**



More than **40** countries worldwide

Over **60** Patents



Taiwan 、 EU 、 USA 、 Japan 、 AU 、 New Zealand 、 HK 、 China....

活



Diverse foundation/piling combination relieving the terrain constraints.

The Amphibious Power Generation



Floating-mount



Cement-Piling



方形
Square



十字
Cross

Concrete -Foundation



H型鋼樁
H-Steel Pile



螺旋樁
Screw Pile

Driven Piling



H-Beam Base



陸

水

Synergy – iPV Bi-Dual System

合



iPV Tracker (Dual Axis Tracker)

+30%* up

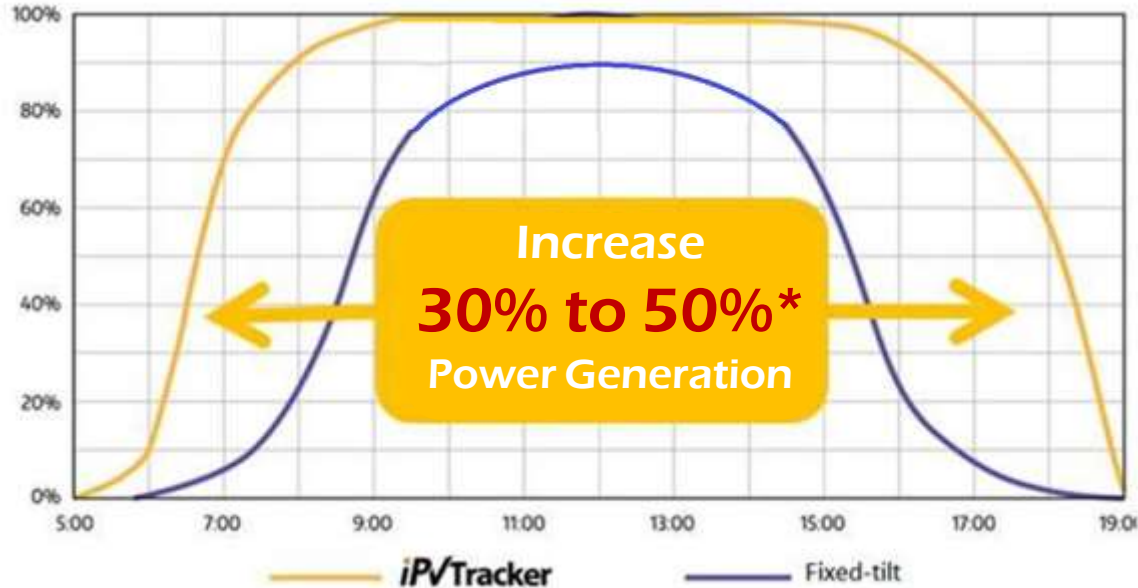
Bifacial Modules

+5%~30%*

Overall power gain by more than **50%**

iPV Tracker Over **30% more** power generation

- iPV Tracker's 360 degrees horizontal tracking effectively capture more solar irradiance, enhance more power generation and moreover, shorten the return period.
- **30% to 50%*** more annual power generation than the fixed tilt system.



*Base on local condition

Bifacial Modules gain 5% to 30% more power generation



Synergy between iPV Tracker with bifacial modules can effectively capture more reflection, scattering & diffuse irradiance throughout the day on the rear side of module.



“Ongoing research and side-by-side testing suggests that a bifacial PV system could generate **5%–30%** more energy than an equivalent monofacial system, depending on how and where you install the modules.”

<http://solarprofessional.com>



LONGi New Product — Bifacial PERC

LONGi Solar

2.4 Module datasheet

Item	Units	Electrical Properties(STC)*—P-PERC Bifacial—predicted data				
		0%	5%	10%	20%	30%
Maximum Power(Pmax)	[W]	363	378	396	432	468
MPP Voltage(Vmpp)	[V]	38.7	38.9	39.1	39.4	39.6
MPP Current(Imp)	[A]	9.30	9.72	10.13	10.96	11.82
Open Circuit Voltage(Voc)	[V]	47.9	48.1	48.3	48.6	48.8
Short Circuit Current(Isc)	[A]	9.76	10.32	10.70	11.60	12.52
Module Efficiency	[%]	18.30	19.32	20.18	22.02	23.85

*Base on local condition

iPV Bi-Dual System Bifacial Module + iPV Tracker(DAT)

