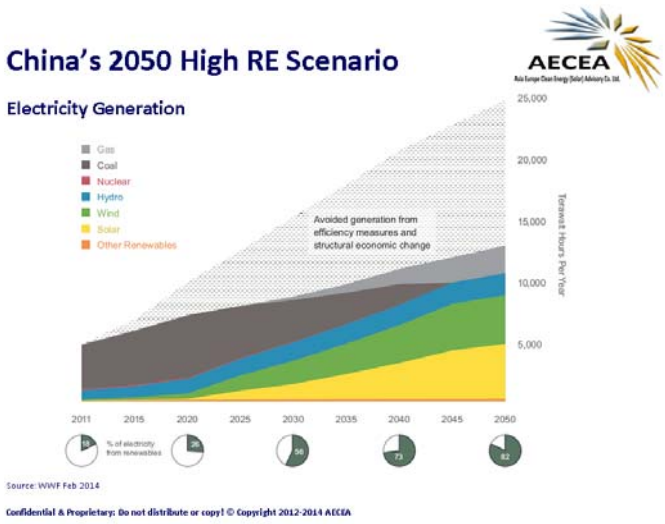
March 2014 – Briefing-Paper – China Solar PV Development

By 2050 China's power demand can be met by renewables suggest a recently published WWF report

Today, China positions itself as a global leader in renewable energy, however it continues to rely heavily on power generation from coal. China's coal consumption has increased for 13 consecutive years, and it currently consumes almost half of the world's coal. This year China has set a target of 4 bln tonnes of coal consumption. To date, nearly 80 percent of electricity consumed in China is generated by coal and conventional wisdom suggests that China can't kick its coal habit, as its massive energy needs are projected to continue to increase in coming years. Transitioning to an energy economy dominated by renewable energy, instead of coal, just isn't possible in the foreseeable future. WWF's report shows that the conventional wisdom is wrong and that even under conservative assumptions about the future cost of renewable electricity technology and innovation potential, a renewable power future is actually within reach. The analysis shows that with "proven technology," around 80% of China's electricity generation can be met by renewable sources by 2050, if China immediately begins to implement ambitious energy efficiency measures and reduces the share of its energy-intensive industries while growing its services as a basis for sustainable economic development. According to a rare public statement "In 2013 it became obvious for all that the energy path that China has pursued the last 10 years were unsustainable" made by a representative of "China National Renewable Energy Center" (CNREC) underlines the need to change China's energy mix.



In the context of the above, early 2013 the "China National Renewable Energy Center" (CNREC) has been commissioned by the central government to elaborate a "2050 China Renewable Energy Roadmap". Although the "roadmap" won't be finalized before the end of 2014, however first possible scenarios have been communicated.

Type	2015	2020	2030	2040	2050
Photovoltaic	35	50 (120*)	750-900*	1400-1700*	2000-2500
Wind	100	200	--	--	1500-2000

Note: Values are cumulative and in GW | * are AECEA's estimates

To put the above in perspective, if the maximum feasible Chinese wind resource of 2,500 GW were indeed exploited, approx. 1 to 2 million 24-story wind towers would occupy an area equal to the size of Sichuan Province (485,000 km^2) or roughly half the territory of Inner Mongolia.

As to solar PV deployment, China has been working for many years on assessing the potential of its Gobi desert area suitable to deploy solar PV on a truly "massive scale". However, given the fact of the poor correlation of high solar radiation in Western China and its load centers located throughout the Eastern provinces along China's coastline would add further significant strain on the already overstretched existing grid infrastructure. Therefore, in August 2013 China's National Energy Administration published support policies designed to promote rather distributed solar PV in an attempt to reduce the burden on the grid and to accommodate China's continued urbanisation in the decades ahead.

2014 China's 12th National People's Congress and Renewables / Solar PV

全国人民代表大会
The National People's Congress of the People's Republic of China

The National People's Congress (NPC) is the highest legislative body in China and has the sole responsibility for enacting legislation in China. The NPC meets once a year early March.

