



Lessons learned from China's solar policies: Implications for Southeast Asia

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19th Party Congress, 2017: the “Driver’s Seat”?

- In 3+ hours, Xi’s speech had 89 mentions of ‘environment,’ just 70 of the ‘economy’
- China now “is in the driver’s seat” on climate cooperation
- Poverty alleviation focus: “Down-to-earth, adaption to local conditions, classified guidance and targeted poverty alleviation”













China's 13th Five Year Plan (2016-2020)

- The “new normal”: from investment-led to consumer-led growth, innovation and services
- “Ecological civilization”: focus on green policies and technologies
- Energy efficiency, promotion of renewables and reduction of coal in the energy mix: 18% reduction in carbon intensity from 2015 levels by 2020
- 15% reduction in energy intensity
- 15% of primary energy from non fossil sources
- Reduce energy consumption below 5 billion tonnes of standard coal equivalent by 2020

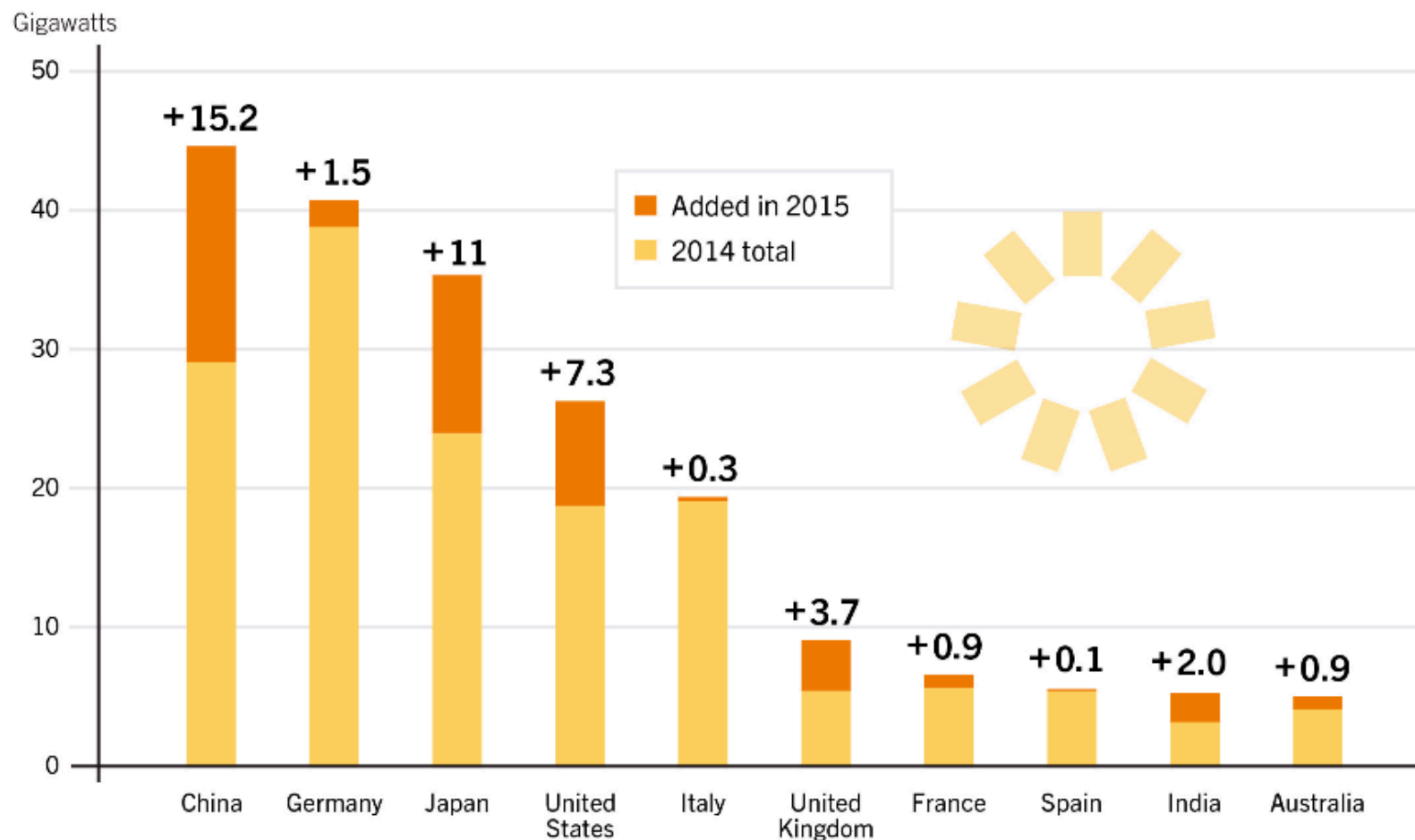
Top Five Countries Annual Investment/Capacity Additions /Production in 2016