Dual-Axis 360° Tracking

Key Factors

Inclination **Angle**

Tracker **Height**

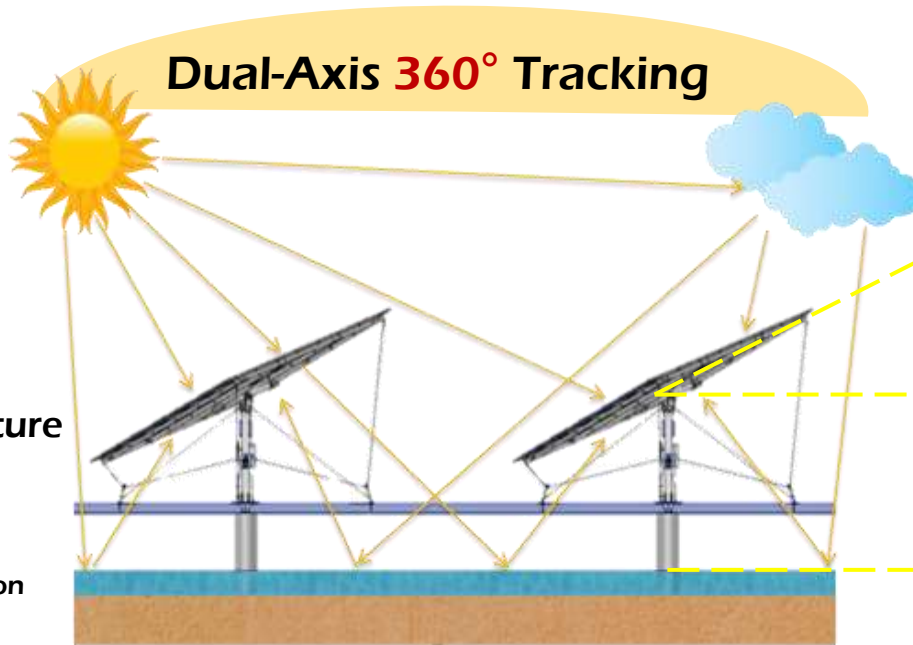
Ground **Albedo**

iPV Tracker (DAT)
+
Bifacial Module

+
H-Beam Base/Elevated Structure
=

50%~200%*

More Power Generation



Bifacial Module
Add Energy

Albedo

10~20%

Mud Grass

Ground



+5%

20~35%

Dry Gravel



+10%

20~50%

Cement



+15%

45~80%

White & Snow



+20%

>85%

Water/Reflecting Material



+25%

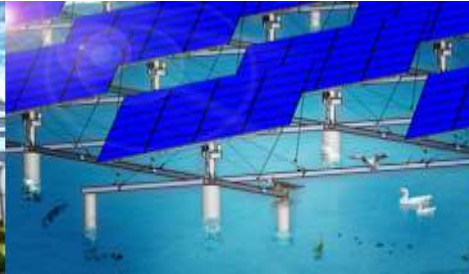
Solutions – One Terrain with multiple yield



“Elevated system” design
adds function and value below



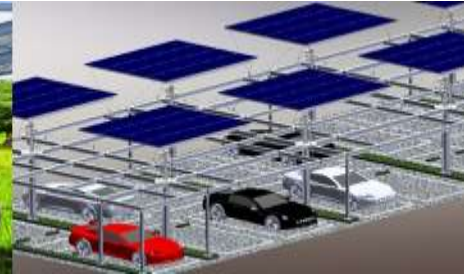
AGRO-SOLAR



AQUA-SOLAR



SOLAR FARM



SOLAR CARPORT

Value Added LANDSCAPE

AQUA-SOLAR

Aqua-Solar can integrate with floating or pile system on freshwater and inshore.

A **good solution** can enhance aquaculture harvest and **earn dual incomes.**



Traditional Aqua-Solar Systems

Floating System



Fit for :

Non-fishery ponds, reservoirs and deep waters.

PROs :

Shading the water surface reduces the evaporation of water, avoid eutrophication.

CONs :

Module adjacent to water runs risk of vapor infiltration and corrosion. System may squeeze and crash during storms. Undesirable environment for aquaculture. Unable to leverage the benefit from bifacial modules.

Fixed Tilt System with Piling



Fit for :

Within 3M deep ponds, shoals, shallow waters.

PROs :

Elevated system with shading and ventilation below.

CONs :

Limited light transmission to water underneath the Fixed tilt systems. The constrained space between cement piles is not encouraging for fishery. Can integrate with bifacial modules, but the benefit is limited by less reflection & diffused lights resulted from shorter height from water.

