

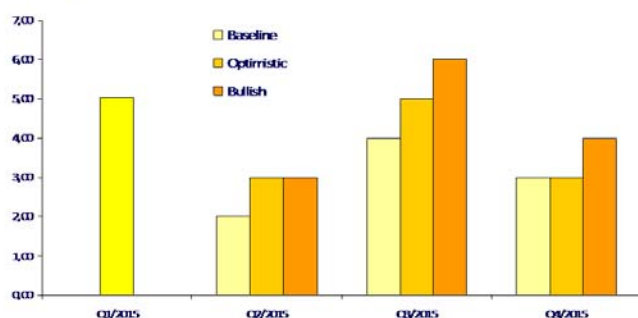
## China’s 2015 Target – 17.8 GW – First Observations

China’s target of installing 17.8 GW makes 2015 a truly ambitious year. The target, a 40% increase YoY (2014: 14 GW) and if successful would translate into a 70% increase YoY (2014: 10.60 GW). If successful by the end of 2015 China could be home to approx. 45 GW of total installed solar PV, which would represent roughly 3% of the total existing power generation capacities. According to the National Energy Administration (NEA), Q1/2015 already witnessed an impressive and rather exceptional high level of installations amounting to 5.04 GW of which AECEA is of the opinion are largely roll-over-projects from Q4/2014. Given the fact that according to the provincial breakdown a fairly large share of the 5.04 GW were installed in West China a region experiencing harsh winters not conducive allowing continued project construction.

## China – 2015 Target of 17.8 GW



Q2 through Q4/2015 Estimated Quarterly Installations in GW



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Doing some simple maths, i.e. deducting 5.04 GW from 17.8 GW means that “just” 12.6 GW remains to be installed by the end of Q4/2015 in order to realize this year’s annual target. Taking into account that NEA decided to replace last years “hard target policy” i.e. 8 GW of distributed and 6.05 GW utility solar PV by a “soft target policy”, i.e. no quota set for any type of application, this rather flexible and possibly more pragmatic approach, taking the myriad of constraints preventing the execution of distributed solar projects into account, shall make it easier to achieve the 17.8 GW target.

Although no specific quotas were set for any type of application, however annual quotas were set for each and every province and local govt were required by NEA to not only prioritize distributed solar PV projects but as well to submit approved project lists by late April. According to AECEA’s research, the majority of Chinese provinces have in the meantime approved either just enough or more than sufficient, i.e. actually exceeding the allocated quota of projects. Furthermore, fairly tight project schedules shall ensure that the targets are being met by December.

AECEA considers several provincial targets as challenging, simply due to the lack of attractiveness in terms of solar irradiation e.g. Sichuan with a 600 MW target (2014: 100 MW) or Heilongjiang with no known local developer industry, but a target of 300 MW (2014: 100 MW). Similarly, it remains to be seen how the 1.5 GW of grid-connected poverty alleviation projects which are part of the 17.8 GW will be executed. Since the installation of hundreds if not thousands of small scale 3-5 kW systems at so-called low income households in designated provinces is according to several developers feedbacks not everyone’s interest.

Overall, NEA’s exceedingly ambitious target of 17.8 GW has so far been met with an equally bullish demand for projects. According to AECEA’s demand analysis, demand during 1-4/2015 is more than double YoY. Drivers are e.g. a possible adjustment of the current FIT scheme effective from 2016 onwards or in addition if approved projects fail to get grid-connected during 2015 developers may run the risk to get suspended for further projects in coming years. Given the overall picture, to date, AECEA is cautiously optimistic and estimates 14-15 GW to be installed in 2015.

## China’s Ambitions Expanding it’s Global PV Manufacturing Footprint

Mid May 2015, China’s State Council outlined in an official notification on how it’s domestic manufacturing industry shall pursue opportunities abroad through international cooperation. Drivers are an increasing assertiveness being able to compete outside of China and the demand for infrastructure projects, sustained industrialization and urbanization in both developing and emerging economies. Identified key industries consist of among others of steel, railway, chemicals, automobile, aerospace, communication, shipping and electric power. The latter explicitly covers thermal, hydro, wind and solar PV.

