

## The "Greening" of China's Black Electric Power System

Insights from 2014 Data

By <u>Hao Tan</u> and John A. <u>Mathews</u> Global Research, March 30, 2015 <u>The Asia-Pacific Journal, Vol. 13, Issue 10</u> 16 March 2015

Index the Dome is a call to China to wake up and start enforcing the environmental laws - against liegal policiers.	in factories, and area, in revenue is interaction, the argue rate account reductance called and a country of the	its ultra-fast industrialization utilize time to grow up, she seems to be tailing her mostly young audience	ig fossil fuels but particularly coal. In And the nheromenal surveys her uiden has had in China Inself sh	we have also as an experience of the second se	ring" published in 1962 But the counterpart to the story of needing
to neis in the pollution is the necessity of building an alternative energy system, one which is based on necessable the black character of Charler electrics power system buil pomer (energy) is the strength of the greening is tendenci- interpretation of what has been happening in China's power testor is senong. We use the latest 2014 data to deter the electric power system and the electric power system All three sources demonstrates a greening the china's power sense.	sources that do not emit cutton or other generhouse gases. It is a fact that Chink's energy system general es. In a widely reproduced bing posting, Armond Cohen (Secutive Director of the Clean Air Task Force In th transhe why it is wrong. The data for Chink's electric gover sector are now to hand, provided by the China tendency that outranks a blackening tendency. We hasten to add that building a green energy system is c	e, and the electric power system in particular, is still largely based on a US) claimed that in 2014, "the amount of new coal energy added to instrictly Council. We use three sources of data to demonstrate that hy one aspect of the problem, and (as Chai Jing insists) the existing play one aspect of the problem, and (as Chai Jing insists) the existing of the problem.	feasi faels consumption - just like every rising industrial power since the China grid exceeded new solar energy by 17 times, new win specing tendencies outrank blackening (local-faeled) tendencies. T pollution needs to be relined in, and new less-polluting technologies n un neurostic	the industrial involution. But it also needs to be accessed and the Chick's needsy system is generally. If the frame than any other companable stand system series by the not than it is not an advected by the prover than 1 clines. This substriates that accesspacing location is need to imply at Chick's we see are date to 2014 electric means that the production is an advected by the clines. The substriate that the production is a discussed baland or we have the the the clines and we not made that the the clines and the the production is a discussed baland or we have the the the clines and the clines that the the substriates are not one that the production is a discussed baland to a product the set of the the inducation are well be using both the the the substriates are not one to baland the site of the clines the source of the substriates are the source of the	m on the planet. Many commentators continue to limit (right)) on thic power system is getting blacker rather than greener. Such an tim for 2024 electric capacity additions; and data for investment in is being recorded.
Data are now available from the China Electricity Council for real electric energy generation added to the system Here are the data. China's power system generated 5,545 TWh of electricity in 2014, an increase of 172 TWh over	in 2014 from multiple sources. The headline results are that China generated less power from thermal (for the 2013 total, or prowth of 3.2%, So the system as a whole is still proving - but not as fast as the economic sources.	sil fuel) sources in 2004 than in 2013, i.e. thermal power generation : power generation y as a whole (an important disjunction). Thermal (main/w coal bornin	ctually decreased in 2014. This is an extremely important milestone tion system. It sources generated 4173 TWh in 2014, down by 48 TWh from the 2	By contrast, power generation from non-thermal sources increased by 19% — and strictly green sources, encompassing water, wind and solar (WWS), in 312 total (or a decrease of 1.1%) - the first reduction in thermal power generation in recent times. Non-thermal sources by contrast accounted for 1272 1	creased by 200 TWh, or 20%. This is the greening edge of a huge Wh of electric energy generated in 2014, up 221 TWh on the 2013
	Expressed in terms of percentage changes to We present these data as in Charts	es (WWS) generated 1245 TWh in 2014, up 200 TWh on the 2013 to the system in 2016, thermal generation declined by 1.2% while WWS Ia and 1b. The charts show the 2004 additions (positive as well as n Fig 1. China electric generat		ne Zold Zota (+17m.). generation, wirtones a straggering 175%. In terms of percentage additions.	
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Our chart dillars markly from the chart monicoust by Armond Cohen, referred to show. Cohen's chart's chart is based to	of no real alarticity assertion reacity. Not rather on reactly additions in 2014 modified by any moderance	Fig. In Danges in statistic energy generated, 2021 Easter of primary data. Data Easte city factory: Column uses these countrilizer to conduce notional addition	Emotion and a second se	neration casability additions". His chart shows notional additions to thermal operation of 240 TWh compared with notional additions for water of 65 TWH set.	wind CI 76th and polar 14 76th rourisar ha showr as a notional