	1	2	3	4	5
Investment in renewable power and fuels (not including hydro > 50 MW)	China	United States	United Kingdom	Japan	Germany
Investment in renewable power and fuels per unit GDP	Bolivia	Senegal	Jordan	Honduras	Iceland
 Geothermal power capacity	Indonesia	Turkey	Kenya	Mexico	Japan
 Hydropower capacity	China	Brazil	Ecuador	Ethopia	Vietnam
 Solar PV capacity	China	United States	Japan	India	United Kingdom
 Concentrating solar thermal power (CSP) capacity	South Africa	China	–	–	–
 Wind power capacity	China	United States	Germany	India	Brazil
 Solar water heating capacity	China	Turkey	Brazil	India	United States
 Biodiesel production	United States	Brazil	Argentina/Germany/Indonesia		
 Fuel ethanol production	United States	Brazil	China	Canada	Thailand

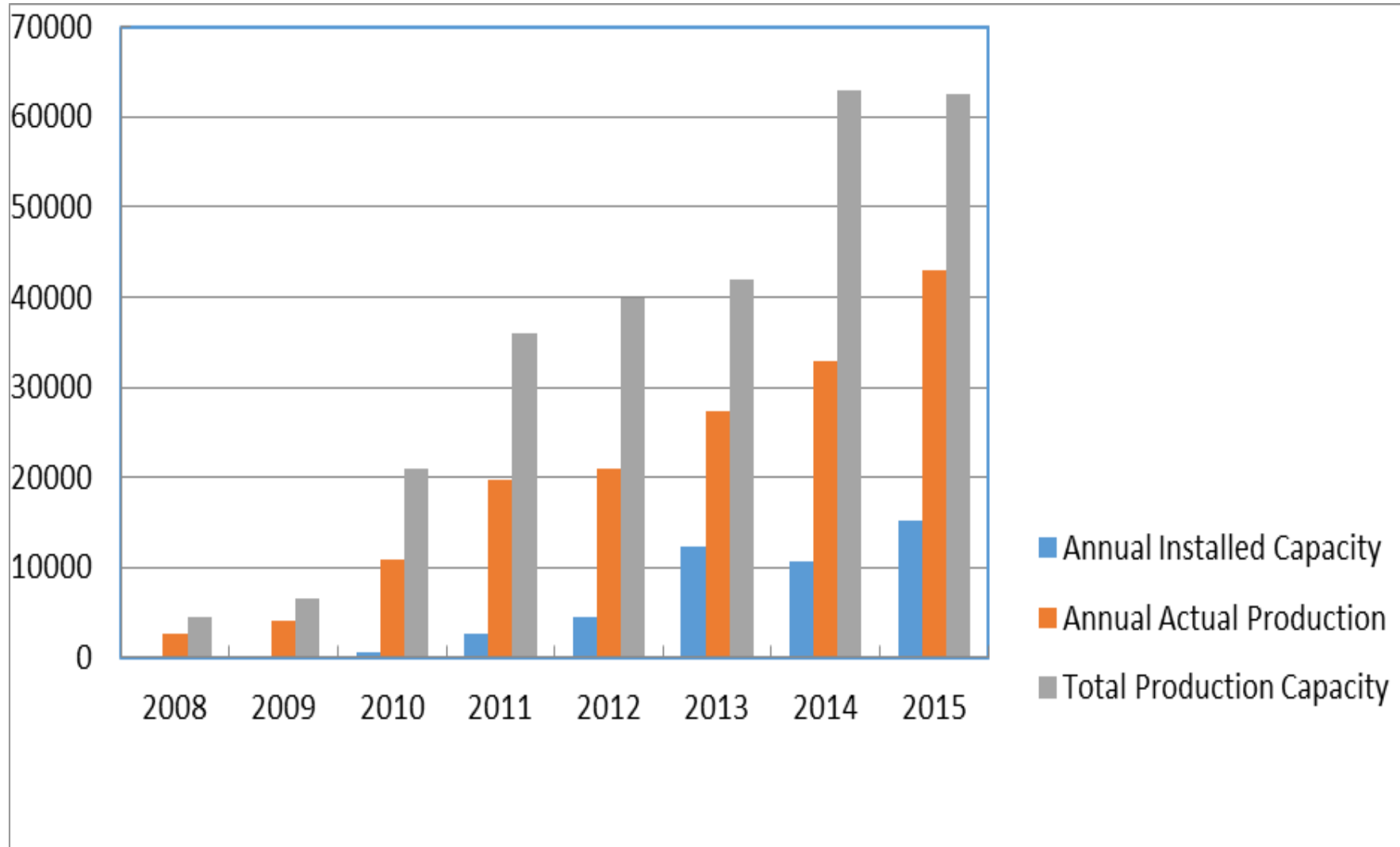
Source: REN21 2017



Solar PV Capacity and Additions, Top 10 Countries, 2015



China's solar industry boom

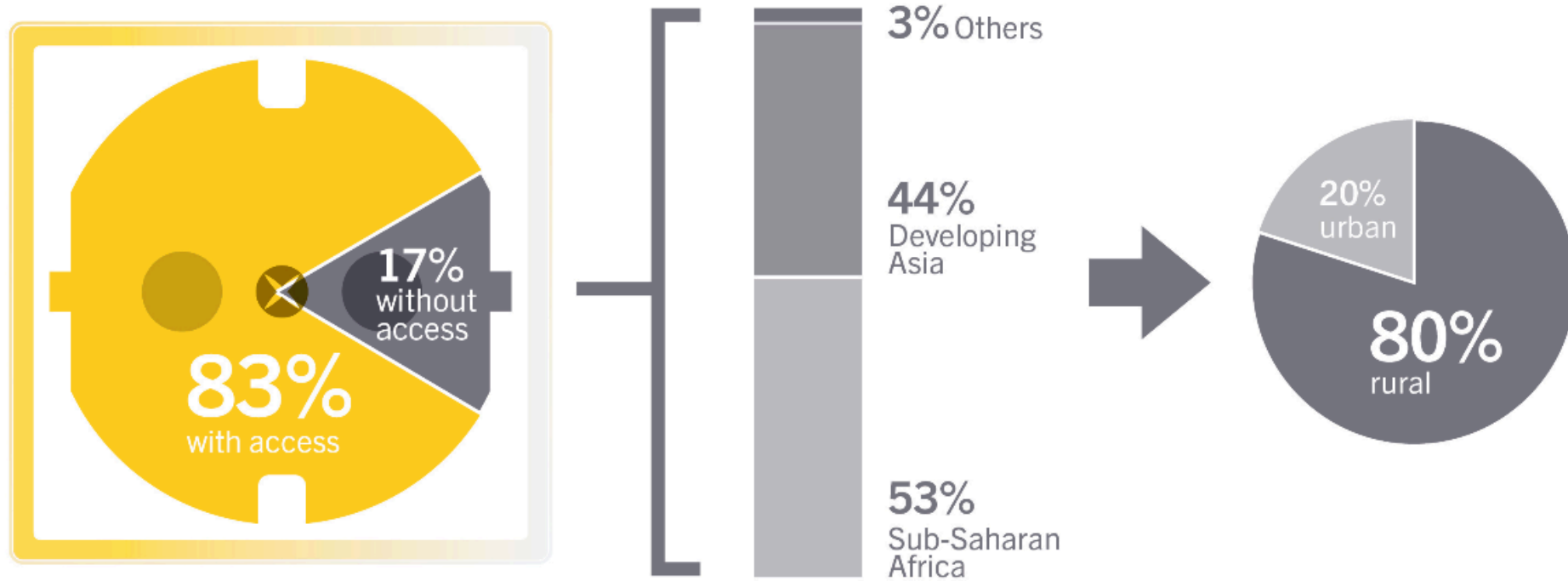


- Crisis in 2010 led to government intervention;
- Domestic market boom between 2010 and 2015;
