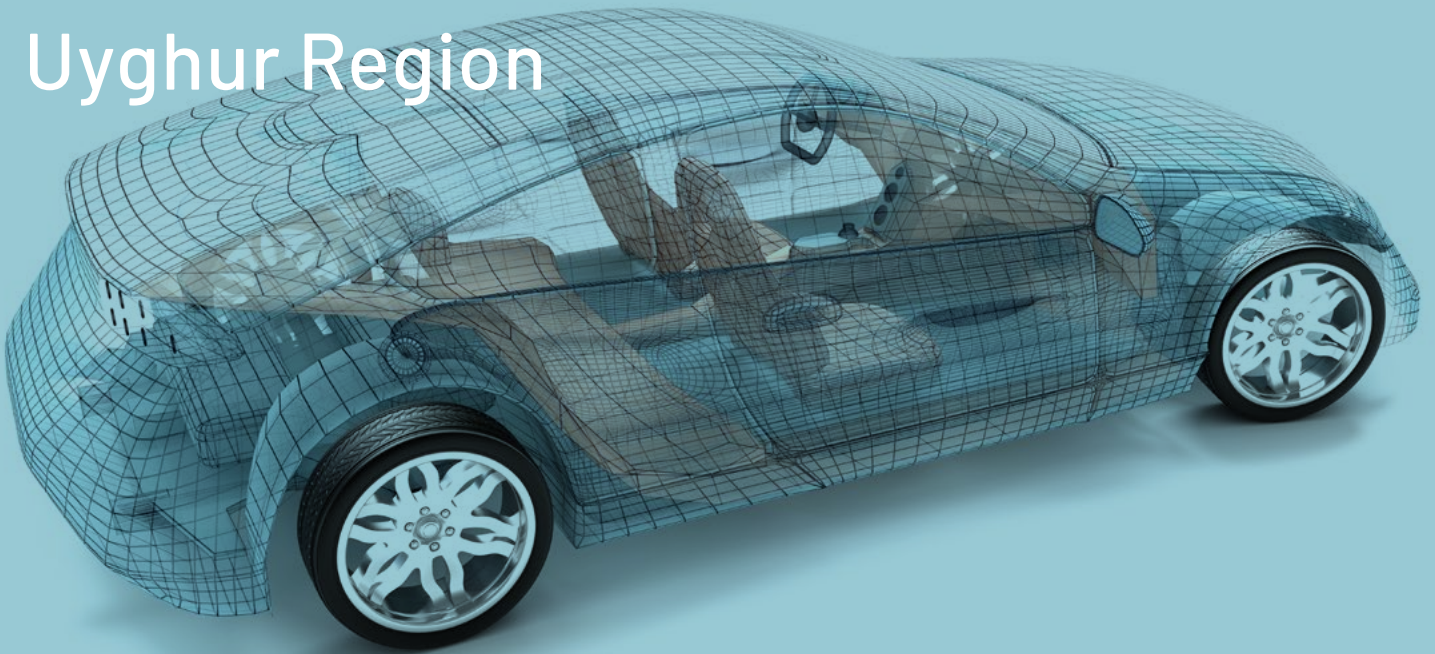


DECEMBER 2022  
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# DRIVING FORCE

Automotive Supply Chains  
and Forced Labor in the  
Uyghur Region



Laura Murphy, Kendyl Salcito, Yalkun Uluyol,  
Mia Rabkin, and an anonymous team of authors

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With a team of researchers with lived experience of the crisis in the Uyghur Region who have chosen to remain anonymous for security reasons.

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This publication is designed to provide accurate and authoritative information in relation to the subject matter covered. It is a point-in-time analysis; some of the information presented herein may change as supply chains or government initiatives shift. It is provided with the understanding that the author and publisher are not engaged in rendering any form of professional or other advice or services through the publication of this report. The report reflects the authors' own conclusions, based on inferences drawn from an analysis of publicly available sources. No person or entity should rely on the contents of this publication without first obtaining professional advice.

**Note:** This report was amended on October 2, 2024 to remove Huizhou Desay SV Automotive Co., Ltd. (惠州市德赛西威汽车电子股份有限公司) that was mistakenly named on page 6.

This report was amended on July 15, 2025; Minth Group have been removed from the table on page 6 that mistakenly identified the company as Chinese owned.

**THE HELENA KENNEDY CENTRE FOR INTERNATIONAL JUSTICE AT SHEFFIELD HALLAM UNIVERSITY** is a leading center for social justice and human rights research, practice, and pedagogy. It provides a vibrant environment at the cutting edge of legal and criminal justice practice which prepares students for excellence in their chosen professional careers.

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# Executive Summary

*This report is part of a series of investigative papers examining goods and materials whose production has been located in the Uyghur Region as part of a Chinese Government effort to repress Uyghur and other minoritized populations and erase traditional cultures. It relies on publicly available sources, including shipping data, corporate financial and media reporting, journalism, state propaganda, remote sensing data, and maps. Research was conducted in English, Mandarin and Uyghur languages. This report documents the automotive industry's reliance on forced labor and other exploitation in the Uyghur Region.*

Automotive parts manufacturing is big business. Globally, the automotive parts manufacturing market is expected to reach nearly US \$2 trillion by 2026.

China is one of the world's top auto parts suppliers, exporting upwards of US \$45 billion worth in 2021. The United States automotive industry is particularly reliant on Chinese parts, receiving approximately a quarter (US \$11.5 billion worth) in 2021.

Through proactive initiatives, China has risen from obscurity in the automotive and auto parts industry to become a global leader in just 20 years. The "Made in China 2025" plan to convert China from "a manufacturing giant to a world manufacturing power," explicitly included the automotive and automotive parts industry. The plan also encompassed materials sourcing. Today China plays a disproportionate role in the processing of raw materials for car parts. Mining, refining, and manufacturing undertaken in the PRC undergirds much of the global automotive industry. China processes most of the world's iron into steel, bauxite into aluminum, and lithium and cobalt into battery-grade materials.

A large and growing share of that very environmentally damaging and energy-intensive work is undertaken in the repressive environment of the Xinjiang Uyghur Autonomous Region (or XUAR or Uyghur Region). While the Uyghur Region is not necessarily rich in all of the raw materials central to automotive manufacturing (such as iron for steel, copper for electrodes and plating, and bauxite for aluminum, or even the lithium used in the making of electric vehicle batteries), **the PRC government has dedicated significant resources to moving the highly polluting and energy-intensive processing of these raw materials into the Uyghur Region, requesting and sometimes requiring public and private companies to incorporate state-sponsored forced-labor programs into their "social responsibility" commitments.**

In its 14th Five-Year Plan covering the years 2021-2026, the XUAR government emphasized the importance of expanding Xinjiang's processing of the materials most critical to the auto industry, namely iron, steel, and non-ferrous metals. These XUAR-based industries were meant to "go global" under this plan, and the automotive sector is explicitly highlighted.

The increased availability of processed raw materials in the Uyghur Region, coupled with extraordinary government incentives and lax implementation of labor and environmental protection

laws, led auto parts manufacturers to expand production in the region in recent years.

## KEY FINDINGS

This report describes the expansion of auto parts and materials production in the Uyghur Region, documents the abuses committed by some of the largest industry actors, and traces the products of those businesses to western car brands, through direct and indirect supply chain links.

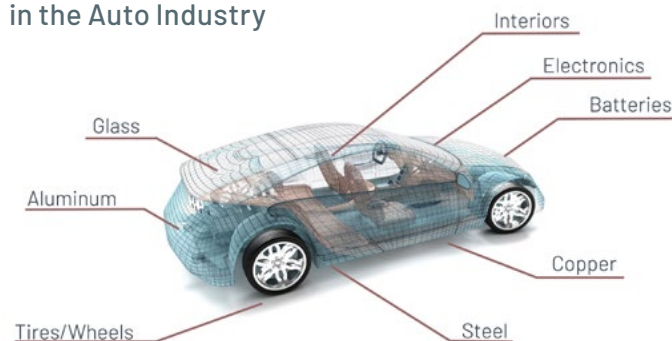
Using publicly available sources, including corporate annual reports, websites, and publicity campaigns; government directives and state media, and customs records, we identified the following:

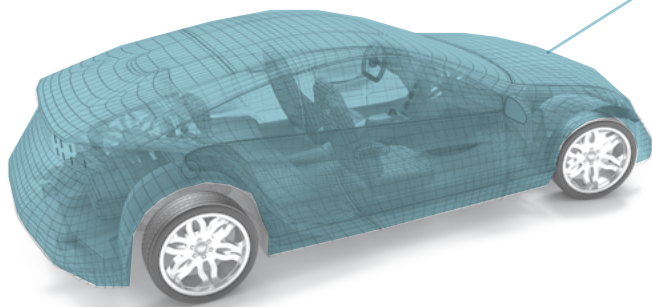
- 96 mining, processing, or manufacturing companies relevant to the automotive sector operating in the Uyghur Region, including at least 38 that have documented engagement in state-sponsored labor transfer programs.
- over 40 automotive-sector manufacturers in China that are sourcing from the Uyghur Region or from companies that have accepted Uyghur labor transfers across China.
- more than 50 international automotive parts or car manufacturers (or their joint ventures) that are sourcing directly from companies operating in the Uyghur Region or from companies that have accepted Uyghur labor transfers across China.
- more than 100 international automotive parts or car manufacturers that have some exposure to forced Uyghur labor made goods.

Several major international auto manufacturers—including **Volkswagen Audi Group, Honda, Ford, General Motors, Mercedes-Benz Group, Toyota, Tesla, Renault, NIO, and Stellantis Group** had several supply chain exposures to the Uyghur Region.

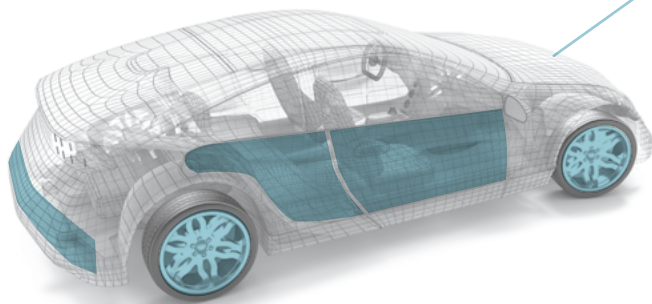
The first several chapters of this report zoom in on three base metals that are central to car part and whole car manufacturing—steel, aluminum, and copper—to demonstrate the central role the Uyghur Region plays in the making of our cars.

## Forced Labor Exposure in the Auto Industry

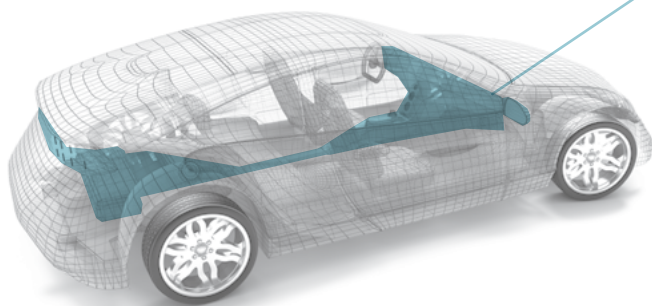




**Steel:** The world's biggest supplier of steel—Baowu—is also the largest steel producer in the Uyghur Region, prolifically employing labor transfers through state programs. Transferred Uyghur laborers marched for hours to factories during Covid lockdowns, then quarantined on-site in sub-standard housing to keep producing steel. Baowu's Toutunhe smelter is surrounded by cottage steel industries including an array of auto parts makers that source steel from Baowu, engage in labor transfers of their own, and export directly to global markets through Ürümqi's 'land port' for import/export.

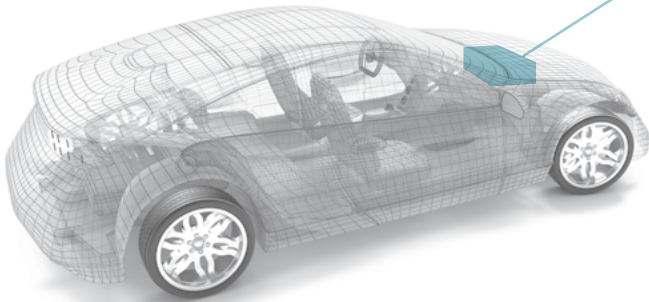


**Aluminum:** Today, XUAR's aluminum production is roughly 6.6 million tons per year, representing about a tenth of global production. The Uyghur Region produced more aluminum than India, Russia, Canada or any other major aluminum producer outside of China. Transferred Uyghur laborers work directly in the sweltering and dangerous smelting rooms as well as in hazardous carbon anode manufacturing plants. Labor transfers into aluminum smelters were documented as recently as 2022.

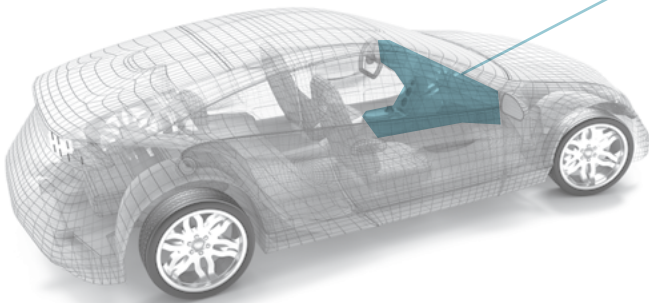


**Copper:** China smelts more copper than the rest of the world combined and is also the largest copper refiner. In the Uyghur Region, the largest copper miner and processor is Xinjiang Nonferrous Metals Company. One of the world's largest copper processors, Zijin Mining Group, is also active in the region. Xinjiang Nonferrous's mining operations were used to architect and pilot transfer schemes to indoctrinate Uyghurs from southern XUAR through labor transfers. Workers experienced collective punishment and exposure to extreme workplace hazards in addition to being forcibly separated from their families.

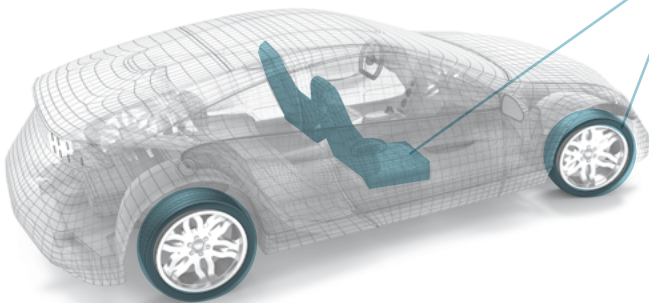
In later chapters, we lay out findings regarding supporting infrastructure that has enabled the movement of parts production and other high-end manufacturing into the Uyghur Region. Batteries for both internal combustion engine (ICE) and electric vehicle battery (EVB) cars are being sourced from the region, as are wheels, tires, glass, interiors and other parts. These later chapters also document how some parts, like automotive electronics, involve cross-regional state-sponsored forced labor transfers.



**Batteries:** Batteries for traditional car engines are 60% lead, by weight. Smelting lead, either through recycling or from mining, is hazardous for workers and downwind communities, which has been a major driver for closing lead smelters in eastern China. Since 2017, the government has licensed five lead-acid battery manufacturers to smelt lead and produce batteries in the Uyghur Region. The largest of these, Camel Group, has faced sanctions for “frequent blood lead incidents.” Transferred workers from southern XUAR were subjected to state-sponsored labor transfer and to a “closed” pre-job training involving military and ideological indoctrination. EV batteries require lithium, nickel, cobalt, graphite, and manganese. China processes 60% of the world’s lithium, with a growing percentage of that refining underway in XUAR. Xinjiang Asia-Europe Rare Metal is the largest lithium actor in the Uyghur Region, receiving “assigned” workers since at least 2017. Its partners include upstream suppliers of the world’s largest lithium-ion battery producers.



**Electronics:** Electronics manufacturing has moved into the Uyghur Region in the last few years. This chapter, however, focuses on long-distance labor transfers, moving Uyghurs to eastern China for work. Manufacturers for some of the world’s most famous electronics brands have benefited from state-sponsored labor transfers of Uyghurs. We document the state transfer of Uyghur individuals to companies making circuit boards, central control systems, safety control systems, touchscreens, transformers, inductors, connectors, and wiring solutions for the automotive industry. Many of these companies have been identified as engaged in China’s repressive programs by journalists and researchers, but the companies’ connections to the automotive industry have not been fully explored.



**Other parts:** Exploitation is acute in the manufacture of car parts that do not require capital-intensive, heavy-industry infrastructure. The sewing of interior cushions and floor mats is underway in factories adjacent to some of the Uyghur Region’s most repressive internment camps, such as the Lop County #4 Education and Training Center internment camp where the notorious photo of Uyghurs in matching blue jumpsuits, fenced in and surrounded by armed guards, was taken. Companies carrying out the manufacture of these parts are deeply linked to global markets.

**Between raw materials mining/processing and auto parts manufacturing, we found that practically every part of the car would require heightened scrutiny to ensure that it was free of Uyghur forced labor.**

In some cases, Uyghur forced labor is apparent at multiple steps in parts manufacturing, including mining, refining, pre-fabrication, and manufacturing. But just one step of the production chain with confirmed forced labor incidents is sufficient to trigger import bans or due diligence red flags in several Western jurisdictions.

## AN INDUSTRY-WIDE PROBLEM THAT REQUIRES INDUSTRY-WIDE SOLUTIONS

**We traced the customers of companies that mine, process, and manufacture products relevant to the automotive industry that have engaged in forced labor in the Uyghur Region. The results were startling—practically every major traditional automotive and electric vehicle manufacturer has significant exposure to forced labor in the Uyghur Region. The auto industry cannot wait another day to trace their supply chains back to the raw materials. To do anything short of full tracing would be an enormous legal, ethical, and reputational risk.**

Manufacturers have indicated that thorough supply chain tracing is out of reach and that understanding the situation in the Uyghur Region is a challenge. Despite acknowledging their responsibilities under domestic law, internal governance, and public expectations to respect human rights, their human rights due diligence efforts to date have been incommensurate with the supply chain risks they face. Current efforts through industry associations and certification schemes emphasize links to raw materials mining but are comparatively blind to the processing and refining involved in converting ore into forged, rolled, cast or manufactured car parts and do not take account of the significant expansion of manufacturing of car parts in the XUAR in recent years.

This report provides a starting point for identifying materials and parts at most significant risk of being sourced directly or indirectly from abusive facilities in the XUAR and models a methodology for companies to vet and adjust their own supply chains to withdraw from the Uyghur Region crisis. It also provides clarity to automotive industry actors that the forced labor risks are, in fact, pervasive in their supply chains. Though the report cannot address every single company in the region, evidence shows that the parts manufacturing, materials processing, and mineral mining associated with the automotive industry is substantially tainted with forced labor. This report shows that the automotive industry should conduct significantly more thorough supply chain tracing to ensure that it is not complicit in the forced labor regime in the Uyghur Region.

A significant, swift shift in supply chains is needed to extricate the automotive sector from the Uyghur Region. Other industries that rely on similar raw materials (e.g. alloys of steel, copper, aluminum, and silicon) are comparably implicated in abuses underway in the processing of these materials. The information provided in this report should serve as a wakeup call to manufacturers across sectors worldwide and as a foundation for cross-sectoral collaboration to end forced labor in raw materials and manufacturing.

## RECOMMENDATIONS

Based on the severity and pervasiveness of forced labor identified in this report and the extent to which it pervades automotive supply chains, we recommend that governments and businesses take immediate action. We recommend the following:

### Recommendations to Governments

1. Governments and legislatures should enact and implement mandatory human rights due diligence laws and ensure the laws require companies to address human rights risks beyond first-tier suppliers, in recognition that abuses can easily be distanced from direct suppliers under state-controlled economic systems. Laws and enforcement should apply to the full supply chain, without exception. In addition to countries that already have enacted human rights due diligence laws (e.g. Germany and Norway), or are developing them (the European Union), human rights due diligence laws should be a priority for countries with deep involvement in the automotive industry, such as Japan and South Korea.
2. Governments and legislatures should enact and implement bans on imports linked to forced labor. Forced labor import bans are a necessary complement to mandatory human rights due diligence, especially where state-sponsored repression prevents companies from conducting on-the-ground assessments of forced labor risks. Forced labor bans should include specific provisions to identify and prohibit the import of goods linked to state-sponsored forced labor.
3. Governments should identify the automotive sector as a priority for the implementation of forced labor import bans. Governments should devote substantial resources to identifying automotive parts and materials linked to forced labor. The United States should, in particular, name the aluminum, steel, and automotive industries as high-priority sectors under the Uyghur Forced Labor Prevention Act (UFLPA).
4. Governments should require that all procurement (including the purchase, lease, and rental) of automobiles for official use be free of parts made in whole or in part in the XUAR.

### Recommendations to Car Companies

1. Car companies should work individually and collectively to conduct or commission their own supply chain mapping and analysis of raw materials mining and processing and parts manufacturing in the XUAR.
2. Corporations in the automotive industry and commodities trading firms should engage in both internal and cross-sector collaborative efforts to cease sourcing all products mined, made, or manufactured, in whole or in part, in the Uyghur Region. This would include ending business relationships or contracts, whether direct or indirect, with any companies that have operations in the Uyghur Region or that have accepted government-supplied laborers from the Uyghur Region in other parts of China.
3. In adherence to the UN Guiding Principles on Business and Human Rights, automotive companies conducting enterprise-wide human rights due diligence should prioritize links to the XUAR as a matter of urgency, as the human rights impacts are severe and pervasive in the region. Given the im-

possibility of conducting meaningful assessments of forced labor risks at facilities in the XUAR, car companies' due diligence efforts should focus on identifying supply chain links to the XUAR and working with suppliers and sub-suppliers to responsibly exit the region.

4. Auto manufacturers should publicly report on findings of supply chain links to the XUAR to facilitate knowledge of supply chain risks across the automotive industry and industries with related supply chains. Decisions to terminate procurement relationships should also be made public to inform other industry actors of identified supply chain problems and promote supply chain transparency.
5. Car companies should not assume that suppliers or sub-suppliers, including mines, mineral processors, and other facilities, are free from links to forced labor in the XUAR, whether at their own facilities or in their supply chains, simply because they have made an attestation to that effect, received an industry certification, or conducted an audit pursuant to industry initiatives or supply chain due diligence schemes.
6. Auto manufacturers should exit the Uyghur Region at every level of their supply chain and cease doing business with suppliers implicated in Uyghur forced labour in line with the demands of the Coalition to End Forced Labour in the Uyghur Region.
7. Remediation of harms inside China is impossible at this time, so car companies are recommended to collaborate with raw metals industries and industry associations to implement reparations to Uyghurs and other minoritized populations in the diaspora working to address oppression and exploitation in the Uyghur Region.

## Recommendations to other Stakeholders

1. All financial institutions and other investors (e.g. commodities traders) should divest from all companies operating in the XUAR or using state-supplied laborers from the Uyghur Region. Passive investment index funds should delist the companies identified in this report as engaging in state-sponsored labor transfers.
2. The London Metal Exchange should suspend issuing warrants to and withdraw current warrants for any companies linked directly or indirectly to state-sponsored labor transfers in the Uyghur Region. The voluntary "LME Passport" program, wherein metals traders provide ESG information and traceability/transparency data about the ingots they are trading on the exchange, should be made mandatory, and the disclosures should include full supply chain data, describing the origin of the ore, and the locations for mining, processing, smelting, other refining, and trading undertaken.

# Introduction

## CHINA'S ROLE IN THE AUTOMOTIVE PARTS INDUSTRY

The automotive parts manufacturing market is enormous. It is expected to reach nearly US \$2 trillion by 2026.<sup>1</sup> China is one of the world's top auto parts suppliers, exporting upwards of US \$45 billion worth in 2021. The United States automotive industry is particularly reliant on Chinese parts imports, receiving approximately a quarter of those exports (US \$11.5 billion worth) in 2021.<sup>2</sup>

China's rise in the automotive parts industry has been swift. Each year, Automotive News releases a list of the top 100 car parts manufacturers globally by income. Germany's Bosch and Japan's Denso top the rankings; Japanese, German, and U.S. companies generally dominate. Nonetheless, in 2022, ten of the top one hundred auto parts manufacturers are headquartered in China—up from only one in 2012 (See Table 1). In addition to these, two subsidiaries of Chinese-owned Ningbo Joyson Electronics—Joyson Safety Systems (U.S.) and Preh (Germany)—ranked 44th and 92nd respectively. None of the top 15 companies count China as their headquarters, but all have manufacturing operations in China.<sup>3</sup>

That China's star is rising in the automotive parts sector is by design. The People's Republic of China's (PRC) "Made in China 2025" plan prioritized becoming "a world manufacturing power," including in the automotive and automotive parts industry. In particular, the PRC government intended to increase the scale and quality of electric vehicle production to match international levels.<sup>4</sup> China's efforts have been largely successful. While promoting the continued development of traditional car manufacturing across the country, China provided enormous subsidies to car manufacturers entering into the EV market and opened up corporate ownership to foreign investors and companies.<sup>5</sup> By 2021, China's auto manufacturers were predicting they would build eight million electric cars a year by 2028, which the New York Times reported was more than what was predicted to be manufactured in Europe and North America combined. China is building electric car factories "almost as fast as the rest of the world combined."<sup>6</sup> The country is also dominating the EV battery and parts markets.

## KEY MATERIALS MINED OR PROCESSED IN THE UYGHUR REGION

Chinese auto parts manufacturers play an even larger role in the sector than would be evident at first glance. **Many of the top global car manufacturers are indebted to mining, refining, or manufacturing undertaken in the PRC. China processes most of the world's iron into steel, bauxite into aluminum, and lithium and cobalt into battery-grade materials.**<sup>7</sup>

**The PRC conducts a lot of that environmentally damaging and energy-consuming work in the extraordinarily repressive environment of the Xinjiang Uyghur Autonomous Region (or XUAR or Uyghur Region).**

The automotive industry relies on dozens of raw materials in the production of vehicles.<sup>8</sup> About 60% of the typical passenger vehicle is made of iron and steel, and about 12% aluminum.<sup>9</sup> Both steel and aluminum are used in the construction of the car's frame as well as in the manufacture of many other essential parts.

**Table 1. Chinese-owned Companies Ranked in the Top 100 Car Parts Manufacturers for 2022 according to Automotive News and their Relationship to the Uyghur Region**

MANUFACTURER	RANK	PRESENCE IN XUAR	DOCUMENTED SOURCING FROM XUAR
Yanfeng Automotive Interiors	16		
BHAP	40	Conducts "poverty alleviation" in the XUAR <sup>10</sup>	
Joyson Safety Systems (HQ in US; parent: Ningbo Joyson)	44	Parent company participates in labor transfer program <sup>11</sup>	
CITIC Dicastal	50	May be developing facilities in the XUAR <sup>12</sup>	Sourcing aluminum from the XUAR
Johnson Electric Group	69		
Wuling Industry	77	Owns Dealership in the XUAR <sup>13</sup>	
Nobo Automotive Systems	81		
Anhui Zhongding Sealing Parts Co.	85		
Ningbo Tupo Group	90		
Preh (HQ in Germany; parent: Ningbo Joyson)	92	Parent company participates in labor transfer program <sup>14</sup>	

*\*Mint Group have been removed from the table that mistakenly identified the company as Chinese owned.*

Aluminum and magnesium alloys are increasingly replacing steel in some parts manufacturing because of their comparable lightness, which improves fuel efficiency.<sup>15</sup> Batteries for traditional internal combustion engine (ICE) vehicles require lead, and electric vehicle (EV) batteries require lithium, graphite, and other elements. Copper and nickel are used in electromechanical aspects of the car to increase conductivity and reduce wear.<sup>16</sup>

The materials used in the manufacturing of automotive vehicles tend to be mined and processed in some of the most remote places in the world, often under horrific labor and environmental conditions. Indeed, a 2022 industry report on the Chinese auto parts industry indicates that the XUAR is ranked third in China for production of these non-ferrous metals that are essential to automotive manufacturing.<sup>17</sup> This is only in small part due to the raw materials resources of the region. To a much greater extent, it is because of **the incentives the government has provided to move processing of those materials closer to coal reserves and laxer regulatory contexts. Xinjiang’s industrial sector is characterized by coal-based energy used in the processing, hazardous working conditions, and diminished rights of workers.**<sup>18</sup>

While the Uyghur Region is not necessarily rich in all of the raw materials central to automotive manufacturing, the PRC government has dedicated significant resources to moving the processing of these raw materials into the Uyghur Region. In both the 13th and 14th Five-Year Plans (spanning the years 2016-2026), the XUAR and XPCC governments emphasized the importance of expanding the region’s processing of the materials most critical to the auto industry, namely iron, steel, and non-ferrous metals. The automotive sector is explicitly highlighted as a target indus-

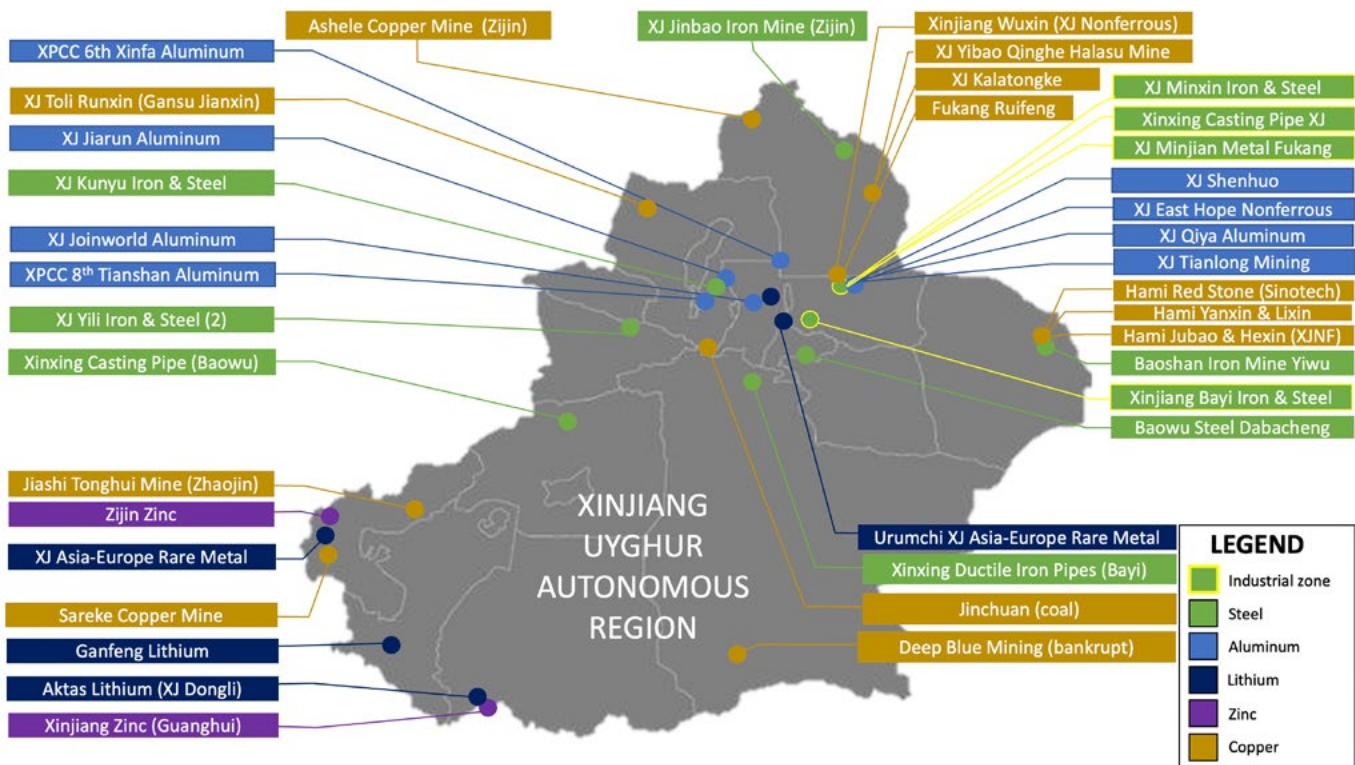
try for these endeavors.<sup>19</sup> The central and regional governments have provided extraordinary incentives for companies to move their raw materials processing out to the Uyghur Region, where labor and environmental standards are enforced less stringently. Expansion of mining, processing, investment, and exports in the region are all of concern to automotive companies.

