



SOLAR
FRONTIER

Corporate Profile

Creating the most economical and ecological solar energy solutions on Earth.





Our Mission:

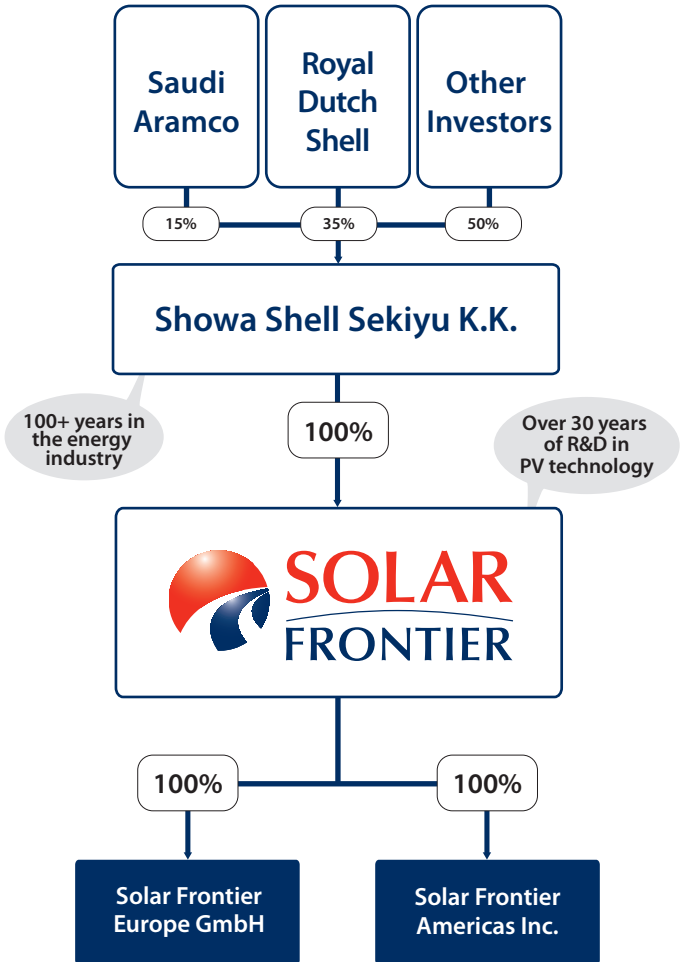
**To create the most
economical and ecological
solar energy solutions on Earth.**

Our Company

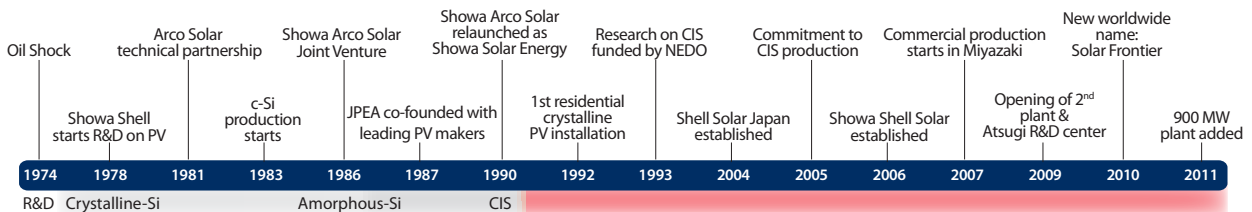
Solar Frontier K.K. is the world's largest and fastest-growing manufacturer of CIS thin-film photovoltaic (PV) modules. We are leading the commercialization of revolutionary CIS PV to help the world achieve a sustainable energy portfolio. In 2011, we brought on line the largest CIS manufacturing plant in the world, raising Solar Frontier's annual production capacity to gigawatt-scale across three factories in Miyazaki, Southern Japan. We are headquartered in Tokyo, have over 1500 employees and staff, and operate regional offices in Germany, Saudi Arabia and the United States.

