



ACCESS A PROPERTIES LTD

Empowering the future with clean, limitless energy.

IN PARTNERSHIP WITH

WONKWANG S&T

Renewable energy specialized company

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ACCESS A PROPERTIES LTD

SOLAR PHOTOVOLTAIC

The Leading Company of Global Photovoltaic energy

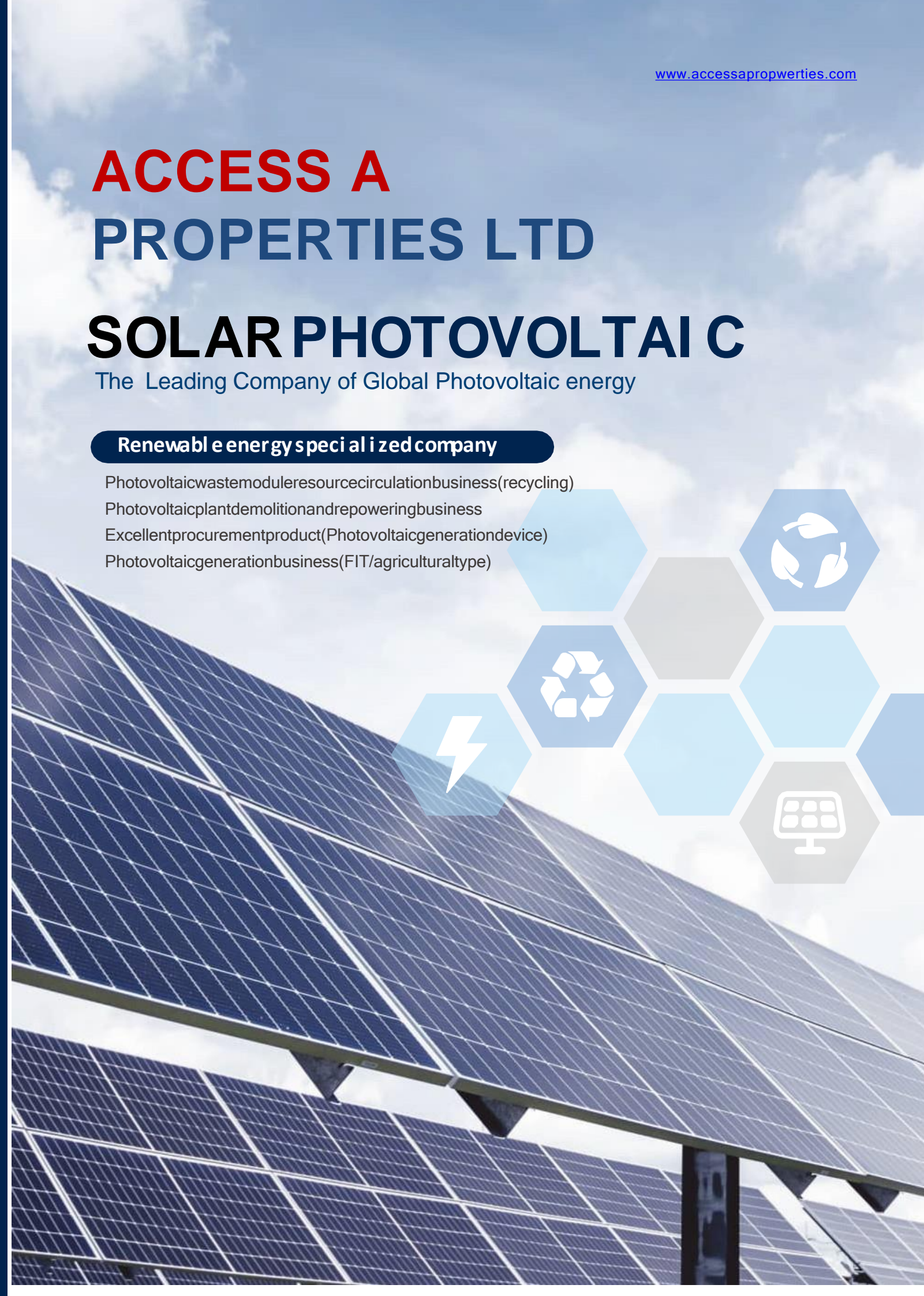
Renewable energy specialized company

Photovoltaicwastemoduleresourcecirculationbusiness(recycling)

Photovoltaicplantdemolitionandrepoweringbusiness

Excellentprocurementproduct(Photovoltaicgenerationdevice)

Photovoltaicgenerationbusiness(FIT/agriculturaltype)



Empowering the future with clean, limitless energy.



ACCESS A PROPERTIES LTD

The company spearheading in solar energy utilization and resource circulation energy solutions essential to the world

Many domestic and foreign customers have already chosen Access A Properties. Meet Access A consultant with a differentiated solar energy total solution from consulting and design to installations!

Business area

Resource circulation project

Waste module recycling project (Notice of EPR system introduction) ·Solar power plant repowering project (Efficiency increase)

Excellent procurement project

·Designated as excellent procurement products (solar power generation device power compensation system) ·Selected as pilot purchase of technology development products, LH new technology certification, SOC tech market Innovative Technology



Solar power generation project (PV Solution)

·EPC turn -key construction / design / construction / maintenance ·Korean type FIT / Farming type solar generation / Solar Roof

Government funded project

·Financial assistance in Housing/ Building/Regional/Convergence
·Designated as a company participating in Korea Energy Agency, and as a A/S dedicated company

Company History

- 2014

·Established as a corporation
- 2015

·Registered as a company specializing in new and renewable energy facilities and installation
·Registered as Electrical Engineering business (Incheon-No. 01153) ·Obtained ITSIS09001 / ITSIS014001 certification ·Designated as venture company
- 2016

·Registered Solar Tracker patent (No. 10-1584241)
- 2017

·Selected as a partner company of Korea Institute of Industrial Technology
·Registered two types of power consumption monitoring patents ·Certified as corporation affiliated research institute
- 2018

·Selected as a company participating in government funded solar energy (housing, building, convergence) distribution project of Korea Energy Agency ·Selected as a company participating in mini Solar Power system Distribution project of Incheon Metropolitan City ·Selected as a company participating in Solar Power Distribution project of Smart Energy Factory in Incheon Metropolitan City ·Designated as a company dedicated to installation and A/S of new renewable energy by Korea Energy Agency (Nationwide) ·Awarded official commendation by the mayor of Incheon Metropolitan City ·Constructed new office building and moved to new location (current address)
·Obtained direct production validation certificate (solar power generation device) ·Obtained K-mark certification (solar power generation system)
- 2019

·Selected as a company participating in government funded solar energy (housing, building, convergence) distribution project by Korea Energy Agency ·Selected as a company participating in mini Solar Power Distribution project of Incheon Metropolitan City ·Designated as excellent procurement product (Solar power generation device: Designation No. 2019169) ·Verified as a company specializing in material parts (Ministry of Trade, Industry and Energy) ·Verified as Root company (Korea National Ppuri Industry Center)
·Obtained Q-mark certification (solar power generation system) ·Designated as excellent venture company ·Established as a corporation affiliated research institute ·Established a branch office in Vietnam ·Established a branch office in Naju city ·Selected as Inno-Biz for Technical Innovation Small and Medium-sized Enterprises
- 2020

·Obtained a permit for waste collection and transportation business ·Obtained a permit for intermediate goods waste recycling business
·Concluded a contract with third party unit price (Excellent procurement product-solar power generation device) ·Registered as Metal-Window-Construction business ·Awarded Energy grand prize of official commendation by the Minister of Trade, Industry and Energy (No. 131575)
·Received an award by Commissioner of Korean Intellectual Property Office at Korea Patent Technology Competition (Solar Power Compensation System)
- 2020

·Obtained a certification of SOC Technology Market Innovation New Technology (Solar power generation device) ·Obtained a certification for new technology by LH New Technology of Korea Land and Housing Corporation (Solar power generation device/ Power compensation system) ·Obtained a certification as excellent job creation company (Incheon Metropolitan City) ·Selected as company dedicated for new renewable energy facilities A/S by Korea Energy Agency (Incheon Metropolitan area) ·Designated as a G-PASS company (Public Procurement Service)
·Designated as the priority purchase of excellent inventions
- 2021

·Selected as a pilot purchase of technology development products by the Ministry of SMEs and Startups (MSS)
·Selected as Korea's Best Job Creation Company in 2021
·Designated as a Small and Medium-sized Enterprises driven by human resource development in 2021 ·Received an official commendation from Minister of SMEs and Startups at 2021 Korea Small and Medium sized Enterprises (SMEs) Competition ·Designated as a global IP star company ·Certified as an excellent job invention compensation company ·Certified as an artificial intelligence company
- 2022

