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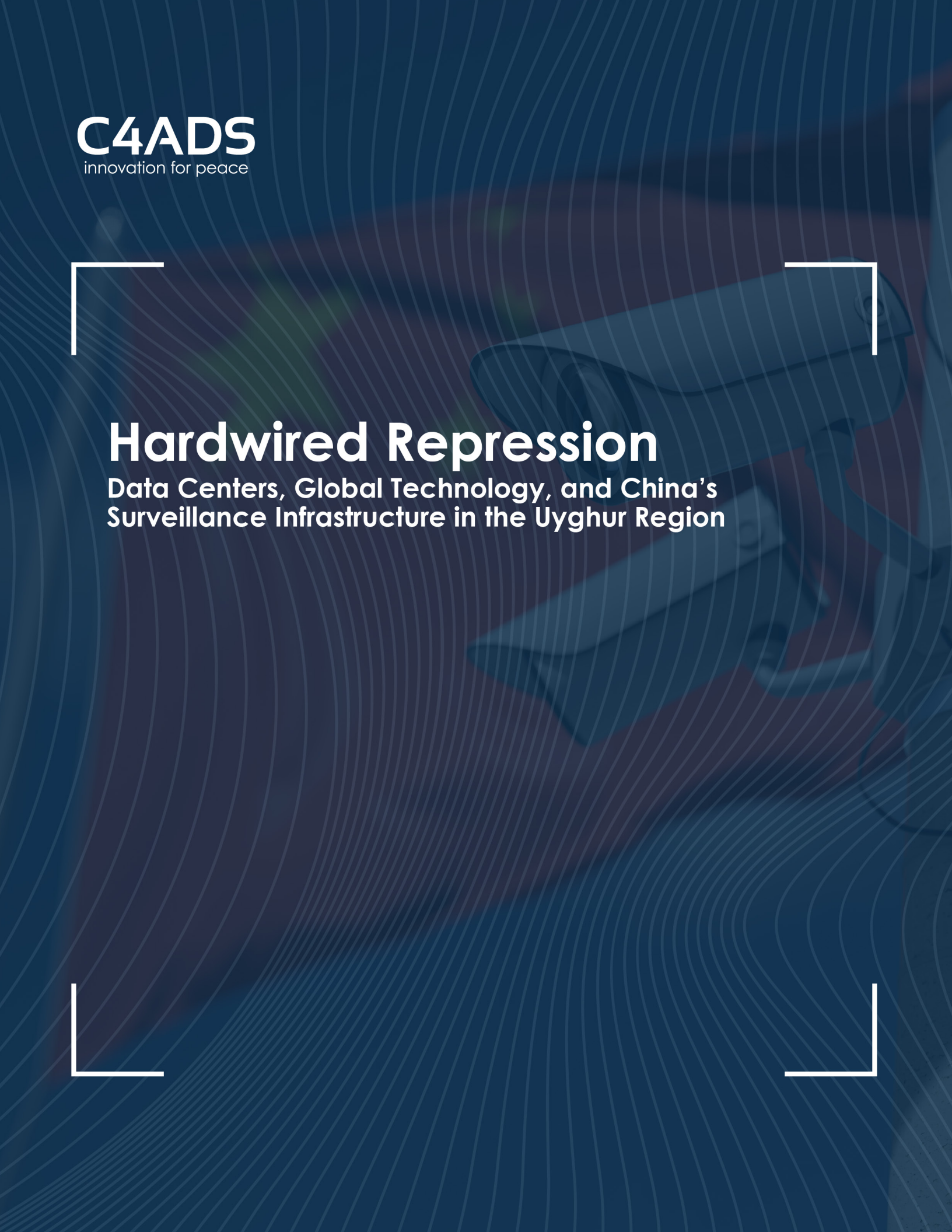
Hardwired Repression

Data Centers, Global Technology, and China's Surveillance Infrastructure in the Uyghur Region



Acknowledgments

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C4ADS (www.c4ads.org) is a 501(c)(3) nonprofit organization dedicated to data-driven analysis and evidence-based reporting of conflict and security issues worldwide. Our approach leverages nontraditional investigative techniques and emerging analytical technologies. We recognize the value of working on the ground, capturing local knowledge, and collecting original data to inform our analysis. At the same time, we employ cutting-edge technology to manage and analyze that data. The result is an innovative analytical approach to conflict prevention and mitigation.

About the Author

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Acknowledgments

C4ADS would like to thank all those who provided guidance, time, and support during this project, including current and former C4ADS staff. Special thanks to Jacob Feldgoise, Senior Data Research Analyst, Center for Security and Emerging Technology (CSET). C4ADS is also grateful to its technology partners, whose software and systems were integral to the project's success.

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Executive Summary

The People's Republic of China (PRC) operates one of the most expansive mass surveillance systems in the world, and data centers are its foundation. These facilities provide the physical infrastructure that stores, processes, and acts on the biometric data, communications records, and behavioral patterns used to monitor citizens, especially ethnic minorities. Despite significant international attention to forced labor, atrocity crimes, and surveillance in the Uyghur region, the digital backbone enabling those abuses has received comparatively little scrutiny.

Beijing's "Eastern Data, Western Computing" initiative has accelerated this buildout, and the Chinese Communist Party (CCP) has designated the region a "crucial component" of the Belt and Road Spatial Information Corridor, with plans to use the data centers in the Uyghur region to extend Chinese data infrastructure into Central Asia. The region simultaneously functions as a testing ground for digital authoritarianism: government records reveal comprehensive digitization of medical, educational, judicial, and administrative systems, with surveillance triggers that include indications of ethnic identity. Individuals identified as high risk can face interrogation, coercive labor, or detention.