**The first several chapters of this report zoom in on three materials that are central to car part and whole car manufacturing—steel, aluminum, and copper—to represent the critical role the Uyghur Region plays in the production of our cars. In the process, we uncover the extraordinary rights violations that are being inflicted on Indigenous Uyghur, Kazakh, and other minoritized people of the region by the companies that are among the most significant miners and processors of those essential raw materials.** Examined together, it becomes clear that a vast array of forced-labor-tainted materials from the Uyghur Region are making their way into cars and other vehicles around the world, including in the U.S., where such imports are now banned.

## INVESTMENT IN AND GROWTH OF THE AUTOMOTIVE PARTS SECTOR IN THE XUAR

To take advantage of the consolidation and expansion of key materials processing in the XUAR, central, regional, and local government agencies have invested significant resources in developing the automotive manufacturing in the last decade. In 2014, the Economic and Information Commission of the XUAR

Figure 1. Map of Companies Mining or Processing Key Materials in the Uyghur Region



announced that the Uyghur Region would “build Xinjiang into an important automobile manufacturing and westward export base” that would take advantage of the region’s location as a transportation hub and its “advanced logistics.” The government kicked off this initiative with the 2014 “Auto Parts and Agricultural Machinery Industry Matchmaking Conference,” which was hosted to share incentives and develop partnerships with automotive companies.<sup>20</sup> The “Made in China 2025 Xinjiang Action Plan” disseminated in 2015 repeatedly mentions the government’s very specific ambitions to expand the automotive industry in the region and to make XUAR-based automotive parts brands into national and internationally recognized brands.<sup>21</sup>

Local and regional governments of the Uyghur Region have worked to create a business-friendly environment to make the remote region more attractive for business and manufacturing. Region-wide incentives such as free rent, subsidized utilities, employee training subsidies, and coercive labor transfers of disciplined Indigenous workers have characterized the constellation of programs offered to Chinese companies to encourage (perhaps even compel) them to move their manufacturing to the Uyghur Region.<sup>22</sup> In March of 2022, the capitol city of Ürümqi announced 87 measures to further “optimize the business environment” in the city, which included “protecting the legitimate rights and interests of enterprises,” “preventing excessive interference,” making the licensing and approval processes speedier, creating differentiated regulatory environments based on corporate social credit scores, reducing the customs documents necessary for

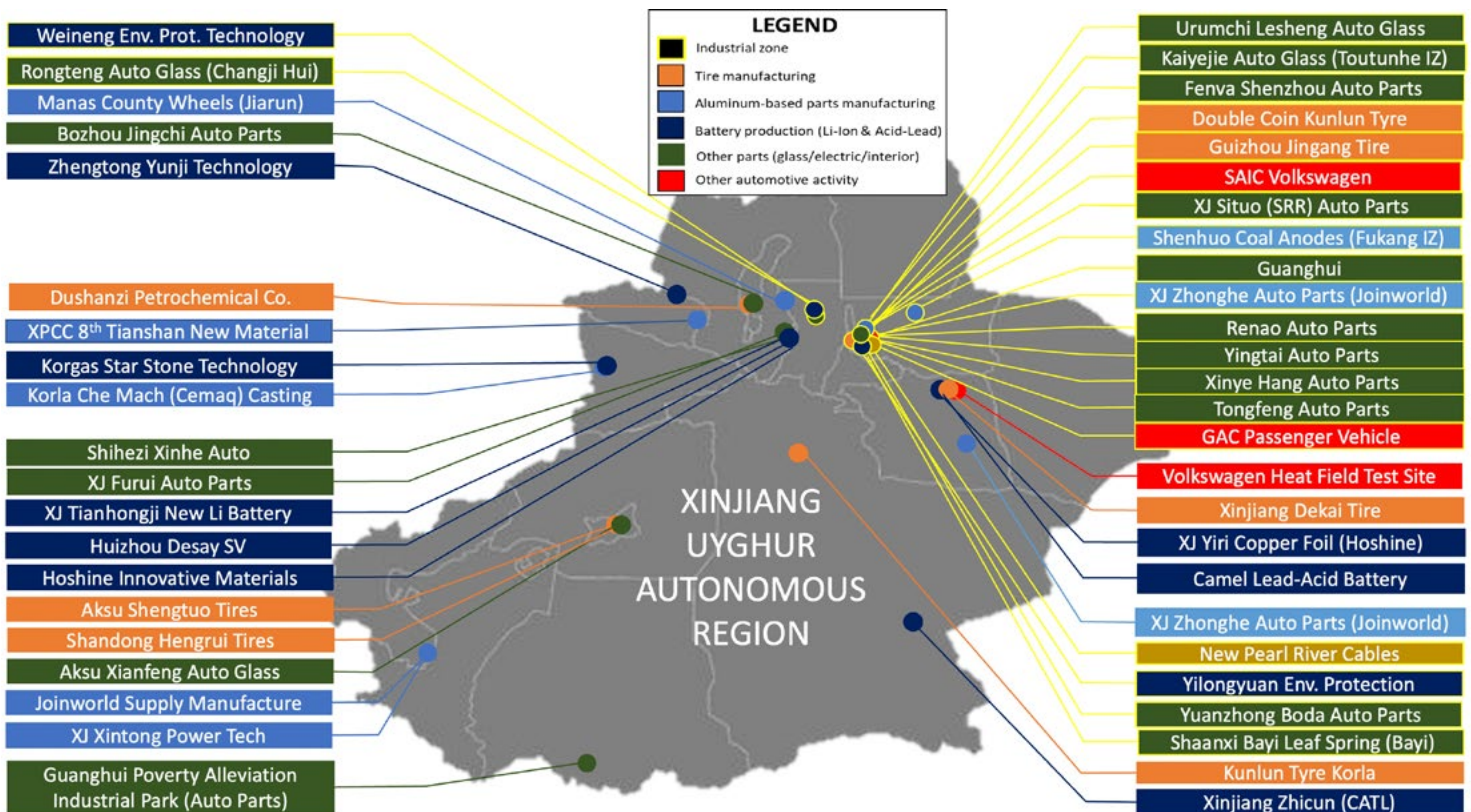
*In sum, our findings suggest that practically all parts of the car are exposed to Uyghur forced labor.*

import and export, providing 1% interest financing to companies, and generally reducing restrictions on corporate development in the region.<sup>23</sup> It is clear that the expansion of manufacturing in the Uyghur Region continues apace, despite setbacks due to domestic economic challenges, human rights crises, and COVID.

**In the second half of this report, we discuss the exceedingly high risk of Uyghur forced labor involved in the manufacture of car parts. One chapter examines both ICE and EV batteries. In another chapter, we analyze the way in which automotive electronics that are sourced from other regions of China are also exposed to forced labor of workers from the Uyghur Region, as electronics manufacturers have been actively engaged in cross-regional state-sponsored forced labor transfers. Finally, we discuss interiors and tires that are made by people subjected to state-sponsored labor transfers in the Uyghur Region. Online Annex A includes a comprehensive list of all auto parts manufacturers we identified operating in the Uyghur Region, even if there is only scant information about them online, as it may be useful for corporate supply chain tracing.**

In sum, our findings suggest that practically all parts of the car are exposed to Uyghur forced labor in one way or another.

Figure 2. Map of Companies Producing Car Parts in the Uyghur Region



## ANTICIPATED EXPANSION

Auto parts manufacturing is now underway in Hotan,<sup>24</sup> Korla,<sup>25</sup> Manas County,<sup>26</sup> Khorghos,<sup>27</sup> and Ürümchi.<sup>28</sup> The automotive part manufacturing industry will continue to expand in the Uyghur Region, as increased subsidies and new facility development project announcements attest.

In February of 2022, a CNY 260 million auto parts manufacturing project with an annual sales projection of CNY 1.6 trillion, was proposed for the Sanji (Ch: Changji) region in the Zhudong Development Zone,<sup>29</sup> 160 kilometers outside of Ürümchi, where the project would take advantage of the proximity of aluminum, scrap steel, and molten iron (and almost certainly the low-cost coal that the region is famous for).

In May of 2022, the Administrative Committee of the Ürümchi government released a new directive on accelerating the further promotion of and increasing investment in the automotive sector in the Toutunhe Economic and Technological Development Zone, where much of the region's car manufacturing takes place (see section on Toutunhe in this chapter). For companies that moved into the Zone and promised to remain for ten years, the district government committed to provide up to CNY 5 million in fixed assets subsidies, free rent on manufacturing workshops for three years and 50% market rate for two years thereafter, and special preferential procurement deals with government agencies. Furthermore, the government developed a special auto industry development sub-fund to "support investment promotion, traditional technological transformation, major technological breakthroughs, industrial platform construction, supporting system and corporate brand building, and new product development." Executives of companies that develop in the Toutunhe Zone qualified for talent rewards and subsidies as well.<sup>30</sup>

In the spring of 2022, government representatives from the border adjacent Khorghos region of the XUAR traveled to several cities across China to develop relationships with enterprises to encourage investment through promoting the significant subsidies and incentives programs in place to attract business to the region. On that trip, a representative of Shaanxi Automobile Holding Group celebrated the company's use of Khorghos as an export hub and indicated that the company is interested in engaging in an auto parts assembly project there in the future.<sup>31</sup> Facilitation of exports is a critical aspect of ensuring the success of automotive part manufacturing in the remote Uyghur Region, and efforts have begun to provide companies assurances that the XUAR will be a conducive place to do business on that front as well.

## EXPORTS TO GLOBAL MARKETS

China's domestic automobile consumption is steadily increasing—both for traditional and electric vehicles—and, thus, it is certain that some of the expansion of the auto parts industry in the XUAR is meant to support that growth. EV vehicle purchases are predicted to account for 20% of car purchases in the Uyghur Region by 2025, and the regional government is mandated to make 50% of their vehicle purchases be EVs.<sup>32</sup> This will certainly create

significant demand for the automotive parts manufactured in the region.

However, the parts manufactured in the Uyghur Region are also being exported internationally, exposing the entire global automotive market to Uyghur forced labor. In 2022, car parts are one of China's top exports passing through the Uyghur Region's land borders by train into Central Asia and on to Europe and Russia.<sup>33</sup> These import/export corridors enable raw materials to enter for processing, processed materials to exit for fabrication, and fabricated materials to be exported to Europe, with connections to the Uyghur Region obscured in the process.

According to United Nations Comtrade data, in 2021, more than US \$30 billion worth of auto parts were shipped from China to the United States (\$11.5b), Japan (\$3.6b), Mexico (\$2.9b), Germany (\$2.4b), South Korea (\$2b), Thailand (\$1.6b), Russia (\$1.4b), Canada (\$1.2b), India (\$1b), the United Kingdom (\$1b), and other countries. Given the deliberate investment the PRC has made in moving a significant part of the automotive industry to the Uyghur Region, this suggests that there is extraordinarily high risk of XUAR-made products being exported to automotive manufacturers worldwide. The following chapters provide insight into the significant exposure of the industry to products made in the Uyghur Region. It is critical that the automotive industry begin to reckon with the extent to which the industry is at legal, financial, and reputational risk, as the industries most central to the sector continue to expand in the Uyghur Region, at the same time as the PRC's systematic program of forced labor expands.

## WHY THE UYGHUR REGION SHOULD MATTER TO THE AUTOMOTIVE INDUSTRY

As has been widely documented and publicized, state-sponsored forced labor is practically ubiquitous in the Uyghur Region.<sup>34</sup>

Since at least 2017, the government of the People's Republic of China (PRC) has implemented a massive systematic program of forced labor in the Xinjiang Uyghur Autonomous Region. Through conscripted seasonal labor, prison and internment labor, and state-coerced labor transfers, the PRC has compelled Indigenous citizens of the Uyghur Region to work in "labor-intensive" industries, as well as on farms and in municipal maintenance both within the region and across China. Significant evidence reveals that labor transfers in the Uyghur Region occur within an environment of unprecedented coercion, undergirded by the constant threat of re-education, internment, and imprisonment. **Because refusal to participate in government assistance can be considered a sign of religious extremism and is punishable with internment or prison in the Uyghur Region, Indigenous workers from the region are unable to refuse or voluntarily exit jobs assigned to them by the government. Thus, these state-sponsored labor transfer programs are tantamount to forcible transfer of populations, forced labor, human trafficking, and enslavement.**

Experts have determined that the PRC's internment camp and prison factories, as well as the "surplus labor" and "labor transfer" initiatives as they are practiced in the Uyghur Region, are

mechanisms of a massive program of compulsory labor. In response, the U.S. government now presumes that all products made in whole or in part in the Uyghur Region are made using forced labor.<sup>35</sup>

State-sponsored forced labor operates through several different (though sometimes overlapping) mechanisms in the Uyghur Region:

- **Prison Labor.** The PRC government requires that all inmates perform compulsory labor. In the XUAR, the majority of prison labor is in agricultural sectors, including cotton planting, harvesting, and ginning. Prisons are attached to farms and factories. Some private and state-owned enterprises locate their factories within the walls of the prisons.
- **Internment Camp Labor.** Beginning in 2016, the PRC began a campaign of mass extra-judicial internment in the Uyghur Region, interning upwards of a million Indigenous citizens of the region, in contravention of numerous international human rights protocols. The internment camps are touted as an anti-terrorist campaign grounded in “vocational training.” Many detainees are required to work. Again, companies often locate factories within the walls of these camps, but other companies receive internment camp victim workers each day at factories located in proximity to the camps.
- **State-Sponsored Labor Transfers.** The PRC has placed millions of Indigenous citizens from the Uyghur Region into what the government calls “surplus labor” (富余劳动力) and “labor transfer” (劳动力转移) programs. Through state agency labor recruiters, the PRC government compels people to be transferred to farms and factories across the Uyghur Region. Others have been “transferred” thousands of miles into the interior of China to work in factories. The XUAR government estimates that it has deployed these programs 2.6 million times (some people may count more than once if transferred more than once).
- **State Conscription of Laborers.** The PRC has made labor compulsory in the Uyghur Region for generations through the “hashar system,” through which Uyghur and other minoritized citizens are conscripted to hand pick cotton and other agricultural products seasonally. Children as young as elementary school age are subject to the hashar system, which continues to operate in the most impoverished villages of the southern XUAR.

The government has deployed legions of state-employed labor recruiters and other cadres who assign work to those deemed by the state to be “surplus laborers.” Government directives require local governments and labor agencies to meet quotas for labor transfers. The forced labor regime is facilitated and monitored by an army of corporate and government cadres who are tasked with the constant surveillance of Indigenous people of the region through initiatives called “Becoming Family” and “*fanghuiju*.”<sup>36</sup> *Fanghuiju* is an abbreviation of the XUAR government campaign called “Visit the People, Benefit the People, and Bring Together the Hearts of the People” (访民情·惠民生·聚民心). The campaign began in 2014. The program has sent as many as 200,000 party cadres to pay frequent visits to the homes of minoritized individuals in Xinjiang Uyghur Autonomous Region.<sup>37</sup> The purpose of the campaign is to increase the visibility and control of the party at the grassroots level. In addition, the largely Han cadres conduct surveillance and collect information on the daily lives of minoritized individuals to compile dossiers. Then, the dossiers are shared with the local security officials and recorded in police databases.<sup>38</sup> The cadres are also encouraged to report ‘extremist’ behaviors, which include a range of normal daily Islamic practices such as possessing a copy of the Qur’an, fasting during Ramadan, having a long beard, and avoiding alcohol.<sup>39</sup> The information collected was also used to rank minoritized individuals from ‘trustworthy’ to ‘untrustworthy,’ which determined whether they would be detained in a re-education camp.<sup>40</sup>

These programs ensure that Indigenous citizens comply with the government mandated assignments to work by sending Han people to monitor the behaviors and decisions of Uyghur citizens as well as to “educate” them on proper comportment and on the benefits of complying with the government’s wishes. A widely circulated government-issued document listed refusal to participate in government assistance programs as a sign of terrorism or extremism, which suggests that refusal of a labor transfer could be punishable by internment or imprisonment.<sup>41</sup>

Hundreds of testimonies from people who have been forced (or whose family members have been forced) to work in the Uyghur Region reveal the strategies of coercion that the government uses to compel people to work. These include threats of being sent to internment camps for refusing government-sponsored labor transfers, repeated (sometimes daily, sometimes overnight) visits by agents of the state to pressure people to be transferred for labor, coercive land transfers that leave farmers landless and unemployed, false promises that family members will receive reduced sentences if a person accepts a labor transfer, and misrepresentation of the labor as otherwise-required ideological training or poverty alleviation.<sup>42</sup>

**These state-sponsored forced labor programs are endemic to the Xinjiang Uyghur Autonomous Region and are present in practically all sectors that mine, farm, or manufacture there, including in the manufacturing of automotive parts. This report documents the automotive industry’s reliance on labor transfers and other worker exploitation in the Uyghur Region. The rapid expansion of auto parts manufacturing in the Uyghur Region means that the vast supply chains of the automotive industry are widely tainted with forced labor.**

## SPOTLIGHT: SAIC VOLKSWAGEN (XINJIANG) AUTOMOTIVE CO., LTD.

Volkswagen has come under intense scrutiny in the last few years as consumers and advocates become increasingly aware of the atrocities being committed in the Uyghur Region. In 2019, the company's then CEO, Herbert Deiss, said that he was unaware of the re-education camps in the Uyghur Region.<sup>43</sup> Since then, the company has denied the use of forced labor at its Ürümchi factory, but questions remain about what steps Volkswagen has taken to address rights violations in the region or to identify the use of forced labor among its suppliers.<sup>44</sup>

With a CNY 2 billion investment, SAIC Volkswagen (Xinjiang) Automotive Co., Ltd. (also known as the Ürümchi Plant of Volkswagen China) was the first car manufacturing project introduced in the Uyghur region, with an expected annual production capacity of 50,000 vehicles.<sup>45</sup> According to China Association of Automobile Manufacturers data, despite its high production capacity, the average annual production of the plant was 18,960 vehicles between 2015–2019. Nonetheless, SAIC-Volkswagen was by far the most significant auto manufacturer in the region; in 2015, SAIC-VW accounted for 98% of total car production in the Uyghur Region. With an increase in automotive manufacturing in the region, SAIC-VW had dropped to a still significant 79% of all cars manufactured in the region in 2019.<sup>46</sup>

However, in the last two years, production at the plant seems to have slowed to a near standstill. SAIC-VW annual production dropped to 3,244 vehicles in 2020 (37% of total automobile production in the Uyghur Region), which could be accounted for by COVID. However, by 2021, when Chinese manufacturing had returned to normal levels, the factory only produced 5,355 vehicles.<sup>47</sup>

The plant appears to have failed economically, as it never reached even half of its expected annual production capacity at the peak of its annual production. Compared with the other two plants of Volkswagen—located in Zhengyi and Ningbo and founded around the same time as the Ürümchi plant—the scale of production in the Ürümchi plant is relatively small. According to Social Security Information of workers in Ürümchi, Zhengyi, and Ningbo plants, there were 678 employees in the Ürümchi plant in 2018, whereas the Zhengyi plant had 3,135 and the Ningbo plant had 4,003. While there has been no concomitant dramatic decrease in the number of workers in Zhengyi and Ningbo plants over the last three years, the number of workers in the Ürümchi plant decreased to 318 in 2021, leaving it with a tenth the employment of its sister plants.<sup>48</sup>

Volkswagen, for its part, has refused to shutter the plant under pressure, and the former CEO Herbert Deiss has claimed that the Volkswagen presence has a “positive impact” on the region.<sup>49</sup> There has been no indication from Volkswagen executives as to why the plant has indeed been slowly winding down production, though there have been reports that the plant is running at “reduced levels.”<sup>50</sup>

In June 2018, one worker from the Volkswagen Ürümchi plant wrote in a post published on an online platform that “the plant is dealing with leftover parts the previous year... some see it as a preparation for a shutdown of the autobody and paint division... the Xinjiang plant will not likely be closed in the short run...It has

political significance, after all.”<sup>51</sup> A more recent statement from Volkswagen Group seems to lend credence to the claim that the continued existence of the Ürümchi plant is more political than economic. Stephan Wöllenstein, Volkswagen China's outgoing CEO, told reporters that SAIC executives told Volkswagen that if the company closes its Xinjiang plant for “political reasons,” it would “do more harm than good.”<sup>52</sup> Indeed, European Parliament member Viola von Cramon-Taubadel spoke with Volkswagen executives who reportedly “tried to convince [her] that if VW decides unilaterally to close [its Xinjiang plant] they could not produce a single car in China anymore.”<sup>53</sup>

The employee from the Volkswagen plant in Ürümchi worried about the effect the downsizing was having on workers. He noted that the downsizing at the plant had left many people laid off, others being paid less than they had expected. He lamented that there didn't seem to be any new materials coming in to ensure the plant would continue production.<sup>54</sup>

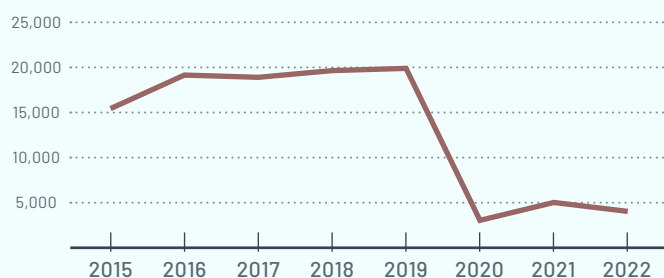
In September 2022, Volkswagen asked Diess to step down and appointed Oliver Blume the new CEO. According to Chinese state media, in his first days in office, Blume stated that the company would maintain its presence in the XUAR, as the company offers “secure well-paid jobs” to people there.<sup>55</sup> Those benefits might be unlikely to accrue to Uyghur people, however, due to discriminatory hiring practices. In at least one of Volkswagen's XUAR-located job advertisements from 2018, a CNY 100,000 a year test engineer job was explicitly only open to a “male of Han nationality.”<sup>56</sup>

Volkswagen's declining production does not decrease the significance of the company's presence in the Uyghur Region. **It appears that the while the factory may not be producing many cars, it is projecting VW's message to the Chinese government that it will remain in the Uyghur Region regardless of international pressure.**

In response to our inquiries, VW Director of Litigation Communications indicated that the proportion of Uyghurs “and other minorities” working at the XUAR plant is proportional to their representation in the city, that those employees were directly employed by SAIC-Volkswagen, and that the plant's slowed production was due to COVID lockdowns and semiconductor shortages. VW also indicated that “plants cannot be built or closed down overnight” and workers' needs must be accounted for.

**As this report will reveal, Volkswagen's engagement in the Uyghur Region is not at all limited to its factory there. The company also has significant exposure to Uyghur oppression through its sourcing.**

Figure 3. SAIC-Volkswagen Plant Annual Production



## THE PURPOSE OF THIS REPORT

This report is intended to provide critical insight into the ways forced labor in the Uyghur Region is affecting global supply chains in the automotive industry. Based on publicly available records, the report aims to inform automotive manufacturers, as well as consumers and governments, of the degree to which automotive manufacturing in the Uyghur Region relies on forced labor and the serious risks associated with sourcing raw materials mined or processed and parts manufactured in the Uyghur Region.

Recent research has begun to highlight the importance of supply chain traceability and the risk of forced labor for the automotive industry. Research firm Horizon Advisory conducted a study of aluminum smelting in the Uyghur Region, and its supply chain connections to the automotive industry were exposed by *Bloomberg*.<sup>57</sup> *The New York Times* identified the Xinjiang Non-ferrous Group as a company that was engaged in labor transfer schemes in the XUAR and a significant supplier of copper and other metals to global markets, including in the supply chains for electric vehicle batteries.<sup>58</sup> Those reports provided insight into particular car parts that are at extremely high risk of being made with Uyghur forced labor and began to show the vulnerability of the automotive industry to forced labor abuses implemented by the Chinese government.

But there are far, far more car parts—and raw materials needed for car parts—manufactured in the Uyghur Region than those three reports could cover. This report provides an overview of the car manufacturing sector in the Uyghur Region, identifying the major mining, processing and manufacturing companies that supply the international automotive industry. We zoom in on steel, aluminum, copper, batteries, and electronics, and also provide examples of other parts of the car that are at very high risk of being made with Uyghur forced labor. For each part, we profile several indicative companies and their participation in repression in the Uyghur Region, including through forced labor programs. We provide lists of all companies we were able to identify that mine, process, or manufacture for the automotive sector within the Uyghur Region.

This report presents a more comprehensive review of supply chain exposure to forced labor in the automotive sector than has been produced to date. However, the scope of automotive industry exposure in the Uyghur Region is vast and cannot be covered entirely in any single report. Some place the number of individual parts in a car at over 30,000. Supply chains for these thousands of parts are complex and often quite obscure. McKinsey & Company estimated in 2020 that the average auto manufacturer is working with 250 tier-one suppliers, and the full value chain could amount to as many as 18,000 suppliers.<sup>59</sup> A longer report might include nickel, graphite, manganese, gold, and other materials essential to car and battery manufacturing. Additional research could uncover forced labor in other parts manufacturing as well.

Here, we examine materials and parts essential to the automotive industry, and it is clear that a wide array of forced-labor-tainted primary materials from the Uyghur Region are making their way into cars and other vehicles around the world, including in the U.S., where such imports are now banned.

It is critical for both ethical and legal reasons that car manufacturers are able to identify suppliers complicit in repression in the Uyghur Region and reckon with the working conditions in their supply chains all the way to the raw materials. Under the U.N. Guiding Principles on Business and Human Rights, companies have the responsibility to avoid causing, contributing to, or benefiting from human rights abuses. With the passing of the Uyghur Forced Labor Prevention Act, the United States now presumes that all goods made in the Uyghur Region are made with forced labor and gives Customs and Border Protection authority to detain all shipments that they believe could be sourced in whole or in part from the XUAR. Guidance from the U.S. government on implementation of the UFLPA has underscored that companies should know the sourcing and sub-sourcing for all parts that go into the final product.<sup>60</sup> A proposed European ban on imports and exports of goods made with forced labor will also, once enacted, block the import of goods linked to forced labor in the Uyghur Region. Proposed European Union human rights and environmental due diligence legislation, as well as a forthcoming EU batteries regulation, will require automakers to identify and address human rights risks in their supply chains.<sup>61</sup>

**Manufacturers, including though not limited to the automotive sector, have indicated that thorough supply chain tracing is out of reach and that understanding the situation in the Uyghur Region is a challenge. This report is meant to provide a starting point for identifying materials and parts at most significant risk and to model a methodology that can be replicated to identify the complicity of suppliers in the crisis in the Uyghur Region.**

Car companies have begun working towards partial supply chain tracing. Drive Sustainability, a consortium of ten major automotive companies, signalled that the automotive industry was working toward collaborative action to address issues in their supply chains when it published a report in 2018 that outlined the ethical, environmental, and human and labor rights risks in raw materials sourcing in the auto industry.<sup>62</sup> Many auto makers have internalized a commitment to improve tracing supply chains in internal governance or through participation in certification schemes or multistakeholder initiatives.

Nonetheless, due diligence has so far largely ignored the industry's deep roots in the Uyghur Region. Car companies' commitments to human rights and responsible sourcing mean they should already be taking steps to identify and address their exposure to forced labor in the Uyghur Region. However, a major limitation of these efforts is that they emphasize links to raw materials mining but are comparatively blind to the processing and refining involved in converting ore into forged, rolled, cast or manufactured car parts and do not take account of the significant expansion of manufacturing of car parts in the Uyghur Region in recent years.

Though the report cannot address every single company in the region, there is sufficient evidence to show that the automotive parts manufacturing and the production of necessary raw materials is a very high-risk sector for forced labor abuses. This report shows that the automotive industry should conduct significantly more thorough supply chain tracing to ensure that it is not complicit in the forced labor regime in the Uyghur Region. The report concludes with recommendations for auto companies, governments, and institutions.