The 12th NPC was formed in March 2013 and will serve a five year term. Reform and in particular the increasing role of the market forces were at the centre of the 2014 session. The central government recognized that the growth model China has applied over the last 35 years is not sustainable and is causing significant challenges. Consequently, the role of the government in the market shall be adjusted, including the backbone of the state planning mechanism the National Development and Reform Commission (NDRC) which exercises most of the central government's authority over China's electric power system.

As the Chinese Premier Li Keqiang noted in his annual government work report, reform and opening-up is creating a range of opportunities in various sectors, i.e. non-state capital shall be allowed to be used in projects which traditionally were restricted to State-Owned-Enterprises (SOE). Sectors explicitly mentioned include among others public utilities, oil, and electricity. Priorities identified for 2014 includes that new sectors have been earmarked for private investments and are expected to be less restrictive for foreign investment, in particular as well new and renewable energy solutions. The premier further elaborated "We should improve the proportion the non-fossil energy power generation, develop smart grid and distributed energy, encourage the development of wind and solar energy, and start construction of a batch of hydropower and nuclear power projects. Furthermore, strengthen the exploration, exploitation and application of natural gas, coal bed gas, and shale gas". By 2015 China aims at 11.4% of final energy coming from renewables, at the end of last year that figure stood at 10.6%.

AECEA is of the opinion since historically, a range of artificially low prices for utilities such as water, oil and electricity did not result in a rational use of the afm. that electricity prices in particular could eventually be adjusted as a means to change consumer behaviours and consequently makes solar PV application more competitive in the coming years. As to the role of SOEs in the power sector, in general, the top-management of SOEs are appointed by the central government, however conduct their business at both provincial and local levels. They increasingly form alliances with regional political representatives, who control much of the non-state-owned power sector, and, together, find ample reasons to resist the mandates of the central government. The non-existence of an independent regulatory agency with a clear mandate given by the central government to oversee the activities of SOEs and guide them toward national rather than corporate goals could pose a challenge for renewables in the mid and longer term.

China's Power Sector Reform

Late March 2014 the National Energy Administration (NEA) submitted a plan outlining a power sector reform to the State Council. As of today, China is home to just two grid operators, i.e. the State Grid Corporation owing approx. 80% of China's grid, whereas China Southern Grid has the remaining 20% under its jurisdiction. Both purchase electricity from the local power utilities and resell it to the end-users. The objective of the power sector reform is to gradually break-up the quasi monopoly in the transaction of electricity and introducing a scheme where large users can purchase electricity directly from the power utilities. Several provinces like Sichuan, Hunan, Gansu, Shandong and Shanxi have already begun on a trial basis allowing larges power consumer the purchase of electricity directly from the local power utilities.

AECEA is of the opinion that at this stage the impact of this intended power sector reform for conventional and renewable power remains to be seen and by when such a reform will be possibly applied throughout China. Given that the last major power sector reform took place in 2002 and the fact that China has transformed substantially over the last decade, a power sector reform is certainly required.

Shanghai Stock Exchange set up a board for Strategic Emerging Industries

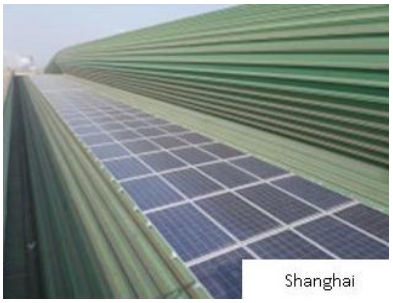
Mainland China is home to two stock exchanges, Shenzhen and Shanghai. The latter established in 1990 had in total 959 companies listed by Feb 2014, whereas 1578 companies were listed in Shenzhen. Early March the Shanghai Stock Exchange (SSE) during the annual National People's Congress (NPC) announced considering setting a new trading board for "Strategic Emerging Industries". The strategic emerging industries (SEI) cover "biotechnology, next generation of IT, clean energy vehicles, energy conservation, environmental protection, high-end equipment manufacturing, new materials and new and renewable energy". Given the expectations attached to the SEIs to significantly contribute to the restructuring of China's industrial infrastructure and to become the future pillars of China's economy, the SSE through such a designated SEI trading board attempts to facilitate raising capital for companies operating in the SEI areas. Whether the new board once established will attract both large and mature, but as well smaller companies remains to be seen, since the average price-earning ratios for companies listed in Shanghai was 10.73, but at the Shenzhen Stock Exchange (SZSE) was 28.58 in late Feb 2014. At the same time seeking a stock-listing abroad has not lost its appeal since Jiangsu based ET Solar is considering and IPO in the US this year. The SSE has yet to announce a clear timetable when the new board will be launched.

