

European PV installation projections to 2015

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ABSTRACT

Germany and Italy are forecasted to drive solar demand to new highs in 2011, with rumours of installations up to 22GW on the cards for this year. The German and Italian markets, scheduled to peak in 2011 and 2012, respectively, face a potential problem in terms of where to sell their modules if these two countries cannot accommodate 10GW of installations per year. The emerging markets can solve part of this challenge and will deliver new opportunities to the solar industry. Some Asian, European and Middle Eastern regions will require up to of 6GW of solar-generated electricity, while the Americas, Africa and Australia are each projected to install approximately 1GW in 2014. This paper takes a look at the development of these emerging markets and provides a projection of likely installation figures up to 2015.

Solar installations in 2011

December 2010 and January 2011 brought political news that affected the industry both negatively and positively.

The good news

In Q4 2010, installations in Italy grew at a much faster pace than was expected by industry consensus. An investigation by iSuppli of Italian EPCs, utilities and associations reveals that Q4 2010 installations in Italy reached 1GW. On January 25th, GSE, the official register for the Italian PV industry, announced that 1.85GW have been officially connected, with an additional 4GW registered. iSuppli expects Italy to install 4GW in 2011 thanks to the fast-growing installation capacity and excellent investment within the country.

The uncertainty

On February 2nd, the German parliament accepted Minister Röttgen's proposal of a mid-year feed-in tariff (FiT) cut in Germany. The amount of the FiT will be set according to the amount of systems installed in March, April and May. Under this new regime, iSuppli forecasts that between 7.3 and 9.4GW will be installed in Germany this year.

The 'not so good' news

The solar markets in Spain, France and the Czech Republic will not expand. Plans to implement serious measures to reduce the solar investor business are underway. The Spanish government is expected to reduce funding of existing solar power parks by approximately 30%. Furthermore, the FiT for new ground installations will drop to €0.14/kWh in 2011.

France suspended any further funding for larger solar systems until it finalizes its new tariff scheme at the end of Q1 2011. The Czech Republic plans to have stopped state support by March 2011 for ground-mounted plants

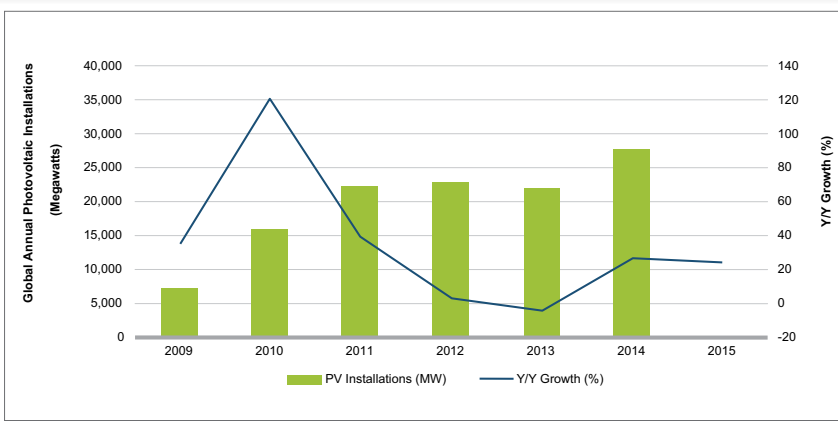


Figure 1. Annual global PV installations showing year-on-year growth projections to 2015.

Taking into account these multiple changes, iSuppli expects that about 22GW will be installed in 2011, growing

by about 40% over figures seen in 2010. Looking forward to the period from 2012 to 2014, markets are not expected to see

Country	2009	2010	2011	2015	CAGR 2015 vs. 2010 (%)
Belgium	292	390	488	814	20
Bulgaria	7	20	70	340	103
China	160	400	700	1,999	50
Czech Republic	397	1,331	350	350	-28*
France	250	520	550	873	14
Germany*	3,806	7,846	9,400	5,000	-11*
Greece	36	120	235	485	42
Italy	720	1,950	3,900	2,750	9
Japan	480	950	1,100	2,686	30
South Korea	168	145	170	353	25
Ontario (Canada)	69	213	730	1,009	47
Spain	70	250	345	1,000	41
United Kingdom	6	95	350	740	67
USA	489	937	2,073	5,018	52
Rest of World	290	798	1,779	11,019	93
Total	7,240	15,966	22,239	34,435	23

Table 1. PV installations by country to 2015(e) [1].