Two case studies illustrate the global dimensions of this infrastructure. The first examines the Yanqi Vocational Technical School, operated by the Xinjiang Production and Construction Corps (XPCC), a sanctioned paramilitary organization. A 2024 government contract reveals that U.S. technology – including processors, graphics cards, and facial recognition hardware – tracks students' movements, meals, and curfew compliance in real time. Vocational schools in the Uyghur region have drawn criticism as sites of indoctrination, forced assimilation, and detention. The required semiconductors ("chips") specified in these documents fall below the threshold for export-controlled AI chips, revealing a critical gap: current controls do not adequately address the PRC's surveillance technology pipeline. The second case study examines China Telecom Xinjiang, a subsidiary of a U.S.-sanctioned state-owned enterprise that operates at least four data centers in the region. The subsidiary holds active contracts with the XPCC and provides services to entities designated as military or intelligence agencies – activity its parent company's OFAC listing has not prevented. Meanwhile, China Telecom, the sanctioned parent company, claims to still operate data centers in the United States.

C4ADS's analysis of 2024-2025 Xinjiang Uyghur Autonomous Region (XUAR) government documents found references to American and Taiwanese technology across data center projects in the region. Whether above or below export control thresholds, American and Taiwanese technology continues to flow into surveillance infrastructure targeting a population subject to documented atrocity crimes. Meaningful change will require action beyond the corporate level. C4ADS recommends adding China Telecom and its provincial subsidiaries to the Commerce Department's Entity List and mandating post-shipment verification for dual-use technology exports destined for regions with documented records of atrocity crimes – with clearer liability standards for exporters whose hardware reaches military or intelligence-affiliated end users.

Introduction: China's Surveillance Infrastructure

The People's Republic of China (PRC) operates one of the most documented and expansive mass surveillance systems in the world, and at its foundation is a critical but often overlooked piece of infrastructure: data centers.[1]

The country's digital surveillance apparatus continuously monitors the population, including through an estimated 700 million facial recognition cameras.[2] In the Uyghur region,[3] authorities subject people to heightened monitoring, including at checkpoints, through Wi-Fi sniffers, and via biometric data collection, with data centralized and processed via platforms such as the Integrated Joint Operations Platform (IJOP).[4] System triggers include indications of ethnic identity – for example, whether an individual "looks Uyghur."[5] Individuals identified as high risk can face interrogation, coercive labor, or detention.[6]

The Uyghur region also serves as a laboratory for digital authoritarianism. Government records on data center projects reveal comprehensive digitization of medical, administrative, judicial, and educational systems, with unified data platforms, artificial intelligence (AI)-enhanced decision-making, state-controlled encryption, and significant reliance on domestic technology.[7] The PRC uses the Uyghur region as a testing ground for digital surveillance, modernized policing, and information integration, creating a governance model that Beijing exports worldwide, along with the enabling technologies.[8]

Since 2017, China has detained millions of Uyghurs in so-called "vocational education and training centers" as part of its campaign that the United States and others have designated a genocide.[9] That system has since evolved. The highly visible, militarized internment camps, surrounded by armed guards and watchtowers, were gradually wound down around 2019-2020, not as a sign of easing repression, but as a tactical shift in accordance with China's long-term strategy in the region.[10] The Chinese Communist Party (CCP) did not reduce coercion;[11] it restructured it into a more diffuse and economically integrated forced labor apparatus.[12] This shift from overt internment to embedded economic coercion forms the backdrop for this report..

The surveillance system's continued expansion depends on data centers – physical facilities that house the large-scale computing hardware required to process the large quantities of data the system generates. They range from small server closets to hyperscale facilities spanning millions of square feet.[13] The larger facilities require substantial energy and supporting infrastructure, including high-capacity electricity, internet connectivity, backup systems, and robust cooling systems to manage heat generation.[14]

This analysis focuses on data centers in the Uyghur region.[15] State-sponsored forced labor and other atrocity crimes in the Uyghur region are well documented and have tainted global supply chains in some of the most strategic industries, including conflict minerals, pharmaceuticals, solar-grade polysilicon, and electric vehicles.[16] Less understood, however, is the surveillance apparatus that enables these abuses: the system relies on a digital backbone that extends far beyond cameras and checkpoints. Data centers, which incorporate Western technology, process vast quantities of biometric data, communications records, and behavioral patterns, forming the technological foundation for the systematic monitoring of Uyghur and other ethnic minorities, both in the Uyghur region and across the PRC.[17]

This investigation examines some of the companies building, operating, and maintaining data centers in the Uyghur region, as well as their ties to the Chinese state, military, police, and intelligence apparatus. It also examines whether and how Western technology continues to flow into this infrastructure, despite export controls and sanctions regimes. Through two case studies, the investigation illustrates how data centers enable surveillance at scale within China, and how the participating companies and input technologies rely on global supply chains.

The analysis begins with an examination of how the PRC has incorporated the Uyghur region into its broader authoritarian digital infrastructure, including through the integration of American and Taiwanese technology in pursuit of global technological primacy. The report concludes with an assessment of broader implications for human rights, global technology markets, and regulatory frameworks, followed by a set of recommendations for government, private-sector, and civil society actors.