iPV SMART Fishery



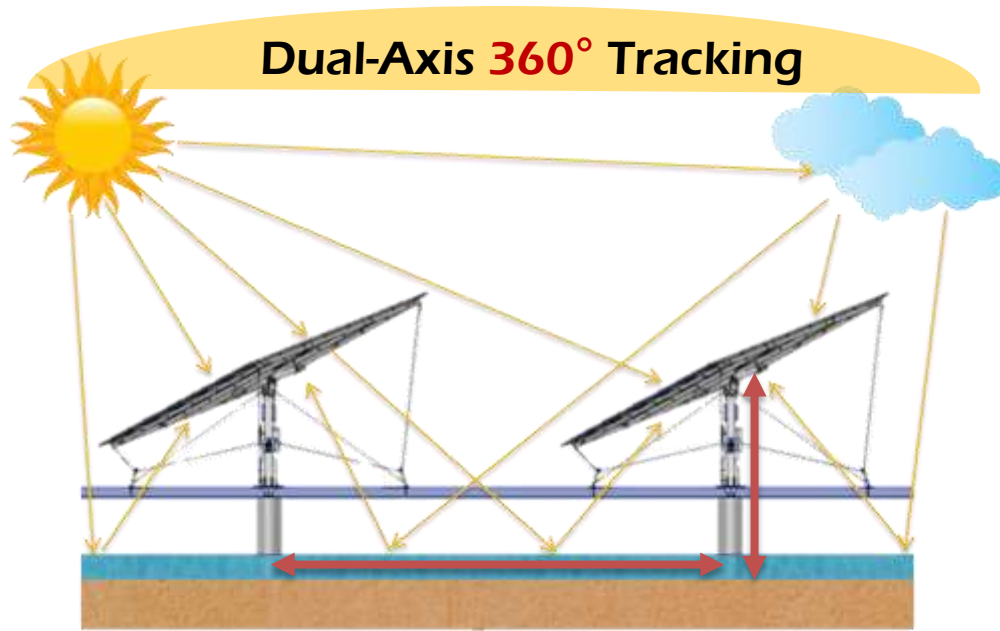
Parties: Local government,
PV provider and Fishery
Entities: iPV Tracker , bi-facial
module, aqua environment

- **IoT Nurture**
- **Mutually Beneficial & Friendly Environment**
- **High-efficiency Green Power**

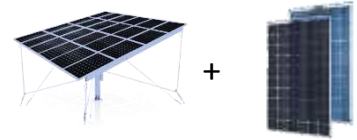
iPV SMART Fishery Bi-Dual system

IoT Nurture

High tech sensing combined with IoT ensures **100% aquaculture yield**, surpassing **70% requirement**.



H-efficiency
Green Power



iPV Tracker
+
Bifacial
+
H-Base Beam & Cement Piles
=
Increase Power Output
50%~60%* up

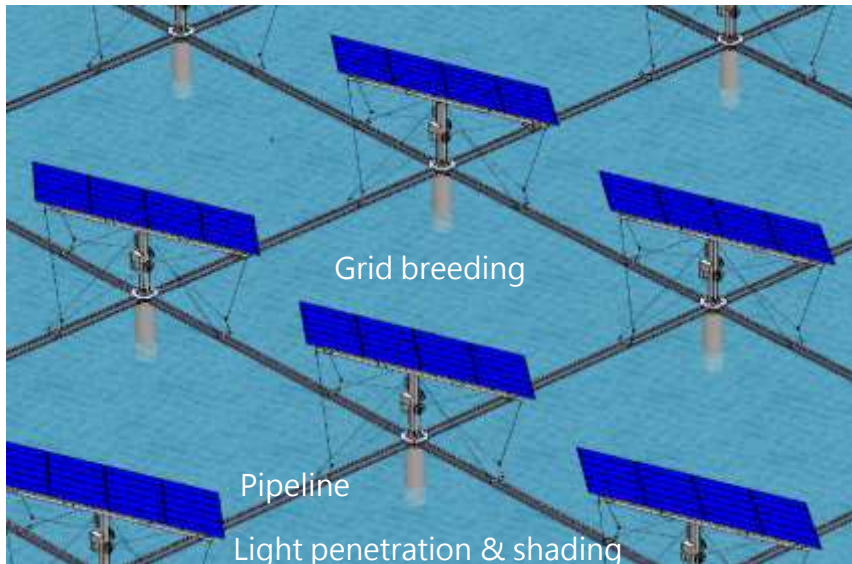
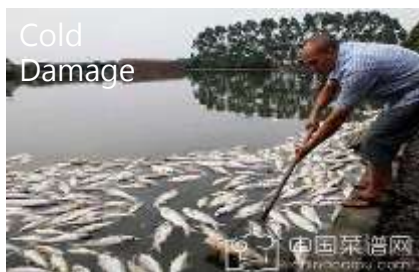
70% light transmission + 40% coverage ratio + 11.6M pile spacing + 6.5M system height