## May 2015 – Briefing-Paper – China Solar PV Development



The State Councils notification stipulates further to actively participate in the investment, construction and operation of PV projects, as well to strive for establishing manufacturing capacities in relevant countries. In this context, national companies considered internationally competitive shall take the lead first, in order to encourage small and medium size companies to follow at a later stage with the aim to cover the entire industrial value chain. By 2020, a batch of global manufacturing bases in various countries shall be established.

Envisaged entry points for setting up such “bases” are designated special economic trade and industrial zones in relevant host countries offering favourable investment environments and strong local demand. To facilitate such global ambitions, China’s policy banks e.g. China Development Bank (CDB), Import-Export Bank, China’s Sovereign Fund the China Investment Corporation (CIC) among others are encouraged to offer active support.

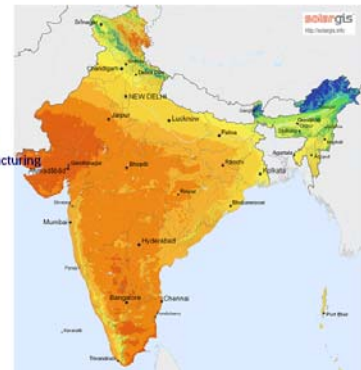
One recent example is that during the visit of the Indian Prime Minister Narendra Modi to China in mid May, multiple MoU’s / agreements between Chinese and Indian solar companies were signed. In this context, already late April the company GCL presented a possible project in the Indian State of Gujarat (Mundra) featuring in addition to a 50.000 t of polysilicon plant, wafer, cell, modules and other materials with each 10 GW production capacities.

### China’s Go Global Ambitions



#### May 2015 – Indian and Chinese Companies signed multiple MoUs

- ◆ Welspun & Trina Solar: 500 MW Cell & 500 MW Module Capacity
- ◆ Adani Group & Golden Concord Holdings (GCL): Integrated PV Industry Park
- ◆ Essel Solar & JA Solar: Cell and Module Production
- ◆ Sun Group & CSI: 5 GW projects & Module Manufacturing



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Given that a number of regions across the globe are anticipated to experience significant growth rates in terms of solar PV deployment, but lack both domestic PV manufacturing industry and the availability to mobilize funding, AECEA is of the opinion that China’s PV industry is well positioned to fill this void.

### AECEA’s Asia Country Watch-List “The Philippines”

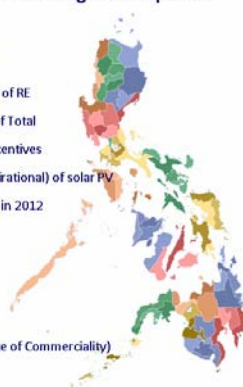
Home to more than 7100 islands and being the 39<sup>th</sup> largest economy, the Philippines are among the fastest growing economies in Asia with an estimated GDP growth of 6.4% and 6.3% in 2015 and 2016 respectively. In order to power its booming economy, according to the Philippines Energy Plan (2012-2030) projections, power generation capacities are expected to increase by 60-80% from 16.2 GW (2012) to 25.8 – 29.3 GW by 2030.

#### Asia Country Watch-List – The Philippines



##### January 2015 – Solar PV Gains Strong Momentum Reaching 2 GW Pipeline

- ◆ 7,107 Islands = 300,000 km<sup>2</sup>; Electrification rate: = 70%
- ◆ Population = 101 Mio (2015) estimated to reach 153 Mio by 2050
- ◆ 2014 Total Power Generation Capacity 19.378 MW with a 2% Share of RE
- ◆ 12/2011 Oil and Coal Power Generation Capacity represent = 49% of Total
- ◆ RE Act passed into Law July 2008 and provides fiscal & non-fiscal incentives
- ◆ Natl. RE Program by 2030 govt. target 248 MW plus 1.528 MW (aspirational) of solar PV
- ◆ 2014 Solar PV Target was increased to 450 MW up from 50 MW set in 2012
- ◆ Solar Irradiation Range 5 kWh/sqm/day
- ◆ FIT US\$ 0.22/kWh
- ◆ 2015-2016 GDP forecast growth put at approx. 6.4 – 6.3%
- ◆ 01/2015 Under the FIT Program: = 501 MW (Pending Application); 1.3 GW (Approved Service Contracts); 297 MW (Approved Certificate of Commerciality)