·Obtained NET certification (Technology related to waste module resource circulation) ·Obtained ISO45001:2018 certification ·Obtained a permit as comprehensive waste recycling business ·Selected as one of 100 promising Green New Deal companies ·Registered as an electric new business operator (Electric vehicle battery charger business) ·Received official commendation from the Head of Public Procurement Service ·Selected as one of 1000 national teams of innovative companies
- 2023

·Acquired Green Technology Certification (Waste Module Recycling Technology) ·Obtained Green Technology Product Certificate (Waste Module Recycling Technology)
·Received Technology Cooperation Award from the Korean Solar Energy Society ·Selected for the Super-Gap Startup 1000+ Project ·Awarded Excellent Environmental Technology Development Company (Minister of Environment) ·Commendation from the Superintendent of Incheon Metropolitan City for social contributions and sponsorship activities ·Presidential Commendation for SME Convergence Promotion ·Designated as an Excellent Environmental Company by the Ministry of Environment
- 2024

·Selected as a participant in the 2024 Korea Energy Agency's Housing and Building Program ·First approval of the Environmental Regulation Sandbox by the Ministry of Environment ·Recognized for Recycling Intermediate Waste from Solar Waste Modules as Circular Resource ·Selected as a 2024 Korea Excellent Job Creation Company ·2024 Circular Economy Leading Company Ministry of Environment Commendation

01

Resource circulation business

Solar energy preserves future environment and energy.

Access built a recycling process facility using the source technology for recycling waste solar modules in the Resource Recycling Building. Through this, we are carrying out the intermediate recycling business. In addition, it is possible to process severely damaged waste modules in connection with the current non damaged solar power waste module recycling process system. We introduced a recycling process system for damaged waste modules..

Photovoltaic waste module resource circulation

Photovoltaic energy is recognized as a representative eco-friendly energy source around the world, but concerns are raised over environmental damage caused by waste module treatment.

As a result of predicting Photovoltaic waste module generation based on Korea Energy Agency's supply statistics, the demand for waste module disposal will increase rapidly starting from 2023. Since more than 10,000 tons of waste modules are expected to be generated every year, the government announced introduction of Extended Producer Responsibility (EPR) for Photovoltaic waste modules starting from 2023. And the demand for waste module treatment is expected to increase continuously.

Up until now, for waste Photovoltaic modules recycling, it is common to smash or bury all the materials except aluminum frames, but **ACCESS** uses crystalline silicon-based solar module recycling technology to separate old waste modules into aluminum frames, reinforced glass, and solar cells to realize efficient recycling environment.

The key technology is to increase recycling efficiency by lowering the cost of separating the aluminum frame, front glass, sandwich element layer, junction box, etc. of the solar modules. It can be collected and classified in a single process, and even the Photovoltaic module with damaged glass substrate can be used through recycling process.

ACCESS will pave the way for solar energy generation to reborn as safer environment-friendly energy source and to be developed as industry of sustainable growth, and for a future new growth project, lead the solar recycling market through continued investment and technology development, by reducing the amount of waste using waste module recycling technology, and by recovering valuable metals such as aluminum, silicon, and glass.

Repowering of station



Repowering of station

Module and other photovoltaic Equipment component replacement Business



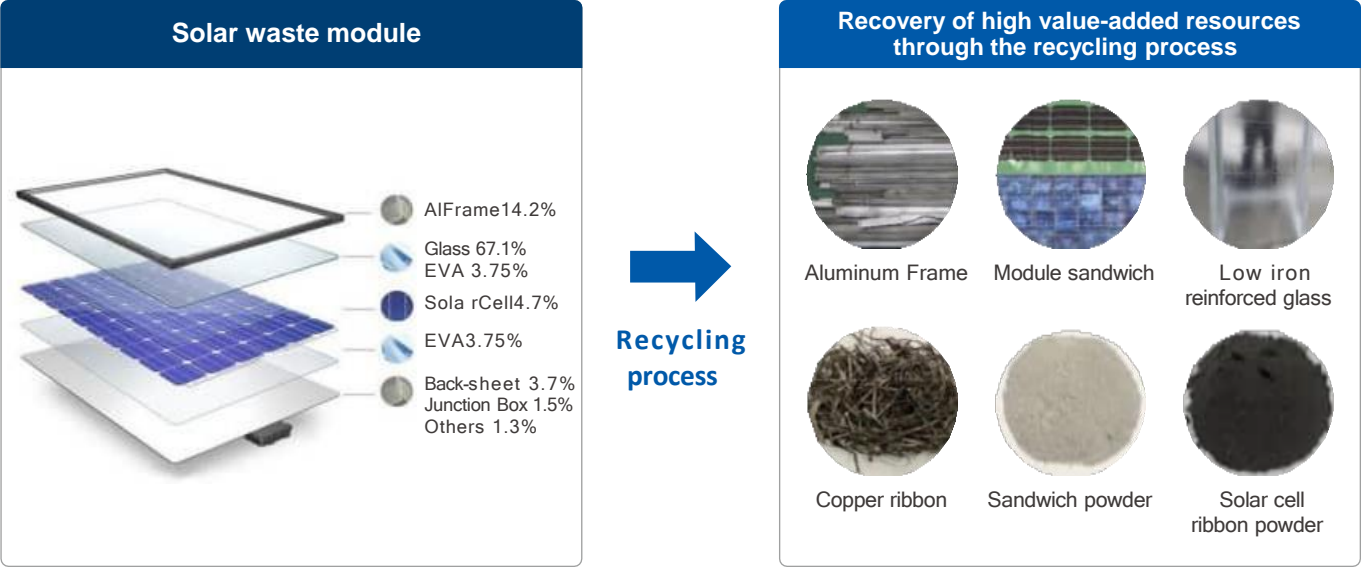
Recycling waste module

Demolition, collection and transportation, intermediate treatment



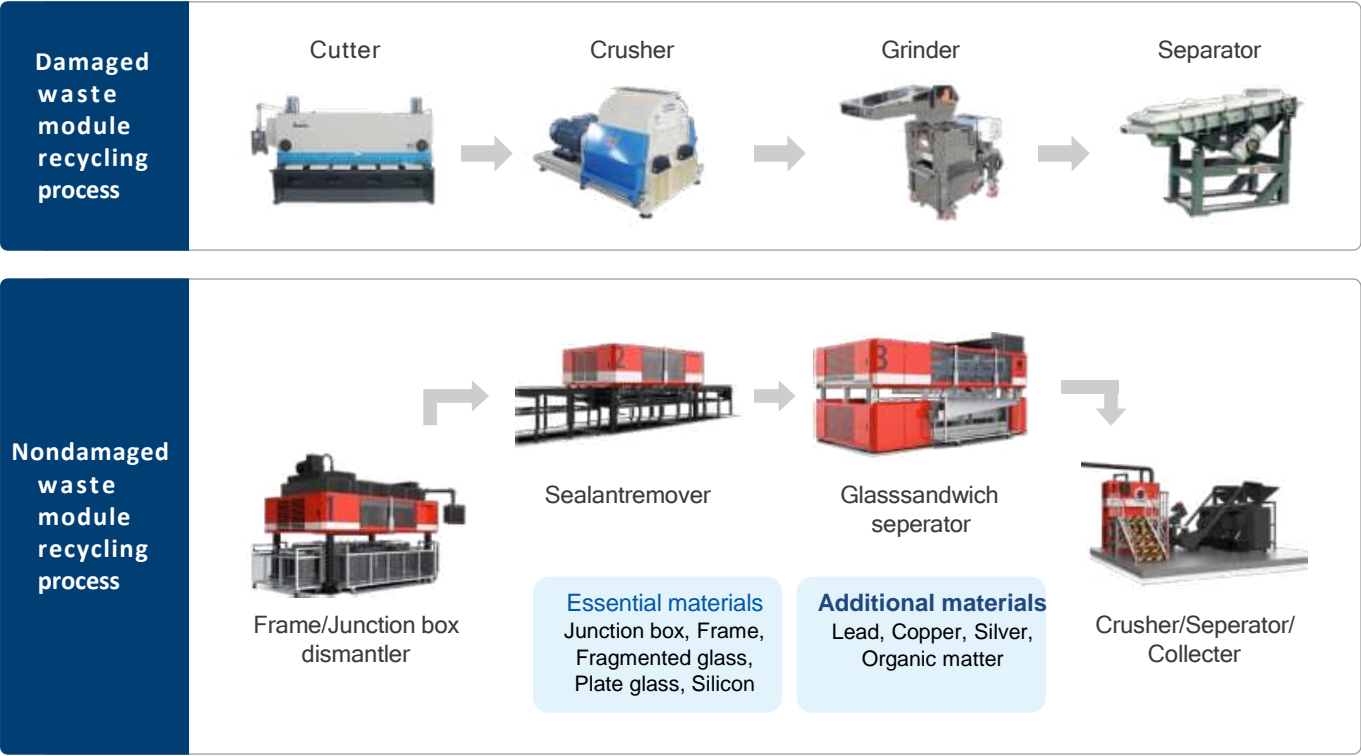
Source technology for waste module recycling (Production)

