

SHARP

50 years of innovations
in solar technology

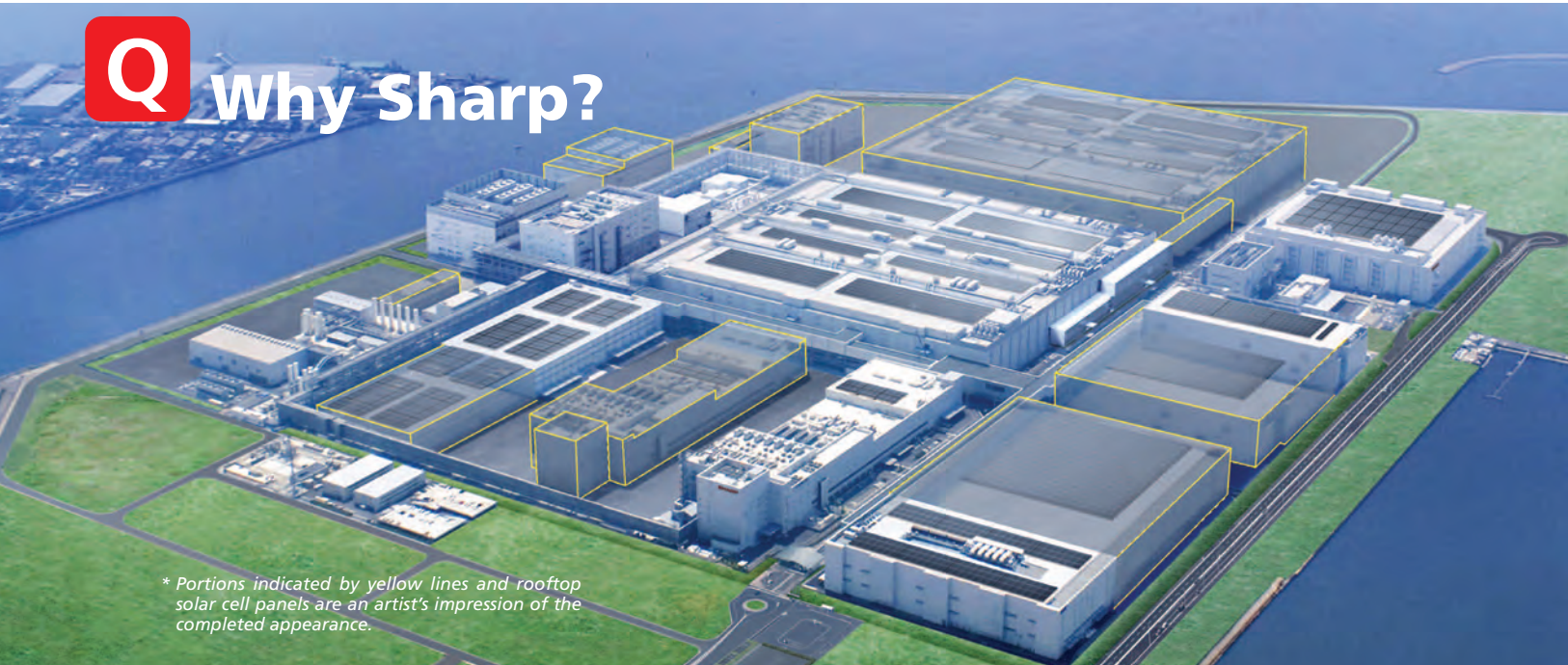


www.sharp-solar.com



The sun is the answer.

Q Why Sharp?



* Portions indicated by yellow lines and rooftop solar cell panels are an artist's impression of the completed appearance.

World-leading environmentally advanced factories

We aim to achieve large-scale solar power generation systems by using available space such as the roofs of buildings within the site. The electricity produced will provide a portion of the power used by the factories.



When you choose Sharp, you get 50 years of proven reliability and outstanding innovations.

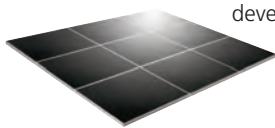
It's been nearly half-century since Sharp's first reliable solar-power solution was first used in a lighthouse. Since then, Sharp has made countless innovations and has grown to a global leader in solar, offering a portfolio of proven solar solutions including monocrystalline, polycrystalline and amorphous silicon.