Proper space combined with friendly environment of automated farming facilities

Mutually Beneficial & Friendly Environment

AQUA-SOLAR iPV SMART Fishery

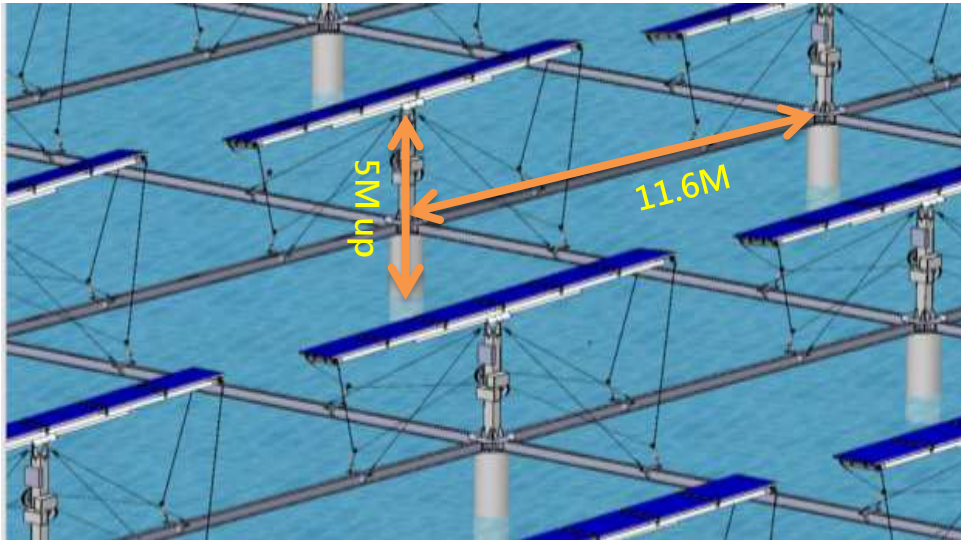
- ◆ **Light penetration & shading** ◦ High light penetration rate at 70~80% reduces water evaporation and sun exposure while increasing water oxygen content.
- ◆ **Grid space interval** ◦ Centralized management will ensure the fishery production.
- ◆ **H-beam base frame** ◦ Pipeline duct combined in H-beam steel Grid lines prevent circuit leakage risk with upgrade option as Tourist passage.



*Base on local condition

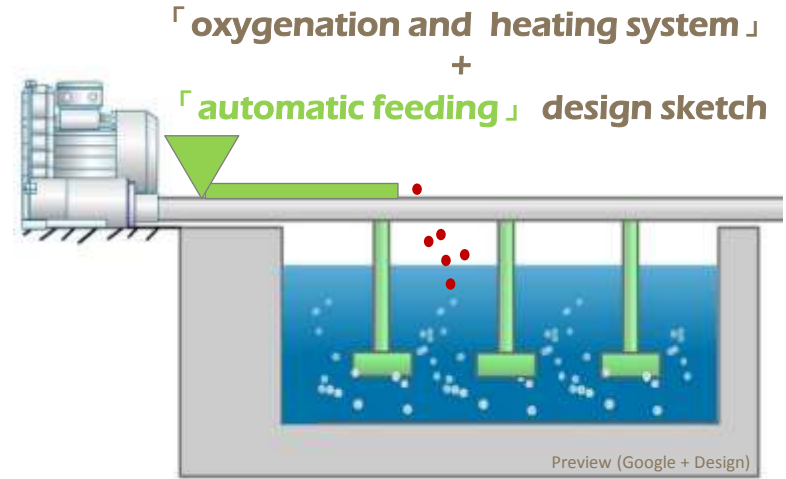
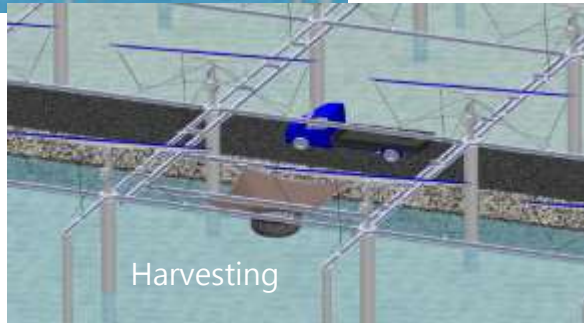
AQUA-SOLAR iPV SMART Fishery

- ◆ **Eco Friendly:** Only 1/5 amount of cement piling used compared to fixed tilt PV systems can cut down cost.
- ◆ **Fishery Friendly :** Tremendous pile spacing of 11.6M, provides plentiful space for aquaculture and ecological activities below.
- ◆ **Synergy Benefit:** Module platform installed > 5M above water can absorb more reflective and diffuse lights to gain more power generation.