Establishment of recycling process by recovering various materials from waste solar modules



Source technology for waste module

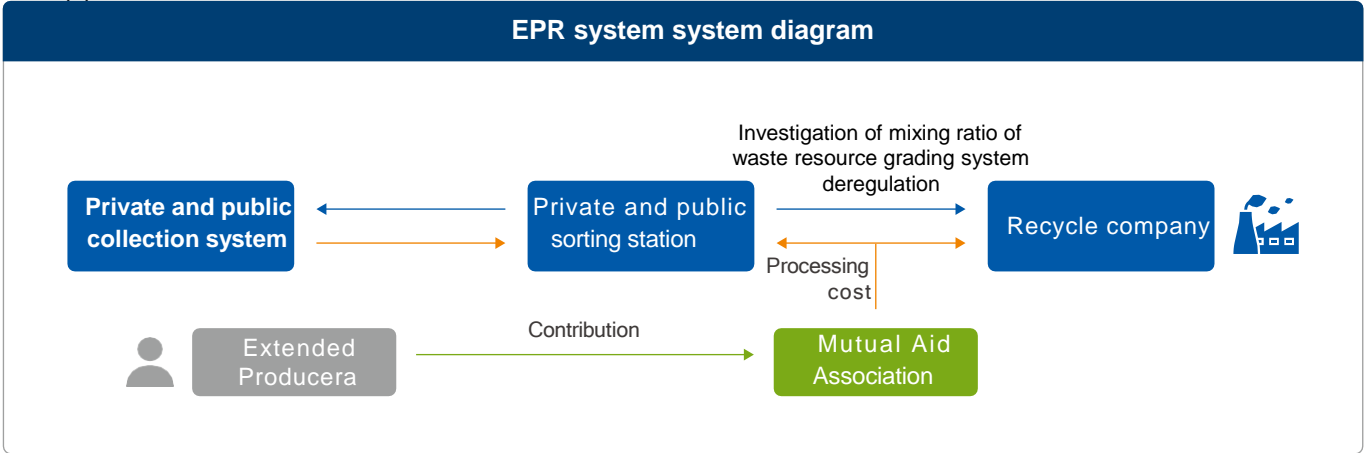
Completed the production of the equipment that utilizes waste module recycling source technology ACCESS A PROPERTIES Resource Circulation zone



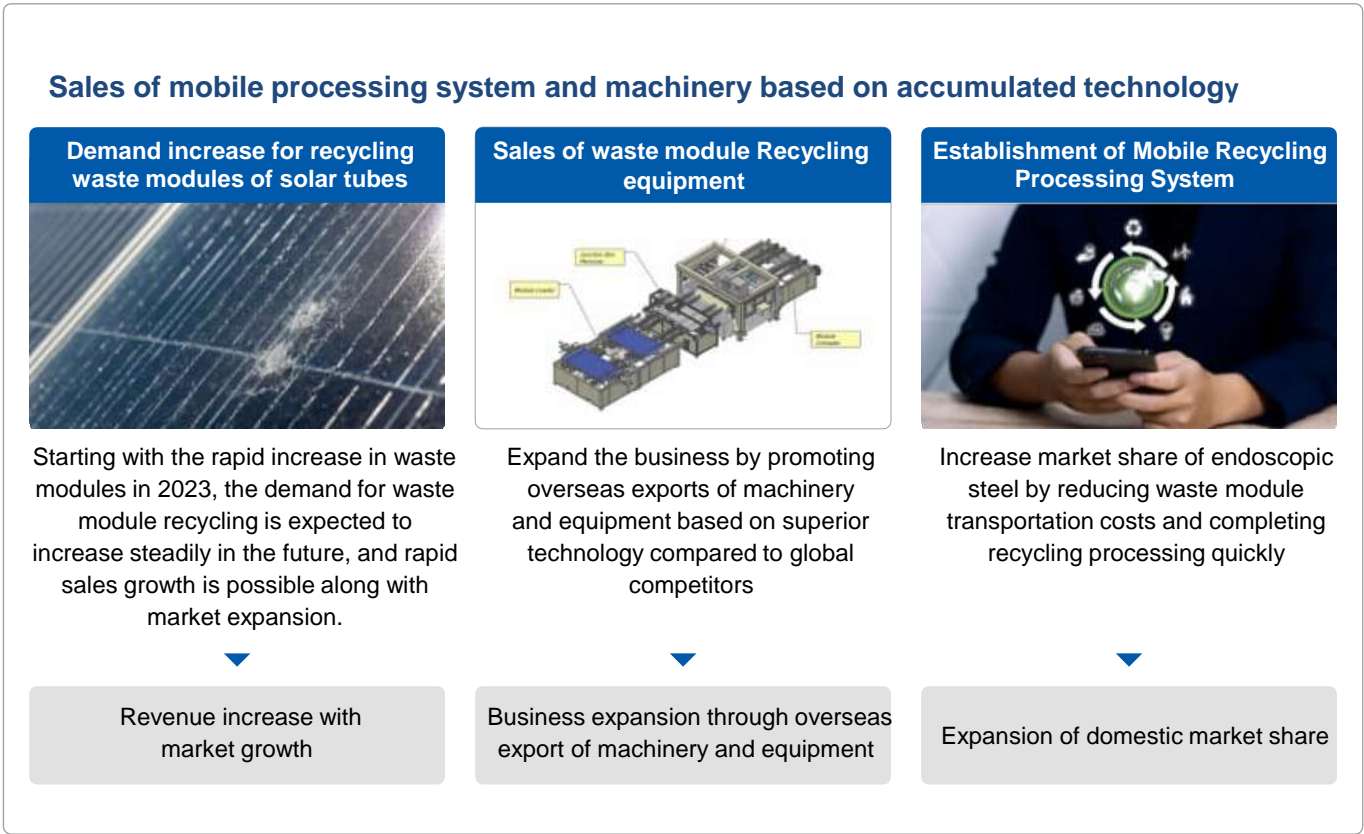
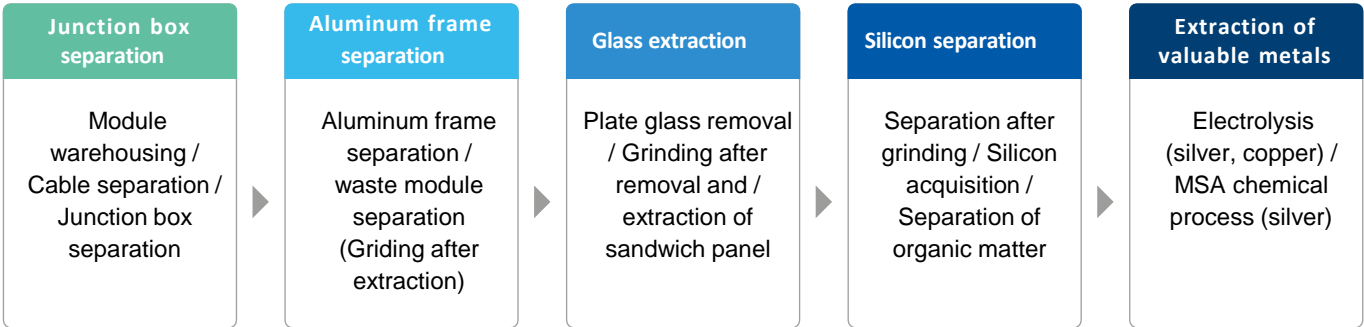
·Junction box and aluminum frame dismantler, glass separator in primary physical process ·Crusher, separator, and valuable metals collector in secondary physical / chemical treatment process
·Processing capacity of solar waste module recycling system: 5 tons/day

