

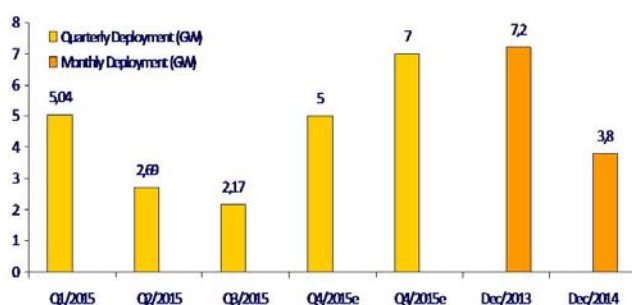
## Is China Underperforming in 2015?

Mid March China announced to have set an annual target of 17.8 GW which makes 2015 its most ambitious year ever, so far. If the 5.53 GW added in Oct are being counted in, China is pushing its ambitions to beyond 23 GW. However, the additionally allocated 5.53 GW are expected to be realized by the end 1H/2016 and therefore according to AECEA’s understanding are not considered to be added to the 2015 target overall, i.e. 17.8 GW in the running year remains unchanged. Nevertheless, China had a good start with 5.04 GW in Q1, benefiting from a significant amount of roll-over projects, i.e. constructed in Q4/2014 and grid connected in Q1/2015. A mere 2.69 GW added in Q2 was to be expected, given that the annual target was released at a relatively late stage. Q3 was not really disappointing, but not really exciting either with just 2.17 GW installed,

## China Quarterly Deployment Trends



Q1-3/2015 | Q4/2015 Forecast | 12/2013 + 12/2014 Reference



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December 2013 and 2014. One if not “the” major reason why China in Dec 2013 truly outperformed with 7.2 GW (Note: This figure refers to State Grid only) was the lowering of the FIT effective from Jan 2014 onwards which triggered a wave of installations towards the end of that year. However, according to AECEA a similar driver does not exist this year, i.e. a reduction of the existing FIT and effective from Jan 2016 appears rather unlikely. Nevertheless, demand is triggered e.g. in the form of the “Top Runner Program” initiated in June/July this year and the winners of that program are expected to deliver 1 GW in one single location (Datong/Shanxi) alone before the end of this year.

To date, NEA’s fairly ambitious target of 17.8 GW has been met with an exceptional bullish demand. According to AECEA’s monthly demand analysis, demand during Q1-Q3/2015 is more than double compared to 2013 and has exceeded the entire year of 2014 already two months ago. In particular July and August witnessed GW’s of projects being put up for tender seeking suppliers and/or service contractors for projects scheduled to be realized before the end of this year. Early July, AECEA in its July Briefing Paper wrote the following ... “Given the overall picture, to date, AECEA is still cautiously optimistic and estimates 14-15 GW (baseline), 16-17 GW (optimistic), and 18 GW (bullish) to be installed in 2015” ... and maintains its view expressed back then.

## China’s 13<sup>th</sup> Five-Year-Plan (2016-2020) – The Sum of all Drivers

In roughly five months, early March 2016, during the next National People’s Congress (NPC), China will release its 13<sup>th</sup> Five-Year-Plan (FYP) stretching from 2016 through 2020. AECEA is of the opinion that by the end of the 13<sup>th</sup> FYP China’s power sector landscape will have gone through fundamental changes, because the author considers the next 5 years as the initial phase of China’s future energy transformation, i.e. a significant shift towards non-fossil fuels (incl. large-scale hydro and nuclear). According to the National Energy Administration’s (NEA) plan, power generation capacity additions will feature very prominent wind and solar PV (incl. CSP). The NEA’s recent indication to plan for 20 GW annually through 2020 and 25-30 GW till 2030, in order to reach 150 GW and 400-450 GW of cumulative installed power generation capacity underlines this opinion. HSBC / Hong Kong has estimated that approx. USD 288 bln will be necessary to fund 100 GW of solar PV till 2020.

