



**Climate Data
Due Diligence**

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Flawed CO2 Data from DC Think Tank Undermines Climate Diplomacy

Background Information and Data

24-March-09



About the Authors

This audit was conducted by Shakeb Afsah, an environmental disclosure specialist and a graduate of Harvard's Kennedy School and Indian Institute of Technology-Delhi, and Kendyl Salcito, a Princeton grad, and a award-winning former journalist and current Director of Nomogaia, a Denver-based nonprofit organization involved in the role of corporations in human rights protections.

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About Climate Data Due Diligence

The Climate Data Due Diligence (CDDD) initiative aims to promote climate management strategies -- including cap and trade, carbon taxes and carbon disclosure -- that are built on accurate CO2 emissions data. Inaccuracies in the current CO2 emissions data reported in national inventories, individual installations and company documents could be detrimentally high, and CDDD aims to create a spirited debate about it.

If the uncertainties inherent in our current CO2 monitoring and reporting systems are not recognized and corrected, assessing the impact of our investments in CO2 reduction efforts on the concentration of CO2 in the atmosphere will be misguided at best, and wasted at worst.

To ensure complete independence, CDDD is funded solely through the in-house R&D budget of Performeks LLC, and it does not accept any funding from external sources.



Audit Methodology

CDDD applied a straight forward approach to check the accuracy of CARMA's estimates. Our research showed that Chinese power companies listed among the top CO2 emitters by CARMA were listed on the Hong Kong stock exchange, and as part of the financial disclosure requirements these companies provided plant level data on actual power generation.

We figured that if CARMA's estimate of energy output were over-estimated it would automatically imply that CARMA CO2 estimates are also proportionally over-estimated. Hence, we compared actual power generated at the company and individual plant level for the year 2008 to evaluate whether or not CARMA 2.0 had over-estimated the CO2 emissions of Chinese power plants and companies.



Data Sources

According to CARMA, Huaneng Power, Datang and Huadian International were ranked first, sixth and ninth largest CO₂ emitting power companies in the world. These companies are also listed on Hong Kong stock exchange and their projected and actual power generation statistics for the 2008 are publicly available.