Solar Waste Module Resource Circulation Solution

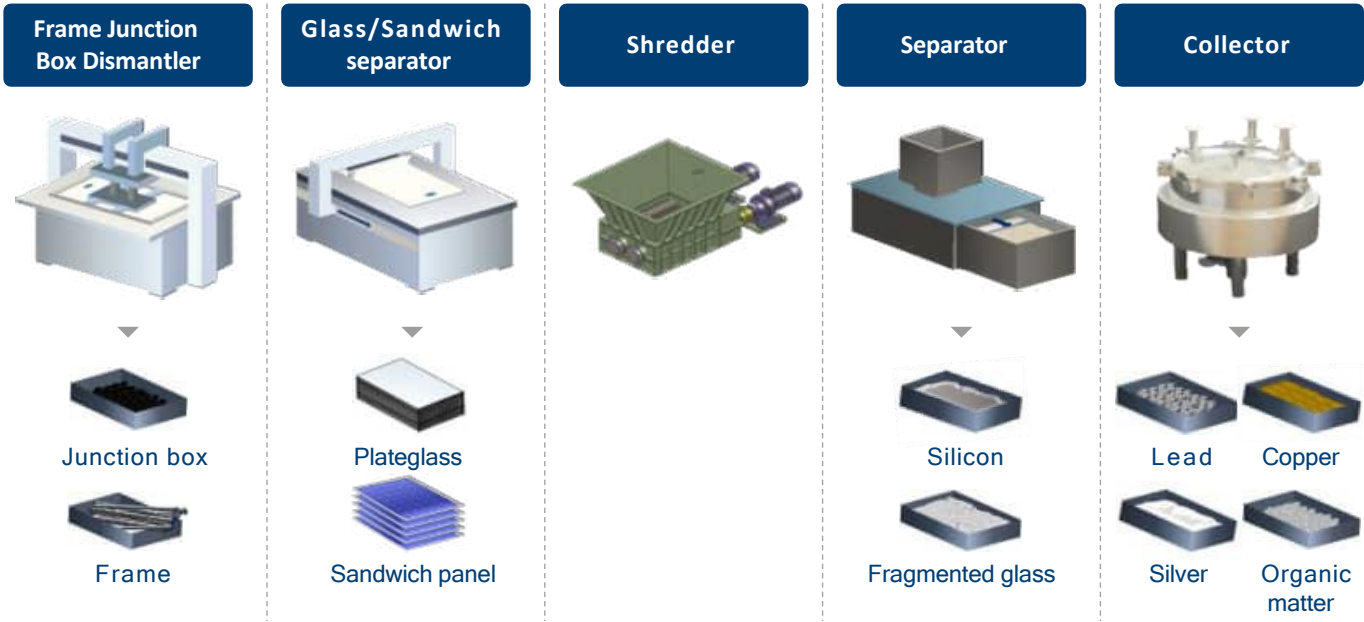
Establishment of recycling process by recovering various materials from waste solar



Solar Waste Module Resource Circulation Process



ACCESS Resource Circulation Retention Equipment



Examples of solar waste panel



Deterioration of power generation performance (shade, aging)



Deterioration of power generation (yellowing deterioration)



Torrential rain (landfall))



Typhoon loss



Falling rock damage



Hail damage



Hots pot damage



Storage after small scale A/S

Photovoltaic plant demolition and repowering project

For domestic photovoltaic generation market, which began to spread in full scale after the introduction of “Feed-in Tariff (FIT)” in 2001, it is now drawing attention to the demolition or re-powering project of aging photovoltaic plants over the course of about 20 years. Currently, solar-related products boast high quality, but the equipment used in early-stage photovoltaic facilities were mostly low-quality products, thus the end-of-life photovoltaic plants were considered to be demolished or repowered.

Although the demolition of photovoltaic plants are difficult due to environmental problems in waste module disposal, **Access** can relieve the concerns of business operators about waste module processing and demolition problems, by using waste module recycling technology. The technology and know-how accumulated in regards to Wonkwang S&T recycling can increase power generation efficiency of aged power plants through the consultation about re-powering of aged power plants, waste module disposal and replacement, and replacement of main equipment such as inverter, junction box. **Access**, which retains a specialized technology enabling simultaneous removal and replacement of photovoltaic plants, will be the best partner to maximize profitability through efficient power plant operation by presenting the best design and construction to power generation business operators.



Demolition of solar generation device



Re-powering construction





02

Photovoltaic project

This business generates profits by selling electricity produced after installing solar modules on land, building rooftops, and factory roofs to Korean Electric Power Corporation (KEPCO) and power generation companies under Renewable Portfolio Standards (RPS) system.

The photovoltaic generation project is an environment friendly power generation project. It is a future growth industry featuring easy maintenance & management and new lifespan of products (more than 20 years), through stable profitable investment and self-consumption reduction investment.

-  Stable income
-  Property value increase
-  Tax deduction benefits
-  environment-friendly development projects

Information on excellent photovoltaic generation products by type

Basic type : Installed on the roof of a building, bare land, etc.

10-20% higher power generation efficiency compared to existing photovoltaic generation devices by applying a power compensation system



Round type : Installed in parking lots, water treatment plants, etc.

10-20% increase in power generation efficiency compared to existing photovoltaic generation devices by applying a power compensation system



Sloped roof type

10 -20 % increase in power generation efficiency compared to existing photovoltaic generation devices by applying a power compensation system



Access inclined roof photovoltaic generation device is for inclined roofs of LH apartments and inclined roofs of public facilities, and is a system that can satisfy both efficiency and aesthetics with an integrated installation method with the roof inclination angle. It is a rail-type construction in which the support is not exposed to the top.

Low-floor type : building roof, apartment roof, etc.

As a photovoltaic generation device installed on the rooftop of public buildings and apartments, it is a model with specifications that are not exposed as much as possible from outside eyes. It can be installed in various places by applying design elements that do not harm the aesthetics of the building and designing a power compensation system' to avoid hindrances such as shadows.



Building integrated type (BIPV)

A photovoltaic power generation system that uses building-integrated photovoltaic modules as building exterior materials in addition to generating electricity from solar energy and supplying it to consumers. By applying solar cell modules instead of building exterior materials, it has a synergistic effect on building design elements and reducing construction costs, thus exerting an influence as a landmark. In addition, it is possible to apply the insulation effect, so it has the characteristic of reducing power consumption during cooling and heating, and it is possible to play a role as a window through high visible light transmittance.



BIPV Features



Green Energy



Excellent Economics



Beautiful Exterior

BIPV Rescue



G2G:GtoGtype



G2B:G to B type



G2G Double Layer type

Building integrated type (BIPV_G to G type)

The building exterior material is used as a G to G module, and it can be used for roofs, windows, and outer walls. As a building external solar power generation system, it not only generates electricity from solar energy, but also uses it as a building exterior material to reduce construction costs and act as a design factor, and increases the value of the building.



Colored BIPV

It is a color BIPV that can be customized according to the site as there is no output deviation for each color as well as aesthetic effect by realizing color through dot patterns. Matte products can be used instead of building exterior materials, and glossy products are used instead of window or glass finishing materials.



Color realization material technology
Nano-color and functional coating materials
·Nano color coating technology with adjustable visible light transmittance (10 ~ 90%)
·A variety of cleaners through inorganic ink synthesis technology
AG (ANTI-GLARE) coating technology



Wet coating process technology for large-area flat glass
Wet coating
·Coating area : 1,250*3,048mm
·Thin film coating (10~30UM) : fast process time and precise control
·AG for antireflection of colored glass surfaces (ANTI-GLARE) coating technology



Non-reflective color glass technology
High transmittance, anti-reflection coated glass technology



Agricultural Photovoltaic business

Agricultural Photovoltaic (Crop cultivation + photovoltaic)

·Utilizing cultivated farmland to reduce farmland reduction rate and increase land use rate
·Share sunlight with crop cultivation by using light that exceeds the light saturation point of crops for photovoltaic generation
·Photovoltaic design to supply adequate amount of sunlight for crop cultivation, and cultivation loss rate of 15% or less

Structure design/construction
Agriculture and photovoltaic at the same time design and construction of structures to enable

Combined farming technology
Tailored to the region to enable Combined farming crop selection and farming cultivation method change

Estimated rural solar capacity : Supply of 10GW by 2030

- Salt-damaged reclaimed land (15,000 Ha within the Agricultural Promotion Zone)
- Farmland (860,000 Ha outside agricultural promotion areas)
- Agricultural reservoir (188ha), etc.

