

Will the Sun Rise on BIPV markets beyond Japan?

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Photo: Bloomberg

In the booming solar photovoltaic (PV) power market, Building Integrated Photovoltaic (BIPV) has been an underdog. High cost of installation, lack of awareness amongst the real estate developers, unsupportive policies, integration issues and supply bottlenecks have constrained this segment of the industry worldwide. But Japan has been fairly successful in embracing BIPV on a remarkable scale, thereby leading other countries in the region.

What are the factors behind Japan's success and what can other countries learn from this?

Light of the World

Globally, Japan is the leader in the field of BIPV systems constituting nearly 40.0 percent of the installed capacity. Its phenomenal

success has been largely attributed to the strong government policy and support which emphasized on achieving low carbon emission levels by 2010 as per the Kyoto Protocol. This was backed up by tremendous interest shown by the urban planners, architects, builders and real estate companies. Centralised PV systems cannot be installed due to the scarcity of open tracts of land in the country. This has indirectly benefited the growth of BIPV systems in urban areas.

High costs of installation have been cited as one of the major reasons for the sluggish development of BIPV systems in other Asian countries, whereas in Japan, large-scale commercialisation of this application has in fact reduced the costs. This is mainly attributed to the local manufacturing base for PV systems where the country dominates over 40.0 percent of global production. In Japan, there are nearly thirteen major manufacturers who focus on developing products for BIPV application. Whereas in other Asian countries BIPV systems are still dependent on imports.

The Price of Progress

Another major driver for the BIPV market, especially among the residential end-user segment in Japan, has been because of the very high cost of grid electricity. The electricity tariff for the residences and housing complexes are considerably higher than what is charged for the industrial segment.

The Subsidy Program for Residential PV Systems launched in 1994 aggressively promoted the usage of BIPV systems among the residential end-users.

To lead by example, the Prime Minister's residence, the Japanese Parliament, and other major government buildings have BIPV systems on roof-tops.

The country aims to cover nearly 50.0 percent of its residential power load from BIPV systems by 2030. On the other hand, cheap as well as subsidised electricity rate from the utility grid to the residential end-user segment deters BIPV adoption in other Asian countries.

Innovations

Japan also leads from the forefront in BIPV application with a robust research & development (R&D) programme to study the feasibility of this system to suit its climatic conditions. Innovation in BIPV has produced light-weight, light transmitting, flexible systems that are used in a majority of office buildings as facades. In this case, other Asian countries are lagging behind as planners, architects, builders and system integrators have only recently commenced R&D programmes to evaluate its commercial viability.

BIPV systems' success in Japan can also be attributed to the excellent rapport between the local manufacturers, real estate project developers and architects. For instance, Kaneka which is one of the top five PV manufacturing companies in Japan works in close association with the building designers to provide innovative roof-top BIPV systems for large office buildings.

In comparison, builders and real estate companies in other Asian countries need to be informed, educated and trained about the technical and commercial aspects of BIPV application.

The Sun Rises on the East

South Korea and Malaysia are two other

countries in Asia which offer immediate promise for BIPV. One of the fastest growing BIPV markets in Asia-Pacific, the demand for BIPV systems in South Korea is driven by government mandated targets (to achieve 1,300 MW by 2011), solar subsidy programs and favorable availability of sunlight. It has been estimated that the BIPV market is likely to reach \$140.0 million by 2010 as there has been a soaring demand for light-weight and cost effective PV systems from the various end-user segments.

Malaysia's Pusat Tenaga Malaysia (PTM) has been aggressively promoting BIPV since 2005. As a showcase BIPV project, PTM has developed the 'Zero Energy Office (ZEO) Building', an innovative building concept that incorporates the features of renewable energy as well as energy efficiency.

The total installed BIPV capacity till 2007 has been valued at 596.3 kW.

Strong government support encouraging BIPV systems in newly constructed buildings provides significant growth opportunities for companies in this industry. The Suria 1000 programme provides assistance to residential and commercial end-user segments to install BIPV systems on their existing or new buildings.

A Photovoltaic Future

As many Asian countries are trying to cope with the mounting problems of power shortage, transmission and distribution (T&D) losses etc BIPV systems are seen an effective solution since power is consumed at the point of generation. BIPV has the potential to emerge as the next big opportunity if the manufacturers and specialised system integrators provide some initial handholding for the residential and commercial building industry to offer technical support.

Countries in Asia Pacific, especially the government, urban planners and real estate project developers can emulate Japan's successful business model in BIPV systems to propel growth in their respective countries.