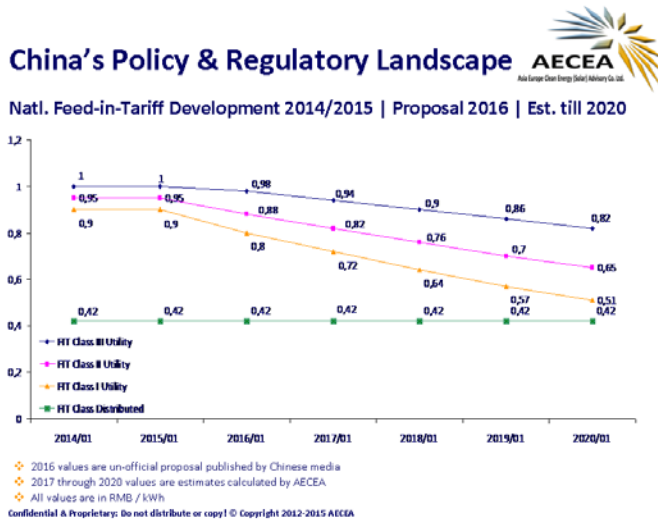


China’s Future Feed-in-Tariff Roadmap from 2016 through 2020 Pose – An Early Assessment

China’s national Feed-in-Tariff (FIT) scheme for both utility-scale and distributed solar PV remained unchanged for the past two years. Sound policy guidelines allowed the market to achieve annual double-digit GW installations between 2013 and 2015 turning China into the world largest market for solar PV applications. By late September 2015 China already surpassed its national target of 35 GW set in the context of the running 12th Five-Year-Plan (2011-2015) and estimates by AECEA anticipates a total installed capacity reaching approx. 43 GW implying approx. 15 GW to be installed in 2015.



Anticipating an adjustment of the current FIT scheme, in particular in light of the approaching 13th Five-Year-Plan (2016-2020), the central government’s requirements to consolidate the market through competition and to see further cost reductions of deployed systems, late October unofficial information leaked to the Chinese media indicated not only reduced FIT effective next year but as well annual reductions between 2-3 and up to 5% in specified locations throughout the country till 2020. On Dec 16, 2015, further un-official information were made available suggesting a greater annual reduction up to 11% in particular in Western provinces, whereas Central provinces face a reduction up to 7% and Eastern provinces are subject to a fairly moderate reduction of just 2%.

and Eastern provinces are subject to a fairly moderate reduction of just 2%.

The central government’s intention is obvious, future installations shall take place in provinces across East China preferably in the form of distributed generation. According to AECEA in particular commercial & industrial (C&I) rooftop installations will be at the heart of this anticipated future development. China is home to approx. 1500 industrial development zones covering approx. 10.000 km² and estimates suggests that these zones could accommodate up to 80 GW of rooftop alone. Financial viability for such types of rooftop systems is further enhanced through the offering of additional fiscal incentives, i.e. provincial FIT, city-level FIT, district-level FIT, capital subsidies provided by local governments, in particular across East China. Estimated average IRR’s for C&I projects are projected to reach 14+%.

The rather significant reduction of FIT in excess of 10% in West China (Class I regions) is no surprise, not only because system capacities in these regions tends to be fairly large allowing lower installation costs, higher levels of solar irradiations, the anticipated massive installations of thermal power generation capacities, but as well that already today e.g. in Xinjiang the average grid curtailment is 19% and in Gansu even 28% according to NEA. The latter constraint shows sign of spreading into Central China provinces this might have been considered too when suggesting to lower FIT in Class II regions by up to 7%. Despite the current build-up of long-distance transmission lines in West and Central regions, the grid curtailment is likely to stay in the foreseeable future.

China’s Policy & Regulatory Landscape AECEA
 Natl. Feed-in-Tariff 2015 | Proposal 2016

2016 Feed-in Tariffs (FIT) for On-Grid PV Power Plants (Un-Official)					
Local Solar Resource Benchmark Class	2015 FIT (RMB/kWh)	(Oct 29) 2016 Potential (RMB/kWh)	Reduction from 2015 Level	(Dec 16) 2016 Potential (RMB/kWh)	Reduction from 2015 Level
I	0.90	0.85	5.88%	0.80	11.11%
II	0.95	0.92	3.16%	0.88	7.37%
III	1.00	0.98	2.00%	0.98	2.00%

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Unclear as of today remains the fact whether the central government intends to adjust as well the FIT for distributed solar PV further since so far publicly available information refers to utility-scale projects only. Regarding distributed PV the last adjustment effective since Sept 2014 allows developers to choose between FIT for distributed or FIT for utility-scale projects under specific conditions.