Combining world-record efficiencies, uncompromising engineering standards, and excellent bankability, we offer our customers more kilowatt-hours, reliability, and ecological peace of mind. To date, we have supplied over 200 MW of our CIS modules across a wide range of sectors and geographies, ranging from residential rooftop installations in Japan to utility power plants in countries such as France, Germany, India, Thailand, Saudi Arabia and the USA.

Solar Frontier is a wholly-owned subsidiary of Showa Shell Sekiyu K.K. (TYO: 5002), which is listed on the Tokyo Stock Exchange. Showa Shell Sekiyu has over 100 years of experience operating in the energy business and is based in Tokyo. Solar energy is the company's second core business, along with petroleum products, as part of its medium-term strategy.



Our History



Solar Frontier leverages over 30 years of leadership in solar R&D and over 100 years of energy expertise derived from our parent company, Showa Shell Sekiyu. Spurred by the oil crises of the 1970s, we began developing solar technologies in collaboration with the Japanese government and academia, and early industry leaders such as Arco Solar. In 1993, we identified CIS as having the greatest potential of any PV technology. We ramped up our first plant in 2007, followed two years later by our second plant. By July 2011, we achieved full commercial operation of the world's first gigawatt-scale CIS production facility – also Japan's largest PV production plant – just 21 months after breaking ground.

Our Strategy

Solar Frontier is determined to reduce the costs of solar energy, while minimizing its ecological impact. With gigawatt-scale production capacity, our scale coupled with our proprietary CIS technology can help our customers achieve the lowest cost per kilowatt-hour with the least effect on the environment.

To this end, we are expanding our global network by working with major system integrators, distributors, project developers, and utilities. Our offices in Japan, Germany, Saudi Arabia, and the United States ensure that we respond rapidly and flexibly to local, regional, or global developments.

Our Financial Strength

Showa Shell Sekiyu, one of Japan's oldest and leading energy companies, has made solar energy its second core business as part of its medium-term growth strategy. It provides Solar Frontier with group resources to enable rapid-scale expansion.

In 2010, Showa Shell Sekiyu had net sales of USD 28 bn¹ (JPY 2,346 bn) and total assets of USD 14 bn (JPY 1,193 bn). Showa Shell Sekiyu is 35% owned by Royal Dutch Shell, the second largest energy corporation in the world by revenue².

Our R&D



The Atsugi Research Center (ARC) was established in 2009 with an investment of USD 83m (JPY 7bn). Its goal: to extend the boundaries of CIS conversion efficiencies on large substrates and to develop gigawatt-scale mass production machinery.

The ARC has set numerous world records, including 17.2% conversion efficiency on a 30 cm by 30 cm substrate. Our product roadmap applies this technology to mass production in shorter periods while also achieving new efficiency records.

The ARC works with specialized equipment makers to develop Solar Frontier's production lines, while jointly exploring next-generation, cost-reducing CZTS (copper, zinc, tin, selenium, sulfur) PV technology with IBM.

Our Bankability

Designed for durability, proven for reliability, and advanced in capability, Solar Frontier's CIS technology has gained the trust and confidence of major customers worldwide. Black & Veatch, an independent and global engineering, consulting, and construction company, has issued a report after assessment of Solar Frontier and its technology, while the quality of our panels is verified through the Atlas 25+ comprehensive PV durability testing.

But equally important is proving to new customers our status as industry leaders. Solar Frontier leverages over 30 years of technological leadership and the over 100 years of energy experience of its parent company, Showa Shell Sekiyu. Solar Frontier is the first Japanese PV module manufacturer to receive warranty insurance from Munich Re, as well as optional coverage for project finances.

Atlas 25+
Black & Veatch
Munich Re

1: All financial data in this document calculated using FOREX USD-JPY exchange rate - December 2010

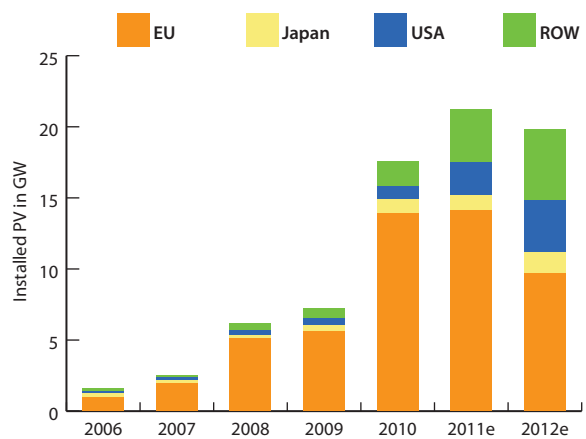
2: Forbes Magazine

“It has been such a long time since Japan has seen a bullish player like Solar Frontier.”

