



## Market Insight Report Reprint

# Beijing steps up power and renewable energy regulations on datacenters

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The city's local government released a sweeping energy draft plan to make it compulsory for new datacenters to adopt renewable energy, while existing facilities must meet efficiency standards. The regulations are in-line with an earlier proposal to phase out older facilities in Beijing with PUE levels over 2.0.

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## Introduction

Beijing's local government released a sweeping energy draft plan on April 26 to mandate that datacenters completed in 2021 and on must include renewable energy in their power sources and incrementally increase the share of renewables by 10% each year to 100% by 2030. Under the proposal, existing datacenters that do not meet the efficiency standard will have higher power tariffs. Facilities with a power utilization rate of less than 80% against its capacity two years after operation will have to file for new energy consumption quotas. The regulations are in line with an earlier proposal released in January to phase out older facilities in Beijing that have PUE levels exceeding 2.0.

### THE 451 TAKE

Beijing's stringent power proposal targeting datacenters puts it ahead of most regional markets; Singapore remains in limbo with the moratorium on the datacenter construction while its government looks for a solution to the power issues. Even without such provisions, development of new facilities has spilled over into Beijing's surrounding cities of Tianjin and Hebei, and further afield to Shanxi and Inner Mongolia. The Beijing-Tianjin-Hebei region has instead grown to be known as the datacenter hub for north China. Tianjin and Hebei are not only for disaster-recovery facilities, but part of a larger ecosystem with areas allocated for hyperscale cloud facilities and renewable energy sources. The more likely impact from the recent proposals is that it will speed up the upgrade and consolidation of smaller facilities in Beijing, while a strict enforcement of the regulations will promote PUE optimization and force providers to adopt renewable energy.

Nevertheless, the new requirements are not expected to pose significant operational headwinds because colocation spaces are at more of a premium in Beijing. Providers such as 21Vianet and GDS that have a significant market share of colocation in Beijing and Shanghai are in an enviable position, given that barriers of entry to these two markets are now much higher. The situation is not unique to Beijing, but prevalent in Shanghai and perhaps other major datacenter hubs because constraint in these primary markets in China is also a challenge for hyperscale self-builds.

## Context

Among China's major or tier 1 cities, Beijing has been at the forefront of datacenter regulations since as early as 2014 when the local government introduced a policy that banned the construction of all new datacenters – with only hyperscale facilities with PUE below 1.5 given exemptions.

In the meantime, the datacenter regulations in Beijing were updated and refined in subsequent years. In 2015, the regulations named six districts – Dongcheng, Xicheng, Chaoyang, Haidian, Fengtai and Shijingshan – in downtown Beijing where construction of datacenters was banned. The local government upped the ante in 2018, lowering the PUE levels for the approved hyperscale facilities to 1.4 before the requirement was further tightened to 1.3 for hyperscale facilities.

The most recent development in the final week of April saw the introduction of the energy policy and the emergency notice sent to datacenter providers – including China's three main telecommunications operators – to report cryptocurrency mining activities. The providers were required to supplement information on energy consumption of these activities over the past year, as well as how much energy it accounted for out of the overall energy consumed by the facility.

The regulations were preceded by a draft policy released in January that outlines measures to phase out datacenters with a PUE above 2.0 in Beijing, with plans for the older datacenters in both the Dongcheng and Xicheng districts to be converted into edge facilities. The local government has further proposed an 'upgrade zone' in selected districts including Chaoyang, Haidian, Shijingshan and Fengtai where existing datacenters can be remodeled to support certain digital economy sectors, AI and blockchain. Notably, the Beijing local government made its intention clear to divert datacenters to surrounding Tianjin and Hebei. According to the proposal, Beijing's local government will work with Tianjin and Hebei to support the growth of datacenters serving medium latency needs and these facilities are encouraged to have high 'green' standards.

## The green energy push

The renewable energy and power efficiency-focused proposal released by the Beijing local government on April 26 could be one of the most comprehensive and significant pieces of legislation, which could potentially have a more tangible impact on the opex and capex of datacenter operators.