**Based on the findings of this report, the automotive industry has a lot of work to do to ensure that it is free of forced labor-made goods. A significant shift in supply chains will have to happen—and happen very quickly—to extricate the sector from the Uyghur Region.**

## SPOTLIGHT: ÜRÜMCHI ECONOMIC AND TECHNOLOGICAL DEVELOPMENT ZONE (TOUTUNHE DISTRICT)

The Ürümqi Economic and Technological Development Zone (Toutunhe District) (乌鲁木齐经济技术开发区(头屯河区)) is a major hub for the automotive sector in the XUAR.<sup>63</sup> The Toutunhe District has an almost 490 square kilometer footprint<sup>64</sup> and houses subsidiaries of some of the world's most significant raw materials mining and processing companies, including Baowu's Xinjiang Bayi Steel Ürümqi (see the steel chapter of this report) and Xinjiang Zhonghe/Joinworld (see the aluminum chapter of this report). Investors included automotive manufacturers from across China, including Zhengwei Group and Fenghua Shenzhou Auto Parts Co., many of whom are moving out to the Uyghur Region to expand manufacturing parts for the EV sector.<sup>65</sup>

State media sources indicate that for Ürümqi, “99.4% of [the city's] automobile manufacturing, and 95% of its metallurgical industry” is undertaken in Toutunhe already,<sup>66</sup> but these sectors are under expansion, in particular through the construction of the Lianghe High-end Manufacturing Technology Industrial Park (两河高端制造科技产业园) inside the vast Toutunhe District in 2022. Lianghe will feature “special vehicle” manufacturing bases (e.g. for agricultural equipment) but also “auto parts manufacturing bases” to support GAC, Shaanxi Automobile and others.<sup>67</sup> The project will “help products to be exported to countries along the Belt and Road routes such as Central Asia and Europe, and drive the industry to extend, supplement, build, and strengthen the chain.” The Lianghe park alone is designed to “solve the employment of nearly 10,000 people,”<sup>68</sup> a euphemism commonly used to describe participation in state-sponsored labor transfers described in this chapter.

### Participation in Labor Transfer Programs

Since at least 2016, the Toutunhe District has engaged in state-sponsored labor transfer programs. Any company in the park could be a recipient of these transferred laborers, which indicates significant exposure to forced labor for the automotive industry, given the concentration of automotive manufacturers in Toutunhe. In 2016, the park established a “docking relationship” with Konasheher County, Kashgar followed by a 2017 “docking relationship” with Guma (Ch: Pishan) County, Hotan to facilitate regular labor transfers,<sup>69</sup> as part of a larger regional project of “population optimizations” that disperses the Uyghur population

The automotive manufacturing sector is not the only one that should be concerned about the findings in this report. We have identified significant forced labor and other human rights abuses in steel, copper, aluminum, and other raw materials mining and processing in the Uyghur Region. **The information provided in this report should serve as a wakeup call to manufacturers across sectors worldwide and as a foundation for cross-sectoral collaboration to end forced labor in raw materials and manufacturing.**

of the south in Han-dominated northern cities.<sup>70</sup> In May 2017, the 12th Division of the XPCC reported that it had transferred 229 people from the southern XUAR, engaging directly with companies “to negotiate and connect them with labor transfers,” though it seems that some of the workers were also assigned “public welfare jobs” in the park.<sup>71</sup> Toutunhe expected to receive 1,570 transferred laborers in 2020.<sup>72</sup> In one transfer, at the height of the pandemic in March 2020, at least 140 people from a single village in Guma County were transferred into Toutunhe District industries.<sup>73</sup> Government officials in Guma and one other county were rewarded for these transfers, receiving both formal commendations as well as CNY 49.1 million in payments for their poverty alleviation work.<sup>74</sup>



Figures 4 and 5. Transferred workers are lined up in an enclosed, fenced area in Toutunhe park after arriving from Guma County. Source: Tianshan Network March 15, 2020, [Online](https://www.ts.cn).

## Supply Chain Risk

The Toutunhe Zone is a major automotive manufacturing hub. The zone hosts direct subsidiaries of, and suppliers to, Western car makers. Companies located in the park include Volkswagen's Ürümchi manufacturing base (see Volkswagen text box in this chapter), and Chinese companies CRCC, CRRC, GAC Group, and Jiangsu Jinsheng.<sup>75</sup> Among parts makers, Xinjiang Fenva Shenzhou Auto Parts Co. (aka Xinjiang Fenghua Shenzhou Auto Parts) makes more than 25,000 after-market car parts under brand names WXQF, Checkstar, and Uniflow. The company's parts are designed for replacement of BMW, Volkswagen, Opel, Daewoo, Toyota, Honda, Nissan, Mazda, Audi, Mercedes, and other manufacturers' parts and exported "to 44 countries and regions including Europe, Asia, America, Africa and Oceania."<sup>76</sup> Fenva parts are available for sale on Amazon's US and UK sites.<sup>77</sup> Xinjiang Zhonghe (aka Xinjiang Joinworld) has a car parts subsidiary, Xinjiang Zhonghe Auto Parts Manufacturing Co., which designs, manufactures and sells auto parts.<sup>78</sup> Zhengwei Group invested in a project that would import copper from Kazakhstan, West Asia, and the EU for "electrolytic copper deep processing" in Toutunhe.<sup>79</sup> Baowu Steel has a subsidiary, Shaanxi Bayi Leaf Spring that makes car parts in Toutunhe and has been sourcing labor transfers from the XPCC since as early as 2011.<sup>80</sup> Xinjiang Situ Auto Parts Manufacturing Co. produces shock absorbers in Toutunhe park and exports those to the global market.<sup>81</sup> Xinjiang Renao Auto Parts Co. Ltd. was established in March of 2021 in the Toutunhe District,<sup>82</sup> producing wholesale auto parts.<sup>83</sup> Other parts manufacturers and recyclers in the region include: Xinjiang Guanghui Industry Investment Group, which has a logistics center and an auto parts import/export business (Xinjiang Tianhui Service Co., Ltd) in Toutunhe (see the section on Xinjiang Guanghui in the "Other Parts" chapter of the report) and manufactures car parts in other parts of the XUAR using transferred laborers; Xinjiang

Xinyehang Auto Parts Co., Ltd., which manufactures and exports brake pads, steering systems, clutch plates, and other steel car parts for global parts supplier Truckman;<sup>84</sup> Xinjiang Zhexin Automobile Technology Co., Ltd., which manufactures car parts and accessories;<sup>85</sup> Xinjiang Tongfeng Auto Parts Remanufacturing Technology Co., Ltd., which recycles auto parts,<sup>86</sup> and GAC Passenger Vehicle Ltd Co, which manufactures cars for the domestic market, but also for the Middle East, Southeast Asia, Eastern Europe, Africa, and the Americas at its factories across China.<sup>87</sup>

The companies named here represent merely a selection of automotive-relevant manufacturers that have located in the Toutunhe industrial zone. In the following chapters, this report will highlight many more companies located in the zone and delve more deeply into those companies' ties to labor transfers and to international supply chains.



Figure 6. Fenva Auto Parts website slider reads: "Based On Xinjiang, Towards the World." Source: Fenva.com, [Online](#).

# 1. Steel

The automotive industry consumes about 13% of the world's steel production.<sup>88</sup> Industry experts indicated in 2020 that the typical passenger car is made of about 60% iron and steel (by weight).<sup>89</sup> Of the more than 800kg of steel in the average car, 40% is in body structure, 23% in the drive train, and 12% in the suspension, with the rest in the wheels, tires, fuel tank, steering, and braking system.<sup>90</sup> Essentially, when we consider the provenance of the primary materials for automotive parts manufacturing, the first thing we need to consider is steel.

China is, by far, the global leader, producing more than half of all of the world's steel. The next contender, India, produces a mere tenth of what China does.<sup>91</sup> In the U.S. and EU, between 50 and 66% of steel is produced by recycling scrap. In China, where scrap is much less available, 90% of crude steel is produced using iron ore. While China is rich in iron ore, it is often cheaper for Chinese firms to import higher-grade iron ore from Australia than to process domestic ore into steel.<sup>92</sup>

## ACCELERATION OF THE STEEL INDUSTRY IN THE UYGHUR REGION

The XUAR government's Five-Year Plans of 2016 and 2021 both actively encouraged the exploitation of iron mines in the Uyghur Region. In 2016, the government indicated that it planned to "enrich the variety of steel products, stretch the industrial chain, and accelerate the development of products from ordinary steel to new materials such as high-performance alloy steel and new cast pipes."<sup>93</sup> In 2021, the XUAR government set on a path of "strategic restructuring" of the steel industry to make Xinjiang an "important characteristic mineral resource base and a strategic resource replacement area."<sup>94</sup>

According to a steel industry report released by Soochow Securities Research in July 2020, even as the annual growth rate of crude steel output in the XUAR reached 40%, a concomitant increase in demand put pressure on the region's steel reserves, indicating a growth in production and consumption of steel in the region. The report predicts that in the future, continued rising demand for steel from new infrastructure projects in the western region would stimulate the development of the steel industry in the Uyghur Region even further.<sup>95</sup>

China's (and the world's) biggest steel producer, Baowu, has consolidated a significant number of the Uyghur Region's iron mines and smelting facilities to become the region's most important actor in the sector. According to data from the Metallurgical Industry Information Center, Baowu Group's Xinjiang Bayi Iron and Steel Co., Ltd., the Uyghur Region's most significant steel company, saw a year-on-year increase of 62.3% in the first quarter of 2021.<sup>96</sup>

In addition to Baowu, at least seven other major steel producers have invested in the Uyghur Region. As Table 2 below shows, at least half of these companies have advertised their participation in state-sponsored labor transfers and other oppressive state-run programs in the region. State-owned steel enterprises, including those run by the Xinjiang Production and Construction

Table 2. Top Steel Producers in the XUAR

MANUFACTURER	CAPACITY (2020, 10,000 TONS)	STATE-OWNED ENTERPRISE	EVIDENCE OF LABOR TRANSFER PARTICIPATION*
Baowu Group Xinjiang Bayi Iron and Steel Co., Ltd. 宝武集团新疆八一钢铁有限公司	1055	✓	✓ <sup>97</sup>
Shiheng Special Steel Group Xinjiang Kuyu Iron and Steel Co., Ltd. 石横特钢新疆昆玉钢铁有限公司	150		✓ <sup>98</sup>
Shougang Group Ili Iron and Steel Co., Ltd. 首钢伊犁钢铁有限公司	50	✓	✓ <sup>99</sup>
Xinjiang Fengtai Iron and Steel Co., Ltd. 新疆丰泰钢铁有限公司	60	✓ XPCC	
Xinjiang Kunlun Iron and Steel Co., Ltd. 新疆昆仑钢铁有限公司	110	✓ XPCC	
Xinjiang Minjian Metal Material Products Co., Ltd. 新疆闽建金属材料制品有限公司	50		
Xinjiang Minxin Iron and Steel (Group) Co., Ltd. 新疆闽新钢铁(集团)有限责任公司	80		
Xinxing Casting Pipe Xinjiang Company 新兴铸管新疆公司 (now owned by Baowu; registered as Xinjiang Tianshan Iron and Steel Bazhou Co., Ltd.) <sup>100</sup>	300	✓	✓ <sup>101</sup>
Xinjiang Daan Special Steel Co., Ltd. 新疆大安特种钢有限责任公司	100	✓ XPCC	
Other	130		
<b>Total</b>	<b>2085</b>		

\*note lack of evidence does not denote lack of participation

Source of list and production capacities: MySteel, China National Finance Securities Research Institute via Sinolink. Reflects 2020 capacities, and adjusted to reflect Baowu acquisition.

Corps, are highly likely to be required to participate in the XPCC's own labor transfer programs.

This chapter focuses on the world's largest steel producer—Baowu Group—and reveals its extensive participation in the state's repressive programs in the Uyghur Region.

## CHINA BAOWU IRON AND STEEL GROUP CO. (中国宝武钢铁集团有限公司)

Baowu Group (formerly known as Baosteel and Baoshan, which are now subsidiaries) is the world's largest producer of steel, making nearly 12% of China's and 6% of the world's steel in 2021.<sup>102</sup> Baowu is a PRC state-owned enterprise with revenue of CNY 364 billion in 2021.<sup>103</sup> The company has been on a fifteen-year growth trajectory, and is poised for continued growth, as the PRC government has deliberately restructured and consolidated the country's steel production through mergers and acquisitions. Baowu is currently in the top 50 of the Global Fortune 500 companies.<sup>104</sup>

Xinjiang Bayi Iron and Steel Co. Ltd. (新疆八一钢铁有限公司) is Baowu Group's subsidiary in Xinjiang. The Xinjiang subsidiary's name means August 1, which is a military holiday in China commemorating the founding of the People's Liberation Army. Xinjiang Bayi was initially established as a state-owned enterprise in 1951 by the then Vice President of the XUAR and the founder of the Xinjiang Production and Construction Corps (XPCC), Wang Zhen, who had claimed the Uyghur Region for the CCP when the Kuomintang surrendered the region and is considered an infamous figure by Uyghurs.<sup>105</sup>

With an investment of CNY 3 billion in capital, Baosteel Group took control of the company in 2007. Bayi is publicly listed on the Shanghai stock exchange. It is the region's largest producer of iron and steel, producing more than 50% of the region's steel and representing at least 9% of Baowu's total production.<sup>106</sup>

Bayi's growth in the 21st century can be attributed at least in part to the expansion of the auto industry in the XUAR. Bayi expected the auto industry to contribute CNY 8 billion to the company's coffers annually as of 2012, and, with recent developments in the industry in the region, the current amount is certainly higher.<sup>107</sup>

Bayi Steel operates its iron mines in two primary locations in the Uyghur Region: the Yamansu iron ore deposit in Qumul (Ch: Hami) and the Mengku deposit in Altay. It reports holding "considerable reserves" elsewhere in the Uyghur Region.<sup>108</sup> Additionally, it runs coal mines and/or coking facilities in Ürümchi, Fukang, and Iwirghol (Ch: Aiweiergou, the central district in Qumul).<sup>109</sup> It primarily processes the steel in at least three production bases: Bazhou Iron and Steel, Ili Iron and Steel,<sup>110</sup> and now Tianshan Iron and Steel. The company also owns a steel casting facility.

*Bayi Iron and Steel's motto is "whatever ore there is in Xinjiang, we will consume it."*

Bayi Iron and Steel's motto is "whatever ore there is in Xinjiang, we will consume it."<sup>111</sup> One of the ways the company pursues that mission is by acquiring the vast majority of the mines and steel processing facilities across the vast region. In 2020, Baowu's "strategic task" was to integrate the production capacity of iron and steel across the entire region. The company has spent billions in the last few years to ensure that it owns subsidiaries across the XUAR.<sup>112</sup> In March 2020, Baosteel Group, Xinjiang Bayi Iron & Steel, China Baowu & Hubao Investment jointly invested CNY 1 billion to establish Tianshan Iron and Steel. Tianshan then acquired Xinjiang Ili Iron and Steel Co., through an equity transfer away from the 31 employees who held more than 77% of the shares. In the same month, Tianshan Iron and Steel also announced that the company would acquire Xinxing Cast Pipe Xinjiang Co. in Bazhou for CNY 2 billion. This is a strategy of consolidation that Baowu has implemented across China.<sup>113</sup>

Bayi's steel products go into building, railways, infrastructure, aviation projects, and many other products.<sup>114</sup> But Bayi has long been a producer of steel parts for the automotive industry. One of the products Xinjiang Bayi has been producing is ultra-low carbon steel, a centerpiece of Baowu's net zero carbon campaign.<sup>115</sup> These materials that Baowu is piloting in its Uyghur Region plants are being touted by the company as the future of its low-carbon product lines.

Because steel is a critical element of all automobiles and Bayi holds such power over the sector, it is important to understand this state-owned corporation's relationship to repressive programs in the Uyghur Region and identify the downstream customers that may be at risk of sourcing from the company.

### Participation in Repressive Government Programs

The original mission of Bayi Iron and Steel is "cultivating and defending the border and serving the country with steel." The company is a "'ballast stone' of Xinjiang social stability and long-term stability."<sup>116</sup> As part of that mission, this state-owned enterprise engages in programs that the central and regional governments have determined as the path toward suppressing dissent in the Uyghur Region.

Between 2014 and 2020, Bayi claims to have engaged in programs through which corporations adopt rural villages for the purpose of social engineering. In one of these efforts, the company created new furniture and metal products factories in a rural area, where minoritized citizens were put to work, with the intention to "increase villagers' income and make [them] rich through industrial poverty alleviation." Bayi celebrated that the villagers now had wages of CNY 9,000 per year/CNY 750 a month (the equivalent of US \$111 a month), far below the regional minimum wage of CNY 1,980 a month.<sup>117</sup> The company declared that the villagers had been lifted out of poverty at those wages. Bayi continued participation in these surveillance and cultural domination programs through 2022, when the company announced that over the last several years it had sent employees into eleven "deeply impoverished" villages to teach night classes in Chinese and farming (the traditional work of the people of those villages) and to model ideal village cadre behaviors.<sup>118</sup>

In 2022, Bayi claimed to have matched 100% of the company's minoritized workers with Han employees, totaling 4,581 pairs, claiming that these fictive "relatives" are better than real relatives of the Indigenous people.<sup>119</sup> Through these programs, corporations like Bayi take part in the state's programs designed to force Uyghurs to conform to government-mandated Han cultural norms and standards in all aspects of their lives.

On the company's official website, Bayi announced that the company saw its own development as tied to "Xinjiang's construction and development and the process of reform and opening up," to which end the company had participated in the government's "work deployment program."<sup>120</sup> Bayi's participation in the government's repressive policies continued even after it declared the company's adopted villages to be free of poverty. In May 2022, Bayi Steel celebrated the company's achievements of the previous year, stating "As a central enterprise in Xinjiang, Bayi Iron and Steel has fully, completely, and accurately implemented the Party's strategy for governing Xinjiang in the new era, consciously fulfilled its political, economic, and social responsibilities, resolutely implemented the autonomous region's poverty alleviation work deployment, and continued to increase *fanghuiju* and targeted poverty alleviations efforts."<sup>121</sup>

### Participation in Labor Transfer Program

In addition to engaging in labor transfers of rural villagers in its adopted rural areas, Bayi employs workers who are assigned to work through the XUAR's notorious labor transfer programs within its own factories and mines. In 2017, Bayi received "ethnic minority urban and rural surplus laborers from the Kashgar and Hotan areas," as part of a three-year program to transfer 100,000 people from those regions to work in China's private and state-owned enterprises.<sup>122</sup> Companies participating in this labor transfer program received subsidies for "helping solve the problem" by "absorbing rural surplus labor."<sup>123</sup> State media outlets *Xinhua* and *Xinjiang Daily* announced that more than 10,000 so-called "surplus laborers" from Kashgar and Hotan had been "absorbed and resettled" by 26 state-owned enterprises, including Bayi Iron and Steel, that year. The companies "carried out intensive education and training including gratitude education and learning of law, national language, 'three loves and three evils' education, military training, safety production and other ideological content."<sup>124</sup>

Bayi's subsidiary Xinjiang Yili Iron & Steel illustrates the way Bayi factories embrace the labor transfer programs in times of significant labor need. In early 2020, as COVID-19 was spreading across China and the PRC government had required that people across China go into a full lockdown, Yili Iron and Steel required workers the Uyghur Region to come into work to ensure that production capacity remained stable. The company reported that nearly 8,000 employees left their homes to return to the factory. According to Bayi's own publicity, "Some employees even walked for eight hours and more than forty kilometers when the city was shut down and there was no car to hire." The company housed some of the workers in tents in order to increase production. The result was that these workers produced in ten days what they typically produced in thirty-five.<sup>125</sup> While other workers across China were protected through lockdown protocols, the workers of Ili

(Ch: Yili) (likely largely the Indigenous workers, based on images provided by corporate publicity), were treated as disposable, required to walk extraordinary distances, and live in sub-standard housing in order to protect Bayi's profits.



Figures 7 and 8. Original caption states: "The pictures show the transferred employees of Bayi Steel receiving security work training."

Source: Bayi Steel, [Online](#).



Figure 9. Bayi subsidiary Yili Iron and Steel's workers during the pandemic, in front of tents set up as accommodation for excess workers deployed for increasing production during the height of the COVID-19 pandemic. Source: Bayi Steel, [Online](#).

In an effort that further put Indigenous laborers at risk, Bayi set up “satellite factories” in its “adopted” village in Yopurgha to produce medical supplies and bandages. The company also set up cross-stitch and agricultural product cooperatives among villagers to help meet the goals of universal employment in impoverished regions of the southern XUAR. The company also “encouraged” villagers to buy chickens and to transform their family yards into sites of agricultural production.<sup>126</sup> It is unclear to what extent villagers had a choice as to whether they work in one of these local projects, given the government mandate for all Indigenous people to be employed.

The company’s corporate social responsibility report for 2020 indicated that that company had actively engaged in implementing the Party’s ethnic policy and promoted national unity and country security and the unity of the motherland. It also noted that 364 laborers from poor families in Kashgar, Hotan, and Kizilsu (Ch: Kezhou) had been “arranged with employment” by the company, another euphemism for state-sponsored labor transfers.<sup>127</sup>

At least through 2021, Bayi continued to participate in the XUAR’s “poverty alleviation work deployment.”<sup>128</sup> Bayi’s subsidiary Xinxing Casting Pipe, for instance, reported in its 2021 corporate social responsibility report that the company had been involved in transferring 57 people for employment during the year and participated in the *fanghuiju* surveillance program.<sup>129</sup>

## Supply Chain Risk

According to its own publicity over the years, Bayi Steel manufactures the following products for the automotive industry in the company’s Uyghur Region locations: automobile leaf springs for suspension systems, auto rear axle casing steel, parts for agricultural machinery and tractors, ultra-low carbon steel for automotive panels, automobile beam sheets, hot-rolled strip, spring flat steel, hot-rolled steel plate and cold-rolled steel strip, color coated steel plate, galvanized steel sheet, cold-rolled steel sheet and cold-rolled strip, cold drawn steel wire, galvanized wire, cold-rolled ribbed steel bar, and spiral welded pipe.<sup>130</sup> These products are manufactured for both the domestic and international markets. They go into parts manufactured across China and are then exported as well.

The PRC government stopped making customs records available to the public in 2018, but before that time, records indicate that Bayi Steel regularly shipped its products directly to Central Asia.<sup>131</sup>

It is difficult to trace precisely where Xinjiang Bayi’s products go currently. A search of customs records for direct shipments from Bayi in the last two years and online searches for sourcing agreements or contracts turn up no results. Parent company Baowu, however, advertises an overseas marketing network with offices and/or subsidiaries in Europe, Africa, the Middle East, Southeast Asia, South Asia, Northeast Asia, Australia, and the Americas. While not all of Baowu’s steel comes from the Uyghur Region, at least 9% does.<sup>132</sup> Thus, we’ve used

customs records, sourcing agreements, and supplier awards for the parent company Baowu and its subsidiaries to identify potential exposure to Xinjiang Bayi steel products through its affiliated companies.

Baowu exports to many of the major car corporations in the world. Customs records indicate that in the last two years,<sup>133</sup> **Toyota Tshusho America** has received shipments of steel coils from Baowu subsidiaries. In 2020, **Toyota** struck a deal with Baowu to source electrical steel sheet for electric vehicles.<sup>134</sup> **General Motors Tech Center** in Michigan received shipments of cold rolled steel sheets in 2020—indeed, **General Motors** named Baosteel (or one of its subsidiaries) a “Global Supplier of the Year” seven times between 2006 and 2020.<sup>135</sup> Shanghai Meishan Iron & Steel Co., Ltd. (a Baowu subsidiary) shipped to **Metal One America** (Metal One is a merger of the steel product divisions of **Mitsubishi Corporation** and **Sojitz Corporation**).<sup>136</sup> Shanghai Meishan Iron & Steel Co., Ltd. (a Baowu subsidiary) exports to **Duferco Steel**, a European manufacturer that sells automotive steel coils. The company also exported to **Coilplus Canada** and **Coilplus Mexico**, to **Ajusteel USA**, and to **R and R Trading Co.** in Canada.<sup>137</sup>

Baowu and several of its subsidiaries export steel products to **Kemeny Overseas Products**, **Marubeni-Itochu Steel Canada**, and **JFE Shoji Power Canada** (formerly **Cogent Power Inc.**, a subsidiary of **JFE Group**). **Kemeny** and **Baowu** have a steel cutting, coating, and printing joint venture in Shanghai.<sup>138</sup> **Baowu** has a joint venture automotive steel processing center with **Marubeni** in Henan.<sup>139</sup> **Shanghai Baowu JFE Clean Iron Powder Co.** and **Guangzhou JFE Steel Sheet** are both joint ventures between **Baowu** and **JFE**, and the companies have recently started a new joint venture, specifically designed to “tap China’s automotive steel market.”<sup>140</sup> **Worthington Steel** has a joint venture with **Baowu** called **Tailor Welded Blanks**, which makes a part used in structural parts of the car to reduce body weight; the parts are reportedly used by **General Motors**, **Volkswagen**, **Ford**, **Toyota**, and **Fiat**.<sup>141</sup> In 2018, **SAIC-Volkswagen**, the company that owns the Ürümqi Volkswagen plant, named **Baowu** an “Excellent Supplier.”<sup>142</sup> **SAIC Motors** has had a strategic cooperation agreement with **Baowu** since 2010 to create the “SAIC-Baowu Automotive Steel Joint Lab,” which “researches and applies lightweight technologies for automotive steel.”<sup>143</sup> **NIO**, the Chinese EV manufacturer, has recently entered into a strategic supply chain partnership with **Baowu**.<sup>144</sup>

*The reality is inescapable—the steel industry in China has invested significantly in the repression of the Uyghurs.*

Furthermore, the XUAR is a focus of **Baowu**’s “greening” of its value chain, both to meet internal goals and to generate marketable low-carbon steel for the global economy. As part of its objective to “create a competitive enterprise green brand,”<sup>145</sup> **Baowu** has retrofitted the Bayi Steel Plant with a novel technology to produce lower-carbon steel.<sup>146</sup> Buyers seeking “green steel” from **Baowu** might inadvertently acquire Xinjiang steel as this transition expands.

This research, based on publicly available information, represents merely a fraction of global sourcing from Baowu. Automotive and other sectors would be prudent to determine to what extent Baowu products manufactured in the Uyghur Region are being introduced into their supply chains.

Notably, one of Baowu's suppliers of iron ore has been **Fortescue Metals Group** of Australia, owned by Andrew Forrest, co-founder of anti-slavery group Minderoo.<sup>147</sup> Fortescue and Baowu operate joint ventures as well.<sup>148</sup> In September of 2022, Rio Tinto signed joint venture agreement to develop an iron ore project in Pilbara Australia, which was accompanied by an iron ore sales agreement for **Rio Tinto** to supply Baowu with 126.5 million tons of iron ore over the next 13 years.<sup>149</sup> Rio Tinto indicates that it does not do business directly with companies in the Uyghur Region, though the company is aware that it has contracts with companies that operate subsidiaries in the region.

## CONCLUSION

Baowu is only one of many producers of steel in the Uyghur Region that have paired with the Uyghur Region to support the implementation of repressive government programs. Table 2 at the beginning of this chapter shows the top ten manufacturers in the industry in 2020, many of which actively and proudly participate in state-sponsored labor transfers. All of these companies feed into automotive supply chains.

**The reality is inescapable—the steel industry in China has invested significantly in the repression of the Uyghurs, and it has benefited from the forced labor of Indigenous people in the region, whether financially or politically. The result is an automotive supply chain tainted with forced labor.**

China domestically consumes a great deal of the steel it produces, but as of 2019, only six to seven percent of China's steel was consumed in the automotive sector. While the automotive industry's reliance on steel means that it must reckon with forced labor in its supply chains, it is worth noting that other industries, such as construction, infrastructure, and machinery, consume the lion's share of China's steel.<sup>150</sup> Thus, the automotive industry might find useful collaborators in those industries in its efforts to address state-sponsored forced labor in steel sourcing.

## ANSTEEL GROUP CO.

(鞍山钢铁集团公司 OR 鞍钢集团)

International automotive corporations do not have to have suppliers directly operating in the XUAR to risk serious exposure to state-sponsored repression of the region's Indigenous peoples. China's second (and the world's third) largest steel producer, Ansteel, has no operations in the XUAR but invests heavily in the region's so-called "poverty alleviation" programs through its supposed "charitable" efforts. Ansteel has invested in family separation, coerced relocation, and cultural indoctrination. The programs that Ansteel has invested in are among some of the most harrowing forms of state repression being inflicted on the Indigenous people of the region, including the building of residential schools for Indigenous children that can justifiably be compared to the universally condemned system of residential schools in Canada. The corporation's own publicity even reveals the extent of the coercion that the company exerts over rural people in the Uyghur Region, as the company actively engages in forced relocation of villagers without their consent.

### Participation in Repressive Government Programs

Relocation (or "ex-situ poverty alleviation relocation" / 易地扶贫搬迁) in Tashqorghan has been a centerpiece of the repression of the Indigenous people of the region, and Ansteel has supported this by levelling 634 acres (3,850 mu) of land for a new resettlement site called Taticuri Immigrant Relocation Point (塔县塔提库里移民搬迁点), which encompasses an array of valley sites along the main Tashqorghan River, focused around agriculture, although the local population lives traditionally in the highlands with pastoralist livelihoods. Ansteel reports that it "converted the livelihoods" of 1,418 people. Ansteel cadres went door-to-door "to talk about preferential policies over and over again" with rural villagers, to explain to them how their forced resettlement would benefit them, regardless of their willingness to go. One family struggling to resettle was told that their children would have no future in their current circumstances, for which reason a state media reporter concluded that "working in the workshop [in the resettled village], life is definitely better now" for them. State media described the need for coercion to draw people out of their mountain homes. One resettled person reflected on the reasons he did not want to leave his home village: "After all, this is the place where our ancestors lived for generations." Another had "mixed feelings" about leaving home and being resettled in completely unfamiliar surroundings, not least because the building

style was so foreign to her she couldn't master the door lock and "didn't dare to go out." The county responded to these reservations by dispatching cadres to "solve the problems encountered in everyone's life in the forms of marriage and households." The same article claims that 40% of Tashqorghan's registered poor households have been relocated. Ansteel was central to facilitating at least some of these forced re-locations.<sup>151</sup>



Figure 10. Children at boarding school supported by Ansteel.

Source: Xinhua, [Online](#).

In 2018, Ansteel began to provide "financial support" to the Tashqorghan Tajik Autonomous County Urban and Rural Boarding Primary School (塔什库尔干塔吉克自治县城乡寄宿制小学), which boards over 2,700 children, almost all of them ethnic minorities from herder and farmer villages across Tashqorghan District.<sup>152</sup> According to several state media sources, this is the largest primary boarding school in all of the southern XUAR.<sup>153</sup> Many such residential schools for Indigenous children were built after 2016 in order to house the children of people who were taken away to internment camps. Indigenous children are also sent to these residential schools in order to indoctrinate them in the dominant cultural behaviors, traditions, knowledge, and ideology.<sup>154</sup> These schools separate families both physically and culturally.

