Clean Cloud 2022

Tracking Renewable Energy
Use in China's Tech Industry

GREENPEACE

Introduction

Since the publication of Greenpeace East Asia's first Clean Cloud ranking in early 2020, China's tech industry has made rapid progress toward emissions reduction. As of January 2020, only one major Chinese tech company had committed to achieve 100% renewable energy by 2030, and a mere 20 percent of ranked companies had disclosed energy use and greenhouse gas emission (GHG) data.

Two and half years later, progress is clearly visible. Six of China's biggest tech conglomerates, including industry leaders Tencent and GDS, have committed to achieve 100% renewable energy by 2030, and more have pledged to achieve carbon neutrality (Scope 1 and 2) by the same year. More than half of ranked companies have published environmental data. It is now easier than ever for companies in China to procure renewable energy, and on September 7, 2021, China's pilot green power trading program officially launched.[1]

However, there is still much work to be done to achieve a significant climate impact. Only one major Chinese tech company reported a renewable energy usage rate for 2021 that exceeded 30%, even as wind and solar procurement options become increasingly accessible. Moreover, only a handful of companies have disclosed supply chain emissions (Scope 3), and just one has set a carbon neutrality target that includes its supply chain.

Our latest Clean Cloud report evaluates which Chinese tech giants have made progress toward reducing their carbon footprint and identifies where the biggest gaps remain. We have tracked 24 of China's leading cloud providers and data center operators and provide pathways for these companies to achieve carbon neutrality and 100% renewable energy by 2030.

Scope

The Clean Cloud 2022 ranking includes 24 of China's largest cloud providers and data center operators, comprising more than 80%[2] and 78%[3] of China's IaaS public cloud and IDC markets, respectively. [4]

Researchers used publicly available information to rate the companies in the categories of transparency, carbon reduction measures and targets, renewable energy procurement and targets, and government and industry influence.

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1. The State Council The People's Republic of China. (2021). Green power trading off to an electric start. Retrieved from
   http://english.www.gov.cn/news/topnews/202109/09/content_WS613961acc6d0df57f98dfe6d.html
2. JD.com. (2022). Gartner: JD.com's IaaS Market Share Ranks No. 4 in China. Retrieved from https://jdcorporateblog.com/gartner-jd-coms-iaas-market-share-ranks-no-4-in-china/ (Note: The combined market share of Alibaba, Huawei, Tencent and JD.com exceeds 80%.)
3. Qianzhan Research Institute. (2020). Analysis of 2020 China IDC Market and Key Companies. Retrieved from
   https://bg.qianzhan.com/trends/detail/506/200914-bb19423f.html
4. Note: IaaS Market segment figures are calculated based on 2021 data; IDC Market segment figures are calculated based on 2019 data.

Key Findings

Eight major Chinese tech companies have committed to achieve carbon neutrality (Scope 1 and 2) by 2030, an eightfold increase since April 2021. Industry leaders Tencent, Alibaba, and GDS have all issued carbon neutrality commitments over the past year.

Six ranked companies have pledged to achieve 100% renewable energy use by 2030, compared to just one (Chindata Group) as of April 2021. Notably, JD.com and ByteDance have not issued any 100% renewable energy commitments.

ByteDance, which recently launched cloud services under the brand Volcano Engine,[5] received one of the lowest overall scores among cloud providers. Unlike many of its cloud services market competitors, ByteDance has not publicly announced any carbon neutrality or 100% renewable energy use goals, nor has it disclosed energy usage data.

Tech giants Tencent, Alibaba and Baidu ranked highest among cloud providers due to their climate commitments, increase in renewable energy procurement, and transparency, among other factors.

Only one major Chinese tech company, Tencent, has issued a carbon neutrality pledge that includes its supply chain (Scope 3 emissions).[6] 79% of ranked companies have not disclosed Scope 3 GHG data.

China's leading tech companies have increased their use of renewable energy over the past year; however, their RE usage rates remain low compared to many global tech brands. Data center operator GDS is the only major Chinese tech company that reported a renewable energy use ratio above 30% in 2021.[7] Alibaba, Tencent, and Chindata Group currently lead in large-scale green power trading.

Transparency

Over the past year, a growing number of Chinese tech companies have disclosed energy usage data, but few companies have disclosed emissions data for their supply chains (Scope 3).

