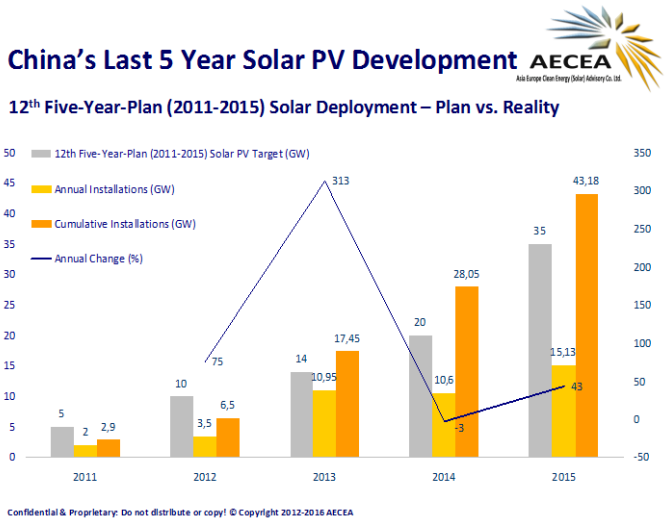
Jan 2016 – Briefing-Paper – China Solar PV Development

2015 – China's last year of its 12th Five-Year-Plan of Solar PV Development – A Review

On Feb 5th, 2016 the National Energy Administration (NEA) of China published the official 2015 solar PV statistics. Apparently, last year's policy change towards a more "soft target" compared to the "hard target" policy favoured in 2014 paid off, because additionally installed 15.13 GW represents a 43% increase YoY, although the share of distributed solar PV dropped from (2014: 2.05 GW) to approx. 1.39 GW (9%). Based on its monthly demand analysis, last years solar PV deployment is perfectly in line with AECEA's baseline forecast of 14/15 GW.



Surprisingly, the official notification neither provides any hint, especially regarding the 5.3 GW added in September, nor regarding the 1.5 GW of poverty alleviation projects (average system size 3 kW to be installed in low-income areas across 6 provinces). Despite the significant increase of 43% YoY, strictly speaking obviously last year's target was missed, if compared to the 17.8 GW (16.3 GW + 1.5 GW poverty alleviation projects) national target set last March. Chief reasons are slow FIT payments and grid curtailment. Overall, China managed to exceed its 35 GW national target by approx. 24% set in the framework of the 12th Five-Year-Plan (2011-2015), thus replacing Germany as the number one country with 43.18 GW.

Taking a closer look at last years installations, a few provinces, as anticipated, significantly underperformed, whereas other provinces clearly outperformed, i.e. the provincial targets were exceeded by up to several hundred MW, and in particular these provinces / autonomous regions give reason for concern, because these provinces were already subject to severe grid curtailment. According to the NEA announcement grid curtailment in e.g. Gansu Province and Xinjiang Autonomous Region reached 31% and 26% respectively, reflecting an increasing trend. National average utilization reached just 1133 hrs. In comparison, a similar development took place in China's wind sector, i.e. last year a staggering 32.97 GW were added (up approx. 60% YoY) and the national average curtailment rate increased by 7ppt to 15% with Gansu (39%) and Xinjiang (32%) taking the lead. Overall, wind utilization (1728 hrs) dropped by 9% YoY.

Looking ahead and aware that the wind sector is trying to geographically diversify, i.e. new projects under construction are largely located in non-grid-curtailment provinces, however, especially these provinces match with the anticipated solar PV development in 2016! To make matters worse, btw. Jan and September 2015 approx. 123 GW of thermal power generation projects received official approval and a majority of these future projects shall be realized as well in such provinces. This is particularly disturbing since China's power consumption growth rate last year reached a historical low level of merely 0.5% YoY, significantly lower than the 3.8% growth rate achieved in 2014.

As of early Feb 2016, the NEA has not provided any view on this year national target. However, late January the China PV Industry Association (CPIA) announced to have estimated that possibly up to 20 GW will be added, which, if successful, would represent an increase of approx. 32% YoY. At this stage, AECEA does not share this view, because the national guidance/target has yet to be announced, i.e. provincial guidance is missing too, despite the fact that the RE power surcharge were increased from RMB 0.015 to RMB 0.019/kWh late Dec, FIT payments remain a constraint in terms of volume and timing, a possible further deterioration of the grid curtailment and a number of other reasons affecting the operation of PV power plants and consequently the expected financial returns.

AECEA is of the opinion, given that NEA already allocated additional 5.3 GW last September which are due to be operational by the end of June, new FIT are effective since January this year and a relatively mild winter, that Q1/2016 could witness similar installation volumes like 2015, i.e. multiple GW.