Classification	Registrationnumber	Titleofinvention	Administrator	Note
Patent	10-2148697	Photovoltaic power generation device for farming	ACCESS	
Patent	10-2171828	Photovoltaic power generation device for farming	ACCESS	
Patent	30-1062214	Photovoltaic power generation device for farming	ACCESS	Agricultural
Patent	30-1061350	Solar panel fixing bracket	ACCESS	Agricultural

특허증
특허청장
제 10-2148697 호
제 10-2171828 호
제 30-1062214 호

Agricultural Photovoltaic Benefits and Advantages

Easing power grid permits

Unlimited access to the power system is allowed for rural photovoltaic projects of 1MW or less

Reduced construction cost and shortened period

27% reduction in construction costs for 100kW individual connection facilities
Reduction of system reinforcement period for unlimited access (5 months → 3 months)

Deregulation

Photovoltaic power within the agricultural promotion zone direct installation of facilities is not possible. So, change it to hybrid land. In progress, but the bill in the future, 'agricultural photovoltaic allow temporary use for other purposes'

No farmland conservation charge

No charge for farmland conversion No development act charge

Environmental preservation

No fear of forest damage less concern about civil complaints



Solar roof

Solar roof is an unnecessary rail structure without additional structural work along with a new roof by overlaying a solar roof on an existing deteriorating factory roof panel. This is a construction method for roof-integrated photovoltaic generation facilities.









Roof type solar total solution

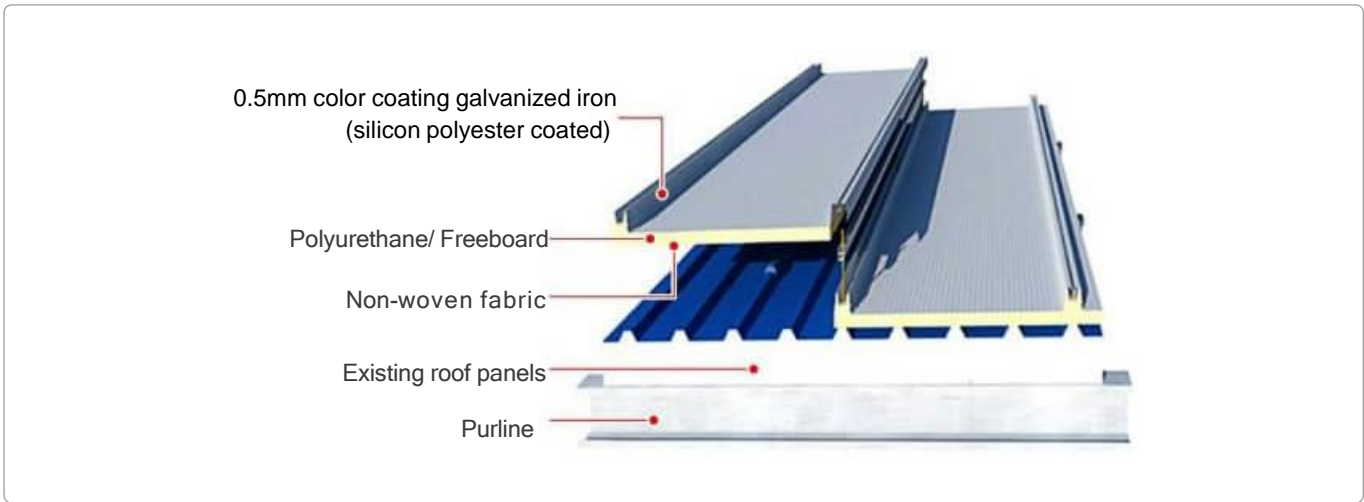
Even when building a new building , solar modules can be installed quickly and economically by constructing solar roof panels as roofing materials.

Solar roof features

Installation of safe photovoltaic plants with solar roof panels through structural review of old buildings..

 Rooftop renewal Changing the old roof into a new one by overlaying the roof on the top of it	 Water proof Perfectly blocking water leak with non-exposure bolt
 Insulation Excellent insulation effect of the polyurethane roof panel	 Roof type PV system The rail structure is capable of installing the PV module without an additional structure
 Design Innovative design of the solar roof and Structure	 New renewable energy Eco-friendly company using the PV energy

Solar roof product shape and material



Comparison of Solar Roof and general panel


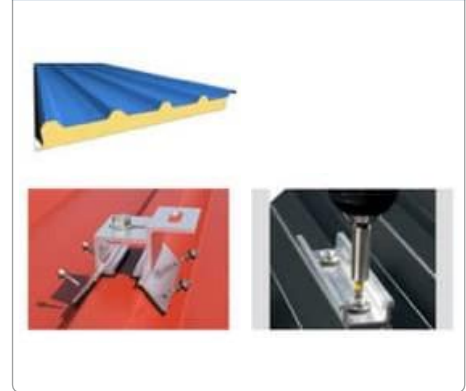
Solarroofpanel_productshapeandfixingdetails



Comparison of general panel_roof shape



Comparison of installation method

Comparison of fixing between Solar Roof panel and PV module 	General panel_general clamp type 
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Problems when installing a general roof-type PV system

Problems when installing a general roof-type PV system If you construct Solar Roof Panels overlaying the whole roof when newly building a structure, you can install the PV module easily, quickly and economically.

We install the PV module using T bolt without drilling holes. There is no load burden as water leak is blocked and the structure of the PV module is simple. We establish the PV power plant integrated with the building roof and PV module.



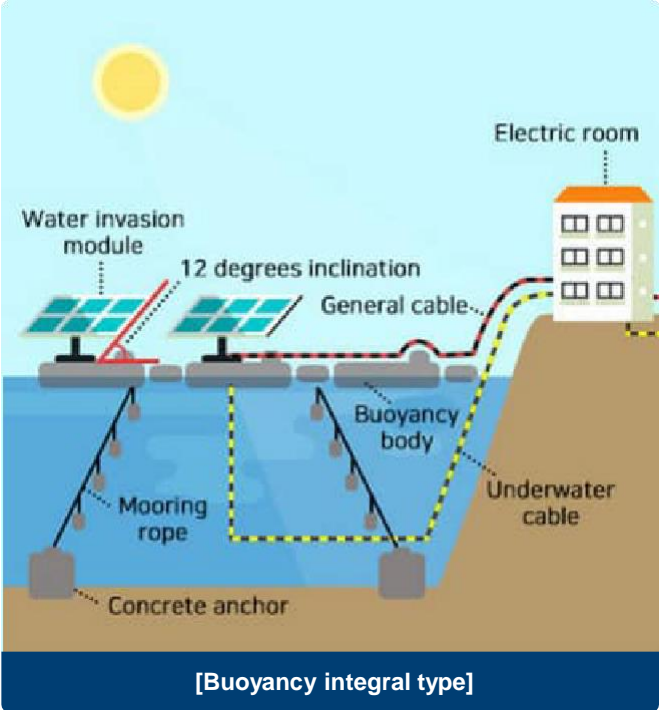
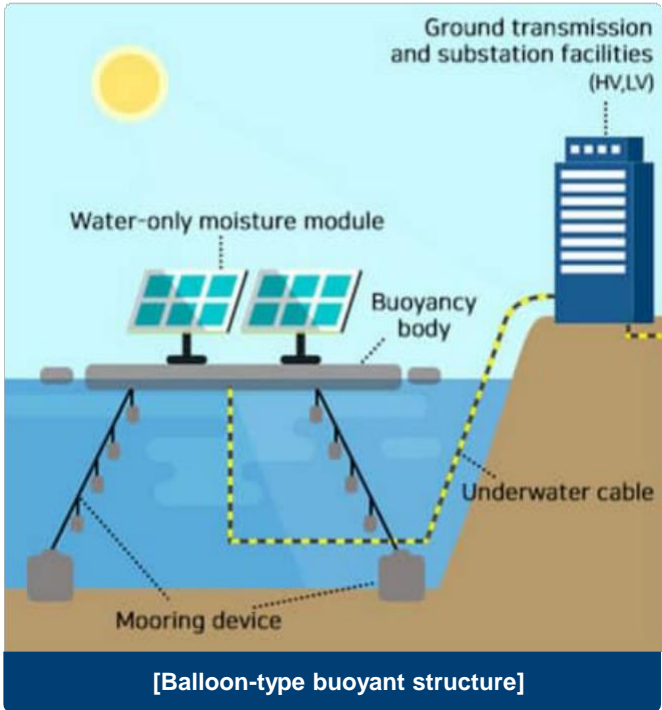
Floating photovoltaic power generation

We will be your reliable business partner in the green energy business and international trade