As of June 2022, more than half of ranked companies had disclosed environmental data, including electricity consumption and Scope 1 and Scope 2 greenhouse gas emissions. Out of the companies that have disclosed environmental data, 71% have improved the reliability of data disclosure through third-party assurance or GHG emissions verification statements.[8]

ByteDance and Sinnet are among the companies that have not disclosed any information about their power usage or GHG emissions.

79% of ranked companies have not disclosed Scope 3 GHG emission data. Alibaba, Tencent, Baidu, JD.com, and VNET Group are the only ranked companies that have published Scope 3 data.

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5. DCD. (2021). ByteDance to offer cloud services on its Volcano Engine. Retrieved from
   https://www.datacenterdynamics.com/en/news/bytedance-to-offer-cloud-services-on-its-volcano-engine/
6. Tencent. (2022). Tencent Announces Plan to Become Carbon Neutral by 2030. Retrieved from
   https://www.tencent.com/en-us/articles/2201287.html
7. GDS. (2022). GDS Annual report 2021. P.102. Retrieved from
   https://investors.gds-services.com/static-files/9f3cc722-27f2-430f-8b1f-cdcc1bfe3372
8. Note: Alibaba, Chindata Group, Huawei, and GDS have not yet published their 2021 environmental data so 2020 disclosures are cited.

Emissions Reduction Targets and Measures

By June 2022, eight major Chinese tech companies had pledged to achieve carbon neutrality (Scope 1 and 2) by 2030: Alibaba, Tencent, Baidu, GDS, Chindata Group, VNET Group, Bohao Internet Data Services, and Guangdong Aofei Data Technology.[9]

Ten ranked companies have utilized energy storage technology to increase renewable energy use. For example, VNET Group has deployed a distributed PV plus energy storage project at a Guangdong data center and participated in the demand response market.[10] A full 96% of ranked companies have implemented data center energy saving and emission reduction management in some form.

Only Tencent[11] and AliCloud, a cloud service provider owned by Alibaba,[12] have committed to achieve Scope 3 carbon neutrality by 2030. The remaining 22 companies have not included Scope 3 emissions in their carbon neutrality targets.

Renewable Energy Targets and Procurement

As of June 2022, six ranked companies had announced commitments to 100% renewable energy use by 2030: Tencent,GDS, VNET Group, Chindata Group, Athub and Bohao Internet Data Services. Alibaba also set a target to use 100% "clean energy" for its cloud services no later than 2030.[13]

China's leading tech companies have rapidly increased renewable energy consumption at scale. Tencent, Alibaba and Chindata Group all executed large-scale trading of green power from 2021 to June 2022, procuring 567 million, 533 million and 183 million kWh of renewable energy, respectively.[14, 15, 16, 17]

9. Aofei Data Technology achieved carbon neutrality in 2021 through the purchase of CCERs (China Certified Voluntary Emission Reduction) and I-RECs (International Green Certificates).

10. VNET.(2021). VNET New Generation Storage System. Retrieved from https://mp.weixin.qq.com/s/eLmEGlVqOP_MxUIlac7KkQ

11. Tencent. (2022). Tencent Announces Plan to Become Carbon Neutral by 2030. Retrieved from https://www.tencent.com/en-us/articles/2201287.html

12. Alibaba Group.(2021). 2021 Alibaba Group Carbon Neutrality Action Report. P. 9. Retrieved from https://sustainability.alibabagroup.com/en

13. Alibaba. (2021). Alibaba Group Carbon Neutrality Action Report. P. 26. Retrieved from https://sustainability.alibabagroup.com/download/Alibaba%20Group%20Carbon%20Neutrality%20Action%20Report_20211217_ENG_Final.pdfAlibaba. (2021).