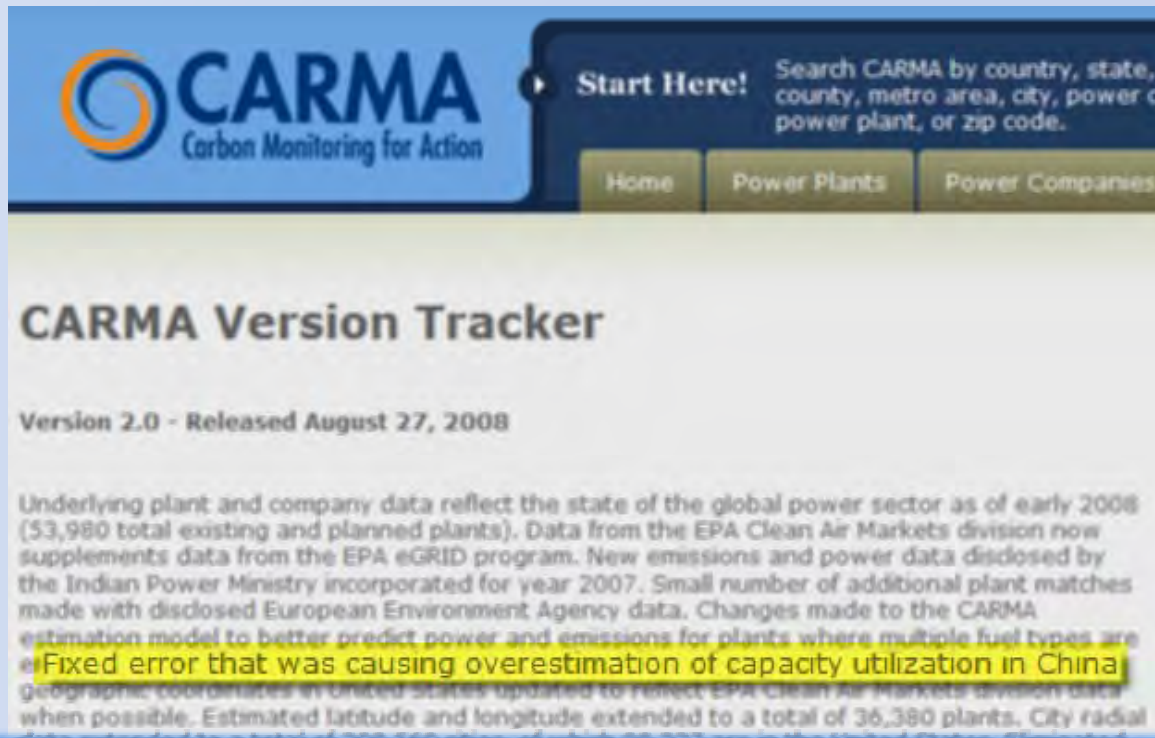
Contextual Background-1

The screenshot shows the website of the Center for Global Development (CGD). The header includes the CGD logo, the tagline "Independent research and practical ideas for global prosperity", and navigation links for HOME, INITIATIVES, RESEARCH TOPICS, PUBLICATIONS, OPINIONS, EVENTS, EXPERTS, BLOGS, ABOUT US, and INVEST. A search bar is also present. The main content area features an article titled "China Passes U.S., Leads World in Power Sector Carbon Emissions - CGD" dated August 27, 2008. The article text states that China set a new world record in CO2 emissions from power generation, surpassing the United States. It also mentions that U.S. power-sector emissions are still nearly four times those of China on a per capita basis. The article is linked to the CARMA (Carbon Monitoring for Action) database. On the right side, there are sections for "Initiative" (Confronting Climate Change), "CGD Expert" (David Wheeler), and "Publications" (Calculating CARMA: Global Estimation of CO2 Emissions from the Power Sector - Working Paper 145, and Information Disclosure and Climate: The Thinking Behind CARMA - Working Paper 132). On the left side, there are sections for "ARTICLE" (New from CGD, CGD in the Media, Press Release, Latest from cgdev.org), "E-MAIL UPDATES" (Sign up to receive updates from CGD), and "RSS FEEDS" (Views from the Center, Global Health Policy).

On August 27, 2008, the Center for Global Development (CGD) launched the CARMA database with the headline “China Passes US, Lead World in Power Sector Carbon Emissions-CGD”. Given the large magnitude of CO2 emissions error identified in the first audit of CARMA, CDDD decided to check the accuracy of the CO2 data for Chinese companies and power plants.



Contextual Background-2



CGD explained in its 2008 data release that the CARMA database had corrected the over-estimation problem with the Chinese power plants. However, CGD did not provide a revised methodology document to explain its new estimation model. Accordingly, CDDD decided to audit the accuracy of the CO2 emissions.



CARMA's Press Release Generated Interest

Related Stories:

The Washington Post

"Power-Sector Emissions Of China To Top U.S." by Steve Mufson, August 27, 2008

Newsweek

"Carbon Villains, the Sequel" by Sharon Begley, blog.newsweek.com, August 29, 2008



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**BUT AUDIT REVEALED SERIOUS DATA QUALITY CONCERNS
ABOUT CARMA'S CO2 ESTIMATES FOR CHINESE POWER
PLANTS AND COMPANIES.**



Tabulation of CO2 Overestimate for Three Top Emitting Chinese Power Companies

POWER COMPANY (CO2 emissions rank by CARMA)	POWER GENERATION				CO2 EMISSIONS			
	CARMA Estimate (mil. MWh)	Company Projection 2008 (mil. MWh)	Actual Generation 2008 (mil. MWh)	CARMA's Overestimate based on actual generation mil MWh (%)	CARMA Estimate (mil tons of CO2)	CARMA's Carbon Intensity Estimate* (lbs/MWh)	Estimate based on Company Actual Generation 2008* (mil tons)	CARMA's Overestimate (million tons of CO2)**
Huaneng Int'l Power (1)	260	200.8	184.6	75.4 (40.8%)	285	2,188	201.95	83.05
Datang Int'l Power (6)	158	140	126.6	31.4 (24.8%)	177	2,237	141.60	35.40
Huadian Power Int'l (9)	128	100	100.68	27.3 (27.1%)	141	2,213	111.40	29.60
Total CO2 Overestimate by CARMA-million tons								148.04

* To give CARMA the benefit of the doubt, we use their estimate of carbon intensity to calculate the CO2 emissions based on actual power generation.