AQUA-SOLAR iPV SMART Fishery

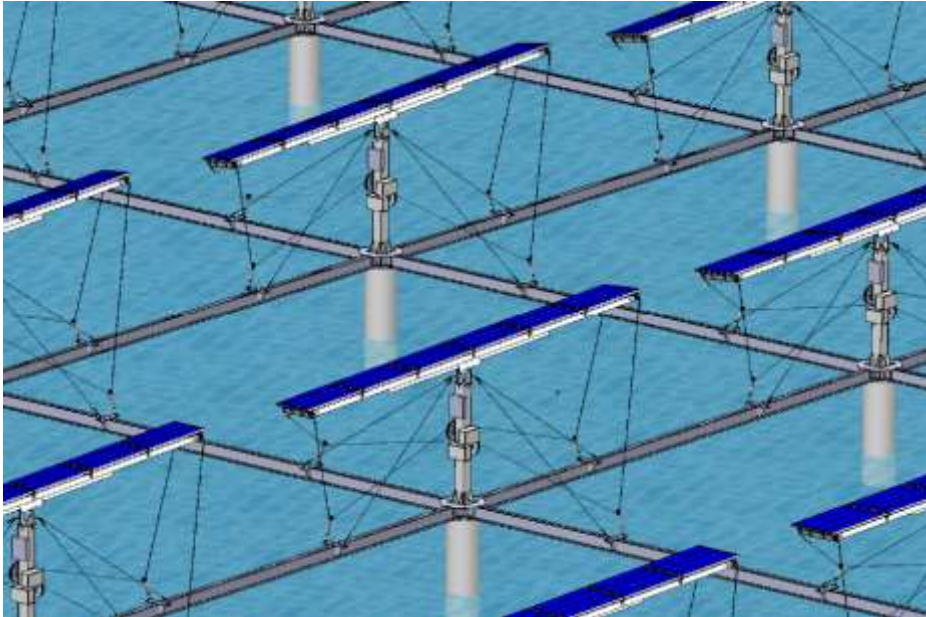
- ◆ Adopting advanced 「overhead crane fishing」 device can **reduce the labor and danger**.
- ◆ Integrate 「oxygenation system」 & 「heating system」 to prevent frequent heat waves and chilling injury induced from climate change.
- ◆ Can plug with 「automatic feeding」 set up to feed with regular quantity at scheduled time.



- ◆ Built along with Pipeline duct combined in H-beam steel Grid lines

AQUA-SOLAR iPV SMART Fishery

- ◆ Extending iPVita monitoring over water quality, fishery weight plus smart automatic heating, feeding devices and etc., to achieve high aquaculture yield and advance towards smart IoT era.



Wind · Temperature
meters



Water Quality



DO



pH



ORP

More for

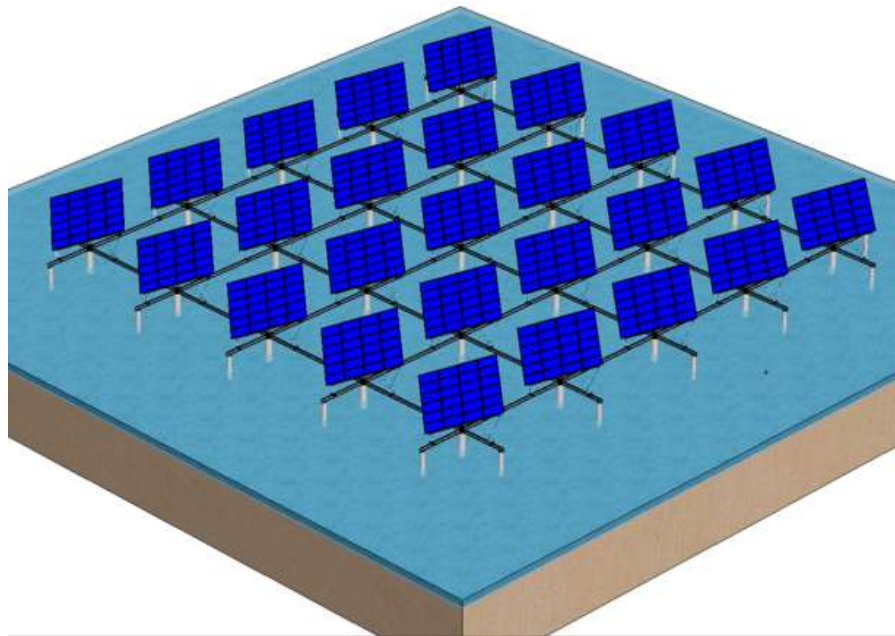
Ammonia, nitrous acid, phosphoric acid, suspended solids, salinity (salt water)...