14. BNEF. (2022). China's Top Clean Energy Buyers and Sellers. Retrieved from https://mp.weixin.qq.com/s/dUknckCMPeCsN8ExpNCAFQ

15. Alibaba Cloud Infrastructure.(2022). The first half of 2022: Alibaba Cloud data center green electricity traded volume hit a new high. Retrieved from https://mp.weixin.qq.com/s/0e10GyfuUS60E2FW1d8JvA

16. Tencent (2022). 2021 Environmental, Social and Governance Report. P.21. Retrieved from https://static.www.tencent.com/uploads/2022/04/19/e4114e693e75636c18e8170735ed50c6.pdf

17. Tencent. (2022). Tencent Announces Plan to Become Carbon Neutral by 2030. Retrieved from https://www.tencent.com/en-us/articles/2201287.html
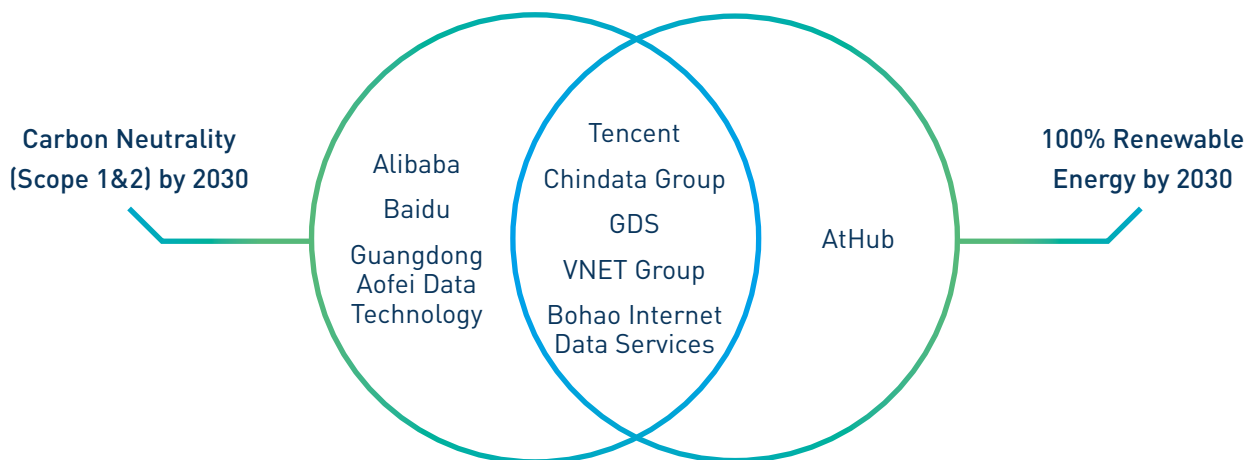
Nearly 90% of ranked companies have actively explored modes of renewable power usage at data centers. Fourteen out of the 24 companies have deployed distributed photovoltaic projects, seven have participated in green power trading,[18] three have directly procured green power certificates, and one has constructed a centralized photovoltaic power plant.

GDS was the only major Chinese tech company with a reported renewable energy usage rate that exceeded 30% in 2021.[19] All other ranked companies utilize less than 10% renewable energy or have not disclosed renewable energy usage data.

Some cloud providers have made slow progress toward 100% renewable energy use. Leading cloud providers JD.com and ByteDance have not publicly committed to achieve 100% renewable energy by 2030.

Figure 1. Carbon neutrality commitments and 100% websites energy targets of major Chinese tech companies
* Source: Corporate official websites, third-party websites, etc. Only Scope 1 and Scope 2 carbon neutrality targets are reflected in this diagram. Scope 3 carbon neutrality targets are not included.

Carbon Neutrality (Scope 1&2) by 2030

Alibaba
Baidu
Guangdong Aofei Data Technology

Tencent
Chindata Group
GDS
VNET Group
Bohao Internet Data Services

AtHub

100% Renewable Energy by 2030

Government and Industry Influence

Nearly 40% of ranked companies have worked with government and power grid authorities to increase renewable energy use at data centers. 67% of companies have shared insights at conferences and with their peers on best practices for renewable energy use.

18. Note: Only companies that have disclosed detailed information about green power trading, such as electricity volume, timeline, market, etc., were counted. Five companies participated in green power market trading (annual or multiple month), and three signed MOUs for multi-year renewable energy procurement.