- 15GW installed in 2015 alone;
- Hit the ceiling when power grid has no capacity for accommodation and transmission;
- Curtailment reaches 50% in some areas in early 2016;
- Distributed system favored by government but not by private investors

Why renewables for development?

- Renewable energy technologies:
 - help to mitigate climate change
 - provide cheap and reliable energy to areas where grid-based provision is unreliable or otherwise prohibited by geography or high costs
 - improve energy availability, energy security and economic resilience.
- In the Mekong region, can help to meet the needs of the poor for expanded energy access (in Myanmar, access at 57%), as well as providing cheap and reliable green energy.
- UN Sustainable Development Goal 7: Affordable and Clean Energy

World Electricity Access and Lack of Access by Region, 2013



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Original research article

Solar energy for poverty alleviation in China: State ambitions, bureaucratic interests, and local realities

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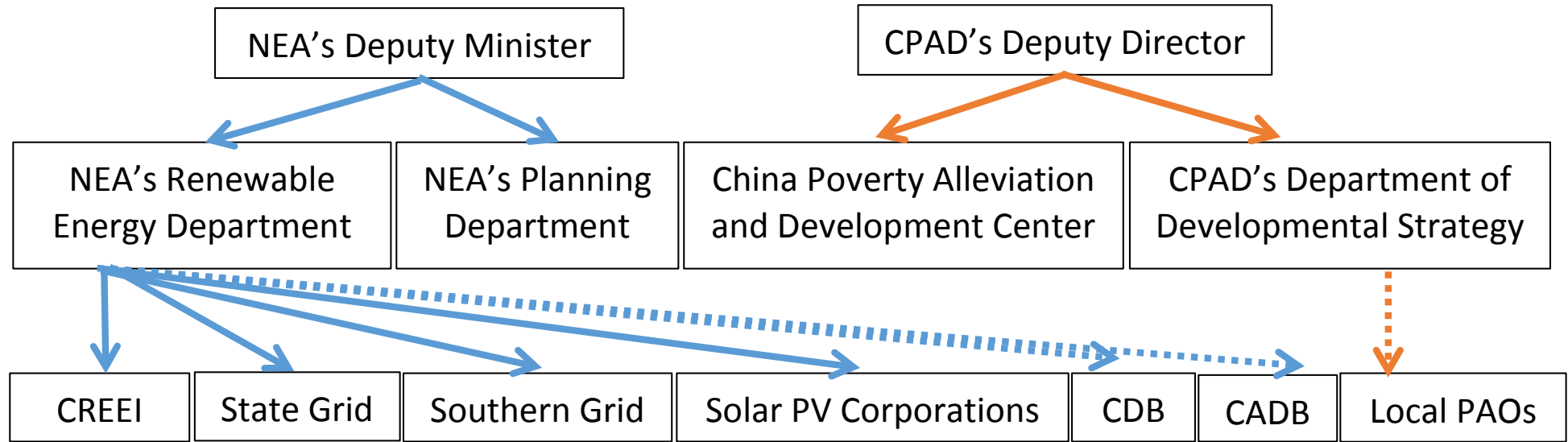
ABSTRACT

In 2014, China announced an ambitious plan to help alleviate rural poverty through deploying distributed solar photovoltaic (PV) systems in poor areas. The solar energy for poverty alleviation programme (SEPAP) aims to add over 10 GW capacity and benefit more than 2 million households from around 35,000 villages across the country by 2020. This article investigates the implications of the initiative through discourse analysis of policy documents and a case study of its implementation in the remote and largely pastoralist county of Guinan, in Qinghai province on the Tibetan plateau. The study illustrates the constraints on implementing SEPAP and contested local perspectives on the buildout of ostensibly low carbon infrastructure for electricity generation. In particular, it raises new perspectives on the limits of a state-led push for energy infrastructure in rural and