To be clear, Ansteel has funded the building of residential schools for Indigenous children of rural Indigenous people and actively assists in the forced relocation of populations in the Uyghur Region. While the company may not be actively operating in the Uyghur Region, it is deeply complicit in the crimes against humanity being perpetrated there.

## 2. Aluminum

Aluminum is one of the lightest and most durable metals in the world. It is seen as critical to reducing the weight of automobiles to meet emissions reduction targets set worldwide. Already the second most commonly used material in car manufacturing, it is also the fastest growing.<sup>155</sup> In 2019, the International Aluminum Institute (IAI) estimated that car manufacturers used 18% of aluminum worldwide. The IAI predicted that carmakers' demand for aluminum would nearly double by 2050 (from almost 17 million tons in 2019 to almost 35 million tons).<sup>156</sup> Aluminum is used in almost every part of a car, from the wiring, to reflective foils in headlights and electrical foils on computer components, to decorative details, to engine blocks, to brazing material for combustion engines, to car frames and exteriors. Despite its ubiquity in cars, its production chain has been considered a "blind spot" by Human Rights Watch,<sup>157</sup> particularly in the processing phases between mining and fabrication.<sup>158</sup>

Aluminum is not a directly mined material, however. Its raw material is bauxite, which is refined into a white powder called aluminum oxide ("alumina"). Roughly four to seven tons of bauxite produces two tons of alumina, which in turn produces one ton of aluminum through a smelting process.<sup>159</sup>

While the XUAR would not be a cost-effective place to process bauxite into alumina, the region's extremely cheap energy and relaxed environmental regulation have led to it becoming a prime location for smelting. Aluminum smelting accounts for roughly 75% of aluminum's carbon footprint, both because the byproduct of electrolytic smelting is carbon gas, and because the electricity demand of smelting is 10 times higher than the energy demand for alumina refining.<sup>160</sup> And because China smelts aluminum using coal, the carbon footprint is the even higher than it might be otherwise—emitting over 16 tons of carbon per ton of aluminum as compared to 4 tons in Europe.<sup>161</sup>

### THE RAPID EXPANSION OF THE UYGHUR REGION'S ALUMINUM INDUSTRY

Global aluminum production was 67.2 million metric tons in 2021. China produced 58% (38.837 million tons) of that—more than every other country in the world, combined.<sup>162</sup> Under the past three Five-Year Plans, the XUAR rose from China's 10th highest aluminum producing region to its second.<sup>163</sup> **Today, the Uyghur Region's production capacity is roughly 8 million tons per year, representing more than a fifth of China's 39 million ton-capacity and almost 12% of the world's.<sup>164</sup> Production caps placed on non-XPCC aluminum smelters reduced the region's output to 6.6 million tons in 2021, but even with these restrictions, the Uyghur Region produced more aluminum than India, Russia, Canada or any other major aluminum producer outside of China.**

The meteoric rise of the XUAR's aluminum smelting industry reflects the policy aims of the PRC government. As the Chinese

government has implemented green growth policies, emissions from aluminum smelting jeopardize the country's environmental targets.<sup>165</sup> Nonetheless, national and regional Five-Year Plans prioritized aluminum and other raw materials processing in the XUAR,<sup>166</sup> where 40% of the country's coal reserves are located.<sup>167</sup> The government provided significant incentives to companies to build smelters in the region with subsidies for land, water and energy and exemptions from nationwide emissions rules.<sup>168</sup> Though some aluminum production may be moving to Yunnan, where manufacturing can be conducted using hydropower,<sup>169</sup> coal-powered aluminum production continues to be a growth industry in the Uyghur Region. Some preferential electricity prices came to an end in early 2022, but this does not have much of a chilling effect on the majority of Uyghur Region smelters,<sup>170</sup> which are often run by companies that own and operate coal companies and coal power plants that are co-located with their aluminum smelting facilities.

### ALUMINUM INDUSTRY PARTICIPATION IN LABOR TRANSFER PROGRAMS IN THE XUAR

There are eight dominant aluminum producers operating in the XUAR, two of which (Xinfa and East Hope) are among the largest producers in the world. Research firm Horizon Advisory carried out a detailed analysis of forced labor risks at all eight of these companies.<sup>171</sup> As Horizon Advisory documented, all of the top eight aluminum companies in the Uyghur Region were involved in labor transfers, either as direct recipients of transferred labor or as coordinators of training and transfer programs. The two with the largest unrestricted production levels (Xinfa and Tianshan) are XPCC companies. Two others have been named "Ethnic Policy" leaders for their involvement in programs designed to increase Indigenous peoples' allegiance to the CCP and reduce their commitment to Indigenous cultural practices and piety.

In this report, we do not reiterate in full the research conducted by Horizon Advisory; for that, we refer readers to its report. We have reviewed the sources included in the Horizon Advisory report and have confirmed the majority of their findings regarding labor transfer programs.<sup>172</sup> The table below provides citations to the original documentation of links to labor transfers discussed in the Horizon Advisory report. The findings in this chapter expand on Horizon Advisory's findings by tracing the supply chains of some of these businesses to international corporations that are relevant to the automotive industry, and in some cases, by providing additional or updated evidence regarding the companies' participation in labor transfers in the Uyghur Region. While not all of these supply chains lead to specific car companies, this information should assist in analyzing automotive industry procurement. All of the companies in Table 3 ship aluminum to companies in other provinces of China, so tracing the original source of

aluminum is critical. It should also be noted that under the U.S. Uyghur Forced Labor Prevention Act, importing any goods made with aluminum or other products produced by these companies is prohibited.

This chapter traces the supply chains of five of the eight aluminum companies, excluding East Hope, Qiya and Tianlong. East Hope is listed on the U.S. government's Uyghur Forced Labor Prevention Act Entity List for producing goods with forced labor, which bans the import of products, including aluminum, made in whole or in part by Xinjiang East Hope.<sup>173</sup> Sheffield Hallam University's report "In Broad Daylight" reviewed East Hope's engagement with labor transfers, but the company's customers remain obscure.<sup>174</sup> Qiya and Tianlong are covered at length in the Horizon Advisory report, and their links to global supply chains come through their relationships with Xinjiang Xintou, covered for its role in logistics, below.

## XINJIANG PRODUCTION AND CONSTRUCTION CORPS AGRICULTURAL SIXTH DIVISION ALUMINUM CO., LTD (XINFA GROUP XINJIANG BRANCH) (新疆农六师铝业有限公司)

Xinfa Group Xinjiang Branch is a joint venture between Shandong Xinfa Group, one of the world's largest aluminum companies, and the XPCC's Sixth Agricultural Division.<sup>184</sup> The Xinjiang branch's subsidiaries include a smelter (Xinjiang Agricultural Sixth Division Aluminum Co., Ltd. 新疆农六师铝业有限公司), a coal mine, a coal-fired power plant, and a carbon anode manufacturing facility.<sup>185</sup>

Wood Mackenzie declared Xinfa Group the third largest aluminum producer in the world and second in China in 2022.<sup>186</sup> Xinfa's supply chain reach is vast.

**More than half of Xinfa Group's 3.6-million-ton capacity (1.9 million tons) is produced in the Uyghur Region.**<sup>187</sup>

### Supply Chain Risk

Because half of Xinfa's aluminum is produced in the XUAR, all customers of Xinfa ventures have heightened exposure to forced labor and the Uyghur Region.

Xinfa is a fully-integrated aluminum company with 72 joint ventures and subsidiaries, including a publicly listed wheel subsidiary, **Xinfa Wheels**. According to customs data, Xinfa ships aluminum alloy wheels directly to the United States, Canada, and Mexico, including to **Forgiato**, a California-based custom wheel

Table 3. Top Aluminum Companies Operating in XUAR

MANUFACTURER	PRODUCTION IN 2021 <sup>175</sup>	STATE-OWNED ENTERPRISE	EVIDENCE OF LABOR TRANSFER PARTICIPATION*
Xinjiang Production and Construction Corps Agricultural Sixth Division Aluminum Co. (Xinfa Group) 信发集团新疆分公司 (新疆农六师铝业有限公司)	1.9 million tons	✓ XPCC joint venture	High Risk <sup>176</sup>
Xinjiang Production and Construction Corps Eighth Division Tianshan Aluminum Co., Ltd. (aka New Territories Pump Group) 新疆生产建设兵团农八师天山铝业有限公司 (新界泵业集团)	1.4 million tons	✓ XPCC	✓ <sup>177</sup>
Xinjiang East Hope Nonferrous Metals Co., Ltd. 新疆东方希望有色金属有限公司	800,000 tons		✓ <sup>178</sup>
Xinjiang Qiya Aluminum Electric Co., Ltd. 新疆其亚铝电有限公司	800,000 tons		✓ <sup>179</sup>
Xinjiang Shenhua Coal and Electricity Co., Ltd. (aka Sunho) 新疆神火煤电有限公司	800,000 tons	✓	✓ <sup>180</sup>
Jiarun Aluminum / Xinjiang Jiarun Resources Holdings Co., Ltd. 嘉润铝 / 新疆嘉润资源控股有限公司	400,000 tons		✓ <sup>181</sup>
Xinjiang Tianlong Mining Co., Ltd. 新疆天龙矿业股份有限公司	250,000 tons	✓	✓ <sup>182</sup>
Xinjiang Zhonghe Co. Ltd. (aka Joinworld) 新疆众和股份有限公司	180,000 tons	✓	✓ <sup>183</sup> (Company assists in the implementation of labor transfer programs)

\* Drawn in part from Horizon Advisory "Base Problem," 3.



Figure 11. Xinfa Group Xinjiang Branch Company facility in Wujiaqu, XUAR. Source: Shandong Provincial People's Government Office in XUAR, [Online](#).

manufacturer that claims to use all American parts, and to Americana Tire and Wheel, whose products are sold on **Amazon U.S. and U.K.** and **Walmart.com**.<sup>188</sup> (See [Annex B](#) online for additional supply chain mapping for Xinfa.).

In April 2021 Xinfa announced an alloying collaboration with **Nanjing Yunhai Special Metals Co.** (南京云海特种金属股份有限公司) “to extend the industrial chain in the direction of automotive lightweight.”<sup>189</sup> Yunhai products are “exported to major foreign companies,” including **many of the most prominent automotive manufacturers in the world**.<sup>190</sup>

Xinfa secures bauxite and alumina from global and domestic sources. Xinfa has bauxite contracts with Australian mining giant **Rio Tinto**,<sup>191</sup> Australia’s **Metro Mining**<sup>192</sup> and **Emirates Global Aluminum** (EGA) in Guinea.<sup>193</sup> Rio Tinto indicates that it does not do business directly with companies in the Uyghur Region, though the company is aware that it has contracts with companies that operate subsidiaries in the region.

## XINJIANG PRODUCTION AND CONSTRUCTION CORPS EIGHTH DIVISION TIANSHAN ALUMINUM CO., LTD. (AKA NEW TERRITORIES PUMP GROUP) (新疆生产建设兵团农八师天山铝业有限公司)

The XPCC’s Xinjiang Tianshan Aluminum is a vertically integrated aluminum company that was developed as an “aid enterprise in response to the national call to support the Xinjiang Production and Construction Corps,” and is situated in the region in part to “rely on Xinjiang’s superior coal resources.”<sup>194</sup> The company is also known as Xinjie/“New Territories” Pump Group (新界泵业集团股份有限公司) after a 2020 reorganization in advance of an IPO under the New Territories trade name.<sup>195</sup> The company’s subsidiary Xinjiang Tianzhan New Material Technology Co., Ltd. (新疆天展新材料科技有限公司) also produces high-purity aluminum.<sup>196</sup>

In addition to forced labor documentation by Horizon Advisory, corporate documents and state media accounts indicate that Tianshan Aluminum’s carbon anode facility, Nanjiang Carbon New Materials Co., Ltd. (新疆碳素新材料有限公司), has been involved in state-sponsored labor transfers in Aral City, southern XUAR, as recently as March of 2022.<sup>197</sup> The carbon factory supplies anodes to Tianshan’s aluminum smelters in Shihezi.<sup>198</sup>

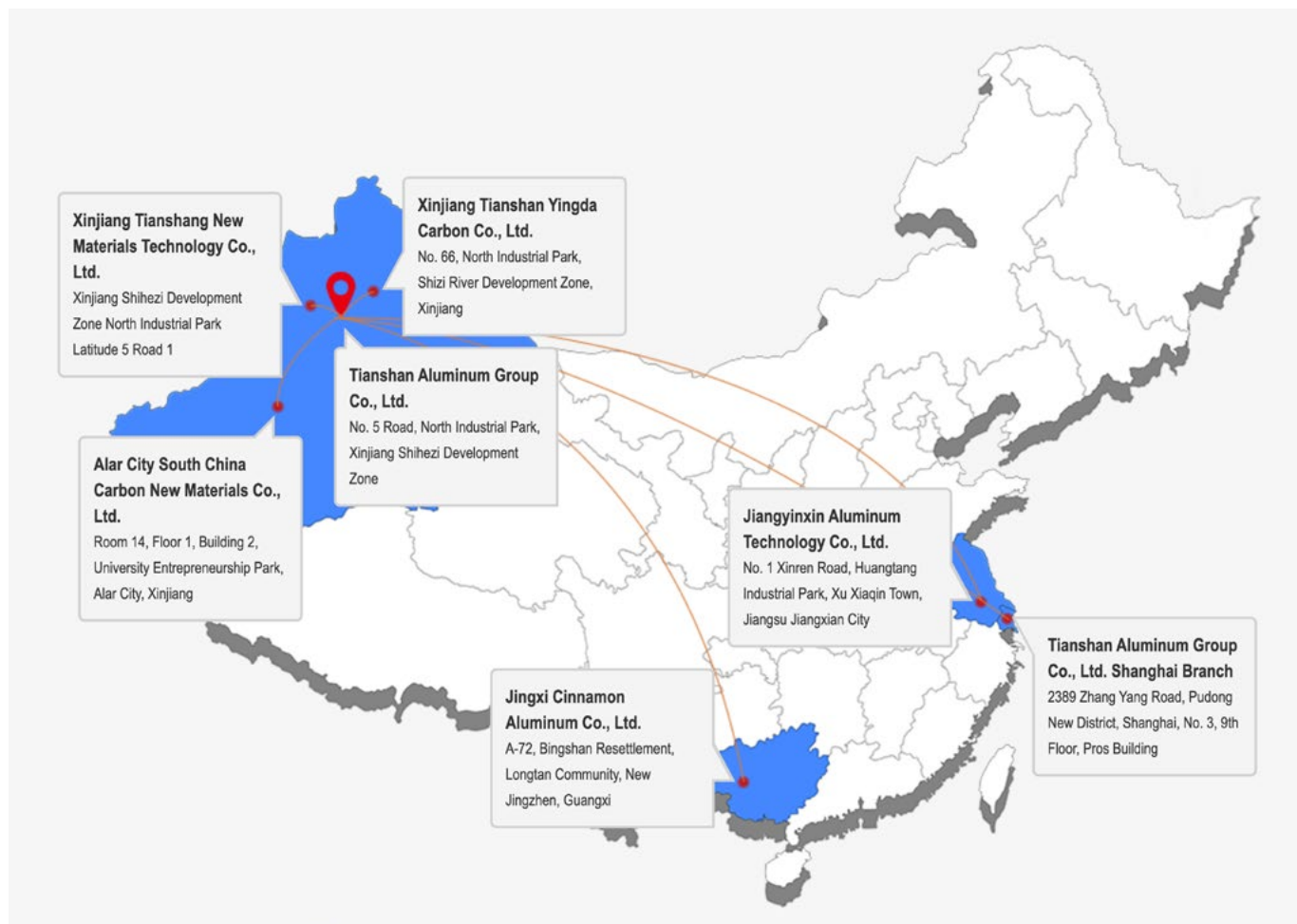


Figure 12. Xinjiang Tianshan subsidiaries map. Source: Xinjiang Tianshan website, [Online](#).

## Supply Chain Risk

Tianshan sources its bauxite from Guangxi and processes it into alumina in its Jinxi Tianguai plant. That alumina is then refined into aluminum in the company's Uyghur Region facilities and then shipped to its **Jiangyin Xinren Aluminum** subsidiary in Jiangsu for manufacture into automotive industry-relevant coils, sheets, and foils.<sup>199</sup>

Tianshan operates as a commodities trader as well as an aluminum smelter, sourcing and selling ingots on the international market. Between 2016 and 2019, **Glencore (UK/Switzerland), Xinfu, Chinalco,** and **Trafigura** were among Tianshan's top ten trading partners.<sup>200</sup> This means that, for example, purchasers of Chinalco ingots may actually have bought Tianshan ingots.<sup>201</sup> In 2016, Chinalco purchased 157,000 tons of Tianshan ingots, representing 17% of Tianshan's total production that year.<sup>202</sup> Likewise, Trafigura and **Gerald Metals** of the U.K. sourced Tianshan ingots and resold them to other clients in 2018 and 2019, representing 30% of Tianshan's total production volume in those years.<sup>203</sup> Tianshan aluminum is circulating on the global market invisibly, as a result of these partnerships.

As of 2021, Trafigura owned US \$30.9 million in equity of XU-AR-headquartered Tianshan Aluminum, as reported in Trafigura's 2021 interim financial report.<sup>204</sup> While Trafigura does not publicly list its clients, its annual filings refer to direct links between increased automotive sector production and its own profits.<sup>205</sup> It is "the largest global independent alumina and aluminium trader," maintaining "long-term customer relationships, which significantly enhanced [their] trading volumes" in 2020.<sup>206</sup> A Trafigura spokesperson stated: "Trafigura does not purchase product from the Xinjiang region to deliver to international customers, including for the automotive industry." Trafigura does not list its customers so we are unable to trace where any XUAR-originating products may enter international supply chains once sold by Trafigura to companies within China.

## XINJIANG SHENHUO COAL AND ELECTRICITY (新疆神火煤电有限公司)

Xinjiang Shenhua is a subsidiary of Henan Shenhua Group (神火集团, also known as Sunho), a state-owned primary aluminum smelting enterprise.<sup>207</sup> Its high-purity remelting ingots (used for alloying in the automotive and other industries) trade on the Shanghai Futures Exchange under the Registered Trademark Rugu (如固).<sup>208</sup> The Uyghur-region subsidiary is Shenhua's "Xinjiang-aid enterprise," and it encompasses three joint ventures, an aluminum smelter and power plant, and an anode manufacturing facility in Fukang Industrial Park, all situated near the massive Zhudong coal fields.<sup>209</sup>

**Nearly half of Shenhua's aluminum (800,000t of its 1.7mt capacity) is produced in the Uyghur Region.**<sup>210</sup>

Xinjiang Shenhua's participation in labor transfers has continued since the publication of Horizon Advisory's report. In Sanji (Ch: Changji) Prefecture's publicity regarding the transfer of 47,800 laborers between January and April of 2022 (toward its goal of "achieving" a total of more than 136,000 labor transfers by the

end of 2022), the government celebrated Shenhua Coal and Electricity's acceptance of the assigned laborers.<sup>211</sup> This indicates that the state-sponsored labor transfer program is alive and well in Sanji and may have even accelerated in 2022.

## Supply Chain Risk

Shenhua's target customers are in the automotive industry. In 2021 the company committed to "increas[ing] the research and development of high-value-added new alloys... and actively explor[ing] the application of new aluminum materials in automotive light-weighting."<sup>212</sup> That same year, the company announced that technology upgrades would allow it to expand into the production of ultra-thin foil for EV battery manufacturing.<sup>213</sup>

Its Shanghai branch operates a joint venture with **Shenmei International Investment Co., Ltd (Hong Kong)** to produce industrial and electronic foils.<sup>214</sup> It additionally produces foils at its joint venture with Xinfu, called **Shenlong Baoding New Material Co.**,<sup>215</sup> which in 2021 piloted successful efforts produce ultra-thin foil for electric battery manufacturing.<sup>216</sup> While we cannot be entirely sure of the precise sourcing at either of these companies, the fact that nearly half of Shenhua's aluminum is produced in the Uyghur Region and half of Xinfu's is as well indicates high risk of forced labor exposure in sourcing from these joint ventures.

## XINJIANG JIARUN RESOURCES HOLDINGS CO., LTD. (新疆嘉润资源控股有限公司)

Xinjiang Jiarun Resources Holdings Co., Ltd. was established in May 2011 with a registered capital of one billion yuan to smelt and alloy aluminum and produce coal power and carbon anodes.<sup>217</sup> Jiarun is in Manas County of Changji prefecture, where its own industrial park (Jiarun Industrial Park) sits within the large Tahe Industrial Park.<sup>218</sup>

## Participation in Repressive Government Programs

Further evidence of Jiarun labor transfers indicate that the company is a long-term and continuing participant. Jiarun's involvement in "vocational training" and "poverty alleviation" work can be traced back to late 2016, when Jiarun and 10 other companies participated in vocational training of 615 individuals, all under the age of 30.<sup>219</sup> The following year, Secretary of the Changji Autonomous Prefecture Party Committee Sharghat Aghan took a research trip to Jiarun to "study the implementation of various decisions and arrangements for social stability and long-term stability." Aghan personally met Jiarun's 60 transferred surplus laborers from Hotan.<sup>220</sup> Jiarun was still receiving new labor transfers in 2021 when Manas County received two waves of surplus labor (110 and 149), and Jiarun participated in the hiring.<sup>221</sup> In a separate March 2021 "Spring Breeze Job Fair" Manas County expected Jiarun and five other companies to "absorb" 238 surplus laborers.<sup>222</sup> Jiarun's hiring manager described the company's "recruitment needs" as "quite large," noting that Jiarun sought to hire electrolyzers and firefighters to work in the sweltering pot

rooms. In March 2022, at another “spring breeze job fair,” Jiarun accepted 90 rural surplus labor transfers.<sup>223</sup>

The hazardous working conditions for these transferred workers are not paired with labor protections. Indigenous and minoritized workers hired through intermediary contractors (presumably the state, which signs their labor contracts), are not considered employees despite working at the factory.<sup>224</sup> Jiarun kept plants operating during the height of the pandemic, potentially risking employees’ well-being.<sup>225</sup>

## Supply Chain Risk

Jiarun’s aluminum is “transported to downstream enterprises across the country by rail... as raw materials for aerospace, automobiles, and high-end medical equipment.”<sup>226</sup> Its ingots are “mainly” used in aviation equipment, car wheels, and household goods.<sup>227</sup> State media announced in August 2022 that an aluminum wheel forging facility would be installed adjacent to Jiarun, equipped to consume 30,000 tons of aluminum alloy per year (3.75% of Jiarun’s annual production).<sup>228</sup>

## XINJIANG ZHONGHE CO., LTD./ JOINWORLD (新疆众和股份有限公司)

Xinjiang Zhonghe Co., Ltd. (also known as “Xinjiang Joinworld”) is an aluminum smelter, alloying company and products manufacturer. Joinworld produces 180,000 tons of aluminum annually and, at least as recently as August 2021, was the world’s largest manufacturer of high-purity aluminum, exporting products to Japan, Europe, South Korea and the U.S.<sup>229</sup>

Automotive electronics rely on high-purity aluminum; each electric vehicle needs at least four high-voltage large-capacity aluminum electrolytic capacitors used in battery charging, voltage conversion, the inverter and other circuits.<sup>230</sup> Joinworld produces these as well as the foil used in reflectors on headlights; the aluminum in microchips and flat-panel displays; and the mechanical components, wiring and autobody parts of international brands.

In addition to Joinworld’s facilitation of labor transfers and so-called “vocational training” documented by Horizon Advisory, Joinworld also reported on its “employment assistance” work in Saghan Township, Yengisar County in 2019. Establishing “1-ton bag processing cooperatives,” Joinworld “solved the employment problems” of 110 laborers, directly placing orders for the bags being sewn.<sup>231</sup> Joinworld’s interventions in this Kashgar township expanded in 2020 and 2021; Joinworld began having local people sew canvas shoe covers, work caps, aprons and other Joinworld uniforms.<sup>232</sup> It is unclear to what extent Joinworld’s transferred laborers are directly employed in its Ürümchi facility. Nonetheless, because Joinworld so avidly participates in these programs and is such a significant supplier to automotive-relevant manufacturers, it is critical to understand how its products may affect global supply chains.

## Supply Chain Risk

Joinworld’s marketing material explicitly and frequently names **BMW** as a client for engine block alloys.<sup>233</sup>

Additional carmakers are linked through Joinworld’s supply chain. In 2019, for example, Joinworld was the single largest aluminum supplier to all **Jingwei Group** (京威股份) companies, representing 13.1% of the company’s total purchases that year (the next largest purchase was for paint, representing 6.22% of annual purchases).<sup>234</sup> Jingwei is an auto parts maker specializing in clutch discs and brake foundations for global car manufacturers.<sup>235</sup> Joinworld supplies aluminum alloys for car parts produced by Jingwei Group companies,<sup>236</sup> which in turn supply **Volkswagen, Ford, SAIC General Motors, BMW, Beijing Benz** and Chinese brands, both directly in China and through Jingwei Company’s foreign subsidiaries **Wikaway North America Holdings, German Wikaway, and Ebsler Aluminum Technology**.<sup>237</sup> Wikaway itself appears to have developed relationships in the XUAR as well; state media has reported that Korla government delegates visited a Wikaway “auto parts base” in Qinhuangdao, Hubei and signed a “strategic cooperation framework agreement” for increasing “industrial linkage, technological innovation, and business exchanges” with local government officials.<sup>238</sup> Beijing WKW’s (also known as Beijing Wikaway) primary customers are **FAW-Volkswagen Automobile Co., BMW Brilliance Automotive Co., Changchun Fuwei-Johnson Controls Automotive Trim System Co., Beijing Benz Automobile Co., and Tianjin FAW Toyota Motor Co.**<sup>239</sup>



Figure 13. Workers wearing Joinworld’s signature blue uniforms with yellow collars. Source: Xinjiang Joinworld 2020 Annual Social Responsibility Report p. 22, [Online](#).

In addition, Joinworld directly supplies aluminum alloys to **Minth Group** (敏实集团).<sup>240</sup> Minth designs and manufactures structural body, trim and decorative parts for the automotive industry. The company has a U.S. subsidiary, production sites in China, the U.S., Mexico, Thailand, Germany, Serbia, the U.K., and the Czech Republic and announced plans to build a new facility in Tennessee in 2020. Worldwide, Minth has over 50 production plants that support automotive markets in 30 different countries, representing 80 percent of the total global auto market share in these goods. According to Minth’s corporate website, its clients include **Honda, Acura, Nissan, Datsun, Infiniti, Toyota, Lexus, Isuzu, Buick, Cadillac, Chevrolet, GMC, Ford, Lincoln, Mustang, Jeep,**

**Chrysler, Dodge, Lucid, Volkswagen, Audi, Skoda, SEAT, Bentley, Porsche, Fiat, Daimler, Maybach, BMW, Rolls-Royce, Opel, Peugeot, Citroen, Volvo, Polestar, Renault, Jaguar Land Rover, Mitsubishi, Mazda, Suzuki, Hyundai, Genesis, KIA and Singapore's EV firm, VinFast.**<sup>241</sup>

Joinworld reports having a similar direct sales relationship with **Chinalco** (Fujian Ruimin, Chinalco Southwest Aluminum, Chinalco Henan Luoyang Aluminum) and BMW Brilliance as it has with Minth.<sup>242</sup> In Chongqing, Chinalco's products include brazing material (used in combustion engines), wires, forged parts, bars and tubes for the automotive sector.<sup>243</sup> All three Chinalco subsidiaries make aluminum plate for the automotive sector.<sup>244</sup> In Fujian, Chinalco reportedly produces rolled sheet for the transportation sector, including aluminum coil for capacitors. It describes its main markets as "North America, South America, [and] Eastern Europe."<sup>245</sup>



Figure 14: Joinworld marketing material depicting "product sales and service network," revealing that all of their products originate in the XUAR, Joinworld Promotional Catalogue, [Online](#).

Again, it is important to note that Joinworld's participation in labor transfer schemes may not be directly connected to its aluminum processing. However, it is certainly a high risk, given the company's deep and diverse engagement in the programs. Because it is impossible to conduct social audits in the region, Joinworld's participation in any state-sponsored labor transfer program suggests a high risk of forced labor in any of the company's products that could not be investigated in any particular part of the company's manufacturing.