From the world's first solar-powered calculator to solar-powered residential, commercial and government applications, Sharp powers more homes, businesses and government entities than any other solar manufacturer in the world. And what's more, Sharp is one of the only PV manufacturers that's been in business longer than anyone else.

Advanced thin-film technology.

Currently our tandem-type thin-film solar cell panel in which a layer of amorphous silicon and micro crystal silicon are applied to a glass substrate has achieved an impressive 9.5% module conversion efficiency. To further boost conversion efficiency, we are

developing a triple-type junction with three silicon layers. At our new plant, we are vigorously striving for improved conversion efficiency of our solar panels.



Sakai Solar Power Station

Our Vision

Sharp, a world leading solar company has been developing sun-fueled energy solutions for half a century - and delivering them to people all over the planet.

Contributing to society through our solar business.

Half a century ago, in 1959, Sharp began developing solar cells. As a manufacturer of products that consume electricity, we've always felt it's our responsibility to create electricity as well. No other companies were thinking like that 50 years ago. We were one of the first to realize the potential of solar energy and have continued to develop it ever since. From lighthouses to space satellites to mega solar power plants, Sharp has been providing reliable solar solutions in an effort to free the world from carbon dependency.



Where have we been over the past 50 years?

Innovations



Powering Japan's space programme

For space application, light weight and high conversion rate are the most desired properties for solar cells. The lighter and higher the efficiency of the cell, the more space the satellite will have for other important equipment. Development started and production of solar cells for space began in 1970. By 1976 the working satellite "Ume" was launched with Sharp's solar cells on board.

Sharp continues to make progress with leading-edge development projects as a designated supplier for the only outer-space development facility in Japan (JAXA), and had installed solar cells on 160 satellites as of December 2010.



▼1966 PV panels power Ogami Lighthouse, Japan

▼1972 National Space Development Agency of Japan, NASDA (now JAXA) authorised Sharp's solar cell for use in space

▼1970 Launches production of solar cells for use in space



▼1963 The world's first buoy supplied with solar cells. Yokohama Bay, Japan

▼1959 Begins development of solar cell

1970

▲1967 Develops solar cells for use in space

▲1963 Launches mass production of solar cells



▲1961 Develops first transistor radio. The first consumer product to use solar cell.

1960

▲1912 Sharp begins operation



▼2010
Next-generation solar plant in Sakai City comes online



▼2010
Tokai University's solar car equipped with Sharp solar cells wins second consecutive victory in the Republic of South Africa



▼1976
First calculator with solar cell batteries released.

▼1980
Begins R&D of thin-film solar cell technologies

▼1988
Cell conversion efficiency for amorphous silicon solar cells reaches 11.5%

1990

▼2000
Becomes the world's leader in annual solar cell production

▼2007
Katsuragi plant expands production capability of thin-film solar cells to 160MW per year

2010

1980

▲1981
Operations began at the Katsuragi Plant.

▲1992
Cell conversion efficiency of 17.1%, the world's highest for polycrystalline solar cells, is achieved.

▲2001
Commercialization of a residential hip roof accommodating system

▲2003
Space photovoltaic module installed on Satellite Observatory "Free Flyer" (SFU)

▲1992
The world's highest cell conversion efficiency of 22% for single-crystal type solar cells capable of mass production is achieved

▲2005
Launches mass production of thin-film tandem solar cells (amorphous silicon and microcrystalline silicon)

▲2007
Attains the world's first 2GW of accumulative solar cell production



▲1976
The first Japanese operational Ionosphere Sounding Satellite "Ume" had 4,940 Sharp's photovoltaic modules on board for power supply.



▲2009
Tokai University wins 2009 Global Green Challenge in solar car equipped with Sharp solar cells.



A heritage of more than 50 years of solar innovation.



What are our solutions?