Methodology and Limitations

The analysis draws on a review of approximately 420,000 projects approved in the Uyghur region by local Xinjiang Uyghur Autonomous Region (XUAR) authorities and the Xinjiang Production and Construction Corps (新疆生产建设兵团), or XPCC. C4ADS identified projects mentioning data centers or "数据中心."[18] XPCC is a paramilitary organization that operates as a quasi-state entity and controls significant portions of the region's economy. Throughout this paper, "Uyghur region" refers to XUAR, unless the context requires reference to existing legal structures, such as governments and financial entities.

C4ADS mapped the corporate actors collaborating with local government and paramilitary authorities to build, operate, and maintain these data centers, as well as their connections to U.S. and other non-PRC companies. This analysis helped reveal the role that global technology plays in China's authoritarian infrastructure.

The first case study focuses on a so-called "vocational technical school" and was selected for its close connections to the XPCC to illustrate the nexus between data centers and known surveillance actors.

The second case study focuses on China Telecom's Xinjiang subsidiary, China Telecom Xinjiang (中国电信股份有限公司新疆分公司). C4ADS selected it for its size, volume of mentions in government documents, and ties to the Chinese defense industry. The case study examines its ties to U.S. and global technology companies to demonstrate that U.S. technology remains integral to Chinese data centers – and by extension, to China's surveillance architecture – despite international sanctions and export controls.

The case studies illustrate specific examples rather than comprehensive trends; readers should not extrapolate broader patterns from them. China's restrictive information environment limits publicly available evidence of coercive land transfers, environmental harms, or adverse impacts of energy development related to data center construction. However, other sources have documented ongoing coercive land transfers in the region and the absence of such evidence or its discussion here does not indicate that such practices are absent from this industry.[19]

Eastern Data, Western Computing

In 2022, Beijing officially launched the "Eastern Data, Western Computing" (EDWC, 东数西算) initiative to build eight major data center hubs across China.[20] These hubs include the Beijing-Tianjin-Hebei Metropolitan Region, the Yangtze River Delta, the Guangdong-Hong Kong-Macau Greater Bay Area in eastern China, the Chengdu-Chongqing region, Guizhou, Inner Mongolia, Gansu, and Ningxia in central and western China.[21] Although the XUAR and the Tibetan Autonomous Region (TAR, or Tibet) are not named in the EDWC, the policy's influence is evident across the country, and local officials often use central government initiatives as justification to pursue related projects.[22] Since its launch, data center development has accelerated in western border regions,[23] including the XUAR and Tibet, driven by provincial and central authorities drawing on the EDWC framework.[24] AI's rapidly advancing processing demands will only accelerate this trend.

The coordinated party-state effort advances Chinese President Xi Jinping's push to build a "digital China" by capitalizing on the western regions' abundant energy resources to supply computing power to the country's eastern economic hubs.[25] The strategy also pushes these resource-intensive data centers away from major population centers, shifting the associated displacement and pollution to vulnerable populations in the periphery.[26] Though discussions around such a plan began as early as 2000, AI's massive energy demands expedited its implementation.[27] By integrating data governance, AI infrastructure, and energy policy under one national framework, the EDWC creates the infrastructure conditions that make digital surveillance at scale viable.[28]

The Uyghur Region as a Laboratory for Digital Authoritarianism

The Uyghur region's sparsely populated land offers ample physical space for large-scale facilities that would be difficult to develop in China's more densely populated regions. The region's colder temperatures reduce the energy required to cool data center hardware, one of the most significant operational costs of running such facilities.[29] While these remote facilities face latency issues for many commercial applications in the eastern hubs of the country,[30] they are well-suited for the computationally intensive work of training algorithms, including those powering China's predictive policing and social control systems.[31]

Domestically, Chinese local governments incentivize companies through subsidies and land access to rapidly construct data centers across the country.[32] The computational intensity of training these models makes energy-rich western regions attractive, despite their distance from end users.

The Uyghur region and Tibet are the two westernmost regions in the country, and researchers have documented a deliberate feedback loop in which surveillance initiatives first piloted in Tibet have been imposed in the Uyghur region, and intrusive measures that debuted in the Uyghur region were subsequently applied back to Tibet.[33]

As of 2025, XPCC owned and operated several of the data centers in the Uyghur region.[34] A paramilitary economic organization operating under direct central government authority, XPCC holds a special administrative status in the Uyghur region and runs cities, farms, and companies, while providing education, policing, and other governance functions for the areas under its control.[35] Its role in the region's security apparatus and involvement in industries linked to forced labor allegations have drawn significant international scrutiny. The United States, the United Kingdom, Canada, the EU, and Australia have sanctioned XPCC for its role in the persecution of the Uyghur population.[36] Despite these sanctions, C4ADS found that XPCC continues to require compatibility with Western technology in its infrastructure.