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China's 13th Five-Year-Plan (2016-2020) for Solar Development – First Details

According to the Chinese zodiac, 2016 will be the year of the Red Fire Monkey! The Monkey is considered smart, vigilant, naughty, wily, and always carries a bag full of tricks, i.e. always good for some monkey business! Fire represents life and energy, hence so does it represent solar PV as well!

Red and Fire shall make the monkey adventurous and ambitious – well – China certainly does not lack ambitions, because according to NEA by the end of the 13th Five-Year-Plan (2016-2020) China is expected to be home to 150 GW of installed solar PV capacity, i.e. China is expected to witness more than a tripling of it's existing 43.18 GW in the next 5 years, i.e. a minimum of 20 GW would have be installed each year, in order to realize this target!

The 13th Five-Year-Plan for Solar Development is under preparation since the fall 2014 and is expected to be officially released during the next annual National People's Congress scheduled to take place in Beijing early March. However, first "unofficial targets and details" are emerging and not surprisingly they emphasize more distributed PV, more competition and more internationalization!

The former against the background that the currently existing grid capacity is not capable of handling all power generated and until further grid capacities will become online a considerable time is expected to pass by. Against this background, literally hundreds of cities are expected to determine mandatory targets stipulating how much MW of rooftop capacity has to be installed by 2020. Due to the fact that various provincial / city-level governments occasionally favour deployment of locally manufactured components in exchange for local support policies, implementation might be slower than expected. In this context, AECEA does not expect a significant increase of residential solar PV systems in the near future. One example is Shanghai which was home to just 6 MW of residential PV systems by the end of 2015. Competition like in the form of the "Top-Runner" Programme in Datong / Shanxi Province last year is expected to play a more prominent role in future. First potential provinces were the Top-Runner Programme could be replicated are already under discussion. Competitive biddings will be used as a market based tool, in order to determine the level of FIT to be paid. An additional financing tool will be the trading of carbon emissions, a national scheme is scheduled for 2017.

It is AECEA's opinion that the coming 5 years will be characterized by a continued internationalization of the Chinese PV industry, both up and downstream. Anticipating continued strong global demand, having learned the lessons from global trade disputes, support policies granted by some of the highest govt levels at home which encourages a "go out / global strategy" will lead to an enlarged global footprint of China's domestic PV industry.

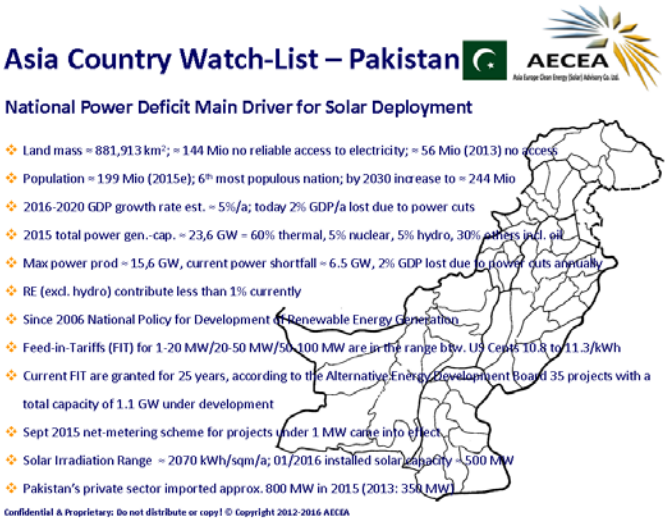
One prominent example is the so-called "One Belt, One Road" (OBOR) promoted by China's President Xi Jinping since late 2013. It is the aim of this OBOR strategy to promote green and low-carbon infrastructure construction, cross-border power supply networks and power transmission lines, regional power grid upgrading and identified mutual power investment areas covering hydropower, nuclear, wind, solar and other renewable energy sources. The just established "Asian Infrastructure Investment Bank" (AIIB) with a "seed funding" of USD 50 bln is expected to play a leading role in this context. Capitalising on this funding is on the minds of numerous Chinese PV companies representing both up and downstream.

China achieved 100% national electrification by the end of 2015

By the end of 2012, China was home to approx. 2.73 Mio people having no access to power. During 2013 and 2015, China invested approx. EUR 574 Mio, in order to provide access to approx. 1.180,500 people living in off-grid areas through 670 off-grid stand alone PV stations (most likely mini-grid systems) and distribution of 350,000 Solar-Home-Systems. No less than nine national power utilities were involved in the construction of such stand-alone PV power stations and/or SHS and it is therefore assumed that they will be responsible for providing long-term operation and maintenance. On December 25, 2015, the National Energy Administration of China announced that in the second half of 2015 the remaining 39,800 people living in off-grid areas in Qinghai Province were enabled to have access to power. This achievement basically translate into that China has achieved 100% national electrification, i.e. every Chinese has access to power/electricity, one target stipulated in China's 12th Five-Year-Plan for Social and Economical Development (2011-2015).