iPVita™

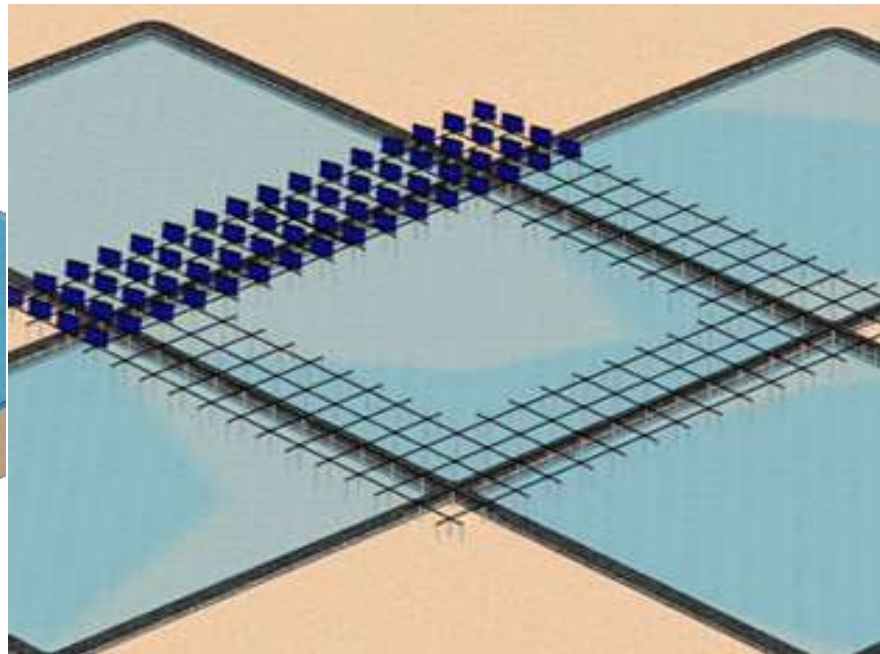
Intelligent Elec.

- Feeder
- Oxygen-Heating
- Overhead Crane

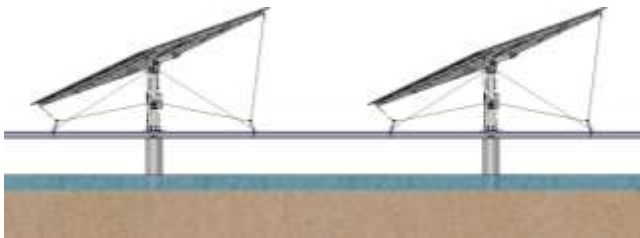
Grid Array



Embankment Array

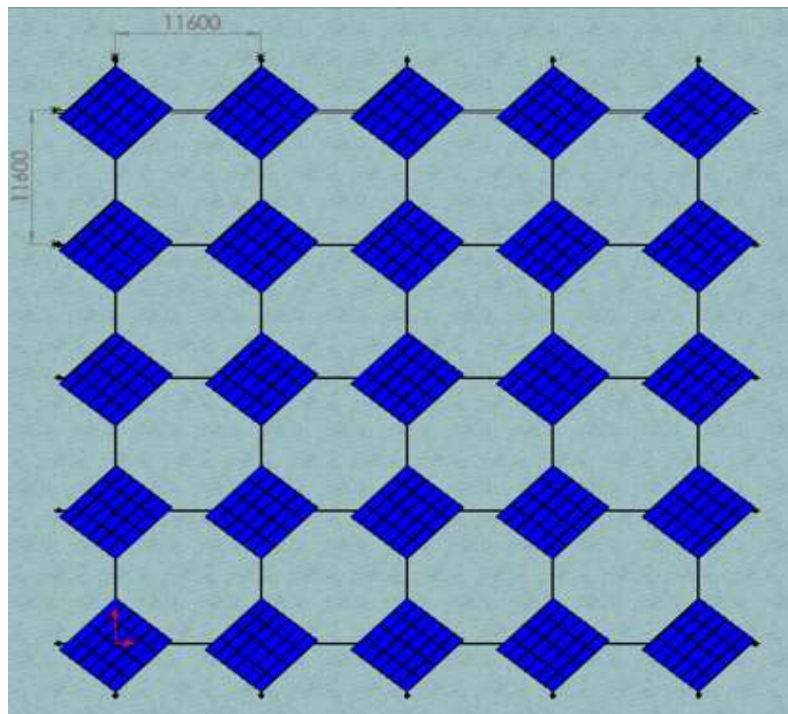


iPV SMART Fishery Most WIN WIN WIN Synergy



- ◆ Auto Breeding
- ◆ IoT Application
- ◆ 70% Transparent
- ◆ 40% Covering Rate
- ◆ 6.5M Height
- ◆ 11.6M Spacing
- ◆ iPV Bi-Dual System

Total Power Gain **50%~60%*** up



*Base on local condition

AGRO-SOLAR



Free Great Picture

AGRO-SOLAR iPV SMART Farm

Highly elevated system structure preserves ample underlying space for agriculture activities.