The region is also central to China's push for global technological dominance. The CCP has designated Uyghur region infrastructure a "crucial component" of the Belt and Road Spatial Information Corridor.[37] Bordering eight countries, the region anchors the PRC's Digital Silk Road ambitions,[38] as the critical node for cross-border fiber optic networks, data flows, and telecommunications infrastructure connecting China to Central Asia and beyond.[39] Chinese tech giants have established cloud computing hubs and 5G networks that extend Beijing's digital standards and governance models westward.[40]

The PRC does not even need to directly export its model to influence data sovereignty beyond its borders. The CCP plans to utilize data centers in the Uyghur region to serve Central Asian countries, deepening regional dependence on its data infrastructure and enabling cross-border data processing services.[41] This arrangement raises concerns over the data sovereignty of the jurisdictions those centers serve. Meanwhile, some Chinese companies involved in data center development are now expanding internationally while obscuring their connections to Chinese state-owned entities (SOEs) – for example, by restructuring through Cayman Islands' holding companies or other secrecy jurisdictions – raising concerns about data sovereignty and security in Central Asia, Southeast Asia, and other markets where they establish facilities.[42] Under PRC law, Chinese SOEs can be compelled to provide data to the Chinese government, meaning that data stored in these facilities – even if located outside China – may be accessible to Beijing.[43]

Case Study 1: Yanqi Vocational Technical School Smart Campus

Government surveillance programs targeting Uyghurs and other ethnic minorities in the Uyghur region have drawn global condemnation; vocational schools, in particular, face criticism as sites of indoctrination and forced assimilation.[44] At Yanqi Vocational Technical School, every aspect of student life – attendance, meals, social interactions, dorm movements, and schedule compliance – is tracked, analyzed, and stored in databases linking behavior to performance.[45] This monitoring relies on Western technology, with biometric systems powered by Intel processors and Nvidia GPUs, exemplifying how imported technologies continue to enable the repression of vulnerable populations.[46]

Yanqi's smart campus project illustrates how data centers function as a fundamental part of the surveillance infrastructure. Surveillance requires active collection, processing, and storage of vast streams of information from campus sensors and cameras, enabling sophisticated surveillance and predictive policing. Data centers provide the critical infrastructure for such large-scale storage and processing. In October 2024, the Yanqi school in the Uyghur region's Yanqi Hui Autonomous County contracted for a 796,900 RMB (US$113,000) "Smart Campus" surveillance system.[47] The project, which was to be completed by March 2025,[48] demonstrates the continued central role of global technology in enabling Chinese surveillance, despite sanctions and international condemnation of the CCP's human rights violations.[49]

C4ADS' analysis of Chinese government documents shows that the platform that generates attendance reports for students entering and leaving the dormitory building specifies Nvidia GeForce RX 4060 and AMD Radeon RX 7600 graphics cards as options, as well as Hikvision surveillance hardware.[50] The documentation also shows Nvidia RTX3050 6GB required for the video editing machine.[51] The project implements international and Chinese technology for the purpose of "dormitory management."[52] Nvidia RTX 4060, RTX 3050 6GB, and AMD RX 7600 sit below the performance threshold of high-performance AI chips and have not been subject to export control restrictions.[53]

While the chips used in the Yanqi surveillance system were not subject to export controls, the fact that they are integral to surveillance systems undermines the common assumption that export controls adequately address the surveillance technology pipeline. In other words, the fact that unrestricted chips are leveraged for monitoring purposes highlights another fundamental enforcement problem: once a chip is sold, ensuring that it reaches only its declared buyer and is not resold, rerouted, or repackaged is extraordinarily difficult in practice.

Project details also reveal the integration of dormitory check-ins, cafeteria access, and physical movements within the campus into a connected system that tracks and logs individual student activity.[54] The system deploys 15 Hikvision facial recognition devices across campus: five terminals controlling cafeteria access and 10 managing building entry. Each device maintains a 50,000-face database, processes identifications in under 0.2 seconds, includes anti-spoofing technology to prevent photo impersonation, and automatically generates alerts with photographic evidence when students violate curfews or access restrictions.[55] The

automated dormitory monitoring system doesn't merely record movements but actively checks for compliance, transmitting real-time alerts containing photos and complete student information whenever someone breaks the routine.[56]

The hardware specifications of this project reveal pervasive dependence on non-Chinese technology. Ten ASUS desktop computers powered by Intel Core i5-13490F processors and Nvidia GeForce RTX 4060 Ti graphics cards handle AI-powered facial recognition processing. A sophisticated video editing workstation features an Intel Core i7-12700 processor, an Nvidia RTX 3050 graphics card, and a massive 64 TB RAID storage array built from eight enterprise-grade hard drives. The Hikvision facial recognition terminals enable real-time video transmission, central monitoring, and automated behavioral alerts.[57]

Case Study 2: China Telecom Co., LTD Xinjiang

China Telecom Xinjiang offers a prominent example of how telecommunications companies can become vectors for human rights abuses and entanglement with China's defense industry.[58] The company's involvement in data center projects in the Uyghur region illustrates how the line between commercial and government service providers has been dissolved in China's surveillance economy. For international companies and democratic governments, this creates an unavoidable problem: engagement on commercial terms is inseparable from complicity in documented human rights violations and exposure to state sanctions, exposing global markets to significant risks.

China Telecom's Global Footprint

China Telecom Xinjiang is a wholly owned subsidiary of China Telecom Corporation Limited (China Telecom). China Telecom is an SOE with close ties to the PRC's military-industrial complex; it is also one of the largest internet and phone service providers in the world.[59] China Telecom is majority owned by China Telecommunications Corporation, a cloud operator approved by the Cyberspace Administration of China, indicating that it has undergone the security assessment mandated for operators serving Chinese government agencies and critical infrastructure.[60] China Telecom is also part of China's quantum industry and is considered one of the top AI companies in China.[61]