* Considering the mid-year FiT adoption, total installations for Germany in 2011 are expected to reach between 7,300 and 9,400MW.

any further significant growth; on the contrary, Germany's market looks like it will contract from 9GW to 5GW.

Germany's FiT review for 2011 and 2012

On January 20th, 2011, Minister Röttgen announced the submission to Parliament of the following changes:

- The FIT shall be adapted at the end of June 2011 if installations are forecasted to reach more than 3.5GW for the full year.
- Total installations in April, March and May 2011 will be extrapolated to an annual value, i.e. the sum of these three months' installation figures will be multiplied by four.

If the derived annual value is:

- < 3.5GW, there will be no FiT cut in July 2011
- > 3.5GW, the FiT cut in July 2011 will be 3%
- > 4.5GW, the FiT cut in July 2011 will be 6%
- > 5.5GW, the FiT cut in July 2011 will be 9%
- > 6.5GW, the FiT cut in July 2011 will be 12%
- > 7.5GW, the FiT cut in July 2011 will be 15%.

For 2012, the FiT will be reduced across the board by 9%.

In the case that installations for the entirety of 2011 do not match the forecasted numbers (applied to the mid-year 2011 FiT cut), this 9% figure will be increased or decreased accordingly. The sum of the two FiT cuts (July 2011 and January 2012) will yield a total according to the 2010 legislation. The only exception in this case is that the maximum cut to be applied will be 24% (instead of 21% as planned in 2010).

To illustrate these figures via an example, take the scenario where 1.3GW are installed from March–May. The full-year 2011 (extrapolated) forecast of 5.2GW leads to a 6% FiT cut in July 2011. However, in December, the register shows that only 4.4GW have been installed over the course of the entire year. Therefore, the FiT applicable in 2012 will be reduced by only 6%.

Expectations for Germany's market in 2011

As of January 28th, 2011, we at iSuppli assume that the FiT changes as announced by Minister Röttgen will receive the support of the parliament during February/March and become mandatory by March 2011. It is likely that German installations in 2011 will follow a similar pattern as that seen in 2010. Installations will pick up during February/early March and will peak in April, May and June. As a

Period	Installations without legislative changes (iSuppli forecast as of Q4 2010)	Installations with FIT cut mid-2011
Q1 2011	500MW	1,000MW
Q2 2011	1,200MW	3,600MW
Q3 2011	3,200MW	800MW
Q4 2011	4,500MW	1,900–4,100MW
Total	9,400MW	7,300–9,400MW

Table 2. Possible scenario for German installations based on official announcements made on January 20th, 2011.

consequence, Q3 will be modest, but Q4 is expected to be very strong before the application of new regulations in 2012.

- Moderate Q1: 1,000MW
- Very strong Q2: 3,600MW
- Modest Q3: 800MW
- Strong Q4: 1,900–4,100MW
- Total: 7,300–9,400MW

Note: installer capacity in Germany is about 1,000 to 1,500MW per month.

Italy's projections

The Italian PV Agency, GSE, has counted 5.8GW of new installations for 2010. As of January 25th, 2011, the previous two years' figures are as follows:

2009: 711MW newly installed
1000MW cumulative at year-end

2010: 1.85GW newly installed, registered and connected
5.8GW newly registered
0.5–1GW installed (estimated)
3GW registered on paper.

