European BIPV projects grow – but legislation is still urgently needed

A recent report has shown that the European Building Integrated Photovoltaics (BIPV) market last year was estimated at €143 million with a total installed capacity of 25.7 MW for the commercial, residential, industrial and public markets combined. Currently, there is substantial amount of interest in this market due to its high year on year growth, as well as an increasing number of countries which now have legislation supporting BIPV technology. However, the key to understanding BIPV market hot spots is pinpointing the countries that have passed BIPV-friendly legislation. It is no secret that the countries with this kind of legislation have seen the most growth.

Led by Germany, and followed by Italy, France and Spain, these markets in particular are ripe for investment. The link between geographic hotspots and legislation is noted by Frost & Sullivan Akhil Sivanandan, Research Analyst, who says: “The common factor to all the best regions for investment in BIPV has been the level of legislative support. These regions have high levels of legislative support for BIPV, usually through feed-in tariffs, although easy availability of loans, solar PV ordinances and other such supportive legislations are also important to grow and sustain the market. Manufacturers have traditionally gravitated towards such regions.”

For construction managers, most of whom share a vision for environmentally improved buildings, the practicalities of integrating innovative green products such as BIPV can considerably increase project complexity, and when things get complicated, so do costs. The irony is that premium exterior cladding systems, for example, cost nearly as much as or even more than building integrated photovoltaics — in layman’s terms a solar electric skin — and they seldom undergo a cost/return-on-investment analysis prior to being specified, while in the past, solar electricity has been subject to unrealistic short-term payback demands. When BIPV is incorporated into the design of a building, a cashflow stream is provided for decades to come, while a facade constructed from premium building materials may only deliver prestige.

A BIPV system consists of integrating photovoltaic modules into the building envelope, such as the roof or the facade. By simultaneously serving as building envelope material and power generator, BIPV systems can provide savings in materials and electricity costs, reduce use of fossil-fuels and emissions of ozone-depleting gases, and add architectural interest to the building.

BIPV modules supplied by BP Solar, for example, have been used extensively in the roof and façade design of recently completed warehouse in Sutton-in-Ashfield, England, and will contribute to the building’s annual 275 tonnes reduction in carbon-dioxide. The project is believed to be the first major installation of BIPV solar power in a retail store design in the UK and the grid-connected solar installation comprises 151 m² solar modules within the roof cladding and 45 m² incorporated in the main entrance elevation. It has a peak power output of 7.6 kW, which will support the electrical loads of the premises. The main entrance elevation has semi-transparent BIPV modules laminated into the double-glazing unit and integrated onto the elevation as a standard curtain walling system.
A larger, 106 m² PV installation on the roof of the store again uses BIPV modules applied onto the seams of the roof cladding. This is mounted flat, using rails through the standard access equipment brackets of the standing seam roof system.

BIPV systems can either be tied to the available utility grid or they may be designed as stand-alone, off-grid systems. One of the benefits of grid-tied BIPV systems is that on-site production of power is typically greatest at or near the time of a building’s peak loads, thereby reducing energy costs through peak shaving and demand-side-management (DST) capabilities. Also, there is opportunity for using BIPV systems for distributed generation.

BIPV systems should be part of an approach to design where energy-conscious design techniques have been employed, and equipment and systems have been carefully selected and specified. They should be viewed in terms of life-cycle cost, and not just initial first-cost because the overall cost may be reduced by the avoided costs of the building materials they replace.

Many benefits can be obtained from integrating photovoltaics into building facades. Installations that reduce the total energy consumption of the building include rooftop arrays, roof-integrated insulation, shading devices, sloped glazing, spandrel glass and curtain-wall systems.

Such BIPV systems supply electricity to the building and, possibly, the utility grid and displace conventional building materials. They also increase a building’s thermal efficiency. Additionally, BIPV systems do not need expensive balance of systems equipment required by field-mounted arrays. Reduced building-energy requirements, electricity value, tax credits, accelerated depreciation, state, local and federal financial incentives and space easily marketed for occupancy due to green image, all combine to add value in favour of BIPV for the building owner.

New or refurbished schemes can exploit building-integrated photovoltaics, which provide the option of PV used as a substitute building material instead of roof tiles or glass. BIPV offers both striking design features and displaces the original building material, thereby reducing the cost of introducing PV. And contrary to popular understanding, PV does not require full sun to provide energy. A typical British grey day will also generate sufficient sunlight to produce electricity. Available technologies now offer a wide choice to designers and architects, and the UK has some of the best solar designers in the world, so there is plenty of scope and expertise around to ensure that projects look right and work effectively. The technology is simple for installers to manage and once installed is very low maintenance.

Of course, the numbers do not always stack-up, and the interpretation of true return on investment is often hazy. However, at least far-sighted chief executives and managing directors who often have hundreds of thousands of pounds to spend annually to deliberately craft a carefully constructed corporate image are now beginning to recognise the high value of being seen by their customers as environmentally responsible corporate citizens. This is the beginning of the commercial market for BIPV.