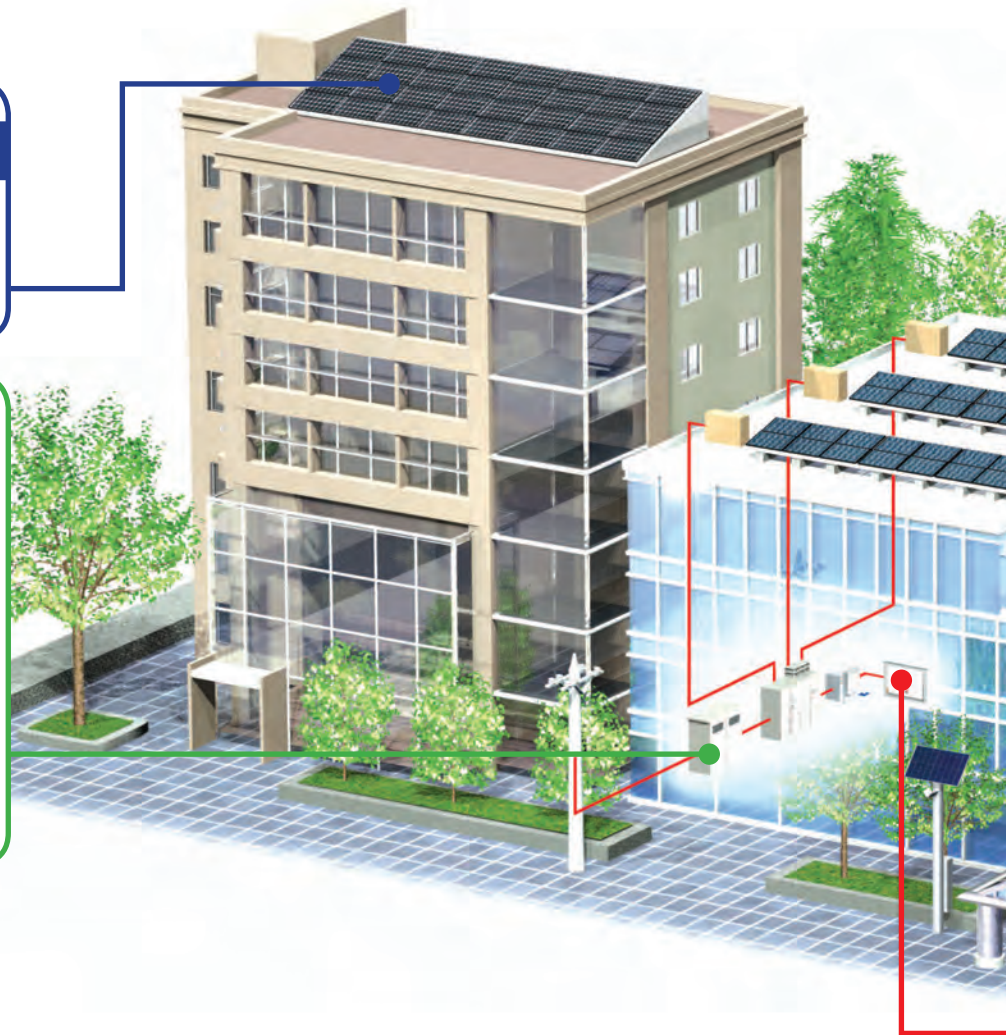
Monocrystalline cells

Monocrystalline cells produce a sustained, reliable yield even under demanding conditions. Suitable for installation in grid-connected systems.