China's "Solar Energy for Poverty Alleviation"

- SEPAP launched in 2014 as pilot, elevated to national programme end of 2015. Aims to:
- Alleviate rural poverty by developing distributed solar energy systems in remote and poor rural areas (fits with 2020 goal to eradicate poverty in China);
- Eligible activities include rooftop systems and solar power stations on non-arable land
- Install 10GW capacity, 2 million households, and 35,000 villages, by 2020;
- Generate additional annual income of over 3,000 RMB yuan (432.55 USD) for each poor household.

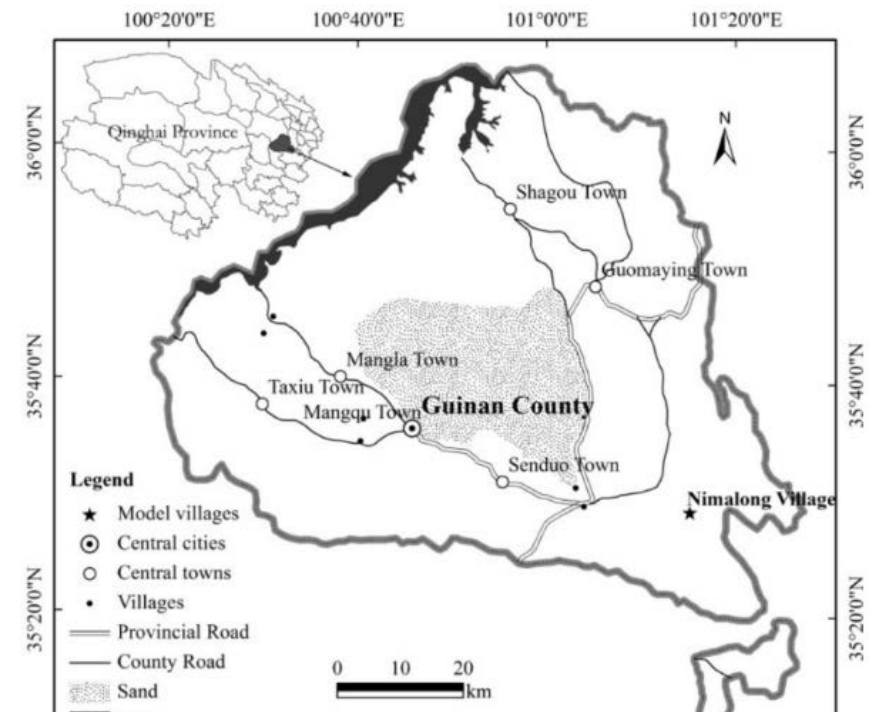
SEPAP: the regulatory framework



- **NEA:** National Energy Administration
- **CPAD:** State Council Office of Poverty Alleviation and Development office
- **CREEI:** China Renewable Energy Engineering Institute
- **CDB:** China Development Bank
- **CADB:** China Agriculture Development Bank
- **PAO:** local poverty alleviation offices

Guinan County, Qinghai

- Pilot county for solar poverty alleviation policy
- Qinghai province is a net electricity exporter
- Dominated by hydropower
- Poorer than average
- In Hainan Tibetan Autonomous Prefecture
- Nomadic pastoral area: semi-arid; winter, spring/autumn and summer pasture; desert; and small urban area in county seat



History

- The Tibetan Plateau as test-bed for the use of solar energy in China.
- Some of the world's best solar energy resources
- At first, solar PV in China developed for lighting and other off-grid products for nomadic populations
- By the end of 2015, Qinghai Province had an installed capacity of 5.6 GW of ground-mounted and 2.8 MW distributed PV



On-grid PV

- Shift towards expanding utility-scale grid-connected solar PV.
- Recent emphasis on the development of large-scale, ground-mounted solar farms in the west, connected to demand centres in the urbanised eastern seaboard via ultra-high-voltage transmission lines built by State Grid



Off-grid PV

- Herders still mobile: use off-grid solar home systems for:
- mobile-phone charging,
- watching television,
- butter churning,
- lighting.