Key items from the proposal can be summarized as follows:

- This regulation is applicable to newly built or retrofitted datacenters with annual energy consumption of at and above 1,000 tons of standard coal, or five million kWh.
- Operations of newly built or retrofitted datacenters must support the four strategic core areas: national politics, cultural growth, international relations and technology innovations.
- Computing datacenters are prioritized for new and retrofitted builds. The ratio of total power for storage function must not be over 20% of the total power, as approved by experts.
- Datacenters completed in 2021 and after should include plans to use renewable energy and incrementally increase the share of 'green' energy by 10% each year to reach a 100% renewable energy target in 2030. Datacenters that have self-built renewable energy capacity at their property must have their green energy-generating process validated. Datacenters could also fulfill the renewable energy requirement by purchasing green certificates from a state-sanctioned platform. For instance, the daily average transaction price for wind power on April 15 was 330 yuan and 622.8 yuan for solar power, according to state-run trading platform [greenenergy.org.cn](http://greenenergy.org.cn), which is operated by the China National Renewable Energy Center.
- A higher power tariff will be imposed on 'inefficient' datacenters. Datacenters with PUE level exceeding 1.4 but lower than 1.8 will be hit with an increase of 0.20 yuan per kWh, while facilities with PUE level exceeding 1.8 will face a hike of 0.50 yuan per kWh.
- Buildings that have over 50% of its gross space used as datacenters should be equipped with distributed solar panels.
- Half of the power quota of a closed datacenter could be transferred to a new facility (not including the forced closed portion), provided that it is of the same provider.
- Newly built and retrofitted datacenters must meet the PUE requirement of 1.3.
- Existing datacenters with annual energy consumption exceeding the limit of 5,000 tons of standard coal should install an online energy monitoring system that is connected to Beijing's energy conservation monitoring platform.
- Datacenters with annual energy consumption of over 20,000 tons of standard coal would undergo review with the municipal energy conservation body.
- Datacenters with utilization rate of less than 80% (measured by power used) after two years of operation must file for a new power allocation.
- All datacenters must set up a unit to monitor energy conservation.

## The green conundrum

China is making a strong push into renewable energy, and it is arguably better positioned than the US in this area under the US's last administration. The Xi Jinping government envisions to be a leading power in climate change and has pledged for China to reach peak carbon emissions by 2030 and to achieve carbon neutrality in 2060. China said it generated about 30% of its electricity from renewable sources in 2020 (the US is currently at ~20%). Mandating datacenters to use renewable energy puts Beijing at the forefront of the effort to address sustainability issues in this sector.

Beijing's effort has some ripple effects. Guangdong is following suit to rein in the power consumption issues of the sector. The local government of the southern Chinese province announced during the last week of April that power allocation for new datacenter projects before 2023 would be suspended, citing capacity and approved projects that exceeded its 2025 target. Approved projects that have not started construction after two years or more will have their power quota revoked. Separately, Chinese datacenter provider Beijing Sinnet announced that it is canceling a project in Kunshan, Jiangsu province, due to failure in obtaining a power allocation. The development was meant to convert an industrial site into a datacenter following the acquisition of a local company.

## Supply and demand in Beijing

Compulsory installation of solar panels, retrofitting of facilities to meet efficiency standards and potential higher power tariffs would all raise operational costs for datacenter providers in Beijing, but it could be passed on to the customers given the tight supply of colocation spaces in the Chinese capital.

While growth in Chinese markets has been mostly driven by the hyperscalers over the recent years, colocation demand is expected to remain steady. Colocation pricing, as well as valuation of the assets, should be on upward trajectory in Beijing since it is expected that no new colocation facilities will be approved in Beijing.

Stringent datacenter regulations have constricted supply in Beijing and providers have resorted to building and acquiring assets in neighboring Tianjin. For instance, GDS acquired a 65% stake into a company that is developing a facility in the Wuqing district of Tianjin. The Chinese provider had earlier acquired three facilities in Beijing in 2019.

The datacenter regulations and the resulting consolidation of the sector would in turn benefit providers that have a huge share of their colocation portfolios parked in Beijing. For instance, 21Vianet said it operates 46% of its self-built datacenters in Beijing (22,900 racks), compared with 20% in Shanghai and Hangzhou. Shanghai is another key datacenter market in China that has imposed similar restrictions such as a PUE limit of 1.3 and below for new hyperscale facilities, while retrofitted facilities should not exceed a PUE level of 1.4. The Shanghai local government has issued guidelines in April for datacenter providers to install equipment and infrastructure to enhance the efficiency of the datacenters.

Meanwhile, ChinData, a relative latecomer to the business, is instead building most of its facilities in neighboring Hebei. The province is now a new ground of expansion, driven by the local government's initiative to develop Zhangjiakou as a renewable energy demonstration zone with significant wind and solar capacity. The Zhangbei and Huailai counties within Zhangjiakou are two key datacenter clusters that are home to datacenter providers and hyperscalers including ChinData, Alibaba Cloud and Tencent Cloud as well as newcomers including GLP and Hoyinn.

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