Nikkei Business, August 2011

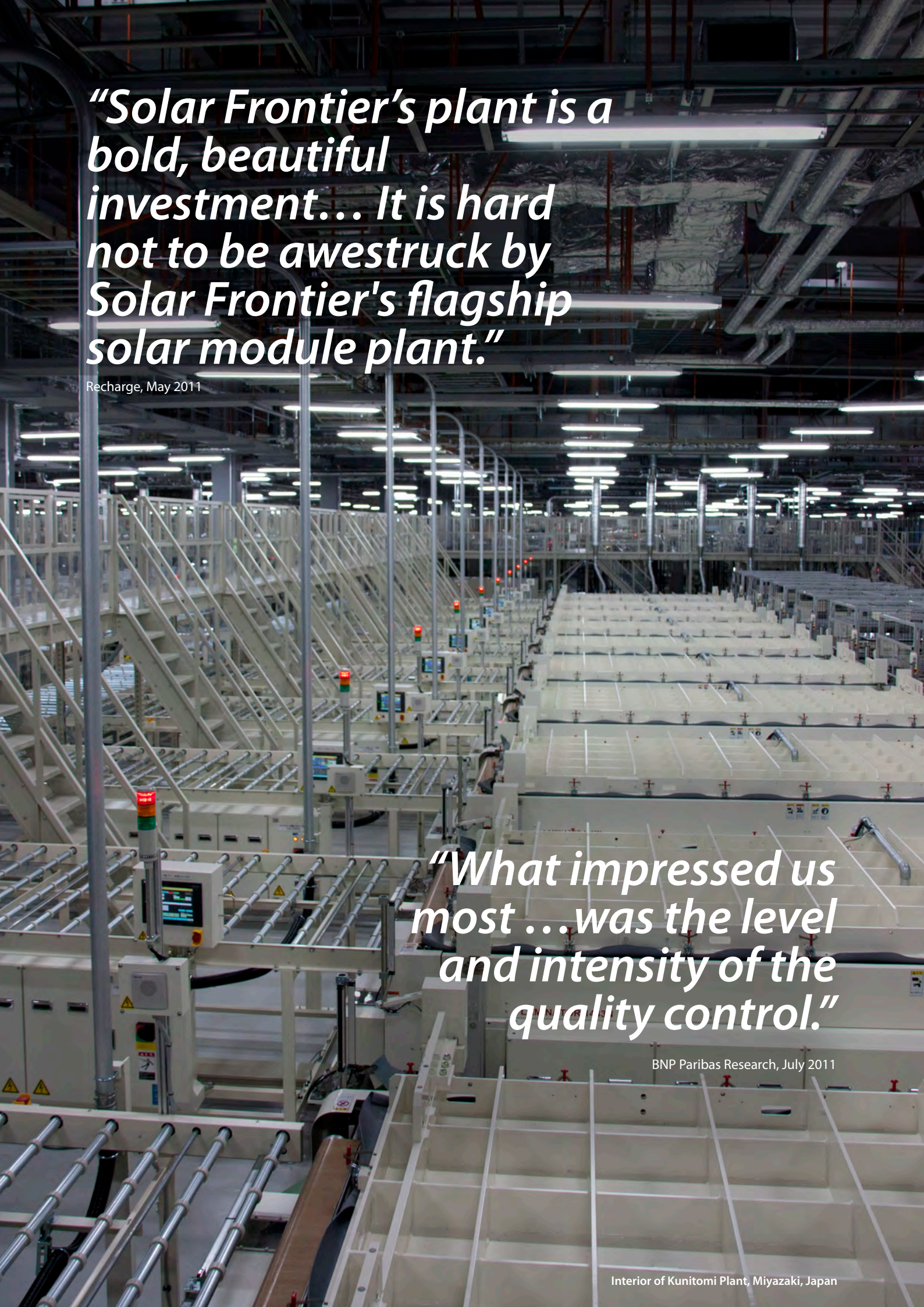
The Global Photovoltaic Market

According to industry data, global installed PV capacity additions more than doubled from 7.2 GW in 2009 to 16.6 GW in 2010, the largest increase to date. This has raised global cumulative capacity to about 40 GW. Germany and Italy took the lion's share of capacity additions, joined mainly by their European peers. The EU will continue to install a significant portion of global capacity, while PV markets in the US, Japan, Asia, and the Middle East, are expected to rapidly scale up. We anticipate immense growth to come.



Global PV Market Estimate 2012

Source: EPIA, iSuppli



“Solar Frontier’s plant is a bold, beautiful investment... It is hard not to be awestruck by Solar Frontier's flagship solar module plant.”

Recharge, May 2011

“What impressed us most ... was the level and intensity of the quality control.”

BNP Paribas Research, July 2011

Interior of Kunitomi Plant, Miyazaki, Japan

Our Product

Economy

Unique CIS properties such as light soaking result in up to 10% more kilowatt hours per kilowatt peak than conventional solar panels.

Power Stability

Superior circuitry design ensures stable output when partially covered by shadows, and CIS modules can absorb a wide range of light frequencies.

Safety

Solar Frontier's CIS panels use zero cadmium, are lead-free³, and are certified as compliant with the European Union's Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) directive.



Reliability

Solar Frontier's CIS modules have been tested in a wide range of environments – from outer space to desert extremes. They are certified for major international quality and safety standards.

Ecology