China's Market for CPV Technologies

September 2013 the Chinese company Suncore commissioned by Shenguang Co. Ltd. finalized a 50 MW High-Concentrating PV project in Golmud / Qinghai Province which makes it so far the largest operating HCPV power plant worldwide. Late March 2014 a Suncore company representative revealed that an even larger HCPV power plant is currently under preparation. Last year witnessed as well the commissioning of three Low-Concentrating PV (LCPV) projects with a combined capacity of 3.5 MW undertaken by the US based company Solaria. At present, the Chinese project developer Focusic deploying HCPV modules supplied by Soitec is executing its second phase (in total 8.5 MW including Phase 1). Suntrix, another Chinese CPV manufacturer publicly announced to have signed a contract for a 30 MW plant and is currently negotiating almost 700 MW of potential projects with various developers for its tracker technology. According to most recent announcements made by SunPower to supply 120 MW of its C7 CPV technology to several projects in Inner Mongolia indicate a significant local demand for CPV based technologies.

Schletter provides mounting systems for close to 20 MW of projects in 2013

Last year the German company Schletter provided mounting solutions for in total 5 projects with a combined capacity of approx. 19 MW. Accordingly, in Henan (4.17 MW), Zhejiang (5.44 MW), Jiangsu (1.09 MW), Liaoning (2.18 MW) and Shanghai (5.96 MW). The majority of the projects were finalized before the end of 2013 to ensure the projects were still eligible for the 2013 Feed-in-Tariffs.



AECEA – Internal Affairs

Upcoming Activities **********

Bank of America / Merrill Lynch (BAML) commissioned AECEA, in order to advise Hong Kong based institutional & private equity investors, all clients of BAML, on the recent China solar PV market developments during BAML's annual flagship "China Energy & Clean Environment Corporate Day" on May 7-9.

Recent Activities **********

AECEA – Internal Affairs

On April 10, 2014 members of the Renewable Energy (RE) Working Group of the European Union Chamber of Commerce in China (EUCCC) located in Beijing re-elected Frank Haugwitz to serve as the Vice-Chairman of the Renewable Energy Working Group for a second tenure. The RE Working Group is a sub-working group of the Energy Working Group. The RE Working Group is primarily composed of renewable energy equipment manufacturers and developers in the biogas, solar, and wind sector.

As of April 2014, AECEA is a member of the Asian Solar Energy Forum (ASEF). In May 2010, the Asian Development Bank (ADB) announced the launch of the Asia Solar Energy Initiative (ASEI), targeted to assist in identifying, developing, and implementing 3 GW of solar power in Asia and the Pacific over the next 3 years. In this context the Asian Solar Energy Forum (ASEF) was created and shall help address barriers and accelerate the development of solar energy in Asia by developing and sharing knowledge of technology, standards, experiences, policies, incentives, approaches to exploit economies of scale, risk mitigation, and long-term financing.

AECEA was been invited to speak at the "International Green Conference 2014" in Daegu, South-Korea on April 3rd, 2014 on "Key Business Development Trends and Market Entry Strategies for Korean Companies in the Chinese Domestic Solar Photovoltaic Market".

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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). 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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