Currently, the largest market for BIPV in Europe is the German market. In 1999 the country began to promote BIPV technology through its 100,000 programme. By guaranteeing feed-in tariffs and interest free loans, the German market developed more quickly than other markets, securing in 2004 the position of the largest PV market in the world. Because of its early focus on BIPV, the country currently has a high level of expertise among BIPV installers, designers, architects and manufacturers, accompanied by a high level of awareness among the end consumers. Recent amendments in Germany’s renewable energy act, the EEG (Erneuerbare Energien Gesetz) ensures that Germany will remain one of the largest markets for BIPV in the world.

Although it took a few more years for the French to pick up speed, by 2006 their BIPV specific feed-in tariffs were introduced, catapulting the country into hotspot status for manufacturers. Just a year after this legislation was enacted, the French market has grown into the second largest market for BIPV in Europe. However because it is still a relatively new market, establishing a strong manufacturing and consumer base will be vital. Currently, BIPV manufacturers are pressed to meet the steep demands within the country. The French BIPV market is also suffering from a lack of expertise for BIPV, especially in design and installation.
At one point the Italian market was projected to the BIPV leader, given the country’s excellent climate conditions and high investment capability, however, slow bureaucracy has leashed its growth. The lack of specific tariffs in Italy was barring BIPV progress, until 2007 when the market was advanced by the introduction of the ‘Conto Energia’ laws which granted very high feed-in tariffs for BIPV, and a clear cut definition for a BIPV installation. Since then the market has grown more rapidly. Despite Italy’s continual slow and complicated bureaucratic process, this market is expected to continue its high growth rate in the coming years.

Couched between France and Italy, the BIPV trend spread to Spain. The Spanish BIPV market took off in 2004, as it was so closely related to Spain’s already established open-field PV market. Although the PV market created a back door for the BIPV market, the Spanish BIPV market has experienced less growth than the general PV market. This is not a surprise as the PV market has been around much longer and thus is more developed. But the tide is set to change at the end of 2008, when the Spanish government is ready to revise its tariffs for PV, giving higher importance to BIPV and scaling down its open-field PV tariffs. This will give preference to BIPV among both consumers and manufacturers from the mid 2009 onwards when the tariffs are to come into effect.

As it stands, Germany, France, Italy and Spain have the stronger BIPV markets in Europe and are paving the way for European BIPV expansion. Countries such as Greece, Portugal and Switzerland are moving in the same direction. Although still in the preliminary stages, these markets are something for investors to keep their eyes on as they are emerging into potential BIPV hotspots.

**Thanks to Frost and Sullivan (www.frost.com)**

---

**Suntech to Supply One of the World’s Largest BIPV Solar Systems to Farm in Alsace, France**

Late last year, Power Holdings Co., Ltd., one of the world’s leading manufacturers of photovoltaic cells and modules, announced it had signed an agreement with Hanau Energies SAS to supply a 4.5MW building integrated PV system (BIPV) to a farm located in Alsace, France.

The project will be one of the largest BIPV installations ever built and will employ Suntech’s ‘Just Roof’ modules to form complete weatherproof roofs on five agricultural warehouses on a farm in the Alsace region of France.

The 4.5MW installation is anticipated to be completed in early 2009, with an additional 1MW already being planned.

The ‘Just Roof’ system was initially released in 1994 and has already been installed on more than 4,000 homes and commercial buildings worldwide. It features interlocking panels mounted on specially designed rails to give a highly aesthetic, weatherproof building skin that can be installed quickly and easily.

Dr. Zhengrong Shi, Suntech’s Chairman and CEO, stated, “This project is a very significant milestone in the development of the French solar market and for BIPV in particular. We are extremely pleased that Suntech’s ‘Just Roof’ system has been selected. We are experiencing great demand for our high quality MSK Solar Design Line of BIPV products all around the world as architects, homeowners and commercial end-users increasingly recognize the aesthetic and power generation benefits of integrating solar into buildings.”

Mr. Westphal, Hanau Energies Chairman, stated, “I am delighted to be working with Suntech on this 4.5MW BIPV project. We examined many possible solutions and decided that Suntech’s ‘Just Roof’ system was the best BIPV solution available from both a technical and commercial perspective. We are looking forward to working closely with Suntech on this and future projects.”

With a progressive solar policy, demand for solar products in France is growing rapidly and, due to enhanced incentives for BIPV, French demand for integrated solar systems is particularly healthy. Suntech has one of the industry’s broadest solar product portfolios and, as a result of its acquisition of Japan’s MSK in 2006, also has an impressive range of BIPV products and solutions.
WACOM Super Solar Simulator for PV Cells

IEC-60904-9
Class A

Super AM1.5G Solar Simulator Spectral Irradiance

Lamp: Xenon+Halogen
Irradiated Area: 155 x 155mm

Super AM0 Solar Simulator Spectral Irradiance

WACOM Long Pules Solar Simulator for PV Modules

Pulse Duration: 80 - 800msec
Irradiated Area: 1.6 x 1.2m
Beam Angle: Horizontal Shine

Manufacturer
WACOM ELECTRIC CO., LTD.
http://www.wacom-ele.co.jp

Sole Agent
M. WATANABE & CO., LTD.
TEL: 03-3241-9171 FAX: 03-3241-9170