** CO2 Overestimate (tons) = (Difference between CARMA Estimate and Actual Power Generation) × CARMA's Carbon Intensity Estimate)/2000

Data Source: Hong Kong Stock Exchange and Annual Reports



Tabulation of CO2 Overestimate for Individual Power Plant Installations

Sno.	Plant Name	Power Company	Power Generation			CO2 Emissions			
			CARMA's Estimate (mil MWh)	Actual Generation 2008 (mil MWh)	Over-estimate-power generation (mil MWh)	CARMA's Carbon Intensity Estimate* (lbs/ MWh)	CARMA Estimate (mil tons CO2)	Estimate based on Actual Generation (mil tons)	CO2-Over-estimate (mil tons)
1	HUANENG YUHUAN	Huaneng Power Int'l	28.8	19.4	9.4 (48%)	1,838	26.5	17.87	8.6
2	HUANENG LUOHUANG	Huaneng Power Int'l	15.9	11.5	4.4 (38%)	2,191	17.4	12.60	4.8
3	DEZHOU (HUALU)	Huaneng Power Int'l	15.5	14.0	1.5 (11%)	2,195	17.0	15.39	1.6
4	QINBEI	Huaneng Power Int'l	15.6	10.5	5.1 (49%)	1,937	15.1	10.17	4.9
5	HUANENG YINGKOU	Huaneng Power Int'l	11.6	10.7	0.9 (8%)	1,986	11.5	10.66	0.9
6	HUANENG HUAIYIN	Huaneng Power Int'l	9.5	7.5	2.1 (28%)	2,289	10.9	8.53	2.4
7	CHANGXING	Huaneng Power Int'l	7.7	1.5	6.1 (406%)	2,331	8.9	1.77	7.2
8	ZOUXIAN	Huadian Power Int'l	34.5	14.6	19.9 (136%)	1,940	33.5	14.16	19.3
9	GUANGAN	Huadian Power Int'l	13.7	6.6	7.1 (109%)	2,218	15.2	7.29	7.9
10	QINGDAO	Huadian Power Int'l	10.1	6.5	3.6 (55%)	2,276	11.5	7.42	4.1
11	SHILIQUAN	Huadian Power Int'l	7.0	5.0	2.0 (40%)	2,350	8.2	5.87	2.3
12	TUOKETUO-1	Datang Int'l	23.3	19.9	3.4 (17%)	2,120	24.7	21.08	3.6
13	YANGZHOU-2	China Resources Pwr	15.0	6.4	8.6 (135%)	2,068	15.5	6.60	8.9
					Total Over-estimate	74			76.5

* To give CARMA the benefit of the doubt, we use their estimate of carbon intensity to calculate the CO2 emissions based on actual power generation.

** CO2 Overestimate (tons) = (Difference between CARMA and Company power generation)*(CARMA's Carbon Intensity Estimate)/2000



Key References

- (1) Myths and Realities about Energy and Energy-Related CO₂ Emissions in China, Mark Levine, China Energy Group, Lawrence Berkeley Lab (<http://china.lbl.gov/print/176>)
- (2) The European Carbon Market In Action: Lessons From The First Trading Period. Interim Report, Frank Convery, Christian De Perthuis, Denny Ellerman, March 2008 (<http://web.mit.edu/ceepr/www/publications/workingpapers/2008-002.pdf>)
- (3) Uncertainties in Accounting for CO₂ From Fossil Fuels, Gregg Marland, Journal of Industrial Ecology, Volume 12 Issue 2, Pages 136 - 139 , Published Online: 21 Mar 2008
- (4) Carbon Monitoring for Action (CARMA): Climate Campaign Built on Questionable Data (<http://climatedataduediligence.org>)
- (5) Direct conversations with various experts



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