Such layered structures of SOEs obscure the boundary between commercial and state actors in China. Both state and commercial entities may be complicit in human rights violations or subject to export controls and state sanctions; complex ownership structures complicate due diligence. Before 2021, many global investment funds, including BlackRock, held investments in China Telecom.[62] In 2021, the United States added China Telecom to the Department of the Treasury's Office of Foreign Assets Control's (OFAC's) Chinese Military Industrial Complex Companies List,[63] which prohibits U.S. persons from trading in the company's publicly listed securities, and to the U.S. General Services Administration's System for Award Management (SAM) Exclusion List, which bars the company from receiving U.S. government contracts.[64] As a result, China Telecom was delisted from the New York Stock Exchange, and BlackRock and other foreign investors divested the majority of their stakes in 2021.[65]

Critically, however, neither designation restricts China Telecom from investing in or operating infrastructure within the United States; that would fall under the separate purview of the Committee on Foreign Investment in the United States. According to its website, the company appears to continue operating data centers in the United States,[66] suggesting a potential gap in the overall regulatory framework governing Chinese military-affiliated entities on U.S. soil. China Telecom also maintains active branches in Europe and Australia.[67]

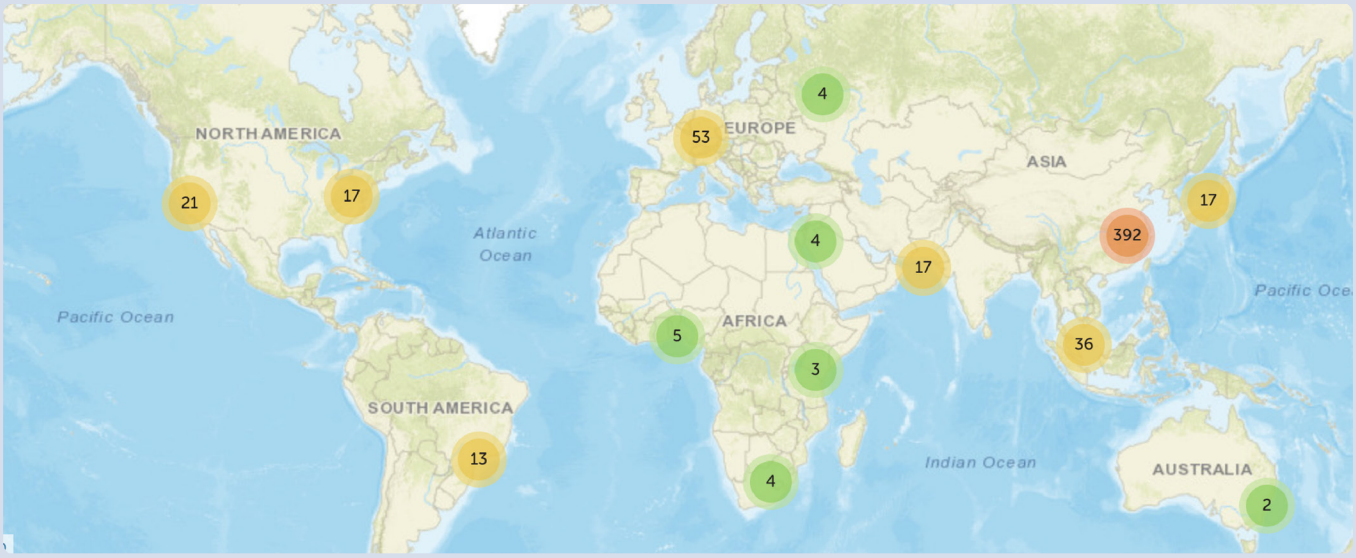

Figure 1: China Telecom Global Data Center Operations[68]

China Telecom Xinjiang operates as a separate legal entity from its parent company. Unlike OFAC's Specially Designated Nationals List, in which the '50% rule' automatically extends restrictions to subsidiaries majority owned by a listed entity, the restrictions applied to China Telecom do not automatically extend to all subsidiaries.

As of March 2026, China Telecom operates at least four data centers in the Uyghur region, located in Aksu, Urumqi, Hami, and Korla.[69] It provides both commercial and government services in the Uyghur region, raising concerns that seemingly neutral technology services may directly support state security systems. For example, China Telecom Xinjiang continues to participate in "poverty alleviation" schemes, which have been linked to the CCP's campaign against the Uyghurs.[70] "Poverty alleviation" is the policy term through which the CCP administers forced displacement, cultural erasure, and economic exploitation of Uyghurs, operating in parallel with and reinforced by the internment camp system.[71]

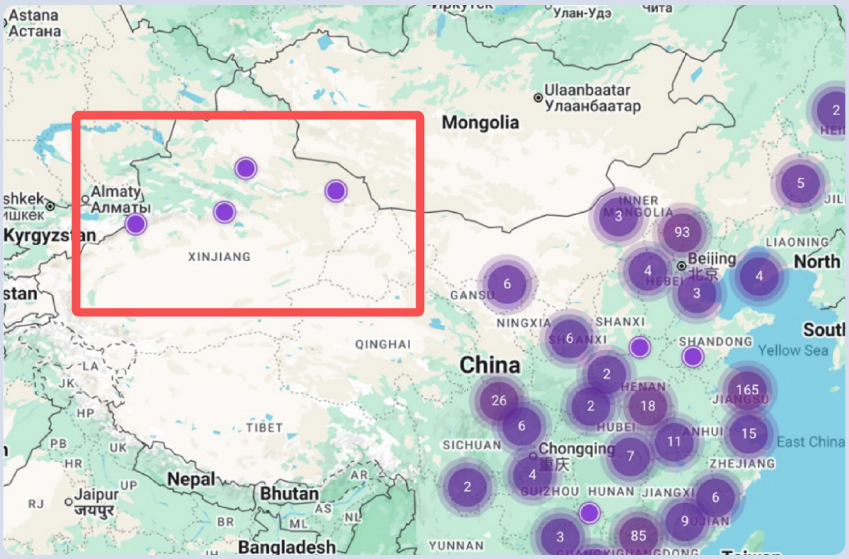

Figure 2: China Telecom Data Center Operations in China[72]