Nevertheless, in order to realize these ambitious targets a number of constraints need to be addressed first, among them to enforce the existing dispatch priority at all levels, ensure a timely grid connection and to minimize grid curtailment. The latter will very likely prevail in the foreseeable future; therefore priority will be given to distributed generation vs. large-scale deployment in Western regions. Equally important will be a streamlining of administrative procedures, notably to ensure FIT payments will take place without great delay which to date can take up to 12-18 months. The level of FIT will be subject to constant monitoring and innovation, i.e. the setting of increasingly higher industrial benchmarks will require bringing down the costs leading to lower system cost which consequently means lower FIT. NEA anticipates a system cost reduction of roughly 50% by 2020 compared to current levels. In this context, according to NEA and the Ministry for Industry and Information Technology (MIIT) the industry will be subject to increased competition will eventually lead to a greater industry consolidation, given that today China is home to approx. 1000 manufacturer.

Global demand for solar PV is expected to experience double-digit growth rates in the years and perhaps decades to come, one reason why China already in 2009/2010 among six other industrial sectors, identified renewable energies as a “Strategic Emerging Industry (SEI), in order to be in the position to meet this future demand. AECEA anticipates a further significant expansion of China’s global PV footprint in the next 5 years compared to today. Estimates suggest that today approx. 5-6 GW of production capacity outside of China and owned by Chinese companies already exists. In this context, late May this year the State Council published a guiding document having identified in total 12 industrial sectors (renewables included) subject to severe over-capacity at home, thus encouraging such capacities to be transferred to various destinations around the world. One vehicle which could possibly facilitate such a global expansion especially in the downstream sector is the so-called “Belt & Road Strategy” initiated by President Xi Jinping in late 2013. The former refers to the ancient silk-road whereas the latter refers to the 21<sup>st</sup> century maritime silk-road. Countries along the “Belt & Road” are subject to massive power infrastructure projects implemented by Chinese companies and solar PV is one favoured option. A transfer of existing production capacities into these countries and regions would the Chinese PV industry help to meet the demand from within these markets.

In the context of the “Sum of all Drivers” the author expects a series of announcements related to the “13<sup>th</sup> Five-Year-Plan for Solar Development” during the coming 5-6 months till the next National People’s Congress outlining various policies designed to shape the business environment at home and abroad.

Setting ambitious solar targets on one hand, but on the other hand, China’s power consumption growth is expected to be in the low single digit range this year (2014: 3.8%) and estimates suggest that approx three digits GW of existing power generation capacities are idle and added coal-fired power plant capacities in Q1-3/2015 have increased 50% YoY. At the same time China’s overall economical situation has changed and the so-called “new normal” may make the setting of such “ambitious targets” obsolete!

### **AECEA’s Asia Country Watch-List “Myanmar“**

Geographically, Myanmar is the largest country throughout Southeast Asia and although endowed with extensive natural resources it is classified as a least-developed country somehow reflected by a national electrification rate of just 30%. During dry season load shedding amounts to approx. 500 MW and due to technical and non-technical line losses were as high as 27% in 2011. Therefore it comes at no surprise that 2/3 of Myanmar’s primary energy supply comes from biomass (firewood and charcoal).

### **China’s 13<sup>th</sup> Five-Year-Plan (2016-2020)**



#### **The Sum of all Drivers**

##### ◆ **Power Sector**

- ◆ Energy Transformation | Power Sector Reform
- ◆ Domestic Deployment | Distributed Generation
- ◆ Grid Connection | Curtailment | Dispatch Priority
- ◆ Competition | Quality
- ◆ Streamlining of Administrative Procedures

##### ◆ **Applications**

- ◆ Technological Advancements & Innovation
- ◆ Competition | Industry Consolidation

##### ◆ **Global PV Footprint**

- ◆ Establishing Production Bases Abroad
- ◆ Belt & Road Strategy

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To date, a host of ministries have responsibilities for developing renewable energies among them the Ministry of Energy (MOE) the national focal point for energy policy and the Ministry of Science and Technology (MOST) taking the lead regarding the overall development and promotion of renewable energy for off-grid and other purposes. As member of the Association of South East Asian Nations (ASEAN), Myanmar is expected to meet the ASEAN policy which requires its members to meet 15% of its energy demand by new and renewable energies by 2015/2016. In this context, although the govt has yet to establish renewable energy targets, the Ministry of Electric Power aims to develop close to 500 MW (mainly small hydropower) by 2016, which represents approx. 15% of installed power generation.