Solar Frontier modules have an Energy Payback Time⁴ of under one year for our CIS panels, compared to 2.5 years for monocrystalline. Solar Frontier panels currently have no special recycling requirements.

Design

All-black Solar Frontier modules have a chic appearance and are well-received by residential and commercial customers.

Our Production

Solar Frontier is the first CIS manufacturer to produce at gigawatt-scale capacity. At 900 MW capacity, the Kunitomi Plant is the largest CIS production plant in the world, as well as the largest PV plant in Japan. It follows the successful commercialization of Miyazaki Plant One and Miyazaki Plant Two, which have respective annual capacities of 20 MW and 60 MW.

Integral to achieving economy and ecology are our proprietary, raw-materials to finished-module production lines, all engineered at our Atsugi Research Center. Through a high degree of automation, we ensure lower production costs and maximum quality and throughput. The Kunitomi Plant only requires about 800 staff at full capacity. Our production process also requires significantly fewer raw materials and energy, resulting in an energy payback time of 0.9 years.

All Solar Frontier process control and product control measurements are based on procedures specified by ISO, using an automatic checking and recording system. The entire control process is traceable through serial numbers set in glass-embedded 2D barcodes, verified through third-party due diligence to be "among the best in class."



Plant Miyazaki Plant One
Site Area 25,000 m²
Capacity 20 MW/year
Employees 80+
Investment USD 60m (JPY 5bn)



Plant Miyazaki Plant Two
Site Area 50,000 m²
Capacity 60 MW/year
Employees 200+
Investment USD180m (JPY 15 bn)



Plant Kunitomi Plant
Site Area 400,000 m²
Capacity 900 MW/year
Employees 800+
Investment USD 1.2bn (JPY 100 bn)