We save that this modellion sources has mided i	addition of 42 TWh. He concludes that Onin Others to derive coordinations that area at odds with empirical fact. In reality the porters is consented at the mo	added an extra (notional) 240 TWh from coal and only (notional) 13	6 TWh from WWS (plus 42 TWh from nuclear), so according to Coher for ins in 2014 to 28 TWh and actual WWS sources increasion by 20	the system is getting increasingly "black". TBN 2 much bioher than Cohen blowed for with his notional data. We swell Cohen's sublir response to our relativison of his widely reproduced blow nort	
	We elaborate on these data by showing historic	trends in China's thermal (Fig 2) and non-thermal (WWS plus nuclear	) generation (Fig. 2) and the changes in the system's composition (t)	1 IV Tabl. The result below arguments that China will be dependent on nuclear for non-carbon sources of electric power. email vs. non-thermal) over the part six years.	
	STILLAN .	TIM			
	(hpte: The share of the focal fuel-based power	peneration has fallen from \$1.2% in 2008 to 75.2% in 2004; while the	of primary data. Does Electricity Council Pap. 4: Electric of electricity generated from he is share of the total non-fossil fuel-based electricity generation increa	Electronic surgered with mechanic last insert derivity generation, 2000 2014 finance of privacy data: Dista Electricity Council ad fram: 18.81% is 24.72% for the same series/adi	
	ernal sources to China's electric power generation. The correct proportion is 75.2%, and not the widely que	ted "approx. 80%" as cited repeatedly by the IEA and reproduced by would accord it the degree of accuracy it de 1. Generation	authors such as Matthew Kahn in Science. The share of fossil fuel-ba serves and address its global significance. In canacity	ed power generation in China has in fact failen from 81.2% in 2008 to 75.2% in 2014, roughly 1% per year. That is a significant rate of change for any po	
				n hours from time to time - but when compared year by year the data do indeed indicate a trend in the generating capacity of the different sources. If year in a row. This is a second indicator of greening. In 2014 China increased its thermal generating capacity by 45 GW, eaching a total of 916 GW; w	
There is an immediate issue to address in these data. How could China add thermal capacity in 2014 but decrea	(Curtailment refers to non-use of an energy source, by switching off its connection to the grid; thu		rmal power production was cut back in face of competition of non-fo- ole.) This also provides a plausible explanation for the difference beb	all ballbaard passes, as well as because of central government mandates. By contrast the utilization of WWS capacity was increased, diminishing the cur een Cohen's national results, discussed above, and our results based on actual generation data. d for thermal capacity).	tailment levels that had been keeping wind power under-utilized.
	1. TTT				
Rg. 1 China Paval had based passer generating capacity and granth 2006-2014 [Bale Bor Re	al believed power providing capacity has continued its grant's at a maderal size (25% in 2526). The definer is head ball laster power get	remation discussed above, iteratives, was presumably due to a bill in the utilization board	in moleng thermal power facilities. Ensure of primary data. Close Electricity Caurul Pro-	The inclusion is the processing of the inclusion of the processing of the pro	In 20% during the part six years)
In capacity terms, it is correct to state that China now has raised its non-thermal capacity to close to one third	of its total power system (and its strictly WWS green capacity to 31%) - in excess of official targets as out	red in the 12" PIP and subsequent Energy Policy statements. The En excee	ergy 12" FYP issued in 2013 projected that China's non-fossil faelled ded.	penerating capacity would reach 20% by 2005. This target has now already been exceeded. Future targets, such as a projected goal for WWS energy sou	rces of reaching 650 GW capacity by 2017, are also likely to be
Pop. 3. Darms of electric generating segacity address fand had some scoreported with mechanic later latered electric segacity, 2008 2008 barres of pr	<sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup> <sup>10</sup>	er period 2018-2014; while that of non-basel had based electricity. Pop. 8. Property	ion of included power capacity from remenable courses (typics, wird and soler). 1992–20	a, and the estimate of the 2021 larged lased on the 12 <sup>4</sup> PPB more of privacy data to data for anise and and value yours capacity up to 2022 are available from IP 2022 Review of Estimation, data for the test	tal electric capacity and the hydroelectric capacity up to 2010 is available from the US
plants declined from 71% to 25% during the period between 2005 and 2013 (Fig 18). The level of investment in	non-fossil fastic-based electricity generation declined slightly in 2014, according to the latest data released	from the China Electricity Council in Feb 2015, but still staying high increa	at a level of 74%. It is important to add that the rapidly declining cos	t of most WWS capacity, especially salar, means that a given level of monetary investment yields far more delivered power. The same is not true of nucl	ear or thermal, whose total costs and unit-generation costs have
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