About the floating PV power generation

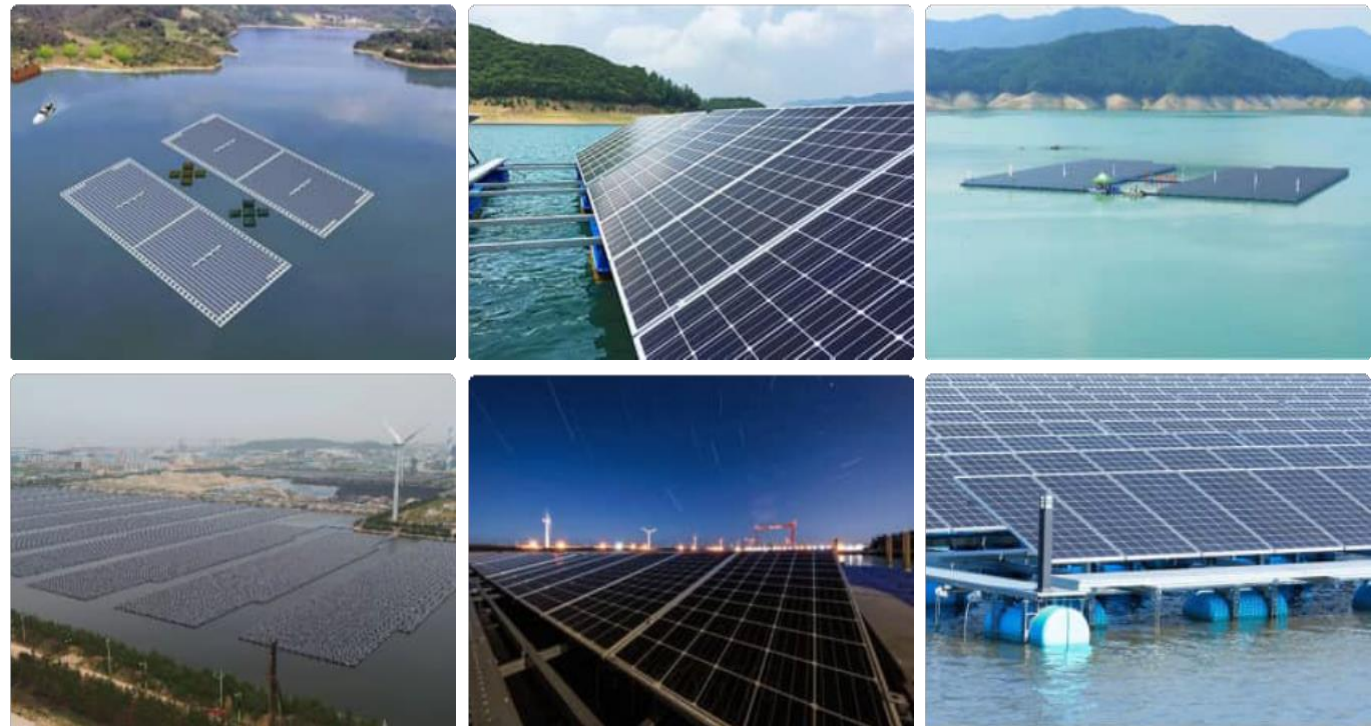
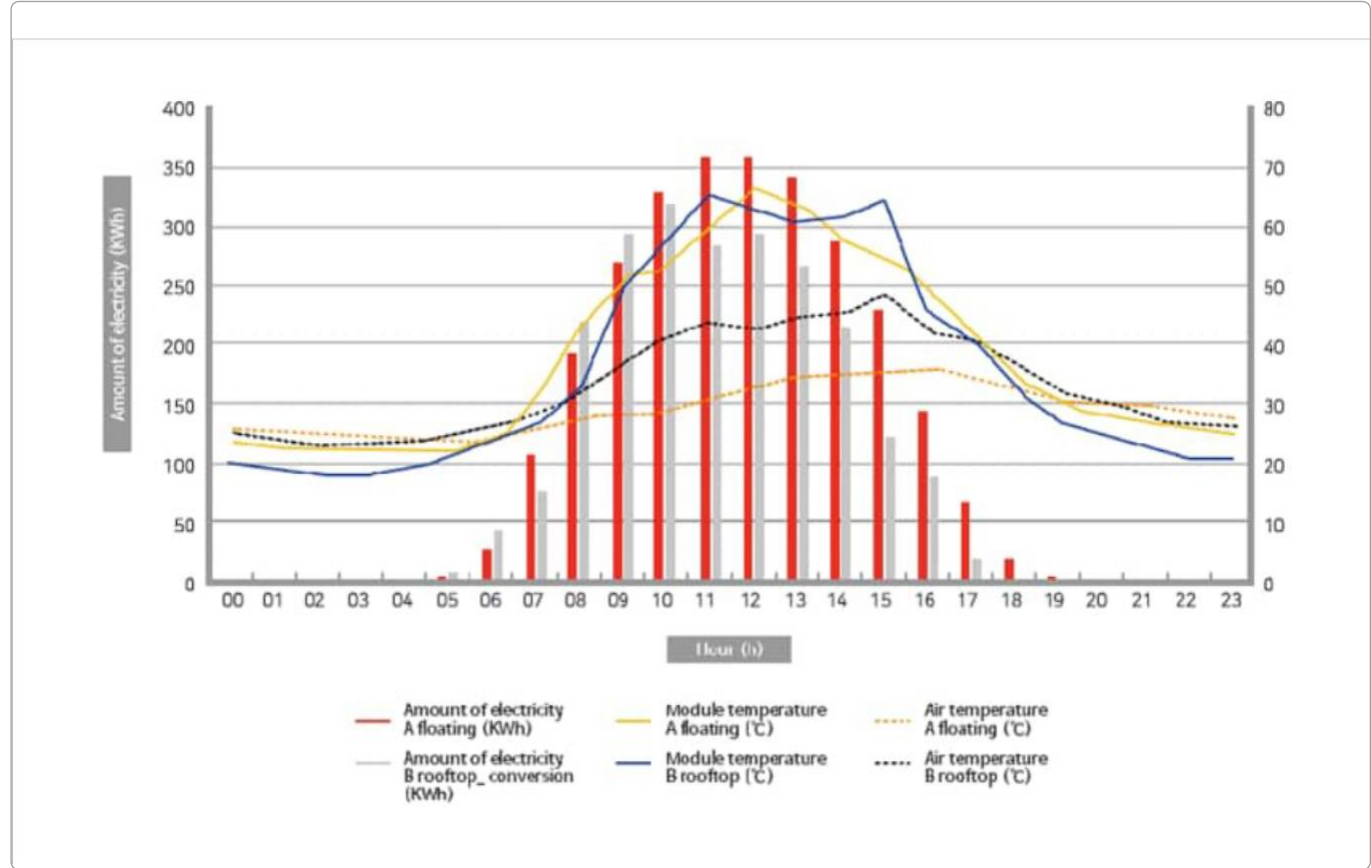
- The floating PV power grneration is same as a existing PV power generation, but it generates the power not on the land but on the surface of the water
- This system consists of the buoyant structure used for floating the PV equipment, structure connecting the floating structure, and the mooring facility for fixing the whole facilities stably.



- We install the balloon-type buoyant structure for the place where water level change is significant and the flow rate is fast such as a wide reservoir or dam and the buoyancy integral type for the place where the water level change is small and the flow rate is such as a pond or a small reservoir.

Comparison of daily data between the : A, floating PV system and B Rooftop Pv system

Due to the optimal temperature of the module, the power generation efficiency in summer when the land is not good. However, in the water, the water temperature lowers the ambient temperature, which can make it more effective



03

Feature Power compensator

Meet Access innovative photovoltaic generation device right now.

Access Photovoltaic generation device was developed in pursuit of maximization of power generation. Shadows in the module installation section. If a snowfall occurs or snow accumulates and becomes polluted, it will suffer a huge loss of Photovoltaic generation.