The following expounds why we at iSuppli do not believe that 6GW has been installed in 2010. Module demand would have exceeded shipments, leading to a module shortage, which did not happen in Q4. On the contrary, inverter and module inventories are building up in Q4. Moreover, 4GW of installations would

require investments of €10 billion, a figure that would not pass unseen.

We confirm that 2 to 3GW of new installations is a realistic number for Italy in 2010. Looking forward to, 2011 it is clear that the Italian energy suppliers and solar stakeholders are alarmed that installations might overheat, and altering the FiT would be the natural consequence. However, it is difficult to predict how important the solar market is to the Berlusconi government and how long the Berlusconi government will stay in power. At time of writing this report (February 7th, 2011), we have no concrete indication that an additional FiT change can be expected in 2011.

USA: the power lies in the States

With a shift to a conservative congress, federal incentives are less likely to be renewed in the near term. At the last moment before it was adjourned, the Treasury Cash Grant program was renewed through the end of 2011, helping investments that are not as driven by 'tax appetite.' Incentives to stimulate demand now lie at the state level.

California continues to support solar with the defeat of Prop. 23, which would have repealed the state's renewable energy targets (a.k.a. AB 32). Funding continues to be an issue at the state level, restricting growth opportunities in the residential and small commercial sectors. This market dynamic is very turbulent for suppliers as

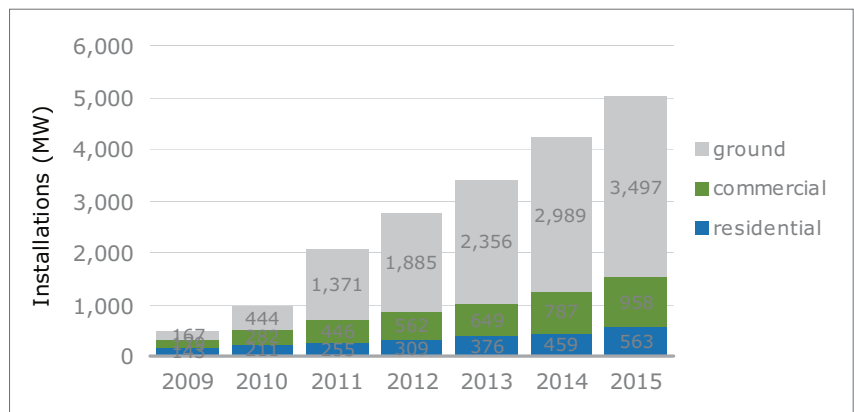


Figure 2. Annual PV installations (MW) by application in the U.S. showing year-on-year growth projections to 2015.

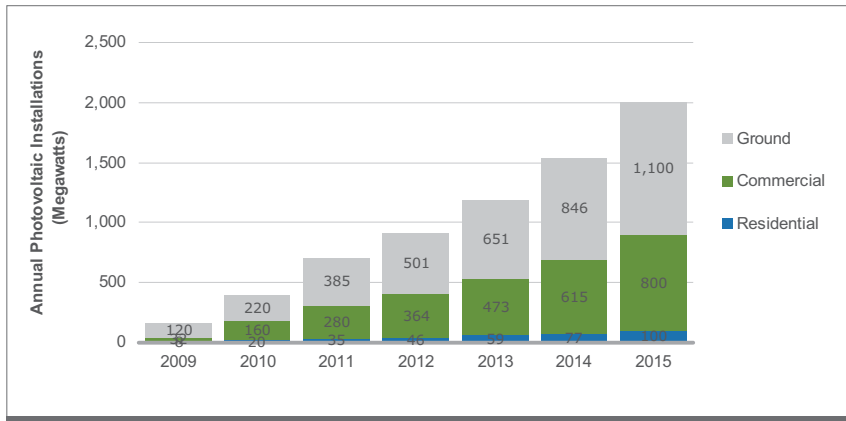


Figure 3. Annual PV installations (MW) by application in China showing year-on-year growth projections to 2015.

inconsistent demand keeps the distribution channel inefficient, thus leading to prices remaining artificially high. This is the case for states like Connecticut, which has US\$3 million in funding allocated to its incentive programs this year.