## REGIONAL DISTRIBUTION OF ALUMINUM AND ATTENDANT SUPPLY CHAIN RISK

Automakers need not engage directly with any of these companies to be linked to Uyghur labor transfers through supply chains, however. Indeed, few of these companies make auto parts at all; they largely produce ingots for sale across China. The main problem arises for automakers in the manufacture of aluminum parts outside of the XUAR that source XUAR-produced ingots. This is

because regional Five-Year Plans have mandated, and companies have been created to ensure, that XUAR aluminum is linked to production chains through "trading venues for bulk commodities such as aluminum and aluminum products."<sup>246</sup>

These trading entities include the XPCC "development" company **Xinjiang Xintou**, whose trading subsidiary Xinjiang Xintou Economic and Trade Development Co., Ltd (新疆新投经贸发展有限公司) directly hires surplus labor from the southern XUAR and lists aluminum trade between the XUAR and the rest of China as a "primary" business activity.<sup>247</sup> Xintou also owns a controlling share of Xinjiang Tianlong Mining, acquired a 48% share of Xinjiang Jiarun in 2016 (giving it operational control), and relies on Jiarun Aluminum, where it manages logistics and warehousing, as its trading base.<sup>248</sup>

Xintou facilitates the vertical integration of the value chain, including "coordinating with downstream high-end aluminum product manufacturers such as **CITIC Dicastal**" to "set up factories in Xinjiang."<sup>249</sup> While it is unclear whether the factories were built, there is high risk that CITIC Dicastal is part of the Xintou value chain. According to its own website, **CITIC Dicastal** is one of the world's largest car wheel manufacturers, producing for **General Motors, Ford, Mercedes-Benz, BMW, Audi, Volkswagen, Stellantis, Renault-Nissan-Mitsubishi, Toyota, Honda, Hyundai-Kia, FAW, SAIC Motor, Dongfeng, Tesla**, and others.<sup>250</sup> In 2019, CITIC Dicastal engaged with officials from Korla, XUAR, for consideration of business collaboration (the respective industrial zones of Qinhuangdao and Korla signed a cooperation agreement to this effect).<sup>251</sup>

Xintou has strong trade relationships with several other aluminum companies, beyond its equity holdings in Tianlong and Jiarun. Xinjiang Qiya, another aluminum smelter, was Xintou's largest supplier in 2018, representing a fifth of Xintou Trade and Development's sourcing that year.<sup>252</sup>

In addition to Xintou, aluminum producers across China are involved in trade and logistics joint-ventures in the XUAR, facilitating the export of XUAR ingots to eastern China and the global market. One such logistics firm of particular concern to global automakers is **Xinjiang Nanshan Silk Road Business Service Co.** (新疆南山丝路商务服务有限公司), a subsidiary of **Shandong Nanshan Aluminum Co. Ltd.** founded in 2017.<sup>253</sup> Xinjiang Nanshan Silk Road is "mainly engaged in the procurement and sales of related materials" but "is not engaged in the production and manufacture of aluminum and aluminum products," a task "entrusted to other electrolytic aluminum enterprises in Xinjiang."<sup>254</sup>

Additionally, Shandong Nanshan Aluminum jointly owns a small railway company that shuttles raw materials and finished goods for industries in Manas County. Xinjiang Lianqiao Logistics Co. (新疆连桥物流有限责任公司) is a loading, unloading and warehousing company facilitating the movement of aluminum smelting inputs and ingots.<sup>255</sup> It is owned 30% by Shandong Nanshan Aluminum, 24% by Xinjiang Xinfu and 24% by Xinjiang Jiarun.<sup>256</sup> This company directly links the XPCC's 6th Division Aluminum Xinfu Branch and Xinjiang Jiarun to Chinese markets, underwritten by Shandong Nanshan Aluminum.

In short, Shandong Nanshan Aluminum seems to have established a company to buy aluminum from smelters in the Uyghur

Region and a second (joint venture) company to facilitate the transportation from XUAR smelters to national railways.

Shandong Nanshan Aluminum<sup>257</sup> is a global producer of electric foils for batteries, rolled sheet for car exteriors, and high-grade aluminum for airplane manufacturers. The company is a direct supplier to **BMW, General Motors, Audi, FAW-Volkswagen, Fiat, Chrysler, Nissan**<sup>258</sup> **Daimler, Hyundai, Volvo, Ford, Jaguar Land Rover, Rivian**,<sup>259</sup> and, since 2020, **Tesla**.<sup>260</sup> Shandong Nanshan announced a new subsidiary in 2022 that would be dedicated to automotive battery manufacturing and claimed that its customers were **CATL, BYD, AVIC Lithium Battery, Ewell Lithium Energy, and Guoxuan Hi-Tech** EV battery producers.<sup>261</sup>

Like Nanshan, **Chinalco** does not produce aluminum directly in the Uyghur Region but has constructed smelting facilities and other infrastructure for other companies in the region, including Tianlong, East Hope, and the XPCC 6th Division.<sup>262</sup> It has also directly financed Xinjiang Jiarun, collaborated with East Hope for materials sourcing, and traded in Zhonghe/Joinworld ingots.<sup>263</sup> Through this infrastructure support, it is promoting and enabling the expansion of the aluminum sector into the region without directly operating there.

The links between XUAR smelting and eastern China/international manufacturing have been deliberately orchestrated. The CCP actively supports the movement of XUAR-produced aluminum to production sites in the east of the country and around the world.

Since 2015, the government has offered preferential freight rates for XUAR-produced aluminum, in some cases undercutting aluminum shipping and sales from other regions in the country.<sup>264</sup> Until at least 2020, the Ürümqi Railway Board was reducing loading and unloading fees and miscellaneous operating charges by 30% to 100%, in addition to the preferential freight rates.<sup>265</sup> In April of 2022, the Ürümqi Railway Bureau visited East Hope specifically to discuss accelerating “the comprehensive strategic relationship between the two parties” to better facilitate shipping aluminum products out of the region.<sup>266</sup> These examples show how deeply complicit the state and private sector are in integrating XUAR-produced aluminum into production chains across the country.

## CONCLUSION

Nearly a fifth of China’s aluminum smelting capacity is in the Uyghur Region, and over a third of that production is being smelted by XPCC companies. This aluminum can be blended with other supplies, obscuring its origin. In other cases, it is being directly shipped to manufacturers for incorporation into parts for global auto makers. Aluminum being sourced without clear provenance on trading platforms like the London Metals Exchange, through international trading firms, or through Chinese companies with unannounced trade links to the Uyghur Region expose international car brands to XUAR forced labor.

# 3. Copper

## THE UYGHUR REGION'S CONTRIBUTION TO CHINA'S COPPER PRODUCTION

China accounts for more than 50% of the world's copper consumption annually but is not a major source of copper itself. According to the International Copper Study Group (ICSG), world copper mine production stood at 20.6 million metric tons in 2020.<sup>267</sup> A recent report released by Insight and Info indicates that Chinese copper mine production accounted for around 9% of that figure in 2021.<sup>268</sup> China's copper resources are mainly concentrated in the Northwest, Southwest and south China, among them Tibet (22.6%), Jiangxi (14%) and Yunnan (14%) account for more than 50% of the total. The Uyghur Region accounts for about 7.2% of the total copper mine production in China.<sup>269</sup>

While China may not be the largest source of copper in the world, it does the vast majority of the processing. According to ICSG, China smelts half of the world's copper and refines 41% (both processes result in metallic copper, the former using electrolysis and the latter using chemical processes).<sup>270</sup> Eight out of the top 20 copper smelters and 10 of the top refineries worldwide are based in China.<sup>271</sup> Some of the most significant miners and processors of copper (and other nonferrous metals) operate in the Uyghur Region.

This chapter focuses primarily on the Xinjiang Nonferrous Metal Industry Group as it operates the largest copper mine deposits in the Uyghur region. We also examine Zijin Mining's operations in the Uyghur Region, as Zijin is among the top 20 copper refineries worldwide. These two companies link copper and copper processing in the Uyghur region to the automotive sector.

Copper is used in the automotive industry in large part in plating to protect electrical and metal parts against corrosion. It's used in electromechanical connector terminals as well as other electronic components. In automatic transmission vehicles it is used as a non-corrosive plating to prevent corrosion from automatic transmission fluids. Copper is also used in brake tubing for its flexibility and in anti-lock braking systems (ABS) for wiring linking brake sensors to computerized components.<sup>272</sup>

Copper usage is roughly three times as high in EVs as in combustion vehicles, because of its conductivity and durability in high temperatures.<sup>273</sup> It is a component in many EV batteries and is used for the wiring, motors and inverters of electric vehicles. EV charging stations require yet more copper, particularly for wiring. If EV charging stations are developed at anticipated rates, copper consumption in 2030 is estimated to be 250% higher than it was in 2019.<sup>274</sup>

## XINJIANG NONFERROUS METAL INDUSTRY GROUP

(新疆有色金属工业(集团)有限责任公司)

Xinjiang Nonferrous Metal Industry Group is a state-owned mining, smelting, and processing company that concentrates on some of the automotive industry's most critical raw materials, including copper, zinc, lithium, gold, and nickel.<sup>275</sup> All of Xinjiang Nonferrous's mining and processing is undertaken in the XUAR. Through its subsidiary Xinxin Mining, Xinjiang Nonferrous has rights to the Yakesi, Kalatongke, Hami Jubao, and Hami Hexin Mines.<sup>276</sup> The company has its own smelting facilities at Xinjiang Wuxin Copper Co.,<sup>277</sup> but it also sells copper to be smelted elsewhere.

**Copper-nickel plate and gold plate generated over 83% of Xinjiang Nonferrous's annual revenue in the first quarter of 2021.**<sup>278</sup>

### Participation in Repressive Government Programs

As a state-owned corporation, Xinjiang Nonferrous has played a substantial role in the XUAR government's programs to match companies with particular villages to implement what the government euphemistically calls "poverty alleviation schemes." One of those schemes is a coercive land transfer program, by which the company facilitates the transfer of whole villages' worth of individually held land over to large cooperatives, typically run by just a handful of selected farmers in the area. Bostan Village in Qaghiliq County was one such village, with Xinjiang Nonferrous facilitating the transfer of nearly 330 acres (2,000 mu) of land, belonging to 196 households over to another XUAR manufacturer, Chengguang Biotech. The workers in that town were then rendered unemployed, marked as "surplus labor" and "transferred" to work in factories and farms.<sup>279</sup>

The company also participates in the *fanghuiju* surveillance and cultural eradication program. One such program poses as a village beautification project, but beautification entails tearing down Uyghur traditional homes, replacing them with identical tract homes with furnishings assigned by the government, and creating courtyard spaces that are antithetical to family gathering.<sup>280</sup> As early as 2016, representatives of Xinjiang Nonferrous set up an after-school program for children in one village where children were taught Chinese and indoctrinated on "going to college in inner China, new concepts and ideas, about hard work, starting a business and making money, and about the dangers of religious extremist thinking" and supports programs that "export" labor out of the town to the rest of the country.<sup>281</sup> In 2020, Xinjiang Nonferrous' Hatu Gold Mine reported that it had been sending company cadres to the company's paired villages for two years, during which time, cadres "live along with the villagers day and night, become relatives with them, eat, live and work together." The report continues "The cadres stationed in the village help them get rid of outdated and backward ideological concepts."<sup>282</sup>

## Participation in Labor Transfer Program

The company also facilitates so-called “labor transfers” for the people living in the villages with which it is paired. Xinjiang Nonferrous and other state-owned enterprises are expected to play a “leading role” in implementing the government’s “surplus labor” programs. The subsidiaries are expected to “actively cooperate with the local government to...drive the employment of surrounding surplus labor.” Xinjiang Nonferrous not only brings in laborers to its own factories but helps to facilitate the programs more broadly. Starting in 2017, Xinjiang Nonferrous directed the company’s *fanghuiju* teams to establish employment bases in the company’s paired villages and to ensure that everyone who was able to work was assigned to a job. Some of those people identified as “surplus labor” were assigned to work in satellite factories making apparel or agricultural products near their homes or in cooperatives set up by Xinjiang Nonferrous. Others were “absorbed” by local enterprises including Xinjiang Nonferrous itself—across the company’s media reports, the company boasted that between 2017 and 2020, it had facilitated as many as 644 such situations.<sup>283</sup>

Xinjiang Nonferrous Metals Group’s subsidiary Xinjiang Yakesi Resources Development Co. (新疆亚克斯资源开发股份有限公司), in the distant Huangshan mining area, appears to have been a testing ground for labor transfers in 2017. As a state-owned enterprise, it served as a sort of architect of the program. According to the Xinjiang Nonferrous’s own social media posts, the company assigned a working group to handle the labor transfers and to implement the directives of the central government regarding transferred laborers from the southern XUAR. The company described in great detail its deliberations to create an “Overall Plan for Pre-job Training for Students in Southern Xinjiang,” which required that all transferred laborers be subject to six full months of “systematic” training that included meetings to denounce so-called “two-faced” people and the “three evil forces” of extremism, separatism, and terrorism, lectures on religious extremism, student essay recitations (likely related to denouncing religious extremism and confessing past actions now deemed illicit), and letter writing to workers’ hometowns to express gratitude to the Party and to Xinjiang Nonferrous. The teaching students were subjected to included “basic Chinese text learning, paramilitary training, [full labor], learning to sing popular songs, legal education, political learning, ideological education, patriotism education, gratitude education, rules and regulations, and civilized etiquette,” as well as “ethnic unity education.” When students were not successful in learning these things, it appears they (and their teachers) were required to stay extra hours to continue the tutelage. Student success was judged regularly, and the company developed a punitive system that fined both the students and the teachers when the students did not successfully learn their lessons, with a potential loss of up to CNY 1,000 in salary. Students who “violated the rules and regulations” were punished even more severely. So-called “trainees” had been fined 72 times for violations of the rules, totaling a loss of CNY 10,000 collectively. The money taken from the students who broke the rules was periodically allocated as rewards for outstanding students. Xinjiang Nonferrous claimed that “this has played a positive role in motivating students to study hard and make progress together.” While

the transferred laborers were still in training, they were forced to perform serious manual labor, including carrying out ball mill cleaning (usually done with a chemical solvent such as Chloroethene,<sup>284</sup> which may cause significant harm to humans if inhaled or ingested.) They also carried out groundskeeping in the mining area, clearing acres of trees, laying drip irrigation, and cleaning the company’s facilities. According to the company’s own reporting, at least nineteen of the approximately forty transferred laborers in the first group fell ill during the six months of their training.

The company also reported significant sacrifices made on the part of the “teachers” of these trainings, who also appear to be Uyghur based on their names. The article’s sympathetic author is, in fact, one of the teachers named in the piece. It appears that the teachers may also been subjected to coercion and may not have been allowed to leave the training center. The teachers suffered from heart disease, stomach ailments, vascular issues, and diabetes. Rather than offer leave, the company commended them for continuing to work through major health issues. One teacher’s daughter fell and was injured at school but she could not return home to assist the girl. Others had been forced to abandon their elderly relatives or missed significant moments in their families’ lives.<sup>285</sup>



Figure 15. Transferred laborers at Yakesi Resource Develop Co. pledge oath to the Chinese flag, as they are educated to oppose the “three evil forces” of radicalism, separatism, and terrorism. Source: Xinjiang Nonferrous Weixin, [Online](#).

In March of 2017, Xinjiang Nonferrous brought in over one hundred people from Keriya County as part of a government scheme to transfer 100,000 workers in three years.<sup>286</sup> In March 2020, at the height of COVID-19 lockdowns in China, Xinjiang Nonferrous was again part of a major government transfer of laborers from the southern XUAR to maintain production during the lockdown.<sup>287</sup> During five weeks in March and April of 2020 alone, Xinjiang Nonferrous brought in 145 “surplus laborers” between the ages of 24 and 48 from the southern XUAR, “under the organization of the State-owned Assets Supervision and Administration Commission (SASAC) of the XUAR.”<sup>288</sup> By this time, the transferred laborers were subjected to three months of on-site Chinese-language and ideological training that included “militarization training, political study, pre-job training, and education in patriotism and ‘loving Xinjiang.’”<sup>289</sup> The company held a symposium in April of 2020 to extol the virtues of the government labor transfer pro-

gram, where workers were told that “the Han nationality cannot be separated from the ethnic minorities, and the ethnic minorities cannot do without the Han nationality.”<sup>290</sup>



Figure 16. Xinjiang Nonferrous labor transfer “farewell ceremony” at which Uyghur families are separated. Source: Xinjiang Nonferrous Weixin, [Online](#).



Figure 17. Workers from the southern XUAR arrive to be assigned to work at Xinjiang Nonferrous during the height of the COVID-19 lockdown. Source: Xinjiang Xinxin Mining Weixin, [Online](#).

As Xinjiang Nonferrous expands its mining footprint across the Uyghur Region, the company promises that it will employ “local surplus labor,” which suggests constantly increasing engagement in labor transfer schemes.<sup>291</sup>

### Supply Chain Risk

Xinjiang Nonferrous Group’s cathode copper products are produced by its subsidiaries, **Wuxin Copper** and **Xinxin Mining**.<sup>292</sup>

According to Xinjiang Nonferrous’s corporate reporting,<sup>293</sup> the company’s top copper customers include **Fukang Ruifeng Copper Industry Co.** (copper smelting and rolling),<sup>294</sup> **Jiangxi Huaye Precision Industry Co.** (produces beryllium copper alloys for electrical systems and manufacturers car motors),<sup>295</sup> **Jingjiang Hongxing Copper Manufacturing Co.** (copper alloy products),<sup>296</sup> **Ningxia CNMC (China Nonferrous Metals Group) New Materials Co.**, **Shaanxi Xinshenghua Industrial Co.**, **Shanghai Haojin**

**Metal Materials Co.** (electronic components, wires, cables),<sup>297</sup> **Suzhou Kaifeng Copper Industry Co.** (automotive electrical parts),<sup>298</sup> **Ürümchi New Pearl River Copper Cable Co.** (copper cables, copper and aluminum smelting),<sup>299</sup> **Xinjiang Boyuan Copper Industry Co.** (processes copper, aluminum, and steel),<sup>300</sup> and **Xinjiang Zhongsheng Copper Industry Co.** (a subsidiary of Xinjiang Zhonghe/Joinworld, discussed in the chapter on aluminum). The Xinjiang Nonferrous corporate report suggests that its metals are traded by **Trafigura Investments**, which is listed as a top twenty customer.<sup>301</sup> A Trafigura spokesperson stated: “Trafigura does not purchase product from the Xinjiang region to deliver to international customers, including for the automotive industry.” Trafigura does not list its customers so we are unable to trace where any XUAR-originating products may enter international supply chains once sold by Trafigura to companies within China.

Companies sourcing automotive parts from China should be aware of the reach of Xinjiang Nonferrous’ customer base. These companies supply the international auto industry with engines, wires, electronics, and other copper alloyed products. While desk-based research cannot identify all supply chain connections or risk, international automotive manufacturers can benefit from this information when tracing their supply chains.

Shanghai Haojin Metal Materials Co., for instance, is a major supplier to **Bohai Automotive Systems**, according to Bohai’s corporate reporting.<sup>302</sup> Bohai is China’s largest supplier of pistons and manufactures other auto parts as well.<sup>303</sup> The company claims to be in a collaborative parts marketing network with some of China’s largest parts manufacturers that together “support international companies,” including some of the world’s most significant auto makers.<sup>304</sup>



Figure 18. At the height of the COVID-19 lockdown, Xinjiang Nonferrous transferred over 100 laborers in a month to continue production while other Chinese citizens were protected by the lockdown. The workers had to undergo ideological training before being assigned work placements.

Source: Xinjiang Nonferrous Weixin, [Online](#).

Xinjiang Nonferrous has a registered subsidiary called **Beijing Xinding Shunze Hi-tech Co.** (北京鑫鼎顺泽高科技有限责任公司) that was intended to sell more than half of Xinjiang Nonferrous’s products when it was registered.<sup>305</sup> Xinjiang Nonferrous also is a shareholder of the trade company **Beijing Baodi Xindi Technology and**

**Trade.**<sup>306</sup> These companies sell the products made by transferred laborers into international markets, without the obvious marker that would indicate the products are made in Xinjiang. Companies procuring nonferrous metal-based products must be aware that these companies are subsidiaries of Xinjiang Nonferrous.

### Xinjiang Nonferrous and Xinjiang Xinxin Mining's Nickel and Iron Products Supply Chain

Xinjiang Nonferrous's subsidiary Xinjiang Xinxin Mining is heavily involved in nickel mining and smelting as well—the company is the “second largest producer of electrolytic nickel using nickel sulfide ore in China.”<sup>307</sup> Nickel is used in cathodes for batteries in the automotive sector, and it is a critical alloy in many aluminum and steel car parts. The automotive sector manufacturers listed here are customers of Xinxin's electrolytic nickel.<sup>308</sup> Among them are major international trading firms and iron companies.

**Table 4. Top Customers Buying Xinxin Electrolytic Nickel**

COMPANY NAME IN ENGLISH	COMPANY NAME IN CHINESE
Trafigura Investments (China) Co., Ltd.	托克投资(中国)有限公司
China Chengtong Commodity Trading Co., Ltd.	中国诚通商品贸易有限公司
Gansu Jiugang Group Hongxing Iron and Steel Co., Ltd.	甘肃酒钢集团宏兴钢铁股份有限公司
Shanghai Haojin Metal Materials Co., Ltd.	上海昊津金属材料有限公司
Shaanxi Xinchenghua Industrial Co., Ltd.	陕西新盛华实业有限公司
Xinjiang Zhonghe/Joinworld Co., Ltd.	新疆众和股份有限公司

Xinjiang Zhonghe/Joinworld is also among its customers (Joinworld is discussed in the aluminum section of this report). Xinjiang Nonferrous' Yakesi Resources subsidiary (described above), in turn owns **Hami Lixin Industry and Trade Co.** (哈密利鑫工贸有限公司), which processes copper-nickel ore.<sup>309</sup> We were unable to identify the company's customers.

A Trafigura spokesperson stated: “Trafigura does not purchase product from the Xinjiang region to deliver to international customers, including for the automotive industry.” Trafigura does not list its customers so we are unable to trace where any XUAR-originating products may enter international supply chains once sold by Trafigura to companies within China.

Xinjiang Nonferrous subsidiaries are also processing lithium for electric vehicle batteries (see chapter on batteries).

**Essentially, Xinjiang Nonferrous is producing most of the major critical materials necessary for automotive manufacturing.**<sup>310</sup>

### ZIJIN MINING GROUP CO., LTD. (紫金矿业有限责任公司)

State-owned Zijin Mining Group is a Global Fortune 500 company that mines, processes, and sells a variety of automotive-relevant raw materials, including gold, copper, zinc, and iron. It is among the top 20 refiners of copper worldwide.<sup>311</sup> Zijin mines have faced numerous allegations of rights violations and hazards globally.<sup>312</sup>

In China, Zijin holds 75% of the country's domestic copper reserves.<sup>313</sup> Among its XUAR holdings, Zijin owns the majority share (51%) of the Ashele Copper Mine<sup>314</sup> in Altay, northern XUAR, which holds copper, zinc, lead, and silver deposits.

The company also owns a zinc smelter, as well as copper and gold mines in the XUAR.<sup>315</sup> Zijin also holds a 17% stake in Xinjiang Tianlong (see the Tianlong section in the chapter on aluminum).<sup>316</sup>

### Participation in Labor Transfer Programs

Zijin's Ashele Copper Mine is involved in the “Thousands of Enterprises Helping Thousands of Villages” program, through which companies “partner” with small villages in the Uyghur Region.<sup>317</sup> As one Zijin worker put it, companies that operate in the Uyghur Region have a responsibility to “make due contributions to the local social and economic development, including solving local employment, maintaining national unity, maintaining social stability, supporting social and economic poverty alleviation and other aspects. The company claims to have “solved the employment problem of 800 local surplus laborers,”<sup>318</sup> which typically is conducted via state-sponsored labor transfers. In 2020, Zijin announced on its website that its Ashele Copper mine “absorbs the poor and marginal households”<sup>319</sup>—again, “absorbs” is the language typically used to describe state transferred labor. The company claims to engage in state-sponsored labor transfers to move people in the areas in which they mine out of their traditional lines of work and into mining for the company in an effort to “effectively change the traditional ideology of farmers and herds-men.”<sup>320</sup>

### Supply Chain Risk

According to Zijin's corporate reports, one of the company's biggest copper customers appears to be **Fujian Shanghang Sun Copper Co.**,<sup>321</sup> though it is likely that the copper sold to the Fujian company comes from Zijin's mine in Shanghang (which allegedly poured a “9,100 cubic meter torrent of toxic slurry” into the Ting River, resulting in the death of four million fish in 2010).<sup>322</sup> However, **Transamine Trading, Trafigura, Gerald Metals** and **IXM** are named among the top five entities with the largest trade receivables balances in 2021, indicating that Zijin trades on credit with some of the largest metals traders in the world, and that Zijin material is being traded on global markets.<sup>323</sup>

Of course, Zijin mines copper in other parts of China and other countries, including in the Democratic Republic of Congo where

it jointly owns a mine with the country's government, in a project designed to meet the needs of electric vehicle battery producers.<sup>324</sup> Between its mining in the DRC and in the XUAR, Zijin copper is clearly a high-risk commodity.

## OTHER COPPER PRODUCERS OPERATING IN THE UYGHUR REGION

Table 5 outlines significant manufacturers in the copper industry in 2020. These companies also feed into automotive supply chains.<sup>325</sup>

## CONCLUSION

Copper is mined, smelted, and manufactured into alloys and other automotive-related products in the Uyghur Region. Some of the world's most significant nonferrous metals companies have operations in the Uyghur Region. Many of those companies are avid participants in the state-sponsored labor transfers in the Uyghur Region. Given copper's numerous applications in the automotive industry, more thorough supply chain tracing is certainly in order.

Table 5. Major Copper Mining and Processing Companies Operating in the XUAR

MANUFACTURER	STATE-OWNED ENTERPRISE	EVIDENCE OF LABOR TRANSFER PARTICIPATION*
Xinjiang Nonferrous Metal Co.	✓	✓
Zijin Mining Co.	✓	✓
Xinjiang Poly Deep Blue Mining Co., Ltd. 新疆保利深蓝矿业 有限公司	*326	✓ <sup>327</sup>
Xinjiang Wuxin Copper 新疆五鑫铜业 有限责任公司 (Xinjiang Nonferrous subsidiary)	✓	✓ <sup>328</sup>
Hami Yanxin Copper Industry Co., Ltd. 哈密焱鑫铜业 有限公司	*329	✓ <sup>330</sup>
Sareke Copper Mine of NFC Daye Mining Branch 中色大冶 矿业分公司萨热克铜矿	✓	Unknown
Xinjiang Yibao Mineral Resources Exploration and Development Co., Ltd. 新疆怡宝 矿产资源勘查开发有限责任公司	No <sup>331</sup>	Unknown
Hami Red Stone Mining Co., Ltd. 哈密红石矿业有 限公司 (Sinotech 中色地科 subsidiary)	No	Unknown
Jiashi County Tonghui Mining Co., Ltd. 伽师县铜辉矿业有 限责任公司 (Zhaojin Mining Co., Ltd. 招金矿业股份有 限公司 subsidiary)	No	✓ <sup>332</sup> (Parent Company)
Xinjiang Kalatongke Mining Co., Ltd. 新疆喀拉通克矿 业有限责任公司 (Xinjiang Nonferrous subsidiary)	✓	✓ <sup>333</sup>
Hami Jubao Resources Development Co., Ltd. 哈密市聚宝 资源开发有限公司 (Xinjiang Nonferrous subsidiary)	✓	✓ (Parent Company)
Gansu Jianxin Group 甘肃建新集团 公司	No	Unknown
Jilin Jien Nickel Industry Co., Ltd. 吉林吉恩镍业股份有 限公司	No	Unknown
Honghe Henghao Mining Co., Ltd. 红河恒昊矿业股份有 限公司	No	Unknown
Jinchuan Group Co., Ltd. 金川集团 有限公司	No	Unknown

## 4. Batteries

There are two primary categories of battery used in the automotive sector: lead-acid and lithium-ion. Lead-acid batteries are used for starting and other ancillary power needs in traditional internal combustion engine automotive vehicles, while lithium-ion batteries are used in place of an engine to power electric vehicles. Both categories have variations but fundamentally function in the same way: the batteries have positively and negatively charged electrodes, between which ions flow, creating an electrical current. Both types of batteries are currently produced in the XUAR, encouraged by the proactive initiatives of the PRC central government. Lead-acid battery manufacturing expanded into the Uyghur Region in the wake of stricter battery production emission standards issued across other regions in 2013, after a wave of crackdowns on badly managed smelters that had caused health and environmental harms to local populations.<sup>334</sup> Lithium-ion battery manufacturing has expanded in the region under formal state directives in the XUAR to “actively study and introduce leading enterprises in new energy vehicles, fuel cells and other industries, support the development of supporting industries for new energy vehicles, encourage the research and development of low-temperature power batteries, charging facilities, and promote the energy conversion of new energy vehicles.”<sup>335</sup>

### RELOCATION OF LEAD-ACID BATTERY MANUFACTURING AND RECYCLING INTO THE UYGHUR REGION

Traditional internal combustion engine automobiles are started by lead-acid batteries, which can withstand the high heat of combustion. By weight, lead is 60% of a lead-acid battery.<sup>336</sup>

However, lead, when ingested or inhaled, has documented dire health effects for humans, particularly children.<sup>337</sup> The WHO has indicated that there is “no safe threshold of lead exposure.”<sup>338</sup> In 2013 China produced a new Battery Production Emission Standard (GB30484) to reduce the environmental and health harms of the lead-acid battery industry. The law sought to rein in harmful environmental and health mismanagement at lead smelters. Despite these regulations, within two years, new lead-acid battery recycling plans were being rolled out in the Uyghur Region.<sup>339</sup> Within five, the Uyghur Region’s first battery-manufacturing lead smelter was under construction. Today, five lead-acid battery manufacturers are licensed to manufacture and recycle lead-acid batteries in the region, accounting for a combined capacity of nearly 65,000 tons/year of lead acid production. Those companies are **Camel Group Xinjiang Battery Co., Ltd.** (骆驼集团新疆蓄电池有限公司), **Zhejiang Tianneng Resource Recycling Technology Co., Ltd.** (浙江天能资源循环科技有限公司), **Xinjiang Chaowei Echelon Energy Technology Co., Ltd.** (新疆超威梯次能源科技有限公司), **Jiangsu Leoch Battery Co., Ltd.** (江苏理士电池有限公司), and **Sail LLC** (aka Fengfan and CSSC, 风帆有限责任公司). In 2019, the Department of Ecology and Environment of the Xinjiang Uyghur Autonomous Re-

gion issued licenses to these five lead battery manufacturers to conduct lead-acid battery waste collection in the Uyghur Region, facilitated by seventeen professional storage centers and over a thousand collection outlets across the country.