Inverter unit

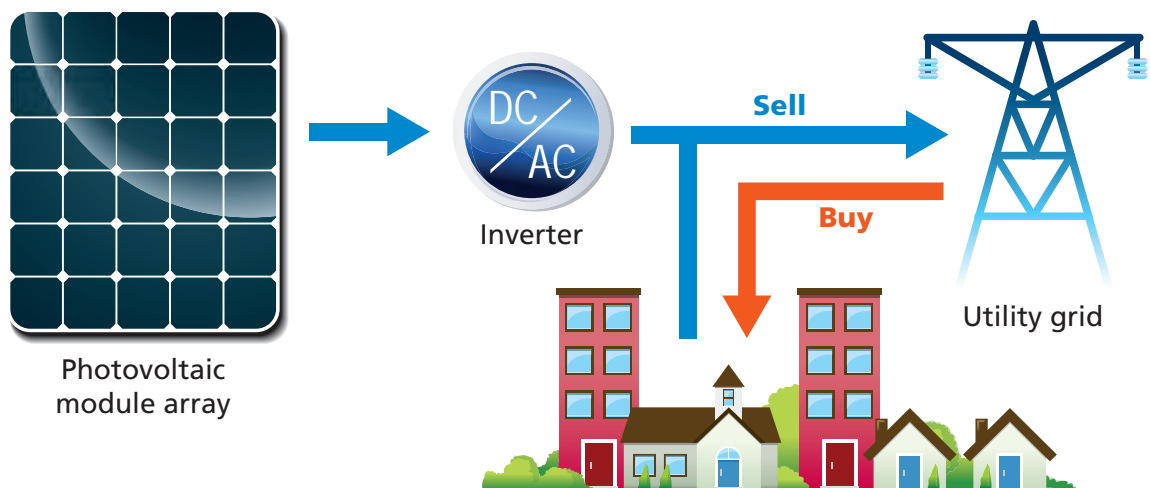


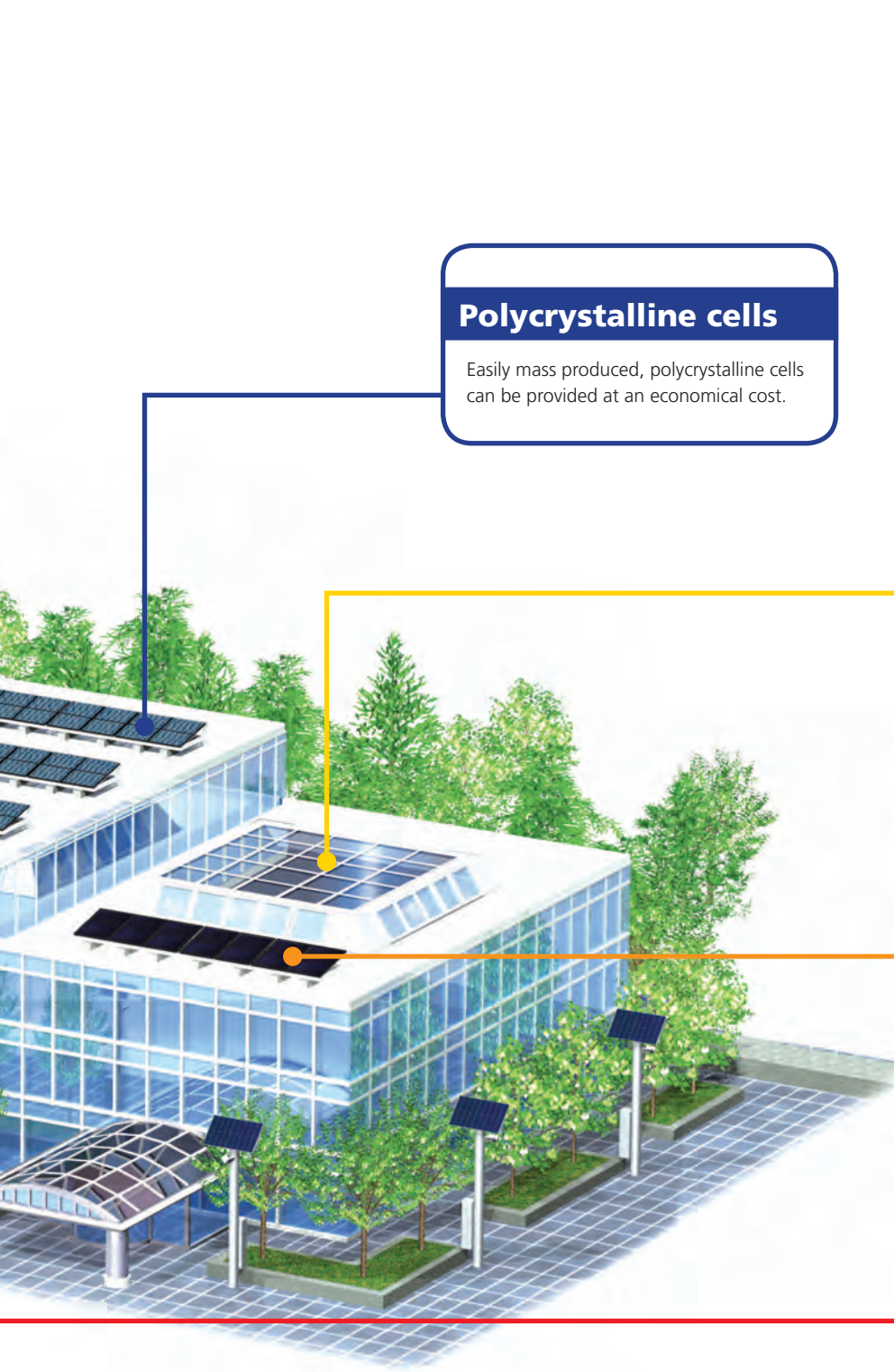
Perfectly matched to Sharp modules and mounting hardware, it is also compatible with many other manufacturers' systems, and is ideal for both residential and commercial applications. Available in 14, 100 & 250kW