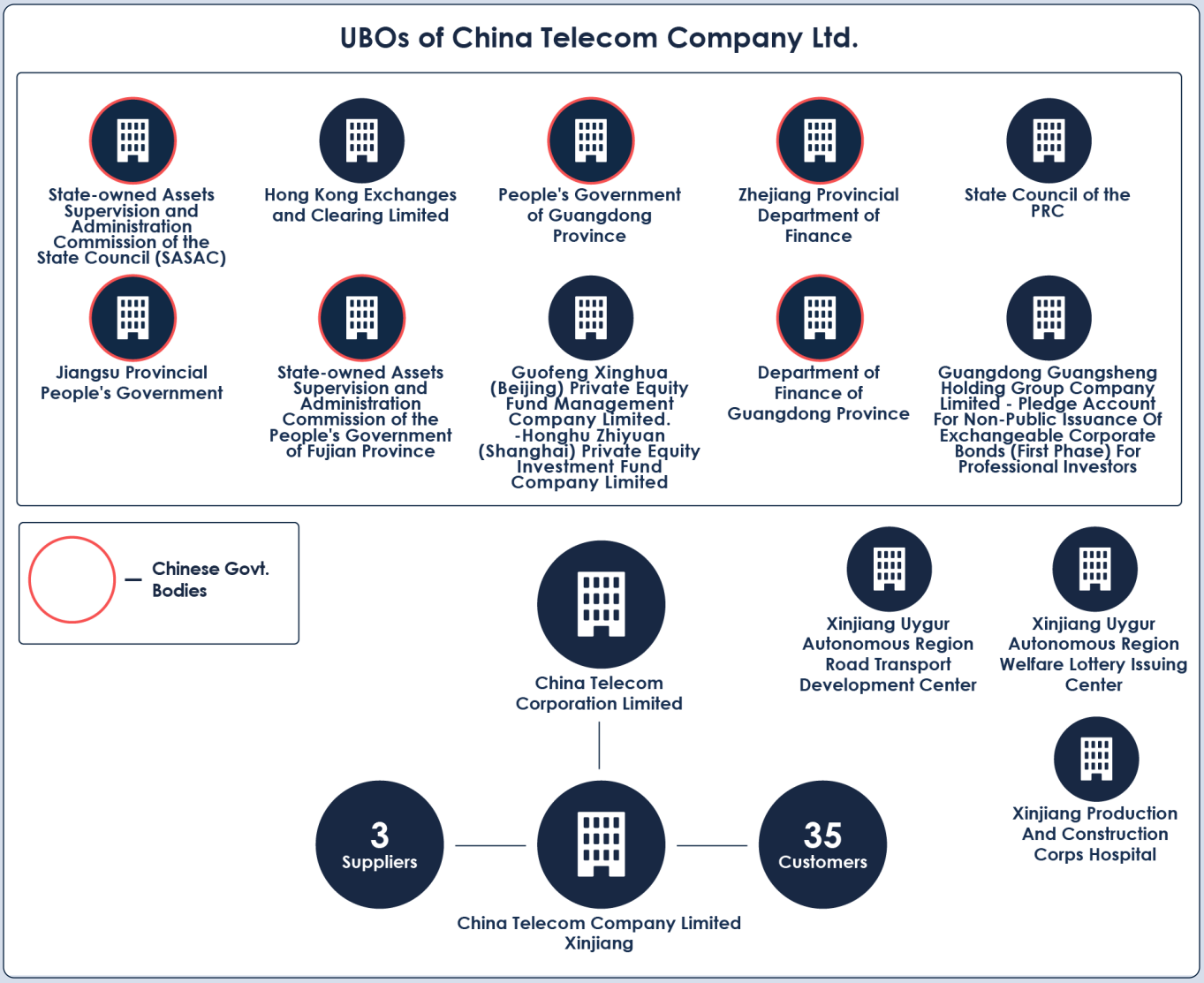

Figure 3: Ultimate Beneficial Owners (UBOs) of China Telecom Company Ltd. See the full list of its suppliers and customers at C4ADS.org/reports/hardwired-repression Source: WireScreen.

XPCC Contracts and Entanglement with State Security

China Telecom Xinjiang also holds active contracts with the XPCC relating to data centers in the region.[73] According to 2025 XPCC documents, for example, China Telecom Xinjiang will build and maintain a dedicated facility for the Xingtuan Statistics Bureau to house its servers, storage systems, and networking equipment; the four-year contract also requires China Telecom Xinjiang to perform routine maintenance.[74] Another contract stipulates that China Telecom Xinjiang will provide one year of services for the equipment room of the XPCC Education Bureau and its subordinate units, including vocational schools.[75] The most expensive China Telecom Xinjiang contract with the XPCC, worth approximately 7.6 million RMB (US$1.1 million), is for the construction of the XPCC Medical Insurance Information Platform. For this project, China Telecom Xinjiang will complete the renewal of server racks, transmission link renewal, and other services.[76]