**As a result, the Uyghur Region has become an important center for lead battery manufacturing and recycling in China. Sourcing from any of these companies risks exposure to the Uyghur Region and human rights violations.**<sup>340</sup>

In this chapter, we focus on the region’s biggest internationally financed lead-acid battery manufacturer and recycler, Camel Group.<sup>341</sup>

### CAMEL GROUP (骆驼集团股份有限公司)

Camel Group<sup>342</sup> is among China’s largest battery manufacturers. Its primary focus is the production, distribution, and recycling of lead-acid storage batteries for automobiles worldwide, counting U.S., European, Japanese, and Korean car manufacturers among its customers. Camel Group operates facilities in Xinjiang, Hebei, Jiangxi, Guangzhou, Hubei, Jiangsu, and Guangxi Provinces, as well as in Malaysia and South Korea. In 2019, Camel Group received a loan from the World Bank’s private lending arm, the International Finance Corporations (IFC), to expand its recycling operations into Toksun County · XUAR, on the property of its recently built manufacturing facility.<sup>343</sup>

Camel Group faced sanctions for “frequent blood lead incidents”<sup>344</sup> during the Chinese government’s crackdown on harmful industry practices in 2011. However, it survived the mass shutdowns and became the first company to conduct recycling and manufacturing of lead batteries in the XUAR.<sup>345</sup>

### Participation in Labor Transfer Program

Camel Group benefits from the labor transfer scheme facilitated by the Toksun County government, under a “Three-Year Plan for the Organized Transfer of Urban and Rural Surplus Labor Forces in Kashgar and Hotan Regions (2017-2019),” issued by regional and municipal governments.<sup>346</sup> In 2017, this government-sponsored labor transfer program transported 165 people from the southern XUAR (as much as 1,300 kilometers away) to Turpan for a 10-day “closed pre-job training” (封闭式岗前培训工作), which indicates that the participants were not allowed to come and go freely from the training. At the training, they received military and ideological training, and they were required to sing patriotic songs and learn the Chinese language. Workers performed a flag raising ceremony and declared their commitment to fight religious extremism and ethnic division, and to “profoundly expose and criticize the crimes of violent and terrorist activities and resolutely fight against nationalist separatists.” Then officials handed the workers to Camel Group and others, to be bussed to their

new jobs.<sup>347</sup> There is no indication that Han migrant workers are subject to the same “closed training” or political/ideological oath taking to work at Camel Group.

These labor transfers may also be highly hazardous to the workers. Camel’s own EIA indicates that no residential areas should be within one kilometer of the facility, and that workers should labor with a 10-150m buffer from several components of the facility. However, Camel has worker dormitories directly on the property.<sup>348</sup> These workers are thus exposed to hazardous contaminants during their shifts and their rest periods.<sup>349</sup>



Figures 19 and 20. Migrant workers from the southern XUAR swear an oath in a “handing over” ceremony before being taken to work at Camel Group and other Turpan companies. Source: Weixin, [Online](#).

## Supply Chain Risk

According to Camel Group, the company’s customers include **Volkswagen, Ford, Audi, General Motors, Honda, Nissan, Jeep, Hyundai, Kia, Peugeot, Citroen, and Volvo**.<sup>350</sup> According to shipping records, importers of Camel Groups products include **Canadian Energy and Power Corp, Canadian Energy Calgary, Prairie Battery**, and several companies in Indonesia, as well as Camel’s

own U.S. subsidiary.<sup>351</sup> The U.S. subsidiary lists **Mazda and Fiat** in addition to the brands named on its parent company website.<sup>352</sup>

## ELECTRIC VEHICLE BATTERY MANUFACTURING AND BATTERY MATERIAL PROCESSING IN THE XUAR

According to estimates from HSBC, nearly 60% of new cars sold in China will be electric by 2030.<sup>353</sup> China is the fastest growing market for electric vehicles, in part because of government incentives and subsidies for electric vehicle buyers.<sup>354</sup> At the same time, EV demand is rising rapidly worldwide. As of 2020, Europe and the U.S. accounted for more than half of the global EV market, while remaining heavily reliant on Chinese companies for EV batteries.<sup>355</sup> Electric vehicle sales are outperforming even the most enthusiastic predictions. And as the price of EV batteries—the most expensive part of an electric vehicle—continues to decline worldwide, demand will rise even further.<sup>356</sup>

It may come as no surprise, then, that in addition to shifting lead-acid battery production into Xinjiang, the Chinese government has actively expanded EV battery production in the Uyghur Region as a feature of the 14th Five-Year Plan.<sup>357</sup>

Lithium-ion battery production requires the mining of key materials (nickel, cobalt, graphite, lithium, manganese, and others), followed by refining, processing, alloying and assembling. Raw materials sourcing is global, but processing and manufacturing is increasingly concentrated in China. A U.S. White House reported indicated that “China is the world’s major processor of lithium carbonate into lithium hydroxide, cobalt into cobalt sulphate, manganese refining, and uncoated spherical graphite refining. China’s ownership of the chemical conversions needed to produce batteries has ensured that the global supply of battery raw materials flows to China for value-added production.”<sup>358</sup> The graphic below, from Benchmark Mineral Intelligence reveals China’s dominance in the processing of critical minerals used in EV battery manufacturing, as well as in the production of cathodes, anodes, and cells.

China is responsible for processing 44% of the world’s lithium, according to Benchmark Mineral Intelligence.<sup>359</sup> Processing lithium carbonate, and further processing into lithium hydroxide for batteries, is complex and expensive. China got a head start on other countries, naming lithium production and processing as a national strategic priority ten years ago in the country’s “Made in China 2025” plan, as the PRC anticipated becoming the dominant force in green energy technologies.<sup>360</sup> Today, China’s car manufacturers are responding to the 2021–2025 14th Five-Year Plan to “make breakthroughs in key technologies such as high-safety power batteries, high-efficiency drive motors, and high-performance power systems for new energy vehicles and accelerate the R&D of key components.”<sup>361</sup> Chinese manufacturers now produce as much as 78% of the cathodes, 91% of the anodes, and 70% of the cells for EV batteries as well.<sup>362</sup> It would be difficult to find an EV battery that has no input from a Chinese manufacturer. Furthermore, as of 2022, six of the top ten EV battery manufacturers were in China, accounting for 56% of the market.<sup>363</sup>

# China's Role in EV Battery Production

The charts at right show China's percentage of total supply across the lithium battery value chain in 2022.

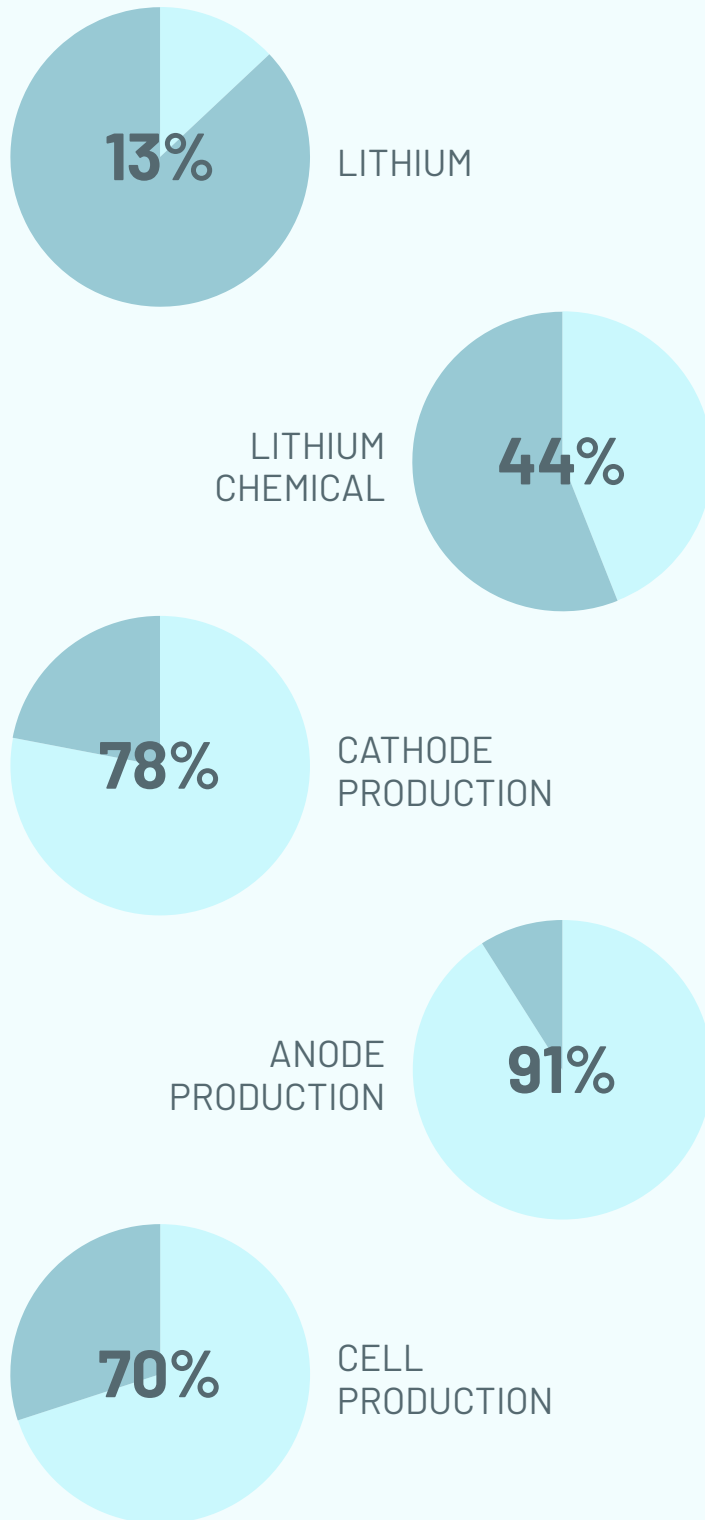


Figure 21. China's production of EV battery materials. Source: Benchmark Mineral Intelligence, "Infographic: China's lithium ion battery supply chain dominance," October 3, 2022, Online.

The search for cheaper batteries, battery cells, and battery materials seems to lead to China.<sup>364</sup> Thus, it is important to understand where the critical minerals and specialty materials for those batteries come from. This chapter focuses on lithium and increased sourcing of it from the Uyghur Region. The Uyghur Region is historically one of the PRC's most significant domestic sources for lithium ore.<sup>365</sup> In addition, lithium processing—from both XUAR-produced and foreign lithium sources—is a particular growth industry in the Uyghur Region, with high likelihood of continued and rapid expansion. The biggest names in the mining, processing, cathode, and battery segments of the supply chain have their sights set on the Uyghur Region, which creates a significant sourcing challenge for the EV industry.

This chapter focuses on Xinjiang Nonferrous's subsidiaries conducting lithium mining and processing, as the company is the major state-owned player operating in the region. The chapter then discusses two newcomers to the region: CATL and Ganfeng Lithium, two of the most significant corporations in lithium and lithium-ion batteries, globally. Their entry into the XUAR signals a major concern for EV battery sourcing.

## XINJIANG ASIA-EUROPE RARE METAL CO. (新疆亚欧稀有金属股份有限公司)

**Xinjiang Nonferrous Metal Industry Group's** (新疆有色金属工业(集团)有限责任公司) lithium processing and distribution is primarily the purview of the company's subsidiary, **Xinjiang Asia-Europe Rare Metal Co.** (新疆亚欧稀有金属股份有限公司) and its sub-subsidiary, **Ürümchi Asia-Europe Rare Metal Co.** (乌鲁木齐市亚欧稀有金属有限责任公司). Asia-Europe Rare Metal Co. has the capacity to produce 1,200 tons of lithium metal, which amounts to 20% of China's lithium production. The company or its predecessors have been mining and processing lithium in the XUAR since 1958. With the advent of lithium-ion batteries, the company's focus has also turned to identifying new energy applications.<sup>366</sup> [For more information on parent company Xinjiang Nonferrous and its extensive engagement in labor transfers and ideological programs, see the raw materials section of this report.]

### Participation in Labor Transfer Programs

As subsidiaries of the state-owned Xinjiang Nonferrous Metals Group, Xinjiang Asia-Europe Rare Metal Co and Ürümchi Asia-Europe Rare Metal Co. are deeply implicated in the region's state-sponsored labor transfer programs. As the chapter on copper reveals, Xinjiang Nonferrous is not merely a participant in the labor transfer programs but played a critical role in facilitating the programs, moving transferred laborers to its own factories, and creating locked down training programs for the workers compelled to participate in the programs.

In 2017, Asia-Europe Rare Metal was part of a labor program that aimed to transfer more than 3,200 "surplus laborers" to the Midong District of Ürümchi in one year, in an effort to induce farmers to "go to work in other industries and enterprises, so that they can leave the land and become industrial workers." Asia-Europe does not typically hire low-skilled workers, but it made an ex-

ception and lowered its job qualification criteria to accept labor transfers with junior high educations.<sup>367</sup>

Another of Xinjiang Nonferrous's subsidiaries, **Akto County Kebang Manganese Co., Ltd.** (阿克陶科邦锰业制造有限公司), mines and processes the manganese necessary for the manufacture of EV batteries and other alloyed metal car parts. At the Kebang facility, many Uyghur people from a small village were assigned to work, including one man who admitted that he was reluctant to leave home for work because he was satisfied with his work and income and he had been tending several acres of land with his family before cadres arrived to do "ideological work" to convince him that he should "go out to work."<sup>368</sup> This kind of repeated indoctrination and visits from government agents leaves Uyghur people little choice but to leave behind their lives for work far from home for Xinjiang Nonferrous.

### Supply Chain Risk

Xinjiang Asia-Europe Rare Metal Co.'s customers are some of the top lithium companies in the world. According to the Xinjiang Nonferrous' corporate reports,<sup>369</sup> the company's lithium customers include **China Energy Lithium Co.** (Tianjin Zhongneng Lithium Industry Co/天津中能锂业有限公司), a major producer of lithium electrodes for EV batteries and a "partner" to battery makers **CATL** (see below), **Daimler**, **BMW**, and **Honda**.<sup>370</sup>

Xinjiang Asia-Europe Rare Metal Co.'s lithium customers also include **Jiangsu Changjili New Energy Technology** (江苏昌吉利新能源科技有限公司), a wholly-owned subsidiary of **Zhejiang Tiantie Industrial Co.**, which makes lithium carbonate, as well as butyl-lithium used in making car interiors.<sup>371</sup> Tiantie does not name its "new energy company" customers but justified its recent expansion into the lithium carbonate market on the basis of "strong downstream demand" in the EV sector.<sup>372</sup> Xinjiang Asia-Europe also supplies **Chengdu Tianqi Lithium Industry Co.**, the world's largest hard-rock lithium producer making EV battery-grade lithium products.<sup>373</sup>

Xinjiang Asia-Europe customer **Xinghua Far Infrared Component Factory** makes lithium sheets and strips, which are sold to its top customer, battery maker **Guangxi Ruiyi New Energy**, which makes EV batteries that are sold in China, Europe, America, the Middle East, and Southeast Asia.<sup>374</sup> Other lithium customers include **Kunming Mingmou Technology Co., Ltd.** and **Tianjin Beidouxing Fine Chemical Co.**<sup>375</sup> This extensive list of influential customers suggests that even if companies are sourcing from eastern Chinese lithium or battery companies, they could inadvertently be sourcing lithium processed in the Uyghur Region.

China ceased publishing its export customs records in 2018, but prior to that time, Ürümchi Asia-Europe Rare Metals was a supplier for **FMC Lithium Division**, the predecessor to **Livent**, a major player in the lithium-ion battery market.<sup>376</sup> Livent told The New York Times in June 2022 that it continues to buy lithium metal from Xinjiang Nonferrous (likely through the Ürümchi Asia-Europe Rare Metals subsidiary) for use in manufacturing automotive interiors.<sup>377</sup> It is a direct supplier to **Tesla** and **General Motors**.<sup>378</sup>

## CATL/CONTEMPORARY AMPEREX TECHNOLOGY CO., LTD. (代新能源科技有限公司)

CATL (aka Contemporary Amperex Technology or Ningde Times New Energy Technology) is the world's most significant manufacturer of batteries and produces the world's cheapest lithium-ion batteries. According to Bloomberg, about 35% of the world's EV batteries are made by CATL. The company supplies the leaders in the electric vehicle industry.<sup>379</sup> CATL is headquartered in Ningde, and benefits from enormous government subsidies, equivalent to a fifth of its net income in 2020, all for a company that has a market cap of almost US \$240 billion.<sup>380</sup> Until recently, it has had little corporate footprint in the Uyghur Region aside from a joint venture with the XUAR State Grid Energy Service Group that focuses on grid-level energy storage systems (unclear whether this project has any international exports).<sup>381</sup> In 2022, however, CATL began expanding in the Uyghur Region.

### Expansion into the Uyghur Region

In February 2022, CATL and Jiangxi Zhicun Lithium Industry Co. jointly registered **Xinjiang Zhicun Lithium Industry Co.**,<sup>382</sup> a lithium processing company in Chaqiliq (Ch: Ruoqiang) County, Bayinghulen. Corporate advertisements indicate that the company expects to become the largest lithium carbonate producer in the world<sup>383</sup> with the development of a 120,000-ton lithium carbonate project.<sup>384</sup>

Talent recruitment advertisements for the company, posted in Fujian Province, suggest that the company seeks high-skilled workers from other provinces.<sup>385</sup> Because the company only started construction in the last several months, it is impossible to know whether it is employing state-sponsored labor transfers. However, state-sponsored labor programs are already in place for other companies in need of workers in Chaqiliq County. The county government collects workers from Hotan, where "there is a large number of surplus laborers that need to be transferred and employed."<sup>386</sup> The lithium carbonate facility is being built adjacent to a TBEA facility currently under expansion, which reportedly includes battery manufacturing.<sup>387</sup> TBEA participation in labor transfer schemes has been well documented.<sup>388</sup>

Chaqiliq County seems to be establishing itself as a hub for new energy, centered in large part around the development of these new enterprises. The government sees this as a way to develop the region's economy while redoubling its commitment to "highlight the employment of the surplus urban and rural labor force,"<sup>389</sup> which is one of the euphemisms the government uses for coercive labor transfer programs.

### Supply Chain Risk

Products made or mined in the Uyghur Region are prohibited from import into the United States. This suggests that lithium-ion batteries sourced from **CATL** could be under greater scrutiny now that the new Xinjiang project is underway. CATL supplies lithium-ion batteries to **Tesla**, through a contract that runs from Jan-

uary 2022 to December 2025, following the completion of their two-year contract that ended in June 2022.<sup>390</sup> The battery maker also has partnerships with **Ford**,<sup>391</sup> **General Motors** (including **Cadillac**, **Buick** and **Chevrolet**),<sup>392</sup> **BMW**,<sup>393</sup> **Mercedes-Benz**,<sup>394</sup> **Honda**,<sup>395</sup> **Hyundai**,<sup>396</sup> **Volkswagen**,<sup>397</sup> German car parts maker **ZF Group**,<sup>398</sup> and **Bosch Automotive**.<sup>399</sup> In its response to our inquiries, Volvo indicated that the company has had a long-term sourcing agreement with CATL since 2019.

## GANFENG LITHIUM INDUSTRY CO. (赣锋锂业股份有限公司)

Ganfeng Lithium Industry Co. is a global, vertically integrated lithium battery goliath, which has holdings that cross the entire EV battery supply chain from the raw lithium ore to the final battery. The company is China's top producer of lithium.

### Expansion into the Uyghur Region

In early 2022, **Xinkuang Ganfeng (Xinjiang) Lithium Industry Co.** (新矿赣锋(新疆)锂业有限公司) (aka New Mine Ganfeng Xinjiang) was officially registered as a joint venture of the Xinjiang Bureau of Geology and Mineral Resources and Ganfeng Lithium. The new company will mine the Dahongliutan Lithium deposit in Hotan, as well as nearby lithium lakes and other mineral deposits.<sup>400</sup> The company invested CNY 90 million in the venture and has plans to conduct further mineral exploration in the Uyghur Region beyond the known reserves.<sup>401</sup>

### Supply Chain Risk

In 2021, Ganfeng signed a two-year "product supply contract" with **Tesla (Shanghai) Co.**<sup>402</sup> The company has a long-term supply agreement through 2024 with **BMW** and a "Memorandum of Strategic Cooperation" with **Volkswagen**.<sup>403</sup> Customs records reveal that Ganfeng's subsidiaries are shipping both batteries and lithium metals globally (some of which may be for automotive while others are for solar power and other storage banks), to the United States and India most frequently in the last two years. Companies currently sourcing from Ganfeng would be unlikely to be importing products made with Xinjiang lithium at this time, but they should be aware of the heightened risk continued sourcing from Ganfeng poses given the company's expansion into the Uyghur Region.

## OTHER LITHIUM SUPPLIERS AND LITHIUM-ION BATTERY MANUFACTURERS OPERATING IN THE UYGHUR REGION

**Xinjiang Tianhongji New Lithium Battery Co.** manufactures lithium battery anodes in the XPCC city of Shihezi. The company's EV, storage, and mobile device lithium battery products are mainly sold to the southeast coastal areas, including Shanghai, Jiangsu, and other areas with large demand for lithium batteries. Major

partners are reported to be **Shanghai Shanshan** (上海杉杉科技有限公司), **Shenzhen Beiterui** (深圳贝特瑞新材料集团股份有限公司), **Dongguan Kaijin** (广东凯金新能源科技股份有限公司), and **Jiangxi Zhengtuo** (江西正拓新能源科技股份有限公司).<sup>404</sup>

**Shandong Ruifu Lithium Industry Co.** focuses on sales of battery-grade lithium materials and holds a subsidiary **Hami Ruifu Lithium Industry** and a sub-subsidiary **Xinjiang Dongli Mining Investment Co.**, which runs the Aktas lithium mine in the XUAR.<sup>405</sup> Ruifu Lithium Industry Co. has an agreement through 2024 to provide Australian lithium giant **Altura** with lithium products.<sup>406</sup> In earlier 2018 acquisition documents, Shandong Ruifu's customers were named as **CITIC Guoan Mengguli Power Technology Co., Ltd.**, (中信国安盟固利电源技术有限公司), **Shanshan New Energy Technology Co., Ltd.**, (杉杉新能源科技股份有限公司), **Xinxiang Tianli Lithium Energy Co., Ltd.**, (新乡天力锂电股份有限公司), **Thornton New Energy Technology Co., Ltd.**, (桑顿新能源科技有限公司), **Jiangmen Keheng Industrial Co., Ltd.**, (江门市科恒实业股份有限公司), and **Tianjin Bamo Technology Co., Ltd.** (天津巴莫科技股份有限公司).<sup>407</sup> In July of 2022, **Shanghai Zhihui Future Medical Service Co., Ltd.** seems to have acquired both Shandong Ruifu Lithium Industry Co. and Xinjiang Dongli Mining Investment Co.<sup>408</sup>

**Table 6. Lithium Battery Manufacturers Operating in the XUAR (relevant to automotive)**

COMPANY NAME	ESTABLISHED
Xinjiang Weineng Environmental Protection Technology Co., Ltd. 新疆威能环保源科技有限公司 <sup>409</sup>	2022
Zhengtong Yunji Technology Co., Ltd. 正通云极科技有限公司 <sup>410</sup>	2022
Xinjiang Yilongyuan Environmental Protection Technology Co., Ltd. 新疆亿隆源环保科技有限公司 <sup>411</sup>	2015 (approved 2018)
Yingtai Group Co., Ltd. Xinjiang Branch 英泰集团有限公司新疆分公司 <sup>412</sup>	2006 (approved 2015)
Khorgos Star Stone Technology Co., Ltd. 霍尔果斯星石科技有限公司 <sup>413</sup>	2017 (approved 2019)

**The downstream customers of Xinjiang Tianhongji and Shandong Ruifu's alone are so significant in the market that practically all EV battery manufacturers are exposed. EV manufacturers should pay careful attention to upstream lithium sourcing for all lithium-ion batteries due to the fact that so many manufacturers seem to be downstream of XUAR lithium.**

Furthermore, in the last several years, several lithium-ion battery manufacturers that feed into automotive supply chains have established factories in the Uyghur Region. Table 6 below lists some of those companies. Because these companies are so newly established, we have little information about them beyond their registration and business purpose.

## CONCLUSION

The rapid expansion of lead acid battery manufacturing/recycling, lithium mining/processing, and lithium-ion battery manufacturing in the Uyghur Region stem from incentives the PRC government has created to move out to the Uyghur Region and to dominate the traditional and EV battery markets. Graphene appears to be the next frontier in EV battery solutions, and we have identified both graphene production companies in the Uyghur Region and significant research on graphene development and uses coming out of XUAR and XPCC universities. The combination of these forces means that it could be difficult to escape Xinjiang forced-labor-made inputs in what is perhaps the most essential part of any car without concerted efforts by corporations and governments.

Whether in traditional lead acid batteries, the rapidly growing lithium EV battery market, or in emerging technologies, companies will need to be vigilant to avoid forced labor supply chain risk. Other manufacturers that use lithium-ion batteries—including, in particular, the solar industry—should conduct similar research into other XUAR-based producers. The list that we provide here are only companies that have some connection to the automotive industry. We identified a great number more lithium-ion battery manufacturers operating in the region.

# 5. Electronics

## RECENT RAPID DEVELOPMENT OF THE ELECTRONICS INDUSTRY IN THE UYGHUR REGION

In the last five to ten years, there has been a surge in electronics manufacturing in the Uyghur Region. The XUAR has focused on developing the “advanced equipment manufacturing industry system” and electronics manufacturing, including for automotive applications, and in particular for electric vehicles, grounded in the region’s resources for aluminum, rare metals, and other primary materials.<sup>414</sup> The manufacturing of automotive electronic equipment was accelerated in 2015 in an effort to extend exports to Central Asia, Europe, and beyond, and that expansion continues apace with the development of electronics manufacturing bases in Ürümqi, Kashgar, and Khorghos.<sup>415</sup> As was advertised on the automotive manufacturing center Toutunhe Economic and Technological Development Zone website in 2022, the “14th Five-Year Plan of 2021” named electronics products as one of the “top ten industries in Xinjiang to become better and stronger” before 2026.<sup>416</sup>

In China, most of the major polysilicon manufacturers in the Uyghur Region also own aluminum smelters and coal processing and energy plants.<sup>417</sup> Since 2016, the Uyghur Region has developed the “coal-electricity-silicon-photovoltaic and other electronic materials” supply chain, and the “coal-electricity-aluminum-electrode foil and other electronic materials” supply chain.<sup>418</sup> As indicated in the chapter on aluminum, production of that critical material for the automotive industry has exploded in recent years. Companies such as TBEA (via its shares in Zhonghe/Joinworld) and East Hope are major players in both the aluminum and polysilicon industries, capitalizing on the low-cost coal energy the companies use to produce both and on the value of both materials to the electronics industry. As a result, the Xinjiang Daily notes, “Xinjiang has become one of the world’s most important producers of photovoltaic silicon-based electronic materials and aluminum electronic materials.”<sup>419</sup> These products are used in a wide variety of applications, but of course, are also integral to automotive manufacturing both inside the Uyghur Region and far beyond.

As state media documented in 2021, the XUAR has introduced preferential policies for electronics manufacturing that have “accelerated their transfer” to the Uyghur Region (and in particular the southern XUAR), which has led to the development of the sector as a “key industry to drive employment, promote poverty alleviation, and increase income and rural revitalization.”<sup>420</sup> While the industry is quite new in the region, it is clear that there is a significant investment in developing it and that we can expect further expansion in the coming years.

This conducive business environment has led a number of automotive electronics companies to move into the Uyghur Region. Perhaps because the industry is only just emerging, there is little

information online regarding the automotive-specific electronics companies operating in the Uyghur Region. The industry should be aware of this emerging risk.

## LONG-DISTANCE LABOR TRANSFERS IN THE AUTOMOTIVE ELECTRONICS SECTOR

While there is a growing automotive electronics industry developing in the Uyghur Region, it is far outstripped by the dominance that the rest of China has in that sector. There are massive multi-national corporations manufacturing automotive electronics in China. Despite their locations outside of the XUAR, these companies are not exempted from scrutiny in regard to Uyghur forced labor. There is substantial information regarding automotive electronics companies outside the Uyghur Region that are benefiting from the state-sponsored labor transfers of Uyghur people.

The electronics industry sheds significant light on the fact that state-sponsored forced labor programs imposed on Indigenous populations do not solely operate in the Uyghur Region. Indeed, research has exposed that between 2017 and 2019 alone, at least 80,000 Uyghur and other minoritized citizens have been transferred from their home communities to factories in other parts of China.<sup>421</sup> The U.S. government included both automotive and electronics manufacturing as industries of concern for “involuntary transfer” of Uyghur laborers in its July 2021 business advisory.<sup>422</sup> This is not a coincidence. It is because there have been an unusual number of reports specifically identifying electronics companies that make products for the automotive industry accepting these laborers across the interior of China.

In this chapter, we will focus on those electronics companies across China that have engaged in these labor transfer programs. To be sure, there are automotive electronics companies manufacturing within the Uyghur Region that are benefiting from state-sponsored forced labor. However, in an effort to reveal the spectrum of forced labor arrangements that affect the Indigenous population of the Uyghur Region, we’ve focused here on those companies in other parts of China that have benefited. Some of these companies have been identified in previous reports. We expand on their involvement in the labor transfer programs, as well as on their customers with heightened supply chain risks, and we update the findings with recent information about the companies’ responses to allegations of forced labor and even of U.S. government repercussions for their participation in state-sponsored labor transfers.

We will caution that it is possible that some of these companies have changed their labor recruitment practices since they first publicized their participation in labor transfer programs. Throughout this chapter, we have included claims the companies

have made to indicate that they have altered their recruitment practices to exclude the transfer of Uyghur laborers. Unlike in the Uyghur Region, where companies are highly incentivized to engage in the labor transfer programs and discouraged from signaling that there has been any change in practices in regard to labor transfers, it does seem that some companies from other parts of China have managed to publicly announce a change in their recruitment strategies. However, highly specialized audits would need to be conducted to ensure these claims are accurate and sustained. While audits may indeed have occurred in some companies, those audits are far from foolproof in recognizing Uyghur forced labor and audit records are not public, and so governments, corporations, and consumers must exercise significant caution in considering sourcing from companies that have a history of engaging in state-sponsored labor transfers of individuals from the Uyghur Region. Furthermore, because electronics was one of the first sectors to be exposed as being engaged in state-sponsored labor transfer programs, there has been little in the way of reporting on hiring and recruitment of Xinjiang laborers since 2020. This should not be construed as meaning the companies have ceased participation in the programs.