SEPAP implementation

A large-scale solar farm in a desert landscape. The foreground shows a close-up of a solar panel mounted on a metal frame. The background features rows of solar panels stretching across a dry, brown field towards a range of mountains under a blue sky with light clouds.

- A newly built 10-MW solar farm, approved under the solar for poverty alleviation policy
- Unlikely to have been approved otherwise, due to concerns about curtailment



Local views

- Opposition to a local hydroelectric dam, with an adjoining solar PV plant
- “there are more pylons than livestock now”
- Heavy equipment building new transmission lines had thrown up dust and led to lung diseases in sheep
- Opinions about the large, utility-scale solar PV plant were also mixed.





South-South Cooperation

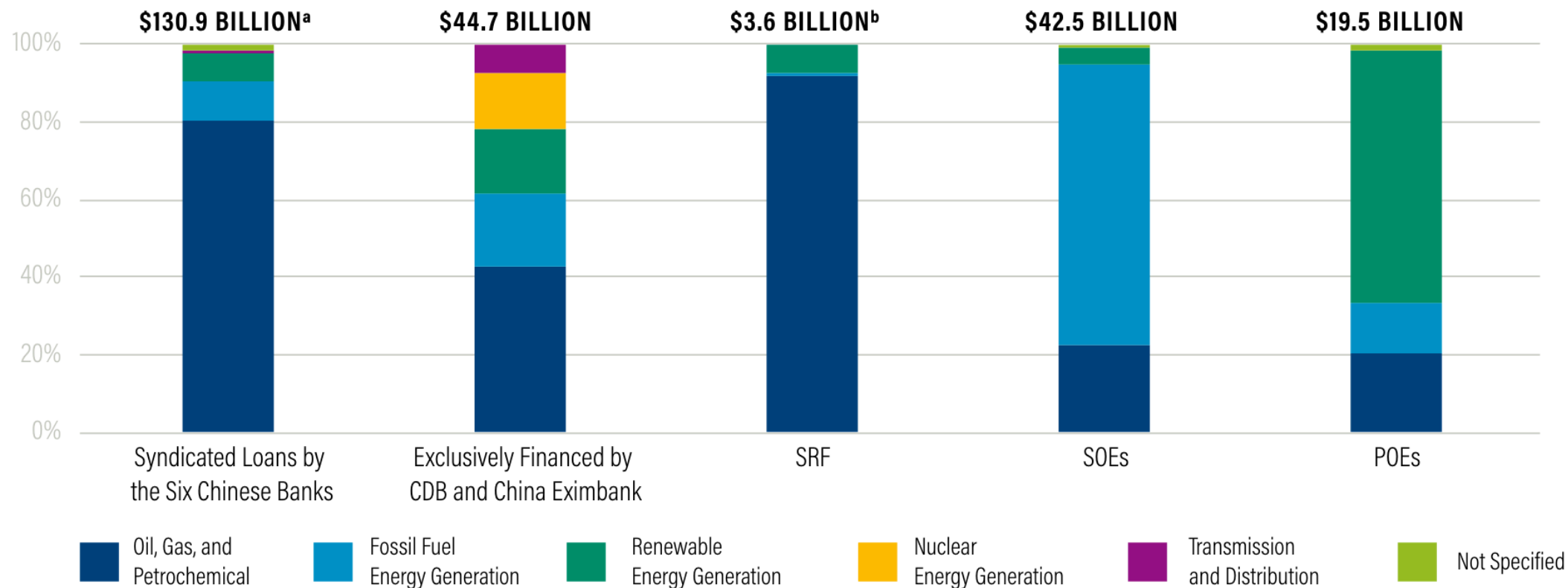
- China and ASEAN should “work together to build the green ‘Belt and Road’, and ... to promote open-ended ‘South-South environmental cooperation’”
- MEP Vice Minister Zhao Yingmin, ASEAN–China Environmental Cooperation Forum in September 2016.