3: As defined by RoHS

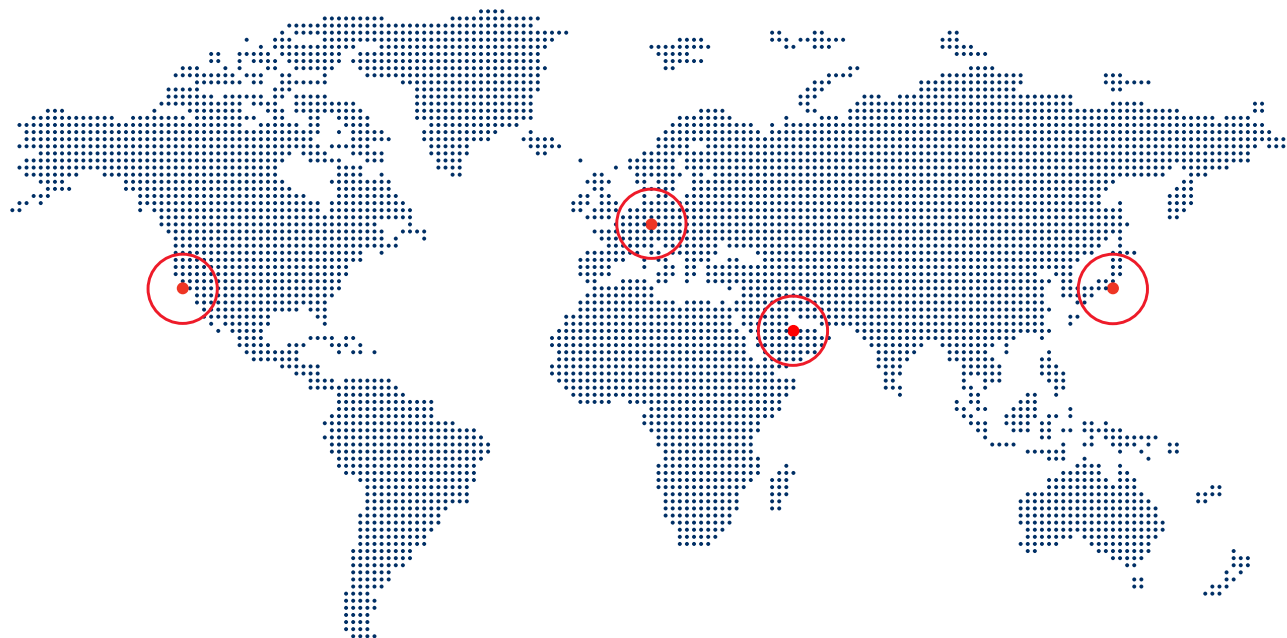
4: Energy Payback Time (EPT) is the time required for a solar panel to generate the same amount of electricity spent in its production.



Company Profile at a Glance

Company name	Solar Frontier K.K.
Representative Director	Shigeaki Kameda, President
Main activities	Manufacturing, selling and exporting of CIS photovoltaic modules
Shareholders	Showa Shell Sekiyu K.K. (100%) Listed on the Tokyo Stock Exchange (TYO:5002)

Management	
President	Shigeaki Kameda
Director	Shigeya Kato
Director	Jun Arai
Director	Richard Carruth
Corporate Executive Officer	Hiroshi Yoshida
Corporate Executive Officer	Atsuhiko Hirano
Corporate Executive Officer	Tomoaki Ito
Executive Officer	Katsumi Kushiya
Executive Officer	Brooks Herring
Executive Officer	Satoru Kuriyagawa
Executive Officer	Colin Chua
Executive Officer	Toshiyuki Tai
Executive Officer	Yukihiro Oyama
Executive Officer	Wolfgang Lange



Americas

Solar Frontier Americas Inc.
3945 Freedom Circle
Santa Clara, CA 95054
USA

Tel: +1 408 916 4150

Europe

Solar Frontier Europe GmbH
Bavariafilmplatz 8
82031 Grünwald bei München
Germany

Tel: +49 89 92 86 142 22

Middle East

Solar Frontier K.K.
Technical & Scientific Office
Eastern Cement Tower, #306
King Fahd Road
Al Khobar
Kingdom of Saudi Arabia

Tel: +966 3882 0260

Asia (HQ)

Solar Frontier K.K.
Daiba Frontier Building
2-3-2 Daiba, Minato-ku,
Tokyo 135-8074
Japan

Tel: +81 3 5531 5626

www.solar-frontier.com