For 2010, iSuppli expects the U.S. market to reach 940MW, a figure that will more than double to 2GW in 2011. By far the largest market in the U.S. will be the ground/utility market with many large projects commencing operation in the 2011 timeframe. This trend will continue through the 2015 timeframe.

China: the giant is slowly awakening

In November, China's Ministry of Finance published the list of suppliers to the Golden Sun Program. Yingli has taken the lion's share of module supply in 2010, announcing that it will have supplied 70% of the country's modules. In addition to its two funding programs, China's Ministries announced that it will further support utilization of solar in China, with plans to reach at least 1,000MW per year from 2012 onwards.

The Golden Sun program: 440MW remaining for 2010 and 2011

In a second incentive program, the Chinese government instructed eight provinces to launch bids for solar projects at a total of

100MW per region. iSuppli expects this program to be executed over the course of three years from 2010 to 2013.

France

On December 10th, 2010, Prime Minister Fillon announced the momentary cessation of support for new solar installations. This solar moratorium is heavily affecting the French solar market. Investors and installers are under threat and fearing for their investments. Tragically, numerous solar plants under construction totalling 100–200MW have not yet seen the light at the end of the tunnel (nor the return on investment). Even investors are having to prepare for the new regulatory scheme, which will not be ready by March 2011.

It is very likely that the French market will be limited to a range of 500–700MW per annum over the next three years. Nevertheless, the French market might still offer attractive investment conditions.

iSuppli confirms its conservative long-term view. With 760MW of new installations expected in 2014 and 870MW in 2015, iSuppli's outlook for the future segmentation of the French market is as follows:

- The French government will continue to support small rooftop installations, probably at attractive rates.

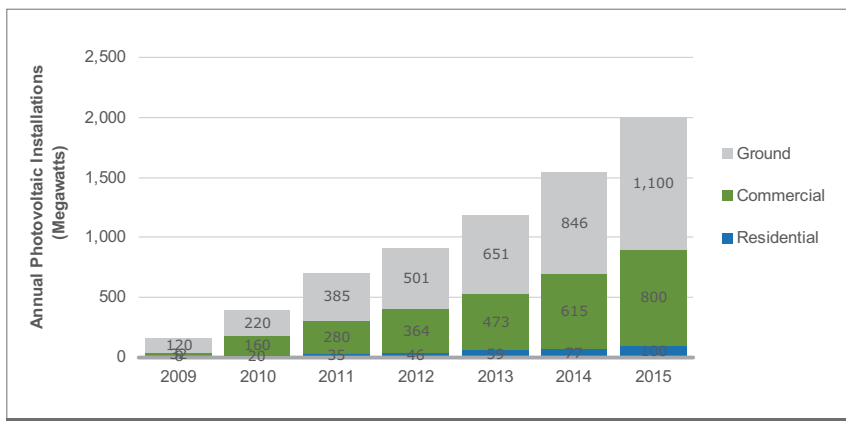


Figure 4. Annual PV installations (MW) by application in the UK showing year-on-year growth projections to 2015.

- Large rooftop installations may have to apply and will be selected based on a quarterly contingent, similar to that of Spain.
- Ground installations may be regulated through a bidding process.

UK

An announcement made on February 8th, 2011 saw the UK energy department launch a "comprehensive review" of the solar power FiT system after concerns that funds intended to promote self-generated power risk being diverted to industrial-scale solar arrays.

"Large-scale solar installations weren't anticipated under the feed-in tariffs scheme we inherited and I'm concerned this could mean that money meant for people who want to produce their own green electricity has the potential to be directed towards large-scale commercial solar projects," said energy secretary Chris Huhne. He pledged to complete the review by the end of this year and leave tariffs unchanged until April 2012. Changes will apply only to new entrants; existing solar installations will be unaffected.

"If the market triples in 2011, the UK government would be the first not to react."