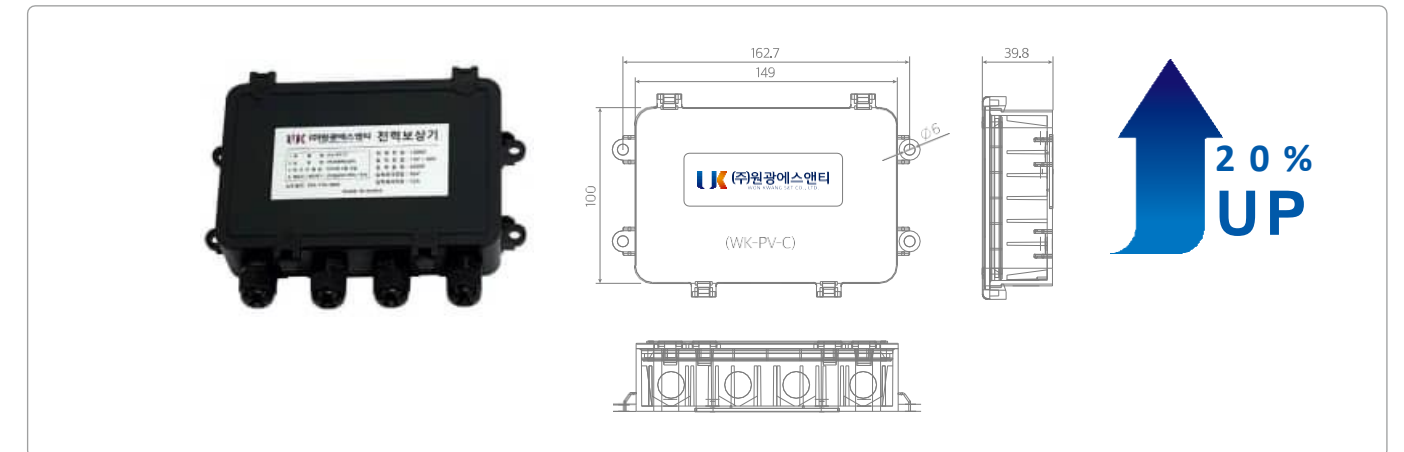
Power of Access The compensation system compensates for the lost power by converging the ICT technology for the loss of power generation caused by the decrease in output. It is the only Photovoltaic generation device that has realized the technology that maximizes the amount of power generation.

Access excellent procurement products are it will be the best choice for supplying and installing renewable energy.

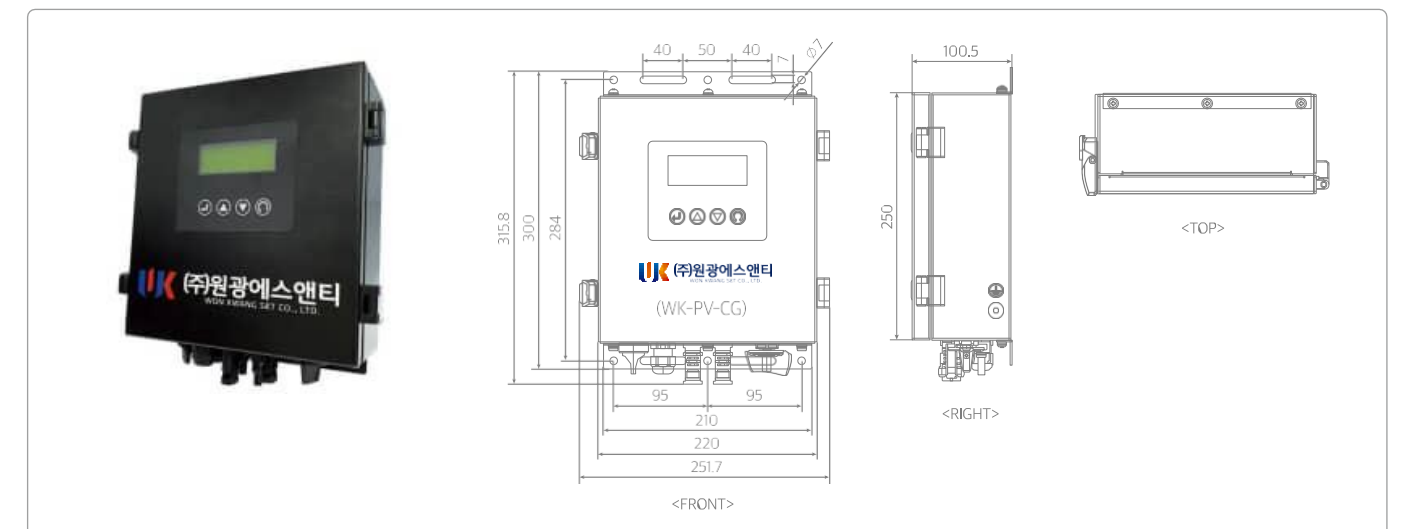
PV Micro compensator

Compensator - Excellent product, K mark Q mark

- The Output efficiency of a photovoltaic power plant reduces due to the occurrence of shading for various reasons and it is the device that compensates for the reduction.
- Improvement of power generation efficiency by more than 20% during the photovoltaic system operation period (over 20years)



Gateway - Excellent product, K mark, Q mark



KTC test report

TESTCODE.			Unit	Results		Method
				Compensator (Installed)	Compensator (not installed)	
Amount of Output	6 MODULES (1module blinded)	DAY1	k W	19.02	13.84	As suggested by the client (Access)
		DAY2		20.07	15.56	
		DAY3		24.84	16.51	
		DAY4		28.84	18.45	
		DAY5		24.87	20.11	

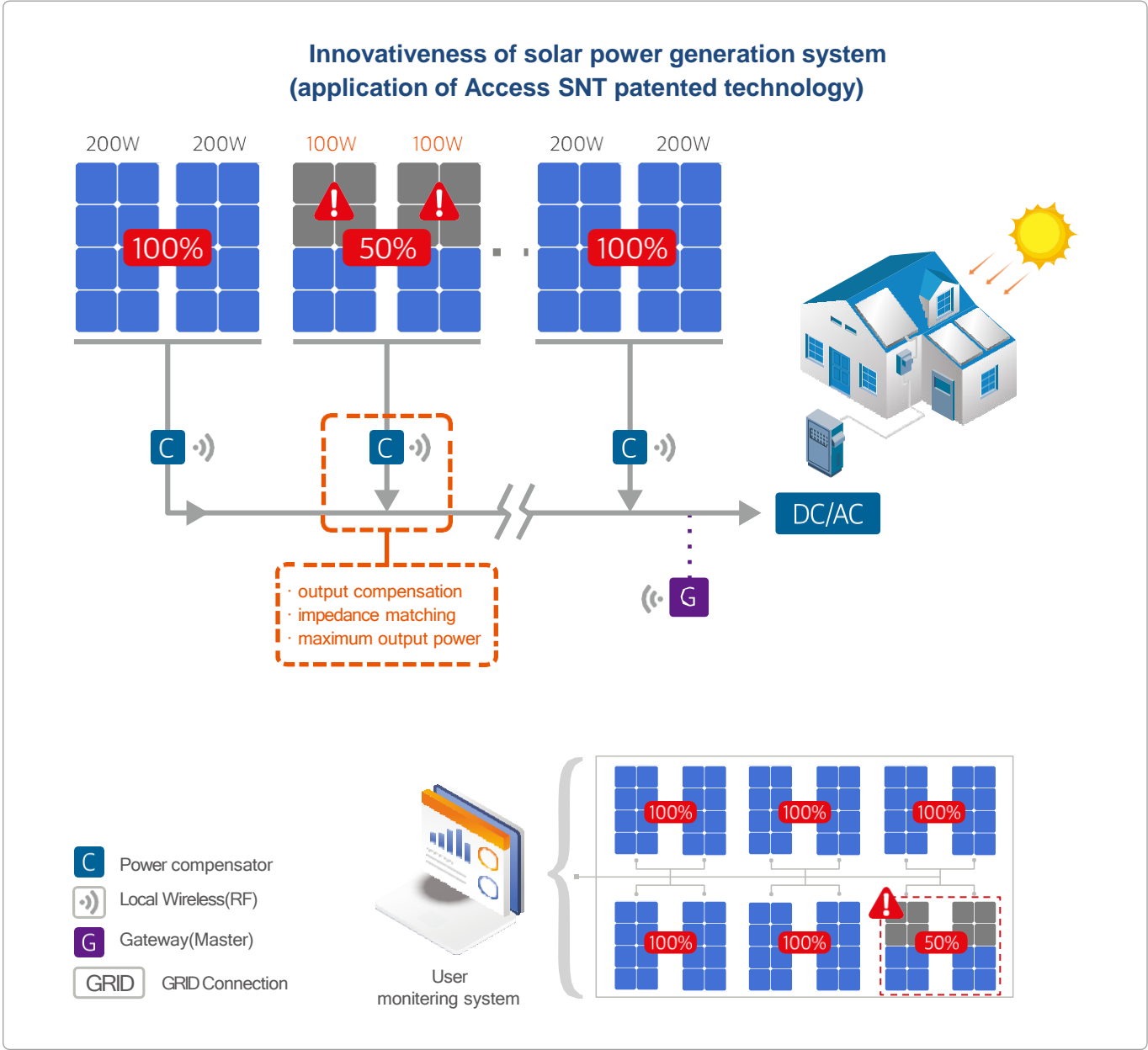


Test location : **Access** plant office Test time : AM 10:00 ~ PM 02:00 The inverter output value is the cumulative output value in the measurement time zone

Features of excellent procurement products

Introduction of Photovoltaic Compensation System

Shading by performing impedance matching according to the microcontroller control signal to solve the biggest problem of existing Photovoltaic generation devices, low power generation in the shaded section A system that maximizes photovoltaic generation efficiency by synchronizing the modules installed in the section with the maximum comparative output module connected together.