Transforming Overseas Investment?



Figure ES-1 | China's Energy-Sector Financial Flows to BRI Countries by Subsector, 2014-2017



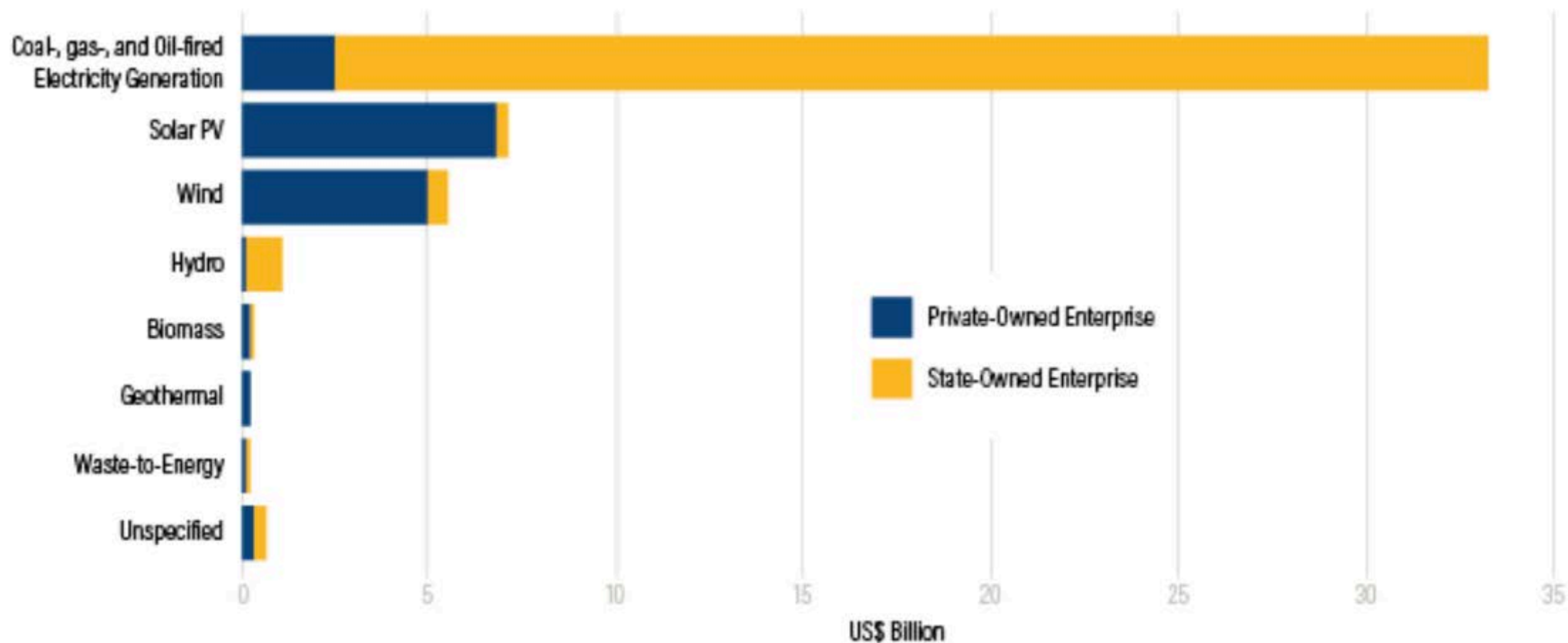
Notes: ^a Syndicated loans by the six Chinese banks are total loan amounts of projects in which the six Chinese banks participated. The actual loan contributions by individual banks were not available for many of the transactions. The six Chinese banks are China Development Bank, Export-Import Bank of China, Agricultural Bank of China, Bank of China, China Construction Bank, and Industrial and Commercial Bank of China.

^b SRF includes four project investments that disclose investment amounts.

Source: Authors' calculations.