The solar market in the UK saw fast growth in Q4 2010, estimated at 48MW. For all of 2010, iSuppli forecasts 95MW. The first power parks are being installed, e.g. ib vogt's 5MW plant in Cambridge and the 5MW Kernow Solar Park in Cornwall.

The UK government expressed a clear focus on the residential sector. The official plans translate into the following installation targets:

- 2011: 60MW
- 2012: 150MW
- 2013: 350MW
- 2014: 600MW

On October 20th, 2010, the government announced that no FiT changes were scheduled for 2011. However, if the market triples in 2011, the UK government would be the first *not* to react. Remembering that the UK's public budget are extremely meagre in comparison to other countries while consumers are having to shoulder increasing taxes, VAT and low public salaries, an additional burden for solar will be perceived as unpopular. As a result, the FiT faces a reduction. Numerous installers, wholesalers and module makers are going on pilgrimage to UK this autumn. German, Taiwanese and Chinese suppliers in particular are opening offices and signing module orders from companies including juwi, ET Solar, Centrosolar and Delsolar.

Emerging markets

Today's booming solar markets in Europe (Germany and Italy) are expected to peak during the coming years. But if Germany and Italy cannot take 10GW per annum, where will the modules be sold? And can emerging markets solve this potential problem and install 10GW by 2014?

Of the 200 nations around the world, approximately 15 regions offer solar funding programs and can be considered solar markets. As a result, these regions form the bulk of today's installations. All other regions, categorized as 'rest of the world,' represent 5% of 2010's installations so far, but are expected to increase and represent 25% by 2014 (see Figs. 5 and 6 and Table 3).

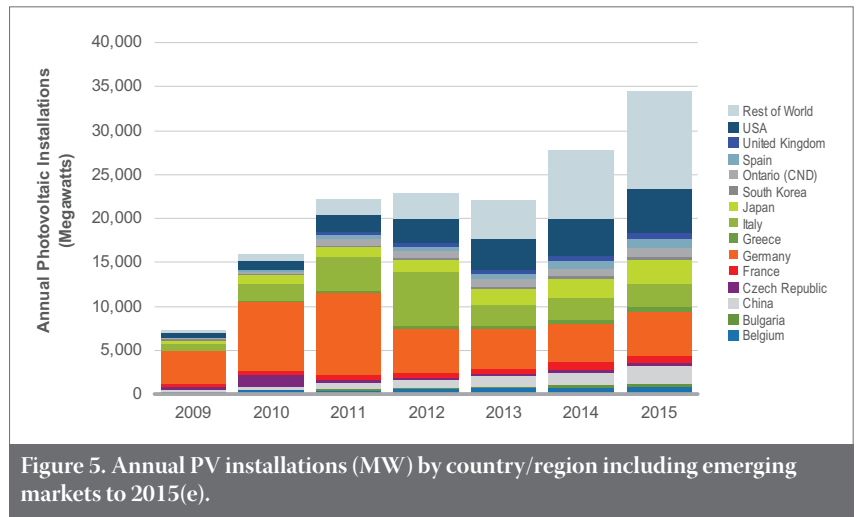


Figure 5. Annual PV installations (MW) by country/region including emerging markets to 2015(e).

Market Watch

“Of the 200 nations around the world, approximately 15 regions offer solar funding programs and can be considered solar markets.”

This 25% market share corresponds to 8GW, so it would seem that emerging markets can indeed solve the problem of shrinking module demand if Europe becomes saturated.

The next question is, of the 185 remaining nations, which will show the most promise and prove itself worthy of investment from a module manufacturer's perspective? Assessment of the market drivers suggests that Asia, (rest of) Europe and the Middle East will be the first to open up.

Solar installations in emerging markets are driven by several factors:

- Increasing need for electricity in fast-growing economic regions (South-East Asia)
- High solar irradiation, making solar competitive versus fossil fuels
- Fast installation and operation compared to nuclear and co-fired power plants
- Rapidly dropping prices of solar systems.