Grid-connected photovoltaic power generation system

A Building Integrated Photovoltaics (BIPV) system is connected to the local utility electricity grid. Excess electricity generated during the day is fed to the grid which services the local load. Conversely, when more electricity is needed, electricity is drawn from the grid.





Polycrystalline cells

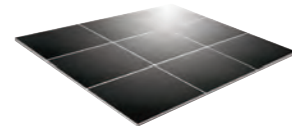
Easily mass produced, polycrystalline cells can be provided at an economical cost.

See-through thin-film modules



These modules do not block the view outside and moderately shade strong light and heat of sunshine, thereby reducing the use of electricity for air conditioning. These thin-film, see-through photovoltaic modules are low-cost, next-generation silicon photovoltaic modules

Thin-film modules



Microamorphous tandem structure provides effective utilisation of solar energy. Modules offer optimal system integration and are suitable for installation in on-grid and off-grid systems.

Monitoring systems



Sharp Solar systems are designed for easy installation and unmatched ease of use. Our attractive solar power monitor has finger-touch controls with clear, easy-to-read messages and graphic readouts. Sharp's fully-integrated systems assure component compatibility and efficiency.



Innovations

Sharp's new thin-film technology

Sharp's thin-film silicon solar cells use only 1/100 the amount of silicon but has a wider light absorption range. Our current thin-film technology has been proven to have a higher yield compared to crystalline cells.

Our thin-film panels have a high infra-red absorbency rate is specially designed for tropical hot weather and is known to perform extremely well in cloudy conditions.



Solar Power Plants



Tenerife Island Mega Solar Power Plant Canary Islands, Spain

- Technology: Crystalline modules
- Installation: Power plant
- Capacity: 12.6MW



Power Plant Osaka, Japan

- Technology: Thin film
- Installation: Power plant
- Capacity: 10MW



Bavaria Solar Power Plant Germany

- Technology: Crystalline modules
- Installation: Power plant
- Capacity: 10.1MW



Power Plant California, USA

- Technology: Thin film
- Installation: Power plant
- Capacity: 6.3MW



Solar Power Plant Sonnen, Germany

- Technology: Crystalline modules
- Installation: Power plant
- Capacity: 1.7MW



World Bank Project Mindanao, Philippines

- Technology: Crystalline modules
- Installation: Power plant
- Capacity: 1MW

 **Solar Power Inverter**



Tokyo International Airport
Tokyo, Japan

- Technology: Thin film
- Installation: Roof top

Capacity: Total 2MW
(250kW x 8 units)



L&T
Chennai, India

- Technology: Thin film
- Installation: Roof top

Capacity: 120kW x 3 Units,
14kW x 7 Unit



Ballarat Solar City
Australia

- Technology: Crystalline modules
- Installation: Free Field

Capacity: 333kW



KANSAI Electric
Osaka, Japan

- Technology: Thin film
- Installation: Free Field

Capacity: Total 10MW
(250kW x 40 units)



Rengo Factory
Fukushima, Japan

- Technology: Thin film
- Installation: Free Field

Capacity: Total 1500kW
(250kW x 6 Units;
100kW x 1 Units)