19. GDS. (2022). GDS Annual report 2021. P.102. Retrieved from https://investors.gds-services.com/static-files/9f3cc722-27f2-430f-8b1f-cdcc1bfe3372
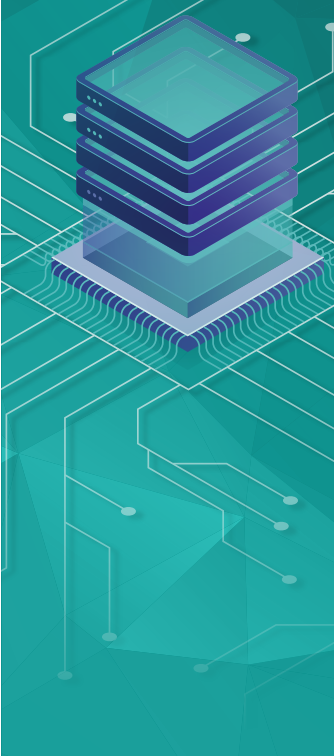
Ranking

Cloud Providers

	Total (100)	Transparency (20%)	Carbon Reduction Measures and Targets (30%)	Renewable Energy Procurement and Targets (40%)	Government and industry influence (10%)
Tencent	84.15	15.86	22.29	37.67	8.33
Alibaba	78.02	13.48	21.21	35.00	8.33
Baidu	67.82	15.86	22.29	23.00	6.67
Huawei	45.22	14.43	14.79	11.00	5.00
JD.com	38.21	14.90	12.64	5.67	5.00
Kingsoft Cloud	35.69	12.52	10.50	11.00	1.67
ByteDance	26.97	4.43	6.21	16.33	0.00
Inspur	25.49	7.29	8.36	5.67	4.17
UCloud	24.66	4.90	9.43	7.00	3.33

Data Center Operators

	Total (100)	Transparency (20%)	Carbon Reduction Measures and Targets (30%)	Renewable Energy Procurement and Targets (40%)	Government and industry influence (10%)
GDS	83.19	14.90	22.29	37.67	8.33
Chindata Group	78.40	13.00	19.07	36.33	10.00
VNET Group	64.17	14.43	19.07	25.67	5.00
AtHub	59.14	14.43	13.71	24.33	6.67
Bohao Internet Data Services	57.19	6.33	15.86	28.33	6.67
China Mobile	48.49	12.52	12.64	15.00	8.33
Guangdong Aofei Data Technology	38.74	3.95	14.79	15.00	5.00
China Telecom	36.23	13.00	11.57	8.33	3.33
Shenzhen ESIN Technology	35.05	3.95	9.43	15.00	6.67
China Unicom	34.24	10.14	9.43	9.67	5.00
CNISP GROUP	29.98	3.95	8.36	11.00	6.67
Kehua Data	28.12	3.95	10.50	7.00	6.67
Hotwon	27.97	4.43	6.21	12.33	5.00
Sinnet	24.69	3.00	8.36	8.33	5.00
Shanghai Baosight Software	15.96	3.00	7.29	5.67	0.00

Methodology

Selected Companies

24 of China's leading cloud service and IDC companies were selected based on industry influence, market capitalization and market share, user scale, and other indicators.

The following updates have been made to the list of the selected companies since Greenpeace's Clean Cloud 2021 ranking was published:

(1) ByteDance has been added to the ranking.[20]
(2) Four companies, Bohao Internet Data Services, Esin Technology, Hotwon, and CNISP GROUP, have been added to the ranking as a result of their recent advancements in renewable energy usage.
(3) Wangsu Science and Technology, Dr. Peng, and Centrin Data Systems were included in the Clean Cloud 2021 ranking but have been omitted from this year's ranking.

Data

This ranking is based on data from public sources, including corporate publications, news reports, government information platforms and third-party voluntary information disclosure platforms.

Scoring reflects both short and long-term indicators. Short-term indicators consist of data for the period January 2021 to June 2022. Long-term indicators are not time bound and include carbon neutrality commitments, renewable energy goals, data center siting and location, corporate governance, etc.

Scoring Criteria

Scoring is based on 1) China's unique power market and its challenges 2) consultation with local renewable energy, data center, and ESG experts and 3) previous Greenpeace Click Clean and Clean Cloud reports.

Scoring criteria have been updated for Clean Cloud 2022 to include corporate disclosure assurance, principles for carbon offsets usage, and corporate R&D and investment in renewable-energy-supporting technologies (e.g., energy storage). Category weight has been adjusted accordingly.