In addition, stable politics and economic power play important roles in developing solar business. Taking into account electricity needs, solar irradiation, economic power and political continuity, iSuppli expects that by 2014 Asia and the rest of Europe and the Middle East will offer the most significant emerging markets.

Asia and EMEA (Europe & Middle East) are forecasted to form the bulk of emerging markets up to 2014. Large populations and fast increasing needs for electricity are driving local markets in Asia. India and a number of countries including Malaysia

and Philippines will launch solar funding programs in 2011/2012, while plans for a very large (70MW) solar power plant have recently been announced in Thailand.

Europe is driven by political REE targets. In addition, even the smaller regions are expected install solar programs. South of Central Europe, Israel, Turkey and Middle Eastern countries such as the UAE and Egypt are expanding their solar activities. High irradiation, low environmental impact, and independency from fossil fuels are driving the uptake of solar power in these regions.

However, despite the high irradiation in the region, iSuppli does not expect Africa to exploit its potential until 2014. South Africa, Morocco and the Desertec Initiative currently represent the solar flagships in Africa.

On the other hand, Australia could well be the next new thing in terms of solar uptake. But despite the continent's offering many sun hours and low-cost carbon-based electricity, the fact that it only has about 22 million inhabitants leads iSuppli to project the country to increase its solar installations in the next years, but to for the market to remain at a much smaller size than others.

In America, outside of the U.S., the greatest solar activity is in Canada with Mexico just beginning its solar conquest. Mexico, already short on sources of electrical power, is close to seeing solar become a regular means of power supply. High irradiation of 1,500–2000kWh/kW and electricity rates of €0.15–21/kWh will mean that the country can pay off any solar investment after 10 years – even without subsidies. However, only a small fraction of the population can finance such solar systems. Loan credits for solar systems are not common and, due to budgetary limits, no political funding can be expected.

Such low public budgets are to be found in all South American nations. Therefore, these markets will not immediately increase their solar power uptake, despite having such high levels of irradiation. The solar front-runners are Argentina, Chile and Brazil, where demonstration plants are currently being built. Similarly, Peru is moving ahead with four 20MW PV projects planned for 2012.

In summary, as a result of the social, political and economical powers, iSuppli expects emerging markets to take off in Asia and EMEA with the Americas

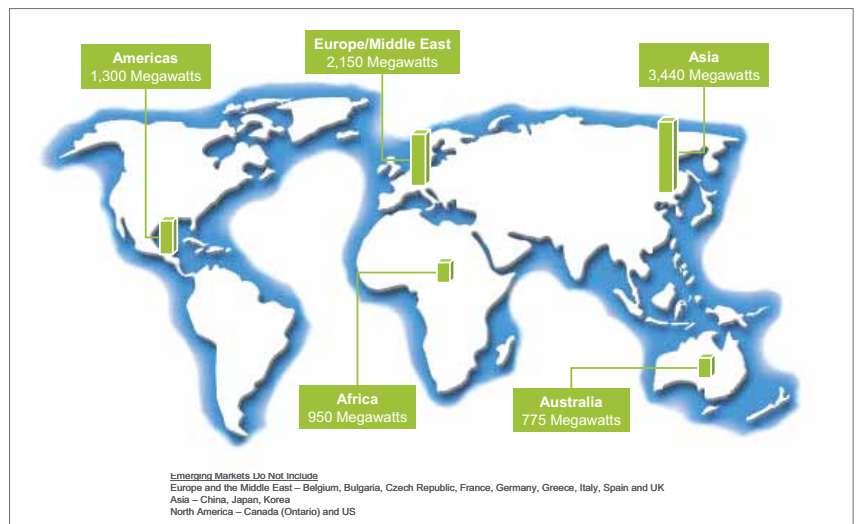


Figure 6. Emerging markets: regional PV installations in 2014(e).