NEDO Project Wakkanai site
Hokkaido, Japan

- Technology: Thin film
- Installation: Free Field

Capacity: Total 900kW
(250kW x 2 Units;
100kW x 4 Units)



Corporate



KL Sentral Kuala Lumpur, Malaysia

- Technology: Thin film
- Installation: Roof top

Capacity: 164kW

Photo courtesy of Pekat Teknologi Sdn Bhd



Lion Eco Complex Pasir Gudang, Johor, Malaysia

- Technology: Crystalline modules
- Installation: Roof top

Capacity: 46.2kW



Green Technology Office Bangi, Malaysia

- Technology: Crystalline modules
- Installation: Roof top

Capacity: 27 kW



Auto Distribution Centre Germany

- Technology: Crystalline modules
- Installation: Roof top

Capacity: 3.2MW



Oakland International Airport United States

- Technology: Crystalline modules
- Installation: Roof top

Capacity: 904kW



HSBC Building London, England

- Technology: Crystalline modules
- Installation: Roof top

Capacity: 100kW



Hybrids



Tribrid System

Perhentian Island, Malaysia

- Technology: Crystalline modules
- Installation: Micro grid
- Capacity: 100kW (for PV only)



Rural Power Supply

Sinulihan Village, Sabah, Malaysia

- Technology: Crystalline modules
- Installation: Ground mounted
- Capacity: Total 510kW for 10 sites



Rural Power Supply

Pulau Banggi, Sabah, Malaysia

- Technology: Crystalline modules
- Installation: Micro grid
- Capacity: 200kW



Rural Power Supply

Kinabatangan, Sabah, Malaysia

- Technology: Crystalline modules
- Installation: Micro grid
- Capacity: Total 430kW for 3 sites



Rural Schools Project

Sabah, Malaysia

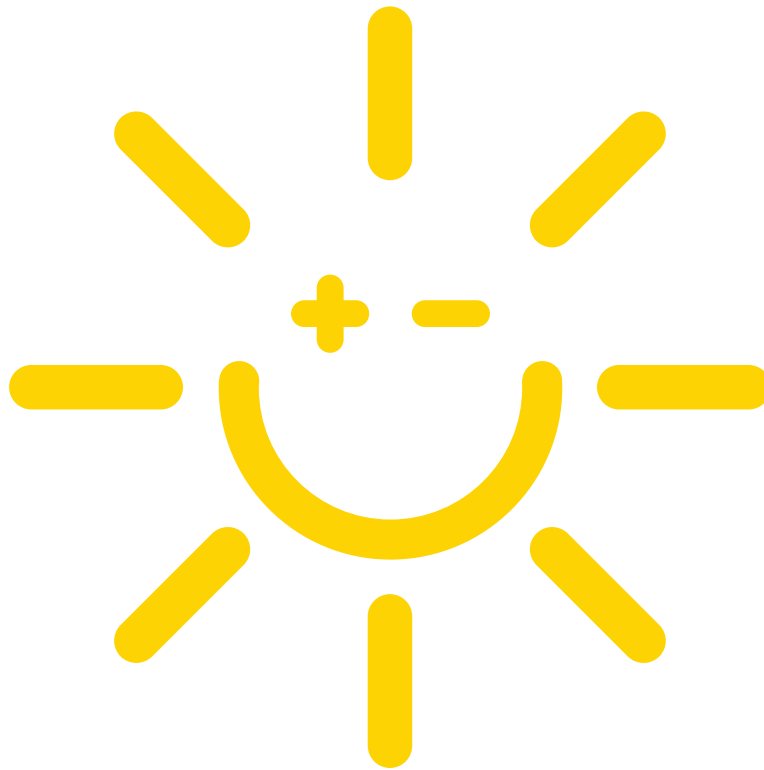
- Technology: Crystalline modules
- Installation: Power plant
- Capacity: 10 - 30kW for 10 rural schools



Village Power Centre

Mongolia

- Technology: Crystalline modules
- Installation: Micro grid
- Capacity: 100kW



A world leading solar company.

Sharp-Roxy Sales & Service Company (M) Sdn Bhd

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