## AVARY HOLDINGS (鹏鼎控股)

Avary Holdings (also referred to as Pengding Holdings, Avary Pengding Holdings; formerly Fukui Precision Components) was established in 1999 by Fukui Precision Component (Shenzhen) Co., Ltd. and has grown into a multinational corporation with production bases in mainland China, Japan, Korea, Taiwan, and the United States.<sup>423</sup> Avary Holdings, a subsidiary of Zhen Ding Tech Group in Taiwan and mainland China,<sup>424</sup> focuses its production on printed circuit boards (PCB), and is expanding its manufacturing of PCBs relevant to automobiles.<sup>425</sup> From 2017–2020 Pengding Holdings (parent company) was named the largest manufacturer of PCB products in the world.<sup>426</sup> Pengding's company mission as stated by the company chairman is "benefiting mankind, improving environmental protection, and making the earth a better place."<sup>427</sup>

## Participation in Labor Transfer Programs

In an October 2019 effort to conform to the government-issued mandate to ensure that at least one person in every household in the southern XUAR was assigned to work, representatives of Mungulkure County (Ili Prefecture, Ch: Yili) conducted household surveys to facilitate labor transfers. The local government Human Resources and Social Security Bureau organized a "job transfer fair" to transfer Uyghur laborers both within the Uyghur Region and further afield, at which 5 companies participated, including Avary's subsidiary Jiangsu Huaian Pengding Holdings (江苏淮安鹏鼎控股有限公司).<sup>428</sup> This subsidiary produces PCBs for the automotive industry, among others, and has been praised in corporate publicity as the most important production base for the company.<sup>429</sup>

That same Avary subsidiary conducted similar job fairs through its 2019 "cooperation mechanism for the transfer of employment." The company participated in hosting fifteen different job fairs in Nilqa County. Jiangsu Huaian Pengding Holding "absorbed" 111 laborers in July of 2019 to work in its factory.<sup>430</sup> At least two Nilqa (Ch: Nilke) County Human Resources reports indicate the concerted effort of the county to transfer people to Pengding Holdings. In one of them, there is a clear emphasis on poor laborers, but specifically the advertisement mentions a preference for Kazakh, Han, and Mongolian rather than Uyghur workers—a discriminatory effort to participate in the state-sponsored programs aimed at changing the ethnic dynamics of the region while still maintaining a racist attitude toward Uyghur. Transferred laborers were expected to be "civilized" and know Mandarin, have no criminal records and be able to "bear hardships, stand hard work, and obey management."<sup>431</sup>

A March 2019 *Ili Daily* article indicated that 110 employees had been transferred to Jiangsu Huaian Pengding, as part of a "batch" of 406 Indigenous rural laborers transferred in the prefecture's "Spring Breeze Action."<sup>432</sup> As reported by the Tech Transparency Project, a 2019 announcement of the Xinyuan County Fengling Labor Dispatch Company announced that it had "exported" 102 people to Jiangsu Huaian Pengding that year.<sup>433</sup>

**公司信息**

新疆县峰凌劳务派遣有限责任公司

所属行业: 200

公司规模: 10—99人

注册日期: 2019-09-03

所在地: 新疆维吾尔自治区伊犁哈萨克自治州新源县

通讯地址: 新疆新源县喀拉布拉镇

**公司介绍**

峰凌劳务派遣有限责任公司主营业务包括劳务派遣、保洁、劳务外包、人事代理等。现有劳务经纪人八名，会计一名，出纳一名，人力资源师一名。新源县乡镇卫生院聘用工由我公司负责派遣。每年劳务输出1500人次，2016年与内地苏州东山精密制造股份有限公司联系，2017年至今都在江苏南京、淮安各类企业输送新疆员工就业。2018年向南京LG熊猫公司输送67人，2019年向江苏淮安鹏鼎控股输送102人。

Figure 22. Announcement of the Xinyuan County Fengling Labor Dispatching Co. Reads: Since 2017, it has sent Xinjiang employees to various enterprises...102 people were sent to Jiangsu Huaian Pengding Holding in 2019. Source: Ili State Employment Network, [Online](#).

Avary's participation in labor transfers continued into 2020. In an article that celebrated that Ili and Huaian are more than 4,200 kilometers apart from one another, the *Xionghao Times* described Avary Holding's active participation in the transfer of laborers from the Uyghur Region. The article indicated that Jiangsu Huaian Pengding had "received and resettled" a total of 389 people from the Uyghur Region, 92% of which were from minoritized communities. The article announced that the "retention rate of Xinjiang employees was 24.62%" suggesting on the one hand that these laborers were not held in their position indefinitely, but on the other hand might indicate a lack of willingness to work for the company in the first place. The article indicates Avary brought in workers from Ili because the area is "rich in surplus labor resources in the rural areas, and the local government attaches great importance to the transfer of employees from Xinjiang to inner

China.” Avary claimed to segregate the workers on a separate floor according to differences in ethnicity and religious beliefs. The company simultaneously put in place programs that would strengthen “patriotic education” and promote “ethnic consolidation and integration.”<sup>434</sup>

Avary’s engagement in labor transfer programs has been the subject of an investigation published by *The Information*<sup>435</sup> (focused on the company’s relationship with Apple) and a letter regarding forced labor allegations from the *Office of the United Nations High Commissioner for Human Rights*.<sup>436</sup> A spokesperson for Avary told *The Information* that it had never employed transferred laborers.<sup>437</sup>

## Supply Chain Risk

Avary’s automotive circuit boards are sold worldwide. Avary Holdings has its own subsidiaries around the world. Available customs records show that many of the Avary’s products move between China and the company’s India subsidiary, making the destination of the end products difficult to trace. There are no customs records available that show the Huaian subsidiary exporting products directly. The closest proxy we have for that is Zhen Ding’s subsidiary Boardtek in Taiwan, which ships to automotive parts manufacturers **Continental AG, Vitesco, and Autoliv**, all of which supply the world’s major automotive manufacturers, according to their own attestations and customs records.<sup>438</sup> It is possible that since Avary’s parent company supplies these companies that the Huaian factories may also have relationships them or may ship products through another one of the corporate subsidiaries.

## NINGBO JOYSON ELECTRONICS CO., LTD. (宁波均胜电子有限公司)

Ningbo Joyson Electronics Co., Ltd. (also known as Joyson Safety Systems, Key Safety Systems) is headquartered in Zhejiang Province and employs over forty thousand people across thirty different countries, including the United States and the United Kingdom.<sup>439</sup> Ningbo Joyson Electronics produces two different lines of products: electronic automotive central control systems and automotive safety systems (some of which are electronic). Joyson Automotive Safety Systems (Jingzhou) Co., Ltd. is one of the over 100 subsidiaries of Ningbo Joyson Electronics. The subsidiary is located in Hubei Province and produces air bags, seat belts, steering wheels, and their respective components.<sup>440</sup> Joyson took control of this factory in 2018, when it acquired Japan’s Takata Corp, which had gone bankrupt after it suffered from an international scandal because of its production of faulty safety equipment that led to consumer deaths and massive product recalls.<sup>441</sup> Since that time, Joyson claims that its safety system branch has become a “global leader” in automotive safety systems supplying domestic and international brands.<sup>442</sup>

## Participation in Labor Transfer Programs

Joyson does not have manufacturing facilities in the Uyghur Region. However, it is Joyson’s Jingzhou safety systems plant that could potentially be related to the Uyghur labor transfers. A September 2021 article published by the United Front Work Department of the Jingzhou Municipal Committee of the CCP indicated that Joyson Safety Systems is a company with a “a concentration of migrant workers from Xinjiang” from “ethnic minorities.”<sup>443</sup> Employing Uyghur workers is not in and of itself a problem if recruitment is fair and open and employees have equitable arrangements and the ability to leave their jobs. However, the United Front’s monitoring of the migrant laborers’ situation at Joyson raises concern because in 2018, Yuan Defang, head of the United Front Work Department of Jingzhou, stated that taking in Xinjiang Uyghur workers was “a ‘political task’ for police, educators, bureaucrats, and cadres.”<sup>444</sup> And 2018 policies indicate that the transferred workers would be required to do three days of language and culture classes a week after work hours.<sup>445</sup> The United Front is an arm of the Chinese Communist Party tasked with influencing the activities of groups outside the party, including religious communities, minority ethnic groups, and non-Chinese organizations abroad. It is a propaganda and bureaucratic body that often exercises substantial power over the rights and experiences of non-CCP members and marginalized groups.

## Supply Chain Risk

Joyson Safety Systems is deeply entrenched in the international automotive market, and supplies components and systems to at least forty multinational automotive corporations, according to the company’s recently updated corporate website.<sup>446</sup> The companies listed as customers on the Joyson corporate website include **Aston Martin, Audi, BAIC Motor, Bentley, BMW, CMC, Daihatsu, Daimler, Dongfeng, Faraday Future, FAW, Ferrari, Fiat Chrysler, Ford, Foton, GAC Group, General Motors, Hino, Honda, Hyundai, Isuzu, Iveco, JAC Motors, Jaguar, JMC, Karma, Kia, KTM, Lamborghini, Land Rover, LEVC, Lifan, Lucid, Mazda, McLaren, Mercedes-Benz, Mitsubishi, Navistar, NEVS, Nissan, Opel, Porsche, Peugeot, Renault, Rolls Royce, SAIC, SEAT, Skoda, Soueast, Spartan, Subaru, Suzuki, Tata, Tesla, Toyota, UD Trucks, Volvo, and Volkswagen.**<sup>447</sup>

Furthermore, Joyson has won “excellent supplier” awards from Porsche, Volkswagen, and General Motors.<sup>448</sup> In 2011, according to its corporate annual reports and corporate website, the company purchased **QUIN** from Germany and these enterprises became wholly owned subsidiaries. That Joyson holding supplies 51% of Tesla’s airbags, seatbelts, steering wheels, battery management systems and related sensors. Tesla alone accounted for CNY 2 billion (US\$252.73 million) of Joyson’s revenue in 2019.<sup>449</sup>

## OFILM TECHNOLOGY CO., LTD. (欧菲光科技股份有限公司)

Over the past twenty years, OFILM Technology or (aka Ou-feiguang Technology Co., Ltd.) has grown into a world leader in the manufacturing of touchscreens, fingerprint recognition, and smart car technologies.<sup>450</sup> OFILM expanded into the automotive industry in 2015, thereafter producing sensors, modules and radar systems for electric and gas cars.<sup>451</sup>

### Participation in Labor Transfer Programs

OFILM Group has actively participated in state-sponsored labor transfer programs. Between 2017 and 2019, 1,800 rural surplus laborers were transferred to work at Nanchang OFILM Technology, a wholly owned subsidiary of OFILM.<sup>452</sup> In one four-day period in 2017 alone, Nanchang OFILM, “absorbed” over 700 Uyghur laborers from Lop County as part of the county’s poverty alleviation initiative.<sup>453</sup> According to state media, in 2018, OFILM’s Nanchang subsidiary transferred 1,096 students from Hotan area secondary vocational high schools, Hotan city vocational high schools, and Guma County vocational and technical secondary schools, in a program that sends them to work before graduating secondary school in a supposed effort to “help their households escape poverty.”<sup>454</sup> In 2019, the Xinjiang Daily reported that the Hotan government had “actively contacted” Nanchang OFILM to ask them to “accept more than 1,300 graduates” to work in its factories. One of the transferred laborers who was interviewed described how she didn’t want to stay at the factory when she arrived.<sup>455</sup>

The Australian Strategic Policy Institute first revealed OFILM’s participation in the labor transfer programs.<sup>456</sup> In March of 2020, AP visited the Nanchang factory and learned that “the mostly Muslim ethnic Uighurs [sic] who labor in the factory are isolated within a walled compound that is fortified with security cameras and guards at the entrance. Their forays out are limited to rare, chaperoned trips, they are not allowed to worship or cover their heads, and they must attend special classes in the evening.” A local small business owner told reporters that the Uyghur workers were only allowed to go outside twice a month and said: “The government chose them to come to OFILM, they didn’t choose it.”<sup>457</sup>

### Supply Chain Risk

Based on these reports and others, OFILM’s subsidiary Nanchang OFILM Tech was placed on the restricted entity list for ties to forced labor by the United States End-User Review Committee (ERC) which is comprised of US representatives in July 2020.<sup>458</sup> Despite clear evidence of participation in state-sponsored labor transfer programs, OFILM defended itself by claiming to obey all laws and regulations.<sup>459</sup>

In June 2022 OFILM was removed from the United States ERC entity list,<sup>460</sup> perhaps due to it de-registering the Nanchang factory.<sup>461</sup> The company has not indicated publicly, however, that it has ceased or repudiated the state-sponsored labor program in which it participated. Without clear evidence that the company has ended all relationships with state-sponsored labor transfers, sourcing from the company may remain a risk.

## SICHUAN MIANYANG JINGWEIDA TECHNOLOGY CO., LTD.

(四川绵阳经纬达科技有限公司)

Sichuan Mianyang Jingweida Technology Co. Ltd (aka JWD Technology) manufactures power and signal transformers and inductors for the automotive industry. The company also makes custom magnetic solutions for automotive applications.<sup>462</sup>

### Participation in Labor Transfer Programs

In February of 2018, Awat County transferred 200 young people as a “batch of industrial workers” to JWD Technology, after they had been trained in a “Mandarin + Moral Education + Work Discipline” program.<sup>463</sup> In July of 2018, the Xinjiang Daily indicated that JWD had “provided 300 employment positions for Awat County” for the county’s rural surplus laborer transfer program.<sup>464</sup> In May of 2020, state media celebrated JWD’s continued participation in the labor transfer program, indicated that it was ongoing, considered a model for ethnic unity, and had recently received another 87 “ethnic minority employees from Xinjiang.”<sup>465</sup> JWD’s engagement in the labor transfer program was reported by ASPI.<sup>466</sup>



Figure 23. Transferred Uyghur laborers at JWD Technology.  
Source: Provincial Ethnic Religious Commission  
via Cover News Sichuan, May 27, 2020, [Online](#).

## Supply Chain Risk

JWD's website indicates that the company has partnered with **SAIC Motors**, **EVTech**, and **Shenzhen Yiweiyuan Technology** within the automotive electronics sector, as well as with a significant number of other electronics companies.<sup>467</sup> EVTech touts itself as the "world's leading supplier of core components for new energy vehicles," specifically manufacturing the on-board power supplies/charging systems for EVs.<sup>468</sup> According to the EVTech website, it manufactures **ORA**, **GAC AION**, **Renault**, and **NIO** on-board power supplies and the **Volkswagen** off-board power supply for energy storage units.<sup>469</sup> Shenzhen Yiweiyuan also produces on- and off-board power supplies for EVs.<sup>470</sup>

## SHENZHEN DEREN ELECTRONICS CO., LTD. (深圳得润电子器件有限公司)

Shenzhen Deren Electronics (aka Derun) is a manufacturer of connectors, wiring harnesses, and other electronics components for the automotive industry.<sup>471</sup>

## Participation in Labor Transfer Programs

As reported by The Information,<sup>472</sup> in 2018, United Front News reported that Deren was "responsible for accepting employment of 1,000 ethnic minority compatriots from Xinjiang." The company was particularly concerned about security in regard to these workers.<sup>473</sup> At about the same time, the United Front Work Department released a so-called "Unity Wind" program for the industrial park in which the people were transferred. The document describing "Unity Wind" revealed that dormitories for the transferred workers in the park would be outfitted with facial recognition control systems and security guards, and Uyghur were accompanied by monitors when they left the building, all purportedly meant to protect the safety of the workers, but nonetheless constituting constant surveillance.<sup>474</sup>

## Supply Chain Risk

Deren indicates on its website that it is "becoming the core supplier for global automotive players" and names **Volkswagen**, **BMW**, **Mercedes Benz**, **Bosch** and **Continental** as part of the company's "international business platform."<sup>475</sup> Bosch denies sourcing directly from Deren. Customs records show that in the last year, Deren shipped products directly to automotive sector companies internationally, including **Aptiv Components India** (electrical systems), **Textron EZ Go Division** (golf carts), **Delta-Q Technologies** (chargers for batteries, including for electronic vehicles), as well as to its Vietnam subsidiary.

## CONCLUSION

For the most part, the revelations in this chapter are not new. Media and research has indicated for several years now that electronics factories across China have been participating in state-sponsored labor transfer schemes that are highly restrictive and coercive. Automotive companies should be aware that this is merely the tip of the iceberg—hundreds of thousands of Uyghur people have been transferred into these programs, and it's clear that the companies they are "absorbed" by very much produce products in automotive supply chains. Companies that employ Uyghur workers outside of the Uyghur Region should be able to provide evidence that they have not recruited workers through state-sponsored programs, and that any Uyghur workers who are employed in their factories are paid on par with Han co-workers, are allowed equal opportunity for jobs at all ranks and promotions, and are free to come and go. Significant evidence has shown that this is not the case for transferred Uyghur laborers, and so anyone sourcing electronics from China should be aware of this heightened exposure to forced labor.

## 6. Interiors, Tires, and Other Parts

As the PRC government has increased incentives for raw materials processing to be conducted in the Uyghur Region, more companies have moved manufacturing reliant on those materials to the Uyghur Region as well. In the process of researching the major components of car manufacturing, we identified companies manufacturing a broad swathe of other car parts that haven't yet been covered in this report—engines, power trains, transmissions, tires, wheels, windshields, mats, seats and sundry other parts. This chapter focuses on a few companies operating in the Uyghur Region that are most clearly benefiting from the state-sponsored labor transfer schemes. These companies are representative of the pervasive participation of Uyghur Region-based companies in repressive government programs.

### XINJIANG GUANGHUI GROUP

(新疆广汇投资实业(集团)有限责任公司)

Xinjiang Guanghui Group is a massive corporate conglomerate headquartered in Ürümqi that owns (wholly or in part) car dealerships, real estate development firms, an e-commerce company, energy companies, a building materials and a machinery company, manganese, coal, and zinc processing companies, logistics firms, a number of investment firms, and a basketball team, as well being a major automotive parts manufacturer.<sup>476</sup> Guanghui Group has been a Global Fortune 500 company since 2017.<sup>477</sup> The chairman of the company, Sun Guangxin, is among the wealthiest men in China.<sup>478</sup>

The company is largely known in the region for its dealerships that sell luxury western car brands to customers of the Uyghur Region and 27 other provinces and cities. In 2021, the company celebrated its 10th year as the top auto dealer in China. According to its own reports, Guanghui is BMW's largest dealer in China and sells Volkswagen cars in the Uyghur Region as well (see the Volkswagen section in the introduction of this report).<sup>479</sup>

Guanghui is deeply engaged in repressive government programs in the Uyghur Region, including state-sponsored labor transfers. According to state media, Sun Guangxin "personally coordinated and arranged the implementation of the industrial actions of the group and required the [company's poverty alleviation] group to do a good job" in its efforts described below.<sup>480</sup>

### Participation in Repressive Government Programs

Guanghui Group is committed to "social stability and long-term stability in Xinjiang."<sup>481</sup> In Guanghui's self-nomination for the 2018 People's Corporate Social Responsibility Award in the XUAR (which it won), Guanghui Group celebrated its role as a "leading goose" among private enterprises in the Uyghur Region. The company identified itself as an active participant in "family pairing" activities, that matched 500 of its (likely Han) employees with lo-

cal people,<sup>482</sup> in programs that are intended to increase people's engagement in government programs and ideology and are also used as a method of surveillance. The company was also celebrated for its extensive participation in a variety of state-sponsored labor transfer programs.

### Participation in Labor Transfer Programs

In 2017, the company "received" and "resettled" 100 "surplus rural laborers" from Hotan and Kashgar, during one of the early government initiatives to transfer 100,000 minoritized citizens out of the southern XUAR and into work. At the time of these first transfers, Guanghui representatives claimed that transferred laborers would make CNY 3,000 a month on average after language and discipline related training.<sup>483</sup>

As part of company engagement in state-sponsored surplus labor programs, Guanghui built five "poverty alleviation factories" within villages in southern Xinjiang in 2018. Reportedly, over 1,200 villagers were working in Guanghui's remote factories, being paid only about 1,500 yuan a month (according to Guanghui's own description), below the regional minimum wage.<sup>484</sup> The workers were likely transferred there by the state through the "surplus labor transfers" that are associated with these poverty alleviation factories established in villages. The company anticipated that across the five satellite factories, it would eventually be able to "employ" as many as 20,000 people. These factories, supposedly designed to alleviate the poverty of the workers, were estimated to bring in CNY 1 billion annually for the company.<sup>485</sup>

Three of those five factories manufacture goods for the automotive industry: **Hotan Xibao Auto Supplies Co., Ltd.** (in Lop), **Xinjiang Guangyi Hengyu Auto Products Co., Ltd.** (in Hotan), and **Xinjiang Guangwei Huichang Auto Products Co., Ltd.** (in Hotan).<sup>486</sup> A fourth of the five "poverty alleviation" enterprises, **Guangyi Huijia Electronic Technology Co., Ltd.**, is located in the same park in Hotan as the others,<sup>487</sup> where it manufactures automotive electronics and in-vehicle computers.<sup>488</sup> Xinjiang Guangwei Huichang Auto Products Co. makes floor mats, seat cushions, window and body films, and rubber and plastic products for cars.<sup>489</sup>

The company established the Guanghui Poverty Alleviation Industrial Park in Aijike Village in Hotan, to house Xinjiang Guangyi, Xinjiang Guangwei Huichang, and Guangyi Huijia Electronic Technology.<sup>490</sup> In 2020, Guanghui announced that it had "driven 386 rural women in the village to find employment" in the company's poverty alleviation industrial park.<sup>491</sup> Guanghui called on companies in the rest of China to establish factories in Hotan alongside them.<sup>492</sup>

Hotan Xibao Auto Supplies Co. was established within the "Green Poverty Alleviation Industrial Park" which is located within the Beijing Industrial Park in Lop County. Hotan Xibao and other automotive parts manufacturing facilities located at this address are

of significant concern for forced labor. The Beijing Industrial Park in Lop in which the factory is located is the site of four internment camps, including the Lop County #4 Education and Training Center, which was made famous when state media published a photo of the men who were interned there. The dissemination of that photo on social media led to international awareness of the severity of the crisis in the Uyghur Region.



Figure 24. Men surrounded by guards and security fencing at the Lop County #4 Education and Training Center. Source: Xinjiang Bureau of Justice WeChat Account, [Online](#).

Hotan Xibao is located in plant number 2 at 38 Jingluo Road within the park,<sup>493</sup> which is located at the same address as the Lop County Hair Product Industrial Park that was the subject of a Withhold Release Order issued by U.S. Customs and Border

Protection, due to evidence that the park was engaged in forced labor that was revealed in Chinese state media.<sup>494</sup> This suggests that in addition to hair products, the industrial park is also manufacturing automotive parts.

It appears that after establishing Hotan Xibao, Guanghui Group arranged for **Shaanxi Lechetu Automobile Accessories Co.** to register the company.<sup>495</sup> The Lop factory would make car storage baskets, cushions, and other products for Shaanxi Lechetu on order.<sup>496</sup> A Hotan Daily article about Hotan Xibao indicated that the industrial park in which the company was located had “solved the employment of more than 125 local surplus laborers.”<sup>497</sup> Based on the photos in state media, it is possible that some of the workers employed by the factory are internment camp victims from the Lop County Number 4 Education and Training Center internment camp. It is unusual for men to work in sewing in the Uyghur Region, and the images of the men working in the factory suggest that they may be older than the young people typically transferred through the state-sponsored surplus labor transfers.

In 2019, Guanghui expanded its efforts in state-sponsored labor transfer schemes when it built new factories in Lop County for the production of storage baskets and cushions, in an effort to “guide ordinary villagers to transform into excellent skilled workers as soon as possible.” The company dispatched workers from its Hotan Xibao factory to teach the workers how to weave. According to state media, workers were paid only CNY 800 to 1,000 while they were learning. Their standard salary could again be as low as CNY 1,500, which is below the minimum wage for the region (though the report indicates it *could* be higher, depending on the skill of the worker).<sup>498</sup>

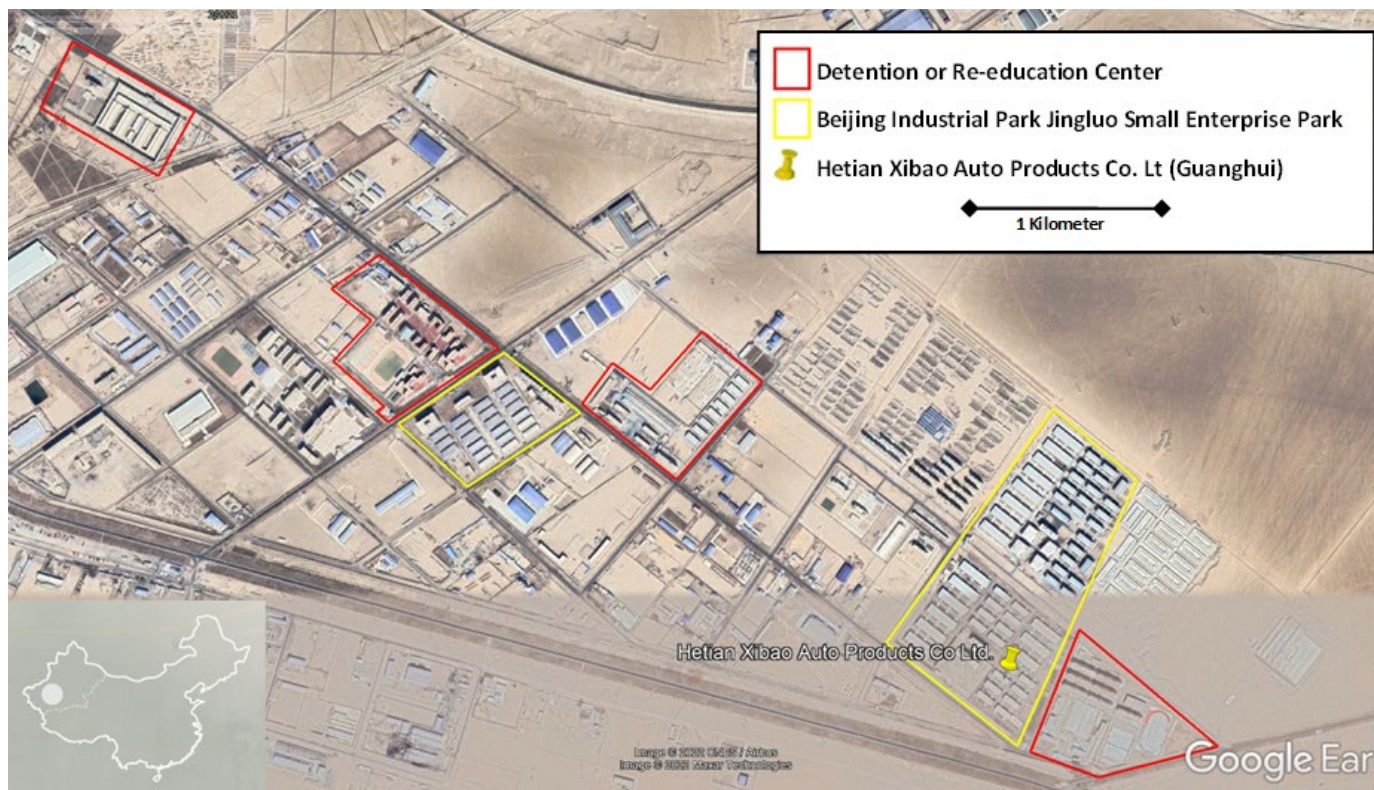


Figure 25. The Beijing Industrial Park/Lop County Hair Products Industrial Park/Poverty Alleviation Park in Lop.



Figure 26. Men make floor mats for Hotan Xibao Auto Accessories in the Poverty Alleviation Industrial Park in Lop, which shares an address with the Beijing Industrial Park and the Lop County Hair Products Industrial Park. Source: Hotan Daily, [Online](#).



Figure 27. Women in Lop County learn to weave auto accessory baskets for Guanghui Group. Source: Xinjiang Daily, [Online](#).

## Supply Chain Risk

It is unclear whether or to what extent Guanghui and Shaanxi Lechetu's automotive subsidiaries export their products internationally or supply companies that manufacture for international brands. Considering the company's engagement in labor transfers and the proximity of its factories to internment camps, sourcing from these companies represents a very high risk.

## HOSHINE SILICON INDUSTRY CO., LTD. (合盛硅业股份有限公司)

Xinjiang Hoshine Silicon Industry Co., Ltd (新疆西部合盛硅业有限公司)<sup>499</sup> is a wholly-owned subsidiary of Zhejiang's Hoshine Silicon Industry Co. Xinjiang Hoshine is one of the world's largest industrial silicon producers.<sup>500</sup> Xinjiang Western Hoshine operates from Shihezi, Xinjiang. The company established Xinjiang East-

ern Hoshine Co. in Pichan (Chinese: Shanshan) outside of Turpan in 2016. There, Hoshine built the "Silicon-based New Material Circular Economy Industrial Park of Hoshine Silicon Industry" as its mining and manufacturing base within the Shanshan Stone Industrial Park. According to a description of the park, "experts" announced "China's stone material depends on Xinjiang, and Xinjiang stone material depends on Shanshan."<sup>501</sup>

In December 2021, after being sanctioned by the United States government for its use of forced labor,<sup>502</sup> Hoshine announced that it was further expanding its manufacturing in the Uyghur Region to include polysilicon manufacturing,<sup>503</sup> with the expectation that it would be used not only for the company's concomitant solar module manufacturing expansion but also for computer semi-conductors. State media indicated that, with this expansion, Hoshine "will become a veritable overlord of silicon-based materials."<sup>504</sup>

The drastic expansion of U.S.-sanctioned Hoshine Silicon in the Uyghur Region has also implicated the automotive sector. The company and its subsidiaries produce materials relevant to tires, wiring and electronics, aluminum, batteries, and a variety of silicon applications.