Beyond its contracts with the XPCC, China Telecom Xinjiang serves more than 21 additional entities in the region, including the Chinese military and intelligence.[77] The company's role extends beyond data center construction to active infrastructure management. For example, it serves the XUAR Highway Development Center and the Urumqi Customs Logistics Management Center.[78] These activities underscore China Telecom Xinjiang's significant contribution to establishing the Uyghur region as a major trading hub and a critical node in China's exports to Central Asia, Europe, and beyond.[79]

While not strictly data center contracts, China Telecom Xinjiang's broader service relationships are relevant as risk indicators. China Telecom Xinjiang provides services to "A Unit," a Chinese government designation generally used for military or intelligence agencies.[80] Additionally, it receives transmission construction services and security management services from Chinese defense contractors, such as Eracom Contracting and Engineering Company Limited (中时讯通信建设有限公司), CCS Public Information Industry Company Limited (中通服公众信息产业股份有限公司), and China Telecom Digital Intelligence Technology Company Limited (中电信数智科技有限公司).[81] These relationships suggest that China Telecom Xinjiang's service footprint extends into military and intelligence-adjacent operations in the region, a relevant consideration when assessing the broader risk profile of its data center expansion.

This case study demonstrates that data centers in the Uyghur region are nodes in an integrated system that connects civilian telecommunications, state surveillance, military contracting, and the coercive labor and social control apparatus directed at the Uyghurs. For Western companies, the layered structure of state-owned enterprise relationships makes clean separation impossible. Every supply chain interaction with China Telecom Xinjiang is more than a purely commercial transaction. Each carries implicit ties to a state-linked entity closely connected to the Chinese government whose infrastructure is implicated in documented human rights violations.

Figure 4: China Telecom Xinjiang has procured goods/services from these defense-related entities. Source: WireScreen.

Why Western Technology Remains Embedded in Chinese Data Centers

As China has escalated efforts to develop competitive domestic technology and achieve technological self-sufficiency, its data infrastructure has continued to rely on American technology.[82] President Xi Jinping began pushing for self-sufficiency in key technologies as early as 2013.[83] That drive was codified through successive state-led initiatives: "Made in China 2025" (2015), the "New Generation AI Development Plan" (2017), and the 14th and 15th Five-Year Plans (2021 and 2026), each reinforcing the strategic objective of technological self-reliance.[84] Since 2022, the United States has implemented trade restrictions limiting China's access to advanced chips and semiconductor technology, prompted by growing concerns over China's Military-Civil Fusion policy, which deliberately blurs the line between civilian industrial development and military applications.[85]

C4ADS' analysis of 2024-2025 government documents reinforces Associated Press findings that American technology continues to play a key role in China's data center infrastructure and, by extension, in the PRC's predictive policing and surveillance capabilities, including those in the Uyghur region.[86] Project specifications reveal a transitional technological landscape: Western components continue to be required in Chinese data center infrastructure, alongside Asian technology such as QNAP (威联通), a Taiwanese company, even as acquisition documents increasingly emphasize preferences for domestic alternatives such as Huawei (华为), H3C (新华三集团), Inspur (浪潮), and Tencent Cloud (腾讯云).[87]

At the same time, the CCP incentivizes data center developers to use Chinese technology by providing subsidies, creating nontariff barriers that favor Chinese firms, and implementing favorable regulatory frameworks.[88] Some projects reviewed explicitly require adherence to localization regulations (国产化), mandating the use of domestic technology (国产品牌) such as Kylin OS (银河麒麟), a Chinese alternative to Windows.[89]

The project requirements for compatibility with Western technology – often involving technologies not subject to export controls – highlight the limitations of that approach. Several explanations may account for this apparent tension between that requirement and the simultaneous push to incentivize domestic alternatives.[90] First, new Chinese systems may need to maintain integration with existing Western-built infrastructure, as moving from one technological ecosystem to another takes time and compatibility is necessary during the transition. Second, as it pertains to export-controlled technologies, China may be anticipating future policy changes that could restore legal avenues for accessing American and other Western technology. Third, as Western technology remains the global industry standard, China may want to ensure interoperability. Finally, for controlled items, Beijing may be calculating that it will be able to circumvent U.S. export controls through smuggling and third-party transshipment – that is, accessing the technology illegally. Taken together, these explanations suggest that the dual requirement reflects Beijing's likely expectation of continued, even if limited, access to U.S. chips and processors, allowing China to hedge between Western technology integration and complete technological self-reliance.

This technological hybridity exposes non-PRC technology companies to the risk of inadvertently supporting Chinese surveillance infrastructure and human rights violations, even as Beijing pursues technological self-sufficiency. The documents show that Intel processors appear across data center-related projects in the Uyghur region, that some projects require Nvidia and AMD compatibility, and that others rely on products made by Dell, HP, Microsoft, Cisco, VMware, and QNAP.[91] The technology identified in those documents fell below the threshold for export-banned chips. A separate Bloomberg analysis found that Chinese firms plan to install more than 115,000 Nvidia AI chips across at least three dozen data centers in the Uyghur region and neighboring Qinghai Province – chips that were subject to U.S. export controls at the time.[92]

Whether above or below these continuously evolving export restrictions, the fact remains that Western companies might inadvertently continue to enable the computational backbone of repressive surveillance systems targeting Uyghurs and other ethnic minorities in the PRC. The due diligence practices of international technology companies have proven effectively insufficient to address risks associated with defense ties and human rights abuses. Meaningful change will require action beyond the corporate level.