40% coverage / **30°** tilt operation

3.5M height / **60%** light penetration



AGRO-SOLAR iPV SMART Farm

Three-dimensional economy

=

effective output value



Upper :
High Solar Power
Generation

Middle :
Highly
economical Plant

Lower :
High Nutrient
Planting

SOLAR FARM



SOLAR Farm iPV Solar Husbandry Farm



Highly elevated system structure provides ample underlying space and shading for livestock farming and cooling, while accelerating half shade plant growth.

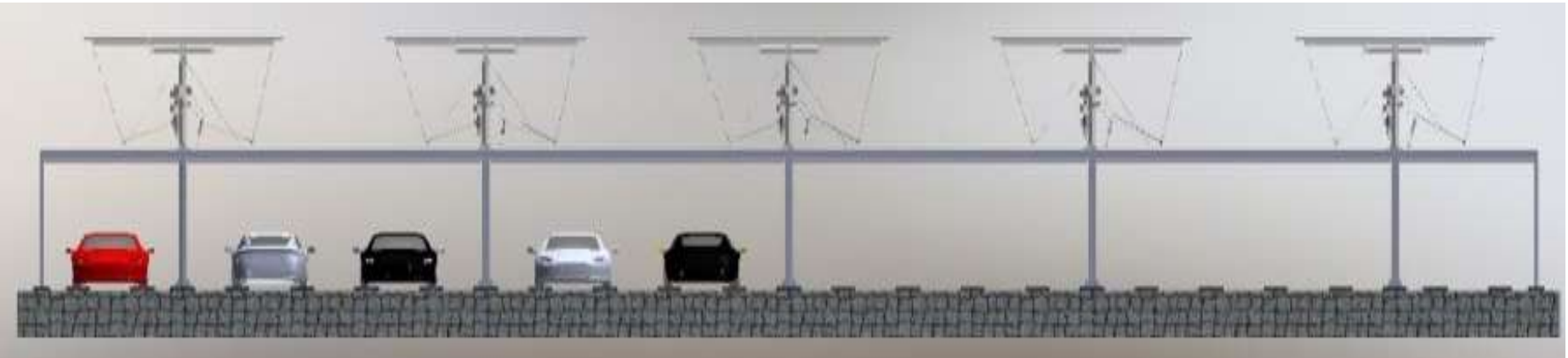
Preview

SOLAR CARPORT



SOLAR CARPORT

- ◆ PV integrated with **storage system** can **recharge electric vehicles**.
- ◆ Partial shading, resulted from **360° rotation tracker**, can **cool down the vehicles and passengers underneath**.



Value Added LANDSCAPE



LANDSCAPE Value Added Leisure Space

◆ **Solar Tree** ◦ Provide a pleasant space for rest and sightseeing!



One terrain with multiple yields.