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20. DCD. (2021). ByteDance to offer cloud services on its Volcano Engine. Retrieved from
    https://www.datacenterdynamics.com/en/news/bytedance-to-offer-cloud-services-on-its-volcano-engine/

Weight	Category	Criteria
20%	**Transparency**	**Assessment of whether a company has disclosed the following information in external communications, media, or on third party information disclosure platforms**
		Data center and company electricity consumption a. Total annual electricity consumption b. Annual electricity consumption of data centers by geographic location
		Data center and company electricity mix a. Total annual electricity mix b. Annual electricity mix of data centers by geographic location
		Data center PUE a. Total annual average PUE b. PUE of data centers by geographic location
		Data center and company greenhouse gas emissions a. Total greenhouse gas emissions b. Data center greenhouse gas emissions by geographic location c. Total supply chain (Scope 3) greenhouse gas emissions (mainly includes Category 1 and Category 2)
		Data disclosure standards, assurance, and verification
		Corporate Governance: Incorporation of ESG matters into the scope of corporate governance; establishment of a specialized committee reporting to and supervised by the CEO and/or board on a regular basis, and establishment of a strategy and risk management mechanism related to climate change; Analysis of the opportunities and challenges posed by climate change, and assessment of strategies and target mechanisms to address these risks
30%	**Carbon Reduction Measures and Targets**	**Assessment of whether a company has set carbon neutrality and emission reduction goals and taken steps to reduce carbon emissions and improve energy efficiency**
		Commitment to carbon neutrality across a company's own operations by 2030; Clear timeline for a Scope 3 carbon neutrality commitment
		Set up a statement of principle for carbon offsets to avoid the use of carbon offsets as much as possible
		Carbon reduction goals a. Absolute carbon reduction goals b. Scope 3 absolute carbon reduction goals
		Energy efficiency goals: annual average PUE goals
		Energy efficiency performance a. Energy efficiency improvement based on measurable targets and methodologies, such as energy saved (tonne coal equivalent), electricity saved (MWh), CO_2e emission reduced (tonne) and PUE (breakdown by geographic region). b. Implementation of energy efficiency measures in data centers, including in buildings, IT equipment, cooling systems, power systems, etc.
		Corporate R&D and investment in renewable energy supporting technologies (e.g., energy storage)

Weight	Category	Criteria
40%	**Renewable Energy Procurement and Targets**	**Assessment of whether a company has set renewable energy targets and taken measures to actively procure renewable energy**
		Commitment to 100% renewable energy use by 2030
		Establishment of data center site selection policy that considers renewable energy supply (reflected in corporate publications)
		Public disclosure of renewable energy procured, including amount and type of renewables, and percentage of the total energy mix. (Procurement mechanisms include distributed wind and solar, investment in large-scale renewables, direct power purchase from markets and green power certificates.)
		Efforts to encourage suppliers to use sustainable energy sources or select suppliers who generate electricity using renewable sources
		Construction of data centers in areas with abundant renewable energy supply
10%	**Government and Industry Influence**	**Assessment of whether a company has publicly leveraged their influence to build government and industry awareness about energy efficiency and renewable energy, including but not limited to the following forms:**
		Cooperation with local governments, grid companies and power retailers to expand renewable energy procurement market mechanisms
		Sharing of renewable energy procurement and energy efficiency best practices with industry peers via conferences, white papers, journal papers, etc.
		Participation in Green Data Center certification programs

Recommendations

The tech industry must take proactive steps to address climate change and transition to low-carbon operations. Greenpeace advocates for the following measures:

1. Cloud provider and IDC companies should achieve 100% renewable energy and Scope 1, 2, and 3 carbon neutrality targets by 2030. While working toward this goal, companies should report on their progress and accomplishments to the public through official channels such as corporate annual reports and ESG reports.

2. Companies should prioritize the reduction of direct emissions by increasing renewable energy procurement and improving energy efficiency. Greenpeace does not encourage companies to use carbon offsets to attain carbon neutrality. In rare cases when carbon offsets are the only available option, companies should choose high-quality carbon offset programs based on additionality, sustainability, and traceability.

3. Companies should increase their procurement of renewable energy via mechanisms that directly support renewable energy development, such as construction of renewable energy power plants and green power trading. To avoid double counting of renewable energy use, companies should improve the traceability of green power by actively disclosing renewable energy sources and EACs (energy attribute certificates).

4. Companies should improve their information transparency by disclosing all types of GHG emissions across the value chain (Scope 1 to 3). When using carbon offset programs, companies should openly report the source and volume of offset GHG emissions, the reasons why they are unable to reduce emissions directly, information on offset programs used, etc.

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For nearly 50 years, Greenpeace has been sailing the world's oceans protecting our planet and fighting for environmental justice.