## Asia Country Watch-List – Myanmar



### National New Energy Law expected to drive demand for Solar PV in future

- ❖ Land mass = 676,577 km<sup>2</sup> ; Electrification rate: ≈ 30% (2013); Human Dev Index 150 out of 187 countries
- ❖ Population = 58 Mio (2014); average growth rate = 2%/a; 28<sup>th</sup> most populous nation
- ❖ 2015-2020 GDP growth rate estimated at approx. 8-9%/annually
- ❖ Average annual power consumption per capita = 160 kWh (2012)
- ❖ Total power generation capacity = 4 GW; due poor maintenance max power supply 1,3 - 1,8 GW (2012)
- ❖ Total installed RE power generation capacity amounts to 150 MW (2012), target 500 MW by 2015
- ❖ National Electrification Plan foresees universal access to electricity by 2030
- ❖ The govt is in the process to draft a “New Energy Law” designed to promote renewable energies
- ❖ During FY 2014/2015: 170,00 Solar Home Systems (SHS) across 1491 villages were installed
- ❖ To date mobile phone penetration less than 10% of population, expected to increase to 40% (22 Mio) by 2017 requiring investment in solar PV powered telecommunication network
- ❖ Solar Irradiation Range 4.3 – 5.6 kWh/sqm/day; installed solar capacity 0.7 MW (2012)
- ❖ Commercial sector demand for solar: Base Transceiver Stations, PV-Pumping, Rooftop Sys, Street Light

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The Electricity Law (1984) regulates energy-related investment in the country. Currently, Myanmar has no specific renewable energy incentives, however investors can draw on incentives stipulated in the Foreign Investment Law (2012). A study concluded that the technical potential for using solar energy in Myanmar amounts to close to 27 GW. A recent ADB supported study estimates a total investment of US\$ 18 billion is required in the power sector to ensure an economic growth rate of 7.5% through 2030. Despite being ranked by the World Bank as the 182 out of 189 countries for ease in Doing Business 2014 report the US based ACO Investment announced August 2014 to invest up to US 480 Mio into a 150 MW solar PV power plant by 2016.

Against this background and given Myanmar’s anticipated high single-digit GDP growth rates requiring substantial investments in the power sector in the coming years leads to the anticipation that solar PV is expected to play a greater role in future, hence AECEA is of the opinion that “Myanmar” qualifies to be on its “Asia Country Watch-List”.

## AECEA – Internal Affairs

### Upcoming Activities \*\*\*\*\*



Bank of America / Merrill Lynch (BAML) commissioned AECEA, in order to advise clients of BAML, on the recent China solar PV market and global PV developments during BAML’s annual China flagship conference in Beijing on Nov 2-5.

AECEA will attend the 7<sup>th</sup> Intersolar India in Mumbai from Nov 18-20, 2015.



## AECEA – Internal Affairs

### Recent Activities \*\*\*\*\*

AECEA has been commissioned to provide advisory services to the board of an international manufacturer of polysilicon in late October.



AECEA was commissioned to conduct a three day Non-Deal-Roadshow (NDR) in New York City and Boston in later September.

AECEA was commissioned by the Renewable Energy Policy Network for the 21<sup>st</sup> Century to contribute to REN21’s annual flagship report “Global Status Report 2016” which will be published early June 2016. <http://www.ren21.net/REN21Activities/GlobalStatusReport.aspx>





AECEA joined a business lunch hosted by UBS New York City, in order to discuss with UBS clients recent China solar PV developments in late September.

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## Global PV Market Report 2015-2020!

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.

## 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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