AECEA's Asia Country Watch-List "Pakistan"

At present, Pakistan's total installed power generation capacity amounts to approx. 23.6 GW and out of a total population of around 200 Mio an estimated 58 Mio people have no access to power at all. The fact that a shortage of 6.5 GW power generation capacity results in an annual loss of 2% GDP urged the Government of Pakistan fostering the utilization of renewable energies notably solar PV. Home to a National Policy for Development of Renewable Energy Generation since 2006, the solar market did not start until 2010. Did in 2010 just 5 MW found their way into the country, last year in 2015 approx. 800 MW of PV modules were imported, almost exclusively from neighbouring China for which the private sector invested approx. USD 432 Mio. Private sector means such imported modules/inverters are used for small scale commercial & industrial plants with capacities of a few kW to a few 100 kW, as well smaller residential systems.



To date, the only existing and operating utility-scale system is the 100 MW plant (out of 1 GW) located in the Quaid e Azam Solar Park (Punjab Province) built in the context of the China-Pakistan Economic Corridor in May 2015. The remaining 900 MW are currently in various stages of development. According to the Alternative Energy Development Board of Pakistan in total 35 projects with a combined capacity of 1.1 GW have received approval and are currently being pursued. Current incentives in the form of Feed-in-Tariffs (FIT) in the range from USD Cents 10.8-11.3/kWh offered for 25 years, combined with the exemption of import duties for 10 years are among other considered the main driver for larger utility systems. The introduction of a net-metering scheme effective since Sept 2015 for systems between 1 kW and up to 1 MW is expected to drive demand for rooftop systems. Demand for captive power systems with system sizes up to 5 MW for the industrial sector is showing strong momentum as well. In light of these developments, current estimates suggest a doubling of demand in 2016 vs. 2015. Overall, the Pakistani PV market is no longer in its infancy.

Against this background and given Pakistan's anticipated mid single-digit GDP growth rates in the next 5 years, requiring substantial investments in the power sector leads to the anticipation that solar PV is expected to play a greater role in future, hence AECEA is of the opinion that "Pakistan" qualifies to be on it's "Asia Country Watch-List".

AECEA – Internal Affairs

Upcoming Activities

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Organized by the Asian Development Bank, AECEA will be speaking during the upcoming 9th Asia Solar Energy Forum in Beijing, China from March 21-23, 2016.

Organized by the Sustainable Energy Development Authority (SEDA) of Malaysia, AECEA has been invited to speak during the 3rd International Sustainable Energy Summit to be held in Kuala Lumpur on April 5-6, 2016

AECEA – Internal Affairs

Recent Activities

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AECEA in its capacity as the Vice-Chairman of the Renewable Energy Working Group of the European Union Chamber of Commerce in China (EUCCC) met with the Deputy Director General of the Renewable Energy Dept. of the National Energy Administration (NEA) Dr. Liang, in order to discuss the upcoming 13th Five-Year-Plan (2016-2020) for Renewable Energy Development on January 22, 2016.

AECEA participated in the annual conference organized and hosted by the China PV Industry Association (CPIA) in Beijing on January 21, 2016.

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Global PV Market Report 2016-2020!

AECEA joined the "**PV Market Alliance**" an alliance formed in 2014 by well-known regional PV experts from the US, Europe, Japan, and Latin America. The PV Market Alliance was formed at the end of 2014 by the Becquerel Institute, AECEA, Creara, RTS and SPV Market Research to provide research on the global markets for photovoltaic, CSP and CPV technologies from the perspective of experts in these markets. The "PV Market Alliance" will publish an annual **"Global PV Outlook"** report on global PV markets. Next edition is due 06/2016!

The PV Market Report Alliance

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Company Profile

Frank Haugwitz is an independent solar energy consultant based in Beijing since 2002. In his early years in China he was seconded by the German govt. and involved in a bilateral solar / PV energy technical cooperation program. Following this assignment he was responsible for the renewable energy component of the EU-China Energy & Environment Program until the fall of 2009. Since then he has been consulting foreign enterprises and international organizations on the development of renewable energies in general and solar / photovoltaic in particular in China. Since early 2010 he works for the organizer of Intersolar as their Head of Intersolar Conference Development.

From late 2009 until August 2012 he worked as a director in the Deutsche China Consult Co. Ltd. (HK) and in October 2012 he founded his company "Asia Europe Clean Energy (Solar) Advisory Co. Ltd. (AECEA) in HK. His services include working with individual clients to apply his extensive China photovoltaic energy-focused insights to their specific needs. Industry experience and in-depth analysis shall assist strategy development and corporate decision making. Focus is on the regulatory framework conditions, policy, as well market and business development. His advisory services provide objective and independent research.

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→ Previous versions of the "Briefing Paper – China Solar PV Development" are available at http://www.aecea.com.de/downloads.html

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