**Applicable for Agriculture, Fishery, Animal Husbandry, Transportation and
Landscape.**

Low Pollution 、 High Return

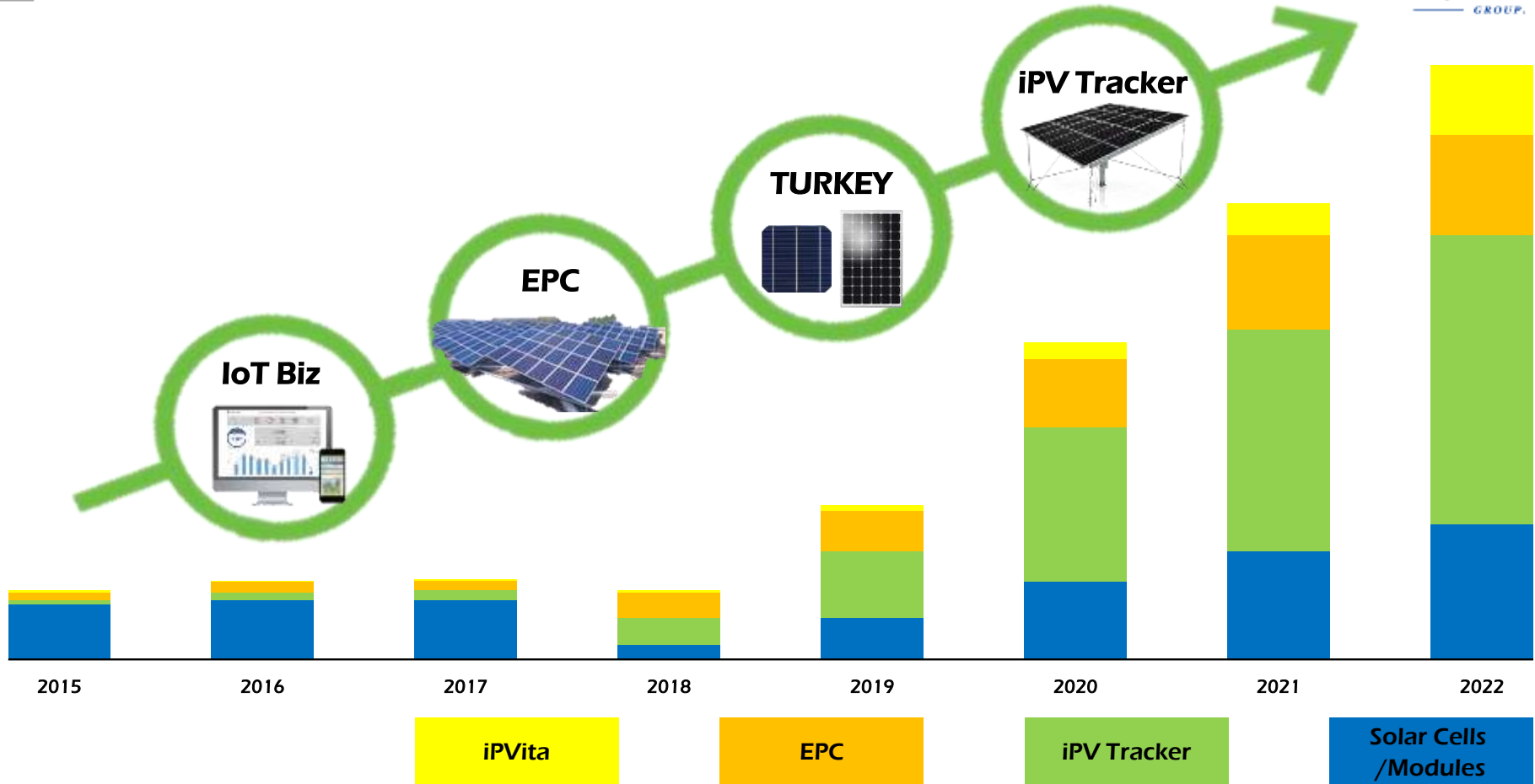
Low Risk 、 High Yield

Automation 、 High Profit

勢

- ◆ **Global PV Market Scenarios 2017~2021** would have **4%~15%** annual Growth – SolarPower Europe
- ◆ **Global PV Tracker Capacity in 2021** would grow to **37.7GW**, **21%** annually from 2017 to 2021 – PV Magazine
- ◆ **Tracker Market** is adapting to **bifacial module** technology – PV magazine
- ◆ **Global Aqua-Solar Market** is expected to reach **US\$ 842M** by 2023 – Research and Markets
- ◆ **Solar installation growth in TURKEY** was a significant **213%** increase year-on-year - SolarPower Europe

Future of BIG SUN



Future Solar Power Plant 24HR Solar Power System

Replace all energy,
unlimited market
potential



The mainstream of future
Solar Power Plant

25%
Supplementary

150%
Primary Energy

- ✓ Taiwan utility patent has been granted : M504944
- ✓ Taiwan invention patent has been granted: I519268
- ✓ Global patents pending

績



More than **20MW** Global installation base,
potential **250MW** in design pipeline

- **TOP 1 in Solar Tracker Market share in TAIWAN**
- **TOP 1 in Solar Tracker Market share in JAPAN** (one site has 4.4MW)
- **The World's Largest DAT Roof-top Project (840kW - Dec.12105)**

Global Projects

Precise tracking of the Sun in 30s

Japan Akagi yama

Capacity: 5MW

Completed: 2016

Product: iPV Tracker T6024



Global Projects



Precise tracking of the Sun in 360°



Japan Shiga-ken Power Plant

Capacity: 795 kW

Completed: 2016

Product: iPV Tracker T6024



View is location and system depend.

Global Projects



Precise tracking of the Sun in 360°



Japan Ogawa-machi

Capacity: 235 kW

Completed: 2016

Product: IPV Tracker T6024





China Xinjiang TBEA

Power Plant

Capacity: 132 kW

Completed: 2015

Product: iPV Tracker T6024





Taiwan Pingtung Power Plant

Capacity: 840 kW

Completed: 2015

Product: iPV Tracker T6024





Taiwan Tainan Power Plant I

Capacity: 274.5 kW

Completed: 2016

Product: iPV Tracker T6006



Global Projects



Taiwan Yulin Farm A

Capacity: 300 kW

Completed: 2015

Product: iPV Tracker T6024



- 
- ✓ **Capital Investment**
 - ✓ **Project Development**
 - ✓ **EPC**
 - ✓ **Global Co-License**
 - ✓ **Product Trading**
 - ✓ **Cross-Biz Integration / Solutions**

iPVTracker

ONE Terrain for INFINITY Profit



www.BIGSUN-ENERGY.com



www.iPVTracker.com