

REVIEW OF OPERATIONS

CIS SOLAR POWERED CELLS



Shigeaki Kameda
Senior Executive Officer,
Showa Shell Solar K.K.
President and Representative Director

Overview of Business Operations

In recent years world demand for solar powered cells is said to be growing at an annual rate of 30 to 40% and we see this as a valuable business opportunity with enormous potential. In accordance with our plans to grow business in next generation CIS (copper, indium, selenium) solar powered cells (hereafter "CIS") as our second core business, we made a decision in 2005 to commercialize the product and proceeded with the construction of our first plant. An investment of approximately 5 billion yen, in 2007 we completed the Miyazaki Plant (annual capacity of 20 megawatt worth of CIS), and commenced commercial production in July. During the plant's inaugural year, we placed priority on stable operation of the plant and the accumulation of production know-how.

Product Superiority

The CIS that Showa Shell produces are made up of three main elements: copper, indium, and selenium. One of the notable features of CIS is the thickness of each cell, which is only about two to three micrometers, or about 1/100 the thickness of crystal silicon cells. A further advantage is the availability of the materials used in CIS. Unaffected by market conditions for silicon, CIS materials can be stably supplied at a low cost. The amount of materials and energy required during production are also modest, and energy payback time (EPT), which indicates the amount of time it takes until the energy input during production is recovered through solar power generation, has been reduced to about half that required for conventional crystal silicon cells.

At the same time, CIS has properties superior in spectral sensitivity, so it is able to absorb light waves over a wider range than conventional solar powered cells and therefore can be expected to have greater electric power generation capacity. Moreover, unlike conventional solar powered cells which cease to function when a part of the cells is in the shade (one of the weaknesses of the traditional cells),

CIS is able to maintain stable generation, powered solely by the areas on which the sun is shining.

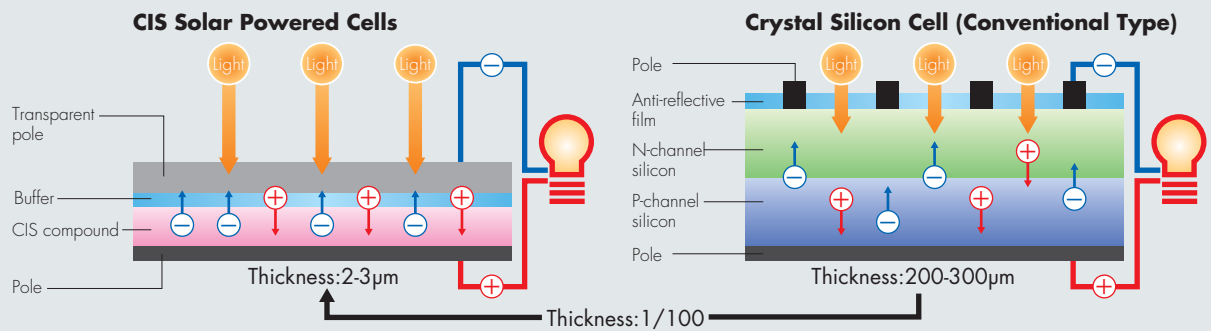
In addition to the superior features of CIS, Showa Shell's achievements in product technology in this area have also received acclaim. In February 2008, we received the METI* Minister's Award, the highest award presented at the 12th New Energy Awards sponsored by the New Energy Foundation. We also received further distinction when we were presented with the Ecology Design Prize in the Good Design Award 2007, sponsored by the Japan Industrial Design Promotion Organization. We believe that Showa Shell received these awards not only in recognition of the significant reduction in the burden on the environment our solar-powered products will achieve but also in recognition of the company's innovation in production technology and potential to improve performance, the prospects for cost cutting through mass production, and the future potential of the superior product design.

*METI: Ministry of Economy, Trade and Industry

Plans for 2008 and Outlook for the Future

We plan to make 2008 a year in which we solidify our operational base in both production and sales in anticipation of reaching a new benchmark in the expansion of our business. We have already commenced construction of a second facility in which we are investing approximately 15 billion yen and will have an annual capacity of 60 megawatt worth of CIS. We anticipate commencing operation of the new facility during the first half of 2009. Building on the knowledge we have gained from our first plant, we will pursue further improvements in product quality and cost competitiveness, and on the strength of these we aim to boost profitability.

As we proceed with the construction of the second facility, we will at the same time make concrete plans for a framework for future business expansion. The challenges



ahead for us are to determine how we can mass produce our products, which have high technical superiority, at a competitive cost, deliver them at a rapid pace to markets in Japan and overseas, and maintain and improve adequate earnings as a business. While there are a number of criteria that we must satisfy to achieve these objectives, our experience to date has given us a sound understanding of what is required. Therefore, we are currently reviewing a number of areas from various perspectives including reinforcement of our R&D framework and securing the necessary management resources.

By achieving business expansion at a rapid pace, we hope to realize high profitability and growth potential, which will provide strong support for our core business and to meet the expectations of our stakeholders.



With excellent design, CIS solar powered cells can be attractively fitted to various types of buildings

Quest for Commercialization

Amid growing concern about environmental problems and how we should address global warming, solar cells are promising as a clean energy alternative to oil. In 1978 Showa Shell commenced research in solar cells and in 1993 was commissioned by NEDO to start research on CIS. We continued our efforts in the practical application of our research, which included the experimental mounting of CIS on the mission demonstration test satellite Tsubasa MDS-1. In 2005 we made a decision to commercialize CIS and established Showa Shell Solar K.K. in September 2006 for this purpose.



Receiving the METI Minister's Award, the highest of the New Energy Awards