Implications Beyond the Uyghur Region

The Uyghur region's surveillance-linked data centers serve a dual purpose: they underpin the CCP's ability to monitor and control its minority populations at home while positioning China as the dominant provider of data infrastructure along its overland corridors into Central Asia.[93] They are not merely tools of repression; they are fundamental to China's governance model, both internally and as an export.[94] Chinese companies with ties to the state surveillance and military apparatus thus maintain access to foreign markets and are well positioned to expand China's extraterritorial data infrastructure, exposing foreign markets to risks associated with human rights abuses and data privacy.

The consolidation of education, medical, and other sectoral data – as documented in XUAR government records – combined with the stated goal of cross-regional data-sharing infrastructure that EDWC and related initiatives aim to enable, points to an unprecedented expansion of authoritarian oversight capabilities.[95] This threat is compounded by the CCP's broader shift from informant-dependent surveillance toward an AI-enabled system capable of monitoring diverse populations continuously and at scale.[96]

This expansion is tied to the PRC's defense and security apparatus in ways that create due diligence and other legal compliance risks for international entities. Funding for surveillance-related projects in the Uyghur region flows directly from Chinese defense and counterterrorism budgets, making the commercial telecommunications sector inseparable from the security state.[97] China Telecom and its subsidiaries – among the largest actors in data center construction in the region – exemplify this entanglement.[98] Any hardware, software, or investment connected to these entities carries inherent risk: the infrastructure they support serves state, military, and surveillance functions – not commercial ones alone.

The Uyghur region's data center development also has a cross-border dimension. Half of the PRC's economic corridors originate there, and Beijing's need to develop the region economically while enforcing political compliance among its population is not incidental but strategic.[99] Data centers are critical infrastructure for both purposes, connecting domestic surveillance to China's broader geopolitical ambitions across Central Asia and beyond.

Conclusion

Western technology, some of which falls under the threshold of high-end, controlled technologies, remains integral to data centers powering China's surveillance apparatus in the Uyghur region, despite export restrictions on some of this technology and international condemnation of the human rights abuses it enables. The data center projects in the Uyghur region continue to require compatibility with Dell, Nvidia, Intel, HP, Microsoft, Cisco, VMware, Western Digital, Seagate, AMD, and QNAP technology. And the Uyghur region is only the starting point for Beijing's AI ambitions and the CCP's drive to maintain strict control over it. The EDWC initiative, Digital Silk Road, and related provincial and central policy efforts optimize China's computing and energy infrastructure. These policies – and the data center infrastructure built to support them – underpin oppressive surveillance and human rights abuses in the PRC, especially in ethnic minority autonomous regions. The role of Uyghur region-based companies in supplying technology services to prisons and governments in other provinces further highlights the interconnected nature of China's digital infrastructure and the replication of repressive tactics across these regions.

This technological interdependence operates largely below the threshold of official Western sanctions designations and export control frameworks most commonly applied to Chinese mass surveillance. Democratic governments must deploy export controls, sanctions, and procurement restrictions to prevent Western technology from enabling surveillance infrastructure targeting Uyghurs and other minorities, and address the implications of this exposure. Technology companies, investors, and multinational corporations must conduct rigorous due diligence to identify and eliminate such exposure to surveillance infrastructure in the Uyghur region.

Recommendations

Based on this analysis, C4ADS offers the following recommendations for governments, private sector actors, as well as civil society and academic institutions:

1. Close the ownership structure opacity gap in sanctions regimes.

The existing U.S. sanctions regime has limited reach when applied to the layered ownership structures of state-owned enterprises and their subsidiaries, through which sanctioned actors continue to operate. China Telecom Corporation Limited carries designations across multiple U.S. sanctions regimes, yet the impact is narrow. The Chinese Military-Industrial Complex Company (CMIC) listing prevents U.S. persons from trading the company's public securities, and the General Services Administration Systems for Award Management (GSA SAM) exclusion bars the company from U.S. government contracts. Neither restriction meaningfully constrains China Telecom Xinjiang, a subsidiary, which is not publicly listed and is unlikely to seek U.S. government contracts. The more consequential policy gap is China Telecom's absence from the Entity List. Adding China Telecom and its provincial subsidiaries, including China Telecom Xinjiang, to the Commerce Department's Entity List would impose license requirements on any U.S. exports to these entities, including hardware, software, and technology, and would create a meaningful barrier to the kind of data center buildout documented in this report.

2. Mandate end-use monitoring and verification for technology exports.[100]

The continued need for Western technology in the Uyghur region's data center infrastructure exposes a core limitation of current export controls. Much of this equipment does not require a license for export to China; however, the mechanisms for verifying where the technology is deployed and who operates

it are insufficient to prevent it from reaching facilities serving military, intelligence-linked entities, and government bodies responsible for carrying out atrocity crimes. Policymakers should consider requiring mandatory, rather than discretionary, post-shipment verification for dual-use technology exports destined for entities operating in regions with documented atrocity crimes and human rights abuses. Policymakers should also establish clearer liability standards for exporters whose hardware reaches the military or intelligence-affiliated end users. [101]

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Intel: Appears in the desktop specifications as an optional CPU (Core i5-13490F with B760 chipset motherboard), in the standalone computer specifications (i7-12700), and in the video editing machine specifications (Core i7-12700 up to 4.9GHz, 12 cores).
NVIDIA: Appears in the desktop specifications as an optional graphics card (GeForce RTX 4060 Ti) and in the video editing machine specifications (RTX 3050 6GB).

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