Assuming that in the remaining days of 2015 the central government will officially publish reduced FIT for 2016 and till 2020 it certainly will provide a greater predictability compared to the past were occasionally various announcement were made at short notice causing a year-end-rush to finalize installations. However, even if the govt will release such a 5 year FIT roadmap, any of these future annual FIT values are certainly not set in stone, i.e. depending on e.g. that technological advancements may lead to financial returns considered too high, the govt reserves the right to adjust the FIT accordingly.

China is bullish on Concentrating Solar Power (CSP)

Already late September the National Energy Administration (NEA) issued an official notification outlining its ambitions to support and promote the deployment of Concentrating Solar Power (CSP) in future. Accordingly it invited the industry to submit project proposals with an individual power generation capacity of minimum 50 MW featuring domestic equipment. Potential projects shall be constructed in regions with a DNI allowing at least 1600 kWh/m²/a, which suggest that basically all potential projects shall be in West China. The share of equity can not be lower than 20%, the VAT is temporarily set at 17% and the intended operation period is 25 years. The industry response was somewhat overwhelming, because expressions of interest amounted to approx. 8.8 GW from which the govt shall select projects with a combined capacity of 1 GW. Corresponding Feed-in-Tariff is still under consideration by NEA. Interestingly, if the proposed FIT by developers is considered too high that project automatically disqualifies itself. In the context of the 12th Five-Year-Plan for Solar Development (2011-2015) China has set a target of 1 GW of CSP and according to China RE Roadmap 2050 indicated 5 GW (baseline scenario) and 10 GW (optimistic scenario) by 2020. To date, approx. 250 to 300 MW of CSP featuring various technologies are in different project developmental stages.

AECEA’s Asia Country Watch-List “India“

To date, India’s total installed power generation capacity amounts to a mere 275 GW (incl. 37 GW of RE) and approx. 300 Mio people have no access to power at all. In the next ten years, India’s power generation capacity requirements are anticipated to double and even to quadruple in the next 20 years. In this context, driven by national and state policies India’s domestic solar PV market is expected to witness double-digit GW annual installations in the years to come. The country’s main governmental body in charge the Ministry for New and

Renewable Energy (MNRE) is looking at a total installed solar capacity of 100 GW by 2022 and expects from 2016 through 2022 annual PV additions in the range from 12 to 17 GW. Ambitious targets, however a number of prevailing constraints may have a slow down effect. For instance the national target of 100 GW is split into 60 GW (utility-scale ground-mounted) and 40 GW of rooftop installations, in particular the latter gives reason to be cautious, are of today just 200 MW installed on roofs across the country. In comparison the acquisition of land for ground-mounted systems is equally challenging, along with today’s overall grid stability and power evacuation capacity.



Asia Country Watch-List – India

Natl. Solar Mission Drives Demand – Challenges Remain – PV Parks Promising

- Land mass = 3,287,590 km²; Electrification rate: = 78% (2012); = 300 Mio have no access to electricity
- Population = 1.295 Billion (2014); by 2030 population increase = +24%
- 2015-2020 GDP growth rate estimated at approx. 7%/annually
- Average annual power consumption per capita = 1,010 kWh (2014)
- 09/2015 total power generation capacity = 275 GW; incl. 37 GW of RE power generation capacity
- Power generation cap projected to double in next decade
- Share of solar in terms of energy penetration and capacity penetration est. to increase from 1% to approx. 8% and 23% respectively by 2022
- Natl. target to install 100 GW (solar), 75 GW (other RE) by 2022
- Natl. solar target 100 GW: 60 GW utility and 40 GW rooftop
- MNRE est. 12 GW of additionally installed PV capacity in 2015/2016
- Solar Irradiation Range = 4–7 kWh/sqm/day; 11/2015 installed solar capacity = 4.8 GW
- 25 Solar PV Parks with a combined capacity of 20 GW appears to be most promising in the near term

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At the same time, the availability of capital or the cost of capital is challenging too, if e.g. interest rates are in the range of 15-17% (and even higher) and the financial health of in particular the power distribution companies gives reason to be alert. Last but not least, the current absence of uniform policies, regulations and bidding guidelines across the nation requires attention too. In the near term a significant enabler are the so-called Solar Parks being pursued across India, because intl. organizations are providing funding in order to improve the park infrastructure capacities allowing a faster execution of utility-scale PV power plants. Against this background and given India’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 “India” qualifies to be on it’s “Asia Country Watch-List”.

AECEA – Internal Affairs

Upcoming Activities *****

AECEA – Internal Affairs

Recent Activities *****

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. The next edition is due 2016!

The PV Market Report Alliance



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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