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Relevant power sector investment has been estimated to exceed USD 25 bln (13 GW) and offers significant opportunities for the deployment of renewable energies in general and solar PV in particular since roughly 49% of the Philippines total installed power generation capacity is fuelled by imported oil and coal together. Although on July 28, 2008 the Philippines govt passed the RE Act into Law, the Energy Regulatory Commission (ERC) published with a four year delay the applicable FIT for solar PV. Payments for the FIT is funded from the collection of a uniform charge called FIT Allowance and shall be paid by all electricity consumers which imply the risk that the FIT Allowance might not be sufficient to pay the FIT to the developers.

# May 2015 – Briefing-Paper – China Solar PV Development



In an attempt to weed out speculators early 2013 the Philippine Dept. of Energy (DOE) announced a first come, first serve policy in respect of entitlement to FIT for solar PV projects, i.e. the FIT allocation will be given to developers who will first commence commercial operation. This policy was subsequently confirmed through the issuance of the guidelines for the selection process of RE projects under the FIT system and the award of certificate for FIT eligibility.

Given The Philippines’s surging economy combined with anticipated high digit power consumption growth rates requiring substantial investments in the power sector in the coming years and the recent announcement made by the President that “renewable energy” can be a competitive choice in order to address the looming power shortage across the nation, which the president estimated may reach a min of 300 MW or max of 1 GW by summer 2015 leads to the anticipation that solar PV is expected to play a greater role than in the past, hence AECEA is of the opinion that “The Philippines” qualifies to be on it’s “Asia Country Watch-List”.

## AECEA – Internal Affairs

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

AECEA will attend the upcoming Intersolar Europe scheduled to take place in Munich / Germany from June 9-12, 2015



## ASIA CLEAN ENERGY FORUM 2015



AECEA will be speaking on “China’s National Solar Photovoltaic Policy – What are the lessons learned since 2009 “at the 10<sup>th</sup> annual Asia Clean Energy Forum 2015 hosted by the ADB in Manila / The Philippines on June 18<sup>th</sup>.

AECEA has been invited by the Asian Development Bank (ADB) to speak during the upcoming 8<sup>th</sup> Asia Solar Energy Forum (ASEF) on “China’s Distributed Solar PV Ambitions – Policies and Challenges in Manila on June 15, 2015.



## AECEA – Internal Affairs

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



Commissioned by Bank of America / Merrill Lynch (BAML), AECEA attended BAML Hong Kong’s “China Energy & Clean Environment Corporate Day”, in order to meet with investors, fund managers for 1on1 / small group meetings during May 27.

AECEA was invited to attend CLSA’s “China Forum 2015” flagship conference as a speaker, which took place in Chengdu / Sichuan from May 11-13, 2015. In addition to AECEA’s speaking engagement 1x1 investor meetings were organized.



Organized by Terrapin, AECEA was invited to speak on “China’s Solar Sector Prospects in Light of the 13<sup>th</sup> Five-Year-Plan (2015-2020)” during the Power & Electricity World Asia 2015 in Singapore on May 6, 2015.

AECEA was commissioned by Bank of America Merrill Lynch (BAML) to conduct a China Solar PV Road-Show in Singapore, in order to meet with institutional investors and fund managers during May 4-5, 2015.





AECEA joined the “PV Market Alliance” an alliance formed in 2014 by well-known regional PV experts from the US, Europe, Japan, China and Latin America. The PV Market Alliance was formed at the end of 2014 by AECEA, the Becquerel Institute, 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 “World PV Outlook” report on global PV markets. The 2015 edition will be forthcoming in early June. More info here: <http://pvmarketalliance.com/>

## 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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