	Population	Electricity needs (GDP per capita)	Economic power kWh/kW	Solar irradiation in solar	Political interest	Forecasted market shares in ROW in 2014
Australia	+	+	+++	+++	++	9%
Americas*	++	++	++	++	+	15%
Africa	++	++	+	+++	+	11%
Asia**	+++	+++	++	++	++	40%
Europe*** & Middle East	++	+	+++	++	+++	25%

**Americas: not including USA, Ontario (CND)*
***Asia: not including China, Japan, Korea*
****Europe: not including Germany, Italy, France, Spain, Belgium, Greece, CZR, Bulgaria and UK*

Table 3. Comparison of emerging market drivers by region.

and Africa following their lead. Business opportunities are sure to appear, but the business mechanism will be different from that seen in the European markets.

The next generation of solar markets in Europe will be different, with the appearance of three new segments in addition to the established solar markets:

- High-electricity markets
- Large-scale, low-margin markets
- Local content-driven markets

High-electricity rate markets

Some markets, e.g. Mexico and Brazil, are close to grid parity in the residential segment due to high electricity rates. According to iSuppli's Q3 2010 forecast, the European markets will slow by 2012, triggering the interest of system installers and module suppliers in developing these high-electricity rate markets. Wholesale and module suppliers can work hand-in-hand by setting up PV packages, including financing for the residential and small industrial rooftop segment (solar kit). Brazil and Mexico should be addressed first for their high electricity rates. Both markets are expected to install approximately 100MW of new installations by 2014. In 2010, system prices were still high (€6/W installed) and above European averages, mainly because the installations are very individual in nature and the volumes shipped were small (between 1 and 5MW per year).

Large-scale, low-margin markets

The bidding for power plants – similar to the structure currently applied in the U.S. and China – represents a second market segment likely to appear in the emerging markets. As demonstrated recently in China, 130 companies and consortia submitted proposals to build 13 PV power plants. The electricity rates proposed

by the companies range from US\$0.108 to US\$0.222/ kWh, which is lower than any FIT. While it seems difficult to obtain margins at US\$0.11/kWh even at irradiation levels of 1,900kWh/kW, it shows that the strategic competition on solar plants has begun. At these prices, PV will compete against fossil and nuclear power. It will be interesting to see how the Spanish market will react in 2011 when tariffs for ground installations drop to €0.15–16/kWh.

Local content-driven markets

Ontario (Canada) opened the floor to a third market segment of solar: regions supporting solar via funding but requiring local content. India is applying a similar strategy by demanding that the installed modules – and even the solar cells from 2012 – must be made in India in order to qualify for funding. Both regions intend to foster the regional industry, either via local production of global suppliers or by supporting national producers (India). The final objective is to create jobs and develop a strong local industry.

“Governments and tax payers will pay a premium to finance higher FiT rates to balance out the higher cost (and prices) of local production.”

On the other hand, it is still debateable whether these rules will conform to GATT regulations. In any case, governments and tax payers will pay a premium to finance higher FiT rates to balance out the higher cost (and prices) of local production. Other regions such as South Africa intend to stimulate local production. Requesting local content is not in line with the current

production strategies of Chinese and Taiwanese producers, who are focusing on economies of scale. It will be interesting to see whether large suppliers will modify their business concept by introducing stipulations such as the requirement of modules being locally produced.

Suppliers that are able to adopt strategies to serve these markets will be able to escape the maturing markets in Central Europe. The next solar business model will ask for joint ventures and partnerships with local utilities and extended services, including financing and operations. Training and quality control of installers will become essential to developing the confidence of end users and investors. In addition, the emergence of easily installed new products, from solar kits to microinverters, will bolster the opportunities available for the less experienced installers.

Reference

- [1] iSuppli PV Market Tracker Q4 2010 and iSuppli Research Notes Q1 2011 [available online at <http://www.isuppli.com/Photovoltaics/Pages/PV-in-2011-Prepares-for-22-Gigawatts.aspx>].

About the Author

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