Power compensator definition and function

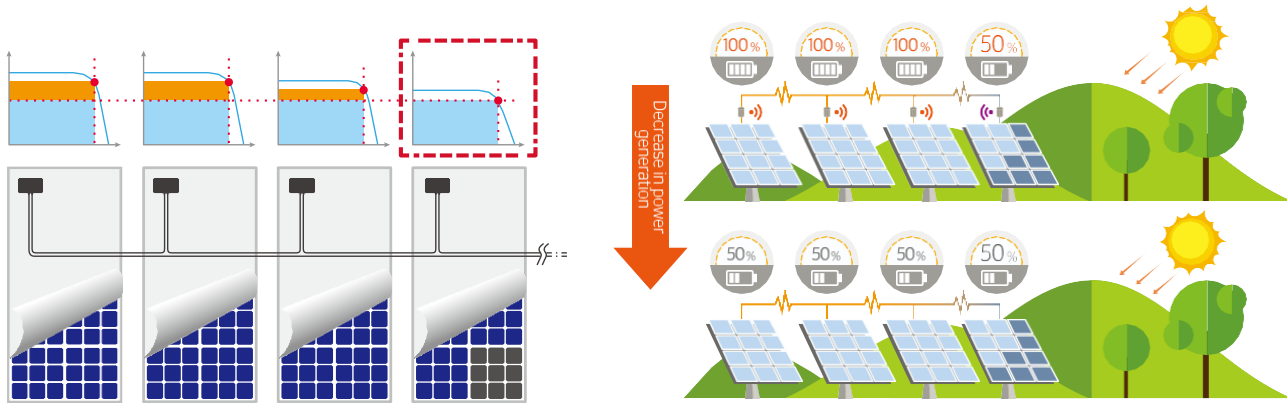
Definition : Photovoltaic Efficiency Maximization System

Function : - Power compensation technology for photovoltaic generation loss caused by shadow, snow, pollution, etc.
[Authorized testing laboratory test data]- Outstanding compatibility that can be applied not only to newly installed photovoltaic generation devices but also to existing photovoltaic generation devices

Technology and differentiation of Access

Problems of existing solar power generation systems

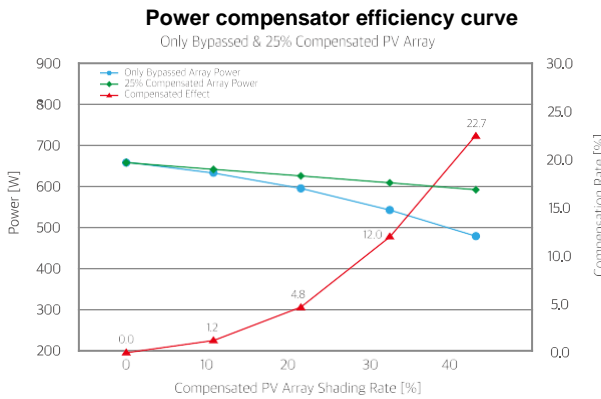
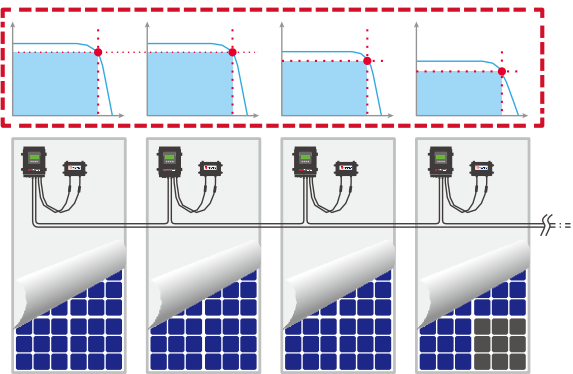
Existing solar cell modules are affected by the solar cell module with the lowest output (shadow section, etc.) However , it has limitations in obtaining the highest efficiency of the photovoltaic power generation system. In other words, the lowest power generation among solar cell modules connected in series and parallel it is adjusted to the module at the point , so the overall efficiency is reduced, which is a very serious problem in terms of operation and management of the photovoltaic power generation system



※ Power loss due to output inconsistency for each module, up to 25% generation loss due to inability to monitor low output phenomenon of shaded modules.

Differentiation and Optimization Points of Access Solar Power Generation System

Access solar power generation system is based on power control of buck boost and converter of power compensator and the effect of MPPT tracking. The output value is also synchronized with the highest output value of the neighboring module, reaching the peak of the power generation of each connected module, and the power generation efficiency is higher than that of the existing system. It is an optimal system that has been greatly improved.



※ Securing maximum power by synchronizing MPPT output for each module
※ Problems in individual modules do not affect the string

- Efficiency increased by about 15-20% compared to the existing photovoltaic power generation system (accredited institution test result)
- Individual solar modules can be monitored
- Measurement of normal operation, life span, etc. · Easing installation conditions with technology to prevent power reduction in shaded areas
- Development of a power compensator capable of improving power generation efficiency as a technology to compensate for the consumption of power generation in the shaded section, which is an obstacle to solar power generation, by converging new and renewable energy fields and ICT technology

Job reference



SeAH Gunsan



SeAH Steel 2nd Factory



SeAH Steel 2nd Factory



ICPA - 3rd Sunlight Plant



PV station, Water purification plant



Second Freeway Solar Power Plant,
Janghang Gyeonggi-do



Paju Agricultural Solar
Power Generation Plant



Seosan STP Power Plant



Blue mountain Plant, Hongcheon



Sangsang Plant, Hongcheon



Cheongju Ilpo-ri Power Plant



SK C&C IT Complex



Woori Packing



SL Lighting



LOT Vacuum



Justice Factory - Rooftop



Euro Rent Car Center



NS Shopping

Job reference



KHNP



Seawater treatment plant, Kangjin



Korea Record Institute, Sunnam



NPS, Hongseong Office



Ministry of Employment and Labor,
Pyeongtaek



KAIST Center for contemplation Science



National Institute of Forest Science



Performance test center of Drone operation



Korea Coast Guard, Incheon Korea



Samsung SDC



OTIS Elevator, Songdo center



KAIST, Smart city engineer center



Seoul Milk Factory, Yangju Korea



ENVIRONMENTAL CORPORATION
OF INCHEON, Songdo center



Senior Welfare Center, Incheon Korea



Ansan Reed Wetland, Education Center



SUPREME PROSECUTOR'S OFFICE,
INCHEON KOREA



National Institute of Biological Resources

Job reference



LH Janghangsungju APT



LH Saeyeoul community center



LH Eumsunggeumsuk APT T



LH Yeosuseokyo APT



LH Goyangjichuk APT



LH NamyangjuByeolnae APT



LH Wonjuttaejang APT



LH Daejundoan & Bongsan APT



LH Asantangjung APT



LH Pajuwoonjung APT



Bandabi Phisical Training Center,
Daejun Yuseonggu



Oryujigu liabrary, Incheon Korea



EX an expressway rest area, Chunhyang



EX an expressway rest area, Yangpyeong



Hwagae Mount. Monorail, Ganghwa



National Election Commission, Incheon



Korea Evironment Corporation - Block 7



Korea Environment Corporation -
Climate and Air Quality Division

Job re ference



Geomdan1 Elementry School



Administrative welfare center,
Sangok Incheon



Sungduk Elementry School



Baekun Elementry School



Hanul Elementry School



Milyang Elementry School



Mansu Girl's Middle School



Senior Welfare Center, Chungju Korea



Family care culture center, Ongjin



Sewage treatment pump system, Pankyo



Administrative welfare center,
Songdo Incheon



Gyeongseo Area 3 Parking Zone



Water purification plant, Sungham



KEITI-BAPV



Public health center, Incheon Seogu



KIBO-Daejun Center



Senior Welfare Center, Seoul Korea



Public liabrary, Pohang