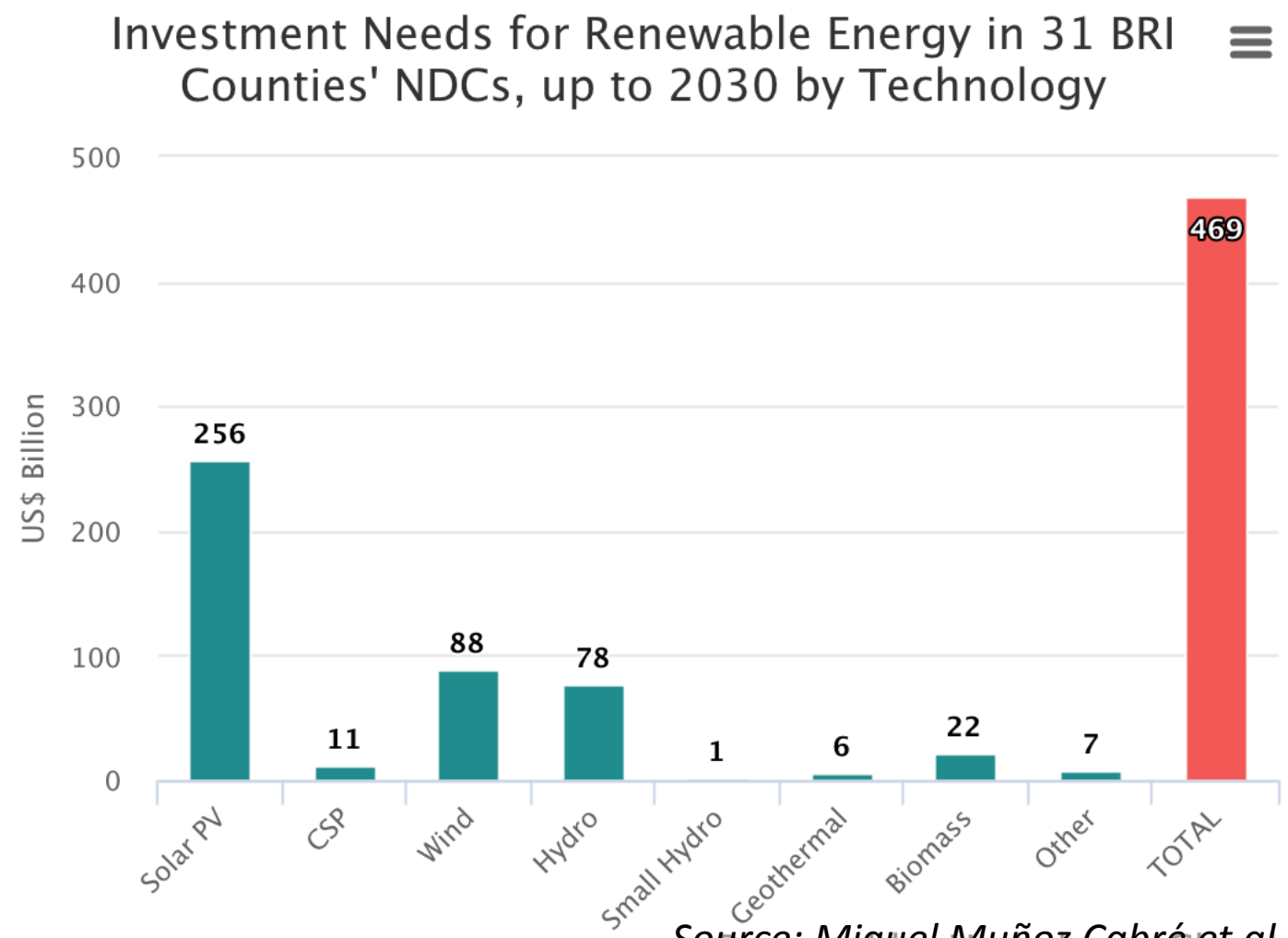
Source: World Resources Institute 2018

Greenfield investments and M&As by Chinese corporations in the power generation and transmission sector by ownership in 56 BRI Countries (2014-2017)





Potential in NDCs



Source: Miquel Muñoz Cabré et al. / 27–49, Vol. 26, No. 6, 2018



Than Bayar Khon village, Myanmar. Solar PV installed by Global Environmental Institute, Beijing.



Thank you!

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