The XUAR government has rolled out an array of tax incentives to encourage this expansion. Hoshine subsidiary **Xinjiang Yiri Copper Foil Technology Co.** (新疆亿日铜箔科技股份有限公司)<sup>505</sup> is developing electrolytic copper foils in the Xinjiang Shanshan Stone Industrial Park, with a production capacity of 20,000 tons per year,<sup>506</sup> for application in laminates, printed circuit boards, and lithium-ion batteries.<sup>507</sup> The company benefitted from an CNY 82 million tax rebate, as one of the "six taxes and two fees reduction and exemption policy." Yiri also enjoyed rebates on the resource tax, urban maintenance tax, construction tax, real estate and land use tax, stamp tax, and cultivated land occupation tax, as well as fee waivers for education surcharges. Hoshine may intend to process the copper itself, through **Xinjiang Hoshine Innovative Materials Co., Ltd.**<sup>508</sup> (新疆合盛创新材料有限公司). It received EIA approval for the project with an annual output of 5,000 tons of copper-based rare earth composite powder materials.<sup>509</sup> Hoshine is also moving into northern Ürümqi, along with TBEA and Shenhua.<sup>510</sup> In 2019, it established an aluminum alloy production line, slated for future expansion designated for the automotive sector, among others.<sup>511</sup> The silicon carbide/aluminum composite ingots also have military applications.<sup>512</sup> The project is located in the northern industrial district of Shihezi.<sup>513</sup>

## Participation in Labor Transfer Programs

There is evidence that Hoshine has actively recruited and employed "transferred surplus labor" from rural villages around Turpan to its Shanshan facility.<sup>514</sup> The company's labor recruitment process promises "transformation of surplus rural labor into industrial workers and urban dwellers, making them become fresh combat troops for industrialization, urbanization, and agricultural modernization."<sup>515</sup> A Hoshine recruitment fair in 2017 included a visit to the County National Unity Education Hall nearby, where the recruits "unanimously agreed that Xinjiang has always been an inalienable part of the motherland, and that people of all ethnicities have staunchly resisted the incursions of foreigners for

over one hundred years.<sup>516</sup> Political indoctrination is an integral aspect of the ideological transformation imposed on rural farmers who are subject to labor transfers.<sup>517</sup>

Xinjiang Hoshine relies on government programs that place rural laborers deemed to be “surplus” in factory work. In its 2019-2021 vocational skills implementation plan, the Turpan government explicitly names Hoshine as a “key enterprise” in the “vocational skills training platform.”<sup>518</sup> One effort early in Hoshine’s development in the Uyghur Region suggests the potential scale of that collaboration. In 2017, the Turpan Bureau of Human Resources assured the media that the agency had adjusted its training of 9,800 surplus rural laborers to provide them with skills required by Hoshine and would be able to “fully meet [Hoshine’s] employment needs” for 5,000 trained laborers.<sup>519</sup> Hoshine further received subsidies from the XPCC to provide its own surplus labor vocational skills training, as a part of an extensive Turpan government multi-agency effort to employ indigenous workers in labor-intensive industries.<sup>520</sup> Guidance from the Turpan government referred to in the Xinjiang Hoshine annual report in relation to labor transfer subsidies indicates that the payments are meant to provide vocational training for “rural surplus laborers” who will be “transferred” to companies in need of workers.<sup>521</sup>

State-sponsored recruitment efforts on Xinjiang Hoshine’s behalf depend on coercive strategies that suggest non-voluntary labor. For instance, one media report depicts a married couple from rural Dikan Township who were targeted for “poverty alleviation.” They were provided a government-determined “income-increasing package,” which began with the assignment of a cadre who instructed them in Chinese language skills “to pave the way for them to leave their hometown to work.” The regional work team then assigned the couple to vocational skills training to learn to be welders in the farming off-season. The couple followed the directives of the cadre, while the regional work team still provided “encouragement and help” for them to do “pre-employment training for the surplus rural labor force,” after which they were transferred to work at Xinjiang Hoshine. Though the couple owned seven acres of grape fields that would need tending, the government “relieved the two of their worries,” by transferring their land use rights (流转) to the state. The couple was transferred to Xinjiang Hoshine, more than 50 kilometers away from home, to work as a mechanic and a product inspector in the Pichan (Ch: Shanshan) County Hoshine Silicon Industry factory, leaving behind their children and ill parents. Though the report indicates that the couple have a bright and spacious house in their village, the photos accompanying the story suggest that the couple now lives in a bunk house with other employees at Xinjiang Hoshine and only rarely return home.<sup>522</sup>

Hoshine’s “surplus labor” recruitment program explicitly strives to “change the employment concept of residents” and for the “transformation of the poor labor force’s thinking” to “strengthen the endogenous motivation of poverty alleviation.”<sup>523</sup> This implies that their inherent beliefs are opposed to poverty alleviation and that they are in need of correction that labor can provide. Hoshine’s recruitment practices thus present labor transfers as a necessary ideological disciplining process.

In 2020, Hoshine’s parent company won an award as a “social support and caring enterprise,” for its efforts to “fight against

poverty, enable local people to increase employment and income, and promote local industrial upgrading” in Pichan County, Xinjiang.<sup>524</sup>

Open worker recruitment advertisements from Hoshine suggest other discriminatory hiring practices. “Minority” workers must be able to speak Chinese and have “no bad political records.” Manual laborers are paid a piece rate of CNY 42 per ton to manually crush silicon, whereas other jobs get paid a salary.<sup>525</sup>

## Supply Chain Risk

Hoshine’s website indicates that it makes several products that are used in automotive applications, including silicone rubbers used in valves, gaskets, seals, and electronics.<sup>526</sup> “Precipitated silica,” another Hoshine product manufactured in Xinjiang,<sup>527</sup> is a replacement material for carbon black in tires; improving traction of the rubber tread. Hoshine has clearly now expanded into producing copper foils for lithium-ion batteries and other automotive uses. While it is unclear what manufacturers source silicone products from Hoshine, the high risk of continuing to do so is clear. Because all Xinjiang Hoshine silica-based products are specifically banned from entering the United States, and because the evidence of labor transfers to the company is so significant, it is imperative that companies identify silica-based products and trace those supply chains.

## DOUBLE COIN (XINJIANG) KUNLUN ENGINEERING TIRE CO., LTD. (双钱集团(新疆)昆仑工程轮胎有限公司)

Double Coin Tire Group Co., Ltd. is a top thirty global tire manufacturer whose products are sold inside China and to more than 100 countries and regions across the globe. Double Coin has four production sites in China: in Jiangsu, Chongqing, Anhui, and the XUAR.<sup>528</sup>

In 2014, Double Coin began operating a factory that had previously been a state-owned military manufacturing base to develop its Uyghur Region subsidiary, Double Coin (Xinjiang) Kunlun Engineering Tire Co., Ltd.<sup>529</sup> The company also has a factory in Korla.<sup>530</sup>

The Xinjiang Production and Construction Corps appears to have provided funding for the expansion of Double Coin’s factories in 2018 and 2019.<sup>531</sup> Google Earth satellite imagery suggests that the factory approximately doubled in size during this period.<sup>532</sup>

## Participation in Repressive Government Programs

Double Coin Xinjiang participated in the *fanghuiju* surveillance program through the company’s designated task force in a village of Maralbeshi, Kashgar. State media reports indicated that the Double Coin village task force was in the village to continuously “enhance grassroots organization, cohesion, and combat effectiveness.” The task force members teamed up with local officials to teach Chinese to the local people and train them in “rational thinking” through “daily meetings, monthly reviews, and seasonal evaluations.”<sup>533</sup>

Double Coin Xinjiang set up corporate village “task forces” that conducted these invasive *fanghuiju* visits in six villages of Kashgar.<sup>534</sup> A report from Huayi’s (Double Coin’s parent company) WeChat official account (which was also shared on Double Coin Group (Xinjiang) Kunlun Tire Co., Ltd.’s official website) claims that the company has continued its participation in *fanghuiju* programs even in the midst of the COVID-19 pandemic in 2020.<sup>535</sup>

In 2021, Double Coin Xinjiang was named one of the 101 organizations recommended by the Office of the Leading Group for Poverty Alleviation and Development of the Xinjiang Uyghur Autonomous Region.<sup>536</sup>

## Participation in Labor Transfer Programs

Double Coin Xinjiang’s involvement in labor transfers can be traced back to 2017, where the company held an “Ethnic Unity Makes a Family” (民族团结一家亲) symposium when it transferred 36 minoritized individuals into its factory from Keriya and Hotan (see Figure 28).<sup>537</sup> A 2018 work report of the Xinjiang Uyghur Autonomous Regional Emergency Management Office reported that 30 people from Ilchi, Hotan had been transferred to Double Coin Xinjiang’s factories in Korla and Ürümqi, more than a thousand kilometers from their homes.<sup>538</sup>



Figure 28. “Ethnic Unity Makes a Family” symposium to “welcome” the transferred laborers from Hotan. Source: Double Coin Website, [Online](#).

In 2018, Double Coin’s cadre leading the company’s Shanghai Aid Xinjiang program indicated that the company would participate in the “10,000 enterprises helping the villages” to find jobs for the people of the XUAR, and to provide programs that would encourage local people to “realize land appreciation, further change villagers’ thinking and living habits, and jointly build beautiful villages” when he visited Kashgar, where Double Coin Tire’s task forces were placed.<sup>539</sup> Then, in 2020, Double Coin’s factory in the Midong District of Ürümqi accepted another 47 surplus laborers from the Kashgar and Hotan regions, most of them in their twenties. The workers were paired with *fanghuiju* “relatives” who are company employees tasked with teaching the transferred laborers

about party policy, ethnic unity, the law, and Chinese language. The “relatives” are also supposed to convince the workers to stay at the factory.<sup>540</sup> Double Coin’s official website news additionally reported that the company held a forum in May of 2020 for “Ethnic Unity” month, where (likely majority Han) workers “paired up” with the (almost exclusively Uyghur or other minoritized people) surplus laborers who are employed at the factory. The company’s rhetoric indicates that they intend to transform the minoritized individuals’ ideology and turn them from farmers into factory workers.<sup>541</sup> In other words, the minoritized workers were not only transferred more than 1,500 km to Ürümqi to work at the factory, but also were under the constant surveillance of the *fanghuiju* program and “trained” by its employees not to leave their jobs.

Double Coin’s participation in the labor transfer program appears to be ongoing. The parent company’s 2021 annual report indicated that it had received a “southern Xinjiang labor subsidy” that year.<sup>542</sup> A Double Coin press release about the company’s participation in labor transfers in November of 2021 indicated that there were 110 workers transferred from Maralbeshi working at the factory at that time.<sup>543</sup>

## Supply Chain Risk

According to the company website, Double Coin supplies several domestic vehicle parts manufacturers, and specifically mentions supplying **Volvo**.<sup>544</sup> In addition to its position in the domestic tire market, Double Coin also indicates that it is increasing its presence in Pakistan, Indonesia, Vietnam, Afghanistan, Central Asia, and other neighboring countries.<sup>545</sup>

According to an industry magazine, Double Coin truck tires have 5.5% of the replacement medium truck tire market share in the US in 2022.<sup>546</sup> Customs records indicate that Double Coin ships tires from its Xinjiang subsidiary to companies in Vietnam, Pakistan, and Ecuador. Double Coin ships tires from its Shanghai Import and Export Company (which could be shipping Xinjiang-made tires as well) to its Canadian dealer **Huayi Tire, China Manufacturers Alliance** (aka CMA) and **Trelleborg Wheel Systems** also in Canada, **Magna Tires** in the United States, and other dealers in Pakistan, Ecuador, Sri Lanka, and Indonesia.<sup>547</sup> Double Coin tires can be purchased online at **Walmart**, **Amazon**, and U.K. online tire retailer **BigTyres**.<sup>548</sup> The tires sell under the brands Double Coin, Warrior, and Kunlun.

## XINJIANG JIALUN TIRE CO., LTD. (新疆嘉轮轮胎有限公司)

Xinjiang Jialun Tire Co., Ltd. was established in 2017 by Shandong Hengrui Tire Co., when it invested 1.55 billion yuan to build production facilities across almost 100 acres (600 mu) of land in the Aksu area. Jialun claims to have an annual production capacity of 1.2 million sets of all-steel high-performance radial tires, primarily for trucks, buses and other large-scale vehicles. The chief engineer for the company said in February 2022 that the company had settled in Aksu because its executives “took a fancy to the huge market potential of countries along the Belt and Road.”<sup>549</sup>

## Participation in Labor Transfer Programs

In August 2017, Sohu, one of the biggest online news platforms in China, cited the Aksu government official website's report, which claimed Shandong Hengrui Tire Co., Ltd. (山东恒锐轮胎有限公司) will invest in Aksu to establish Xinjiang Jialun Tire Co. The company stated that this enormous investment will bring over one thousand jobs to locals.<sup>550</sup> In 2020, Aksu Daily reported that Xinjiang Jialun Tire Co. planned to provide 1,200 jobs to "rural surplus labor."<sup>551</sup> This is confirmed by multiple sources that report Xinjiang Jialun Tire Co. provides over a thousand jobs to "advance rural surplus labor's employment."<sup>552</sup> One report indicated that 95% of the workforce in Jialun's factory is constituted by "local poor people."<sup>553</sup> The transferred laborers work directly in the production of Jialun's tires.

## Supply Chain Risk

In addition to selling in the domestic market, Jialun reports that its tires are also exported to more than 20 countries and regions such as Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, and Turkmenistan in Central Asia, Russia, Belarus, and Ukraine in Eastern Europe, and Iran and Iraq in the Middle East.<sup>554</sup>

## DUSHANZI PETROCHEMICAL CO., LTD. (独山子石化分公司)

Dushanzi Petrochemical Company is a subsidiary of the China National Petroleum Company (PetroChina or CNPC), operating in Karamay.<sup>555</sup> By 2017 Dushanzi accounted more than half of China's production of a synthetic rubber (SSBR). Since then, it has increased production capacity 160%.<sup>556</sup> In September 2022 it announced plans for another expansion, of 25,000 tons/year production.<sup>557</sup> According to state media, Dushanzi Petrochemical was "the only enterprise producing environmentally friendly rubber in China" as of 2021.<sup>558</sup> This purportedly "green" technology plays a key role in "helping environmentally friendly tires go international."<sup>559</sup> Among the new products Dushanzi Petrochemical developed in 2020, two were specific "specialized materials for the series of general use tires, winter tires, and racing tires."<sup>560</sup> Adjacent Dushanzi Petrochemical operations is a separate 50,000 ton/year synthetic rubber facility at Xinjiang Lande Fine Petrochemical (新疆蓝德精细石油化工有限公司),<sup>561</sup> which also ranks among China's major synthetic rubber manufacturers.<sup>562</sup>

Car tires are made of steel wires, textiles, and an array of synthetic and natural rubbers.<sup>563</sup> Among synthetic rubbers, which are petroleum byproducts, the tire industry consumes roughly 70% of global production of the solution-polymerized styrene butadiene rubber (SSBR) market, and a comparable percentage of the butadiene rubber (BR) market more broadly.<sup>564</sup> Tire manufacturing dominates the synthetic rubber industry.<sup>565</sup>

## Participation in Repressive Government Programs and Labor Transfer Programs

Dushanzi Petrochemical has carried out villager-level "pairing" with cadres,<sup>566</sup> supported construction of residential schools for Indigenous children, financed the (typically coercive) conversion of pastoralist lifestyles to agricultural labor, and engaged in labor transfers of people from poverty-stricken villages.<sup>567</sup> State media photos of one such project shows it encircled by concertina wire.<sup>568</sup> Petroleum processed at Dushanzi Petrochemical is sourced from the Tarim Oilfield, which like "all oil companies in Xinjiang" has been "actively... recruiting ethnic minority brothers to work."<sup>569</sup>

Dushanzi Petrochemical has established a poverty alleviation industrial park in a small village in the southern XUAR, which is designed for the "transfer of the poor labor force." Cadres that work for Dushanzi Petrochemical are dispatched to the village to "guide surplus laborers to transfer employment." The Dushanzi Petrochemical work team sends workers into its parent company's oilfields and to enterprises in other parts of China.<sup>570</sup> Furthermore, as the major national-level industry operating in Karamay, Dushanzi Petrochemical would be a likely destination for some of the "230 people" who "were newly resettled for the transfer of surplus labor force in southern Xinjiang" into Karamay by the government in 2019.<sup>571</sup>

## Supply Chain Risk

Major global tire manufacturers are sourcing rubber from the XUAR. According to state media, **Bridgestone**, **Michelin**, and **Kumho** are among the tire brands that have sourced from the Dushanzi Petrochemical plant in Karamay,<sup>572</sup> controlled by PetroChina, which is China's single largest producer of a specific rubber used in passenger car tires.<sup>573</sup> Additionally, domestic brand **Sailun** partners with and sources from Dushanzi Petrochemical<sup>574</sup> and sells tires internationally.

Additional supply chain risks arise as Dushanzi Petrochemical is continually launching new products. In 2020 it developed new product lines for blow-molding.<sup>575</sup> Blow molding is a technology and product used in the manufacture of car paneling, railings, bumper support, fenders, mud guards, door locking systems, consoles, garnish pillars, braking, seating, storage systems, entertainment/audio/video components, console lids, shifter knobs, steering wheels, fan shrouds, cooling systems, resonators, fuel tank systems, electrical covers, and decorative parts.<sup>576</sup>

## CONCLUSION

The auto parts manufacturing sector is rapidly expanding in the Uyghur Region. In the process of conducting this study, we researched a total of over 100 companies operating in the Uyghur Region or potentially engaged in labor transfers of minoritized citizens of the XUAR that are relevant to the automotive industry. We reviewed at least twenty more companies that had subsidiaries in the Uyghur Region. The automotive parts manufacturing sector in the region (and its attendant mining and processing of materials) is vast and rapidly expanding. Many of the car parts manufacturers we identified have only begun operations in the last year or two or are just now constructing their plants. Thus, the companies have little to no presence online and their hiring practices and other rights protections cannot yet be assessed. The automotive industry should pay attention to this expansion in the Uyghur Region and be alert to exposures to forced labor.

In addition to companies and parts discussed at length in this report, Table 7 lists companies identified in the process of this project that we have less information about but that nonetheless are manufacturing auto parts in the region.

To aid in supply chain tracing, we have included [Annex A](#) that lists all relevant companies we identified operating in the XUAR and [Annex B](#) that provides a graphic representation of the automotive supply chain exposures to the XUAR. Some of the parts manufactured in the Uyghur Region may be used in domestic production and sold within China. Nonetheless, this list should provide information valuable to due diligence efforts.

**Table 7. Additional Automotive Parts Manufacturers Operating in the Uyghur Region**

COMPANY NAME IN ENGLISH	COMPANY NAME IN CHINESE	MANUFACTURES
Jingang Tire (aka King Kong Tire, (subsidiary of Guizhou Tire Co)	金刚轮胎	Tires
Xinjiang Dekai Tire Co., Ltd.	新疆德凯轮胎有限公司	Tires
Aksu Shengtuo (aka Holy Camel) Tire Co., Ltd.	阿克苏圣驼轮胎有限公司	Tires
Xinjiang Rongteng Auto Glass Co., Ltd.	新疆荣腾汽车玻璃有限公司	Automotive glass
Aksu Xianfeng Auto Glass Co., Ltd.	阿克苏先峰汽车玻璃有限公司	Automotive glass
Ürümchi Lesheng Auto Glass Co., Ltd	乌鲁木齐乐晟汽车玻璃有限公司	Automotive glass
Ürümchi Kaiyejie Auto Glass Co., Ltd	乌鲁木齐市凯业杰汽车玻璃有限公司	Automotive glass, decorations
Xinjiang Xintong Power Technology Co. Ltd.	新疆欣通动力科技有限公司	Automotive components and accessories
Bozhou Jingchi Auto Parts Co., Ltd.	博州精驰汽车部件有限公司	Auto parts and accessories, decorations
Xinjiang Furui Auto Parts Co., Ltd.	新疆孚瑞汽车零部件有限公司	Auto parts and accessories
Xinjiang Yuanzhong Boda Auto Parts Manufacturing Co., Ltd.	新疆源众博达汽车零部件加工制造有限公司	Auto parts and accessories
Shihezi Xinhe Auto Parts Co., Ltd.	石河子市信合汽车配件有限公司	Filters

# Conclusions and Recommendations

We are six years into the crisis in the Uyghur Region, and people around the world are now aware of the atrocities being committed against Uyghurs and other minoritized citizens in western China. Governments, international bodies, tribunals, and rights groups have called the situation a genocide and crimes against humanity, and many have called for global action. Governments around the world have either adopted import bans and due diligence relevant to the forced labor-made goods or they are considering new legislation. Investors are calling on companies to disclose their entire supply chains and monitor them more thoroughly for forced labor and other rights violations related to the Uyghur Region. There is no longer any plausible deniability.

Practically every major car brand has supply chain links to the abuses in the Uyghur Region. As companies are required to reckon with this fact, they will need to rigorously evaluate the extent of their complicity in harms. Companies can no longer make the excuse that supply chains are simply too complex or allow some part of their supply chains to remain obscure. The risks to people in the Uyghur Region are too high.

The auto industry would be wise to conduct thorough reviews of supply chains, down to the raw materials. International companies should instruct their procurement teams and their suppliers to extract themselves from contracts with any companies that have engaged in any labor transfer programs in any part of their business. This is advised even if those businesses claim that those forced labor-made goods are not directly in the end manufacturer's supply chains. Too many of these materials are blended or shipped across long distances to be able to rely on supplier attestations that they have bifurcated their supply chains and are selling only the forced labor-free products to international markets. The only way to ensure that a company is not sourcing forced labor-made goods is to not buy anything from suppliers that are willing to use forced labor anywhere in their operations or source from companies that do.

Some car companies have begun developing direct sourcing relationships with raw materials producers. This is most prevalent in lithium sourcing, but it is by no means universal. Traceability in the intermediary processing steps between the mining of ore and the manufacturing of a car part remains unachieved. Many car companies have virtually no direct sourcing capability for lithium or any other raw material. The vast majority of materials, especially metals like steel and aluminum, include huge amounts of indirect sourcing. The number of suppliers for parts and materials also varies hugely by material and car brand.

Automotive companies have made internal governance commitments towards more transparency and traceability. What is needed now is the will and commitment to fully trace supply chains. This can be done most efficiently if companies collaborate. Most XUAR-originating supply chains reach many international brands. It is possible to make an industry-wide commitment to traceability—and it's possible to cross manufacturing sectors to find other

industries sourcing the same products to enhance traceability and to use their collective economic leverage to effect urgent change.

## RECOMMENDATIONS

Based on the severity and pervasiveness of forced labor identified in this report and the extent to which it pervades automotive supply chains, we recommend that governments and businesses take immediate action. We recommend the following:

### Recommendations to Governments

1. Governments and legislatures should enact and implement mandatory human rights due diligence laws and ensure the laws require companies to address human rights risks beyond first-tier suppliers, in recognition that abuses can easily be distanced from direct suppliers under state-controlled economic systems. Laws and enforcement should apply to the full supply chain, without exception. In addition to countries that already have enacted human rights due diligence laws (e.g. Germany and Norway), or are developing them (European Union), human rights due diligence laws should be a priority for countries with deep involvement in the automotive industry, such as Japan and South Korea.
2. Governments and legislatures should enact and implement bans on imports linked to forced labor. Forced labor import bans are a necessary complement to mandatory human rights due diligence, especially where state-sponsored repression prevents companies from conducting on-the-ground assessments of forced labor risks. Forced labor bans should include specific provisions to identify and prohibit the import of goods linked to state-sponsored forced labor.
3. Governments should identify the automotive sector as a priority for the implementation of forced labor import bans. Governments should devote substantial resources to identifying automotive parts and materials linked to forced labor. The United States should, in particular, name the aluminum, steel, and automotive industries as high-priority sectors under the Uyghur Forced Labor Prevention Act (UFLPA).
4. Governments should require that all procurement (including the purchase, lease, and rental) of automobiles for official use be free of parts made in whole or in part in the XUAR.

## Recommendations to Car Companies

1. Car companies should work individually and collectively to conduct or commission their own supply chain mapping and analysis of raw materials mining and processing and parts manufacturing in the XUAR.
2. Corporations in the automotive industry and commodities trading firms should engage in both internal and cross-sector collaborative efforts to cease sourcing all products mined, made, or manufactured, in whole or in part, in the Uyghur Region. This would include ending business relationships or contracts, whether direct or indirect, with any companies that have operations in the Uyghur Region or that have accepted government-supplied laborers from the Uyghur Region in other parts of China.
3. In adherence to the UN Guiding Principles on Business and Human Rights, automotive companies conducting enterprise-wide human rights due diligence should prioritize links to the XUAR as a matter of urgency, as the human rights impacts are severe and pervasive in the region. Given the impossibility of conducting meaningful assessments of forced labor risks at facilities in the XUAR, car companies' due diligence efforts should focus on identifying supply chains links to the XUAR and working with suppliers and sub-suppliers to responsibly exit the region.
4. Auto manufacturers should publicly report on findings of supply chain links to the XUAR to facilitate knowledge of supply chain risks across the automotive industry and industries with related supply chains. Decisions to terminate procurement relationships should also be made public to inform other industry actors of identified supply chain problems and promote supply chain transparency.
5. Car companies should not assume that suppliers or sub-suppliers, including mines, mineral processors, and other facilities, are free from links to forced labor in the XUAR, whether at their own facilities or in their supply chains, simply because they have made an attestation to that effect, received an industry certification, or conducted an audit pursuant to industry initiatives or supply chain due diligence schemes.
6. Auto manufacturers should exit the Uyghur Region at every level of their supply chain and cease doing business with suppliers implicated in Uyghur forced labour in line with the demands of the Coalition to End Forced Labour in the Uyghur Region.
7. Remediation of harms inside China is impossible at this time, so car companies are recommended to collaborate with raw metals industries and industry associations to implement reparations to Uyghurs and other minoritized populations in the diaspora working to address oppression and exploitation in the Uyghur Region.

## Recommendations to Other Stakeholders

1. All financial institutions and other investors (e.g. commodities traders) should divest from all companies operating in the XUAR or using state-supplied laborers from the Uyghur Region. Passive investment index funds should delist the companies identified in this report as engaging in state-sponsored labor transfers.
2. The London Metal Exchange should suspend issuing warrants to and withdraw current warrants for any companies linked directly or indirectly to state-sponsored labor transfers in the Uyghur Region. The voluntary "LME Passport" program, wherein metals traders provide ESG information and traceability/transparency data about the ingots they are trading on the exchange, should be made mandatory, and the disclosures should include full supply chain data, describing the origin of the ore, and the locations for mining, processing, smelting, other refining, and trading undertaken.

# Endnotes

Note: Most hyperlinks in this report refer to an archived version of the website, in an effort to increase link stability. Videos and PDFs are not archived in full, so any such media referenced in the notes have been uploaded to the [report's website](#) at Sheffield Hallam University. A list of all auto-industry relevant companies operating in the XUAR that were identified in this report are listed in [Annex A](#). A graphic representation of automotive supply chain exposures is available in [Annex B](#). All of the companies named in this report were contacted to provide them the opportunity to respond. Their responses are available in [Annex C](#).

1. "Global auto parts and accessories market to reach \$2.3 trillion by 2026," Global Industry Analysts, Inc. via *Cision PR Newswire*, September 8, 2021, [Online](#).
2. Felix Richter, "U.S. car industry most reliant on Chinese parts," *Statista*, February 21, 2020, [Online](#); UN Comtrade data accessed via Panjiva Market Intelligence. This data includes parts, bodies, and chassis for a range of vehicles, including tractors, motor homes, and ambulances, not just passenger vehicles.
3. John Irwin, "Top Suppliers: North America, Europe and the World," *Automotive News*, June 26, 2022, [Online](#). Wu Qingping, "2022年全球汽车零部件供应商百强榜：十家中国企业上榜挤进第二梯队" [2022 Top 100 global auto parts suppliers list: Ten Chinese companies on the list squeeze into the second echelon], *Interface News*, June 28, 2022, [Online](#).
4. "国务院关于印发《中国制造2025》的通知" [State Council notice on publication of "Made in China 2025"], State Department of China, Guo Fa No. 28, May 8, 2015, [Online](#). Specific reference to the automotive industry is in Section 6(6), with additional attention to "brand building" in Section 4; Godfrey Yeung, "Made in China 2025: The development of a new energy vehicle industry in China," *Area Development and Policy*, 4(1), September 5, 2018, [Online](#); Daniel Ren, "Exclusive | 'Made in China 2025': World's biggest auto market wants to be the most powerful maker of electric cars," *South China Morning Post*, Oct 22, 2018, [Online](#).
5. Mario Winterstein, "Automotive production trends post-COVID-19: China," *Association for Manufacturing Technology*, May 17, 2021, [Online](#); Daniel Ren, "'Made in China 2025': World's biggest auto market wants to be the most powerful maker of electric cars," *South China Morning Post*, October 22, 2018, [Online](#); Kenji Kawase, "'Made in China 2025' thrives with subsidies for tech, EV makers," *Nikkei Asia*, July 22, 2022, [Online](#).
6. Keith Bradsher, "As cars go electric, China builds a big lead in factories," *The New York Times*, May 4, 2021, [Online](#).
7. The White House, "Building resilient supply chains, revitalizing American manufacturing, and fostering broad-based growth: 100-Day reviews under Executive Order 14017," June 2021, [Online](#), p. 7. For steel and aluminum processing see, respectively: World Steel Association, "World steel in figures: 2022," April 2022, [Online](#). Also: "Statistics," International Aluminum Institute, [Online](#).
8. Drive Sustainability, the Responsible Minerals Initiative and the Dragonfly Institute, "Material change: A study of risks and opportunities for collective action in the materials supply chains of the automotive and electronics industries," July 2018, [Online](#).
9. Abey Abraham, Richard Schultz, Bertrand Rakoto, James Murphy, Leonard Ling, Matt Merta, and Joseph Dudley, "2020 North America light vehicle aluminum content and outlook: Final report summary," *Ducker Frontier*, July 2020, [Online](#), p. 14.
10. Beijing Hainachuan Auto Parts Co., Ltd. "心怀热爱 滴水入海 | 让发展与担当同行" [Love in the heart like a drop of water entering the sea | Let development and responsibility go hand in hand], *Zhihu Zhuanlan*, March 28, 2022, [Online](#).
11. "李水斌节前看望新疆少数民族农民工" [Li Shuibin in visits Xinjiang ethnic minority migrant workers before the festival], Municipal Ethnic and Religious Affairs Committee, September 15 2021, [Online](#). (See section on Joyson in the electronics chapter of this report for labor transfer evidence.)
12. Liang Shuang, "新疆巴州考察团到开发区考察" [Xinjiang Bazhou delegation visits the development zone], Qinhuangdao Economic and Technological Development Zone (QETDZ) Management Committee website, April 24, 2019, [Online](#); "新疆投资发展(集团)有限责任公司公司债券半年度报告(2018年上半年)" [Xinjiang Investment Development (Group) Co., Ltd. corporate bond semi-annual report (first half of 2018)], August 2018, [Online](#), p. 27.
13. "关于我们" [About us], Xinjiang Zhongtian corporate website, [Online](#).
14. "李水斌节前看望新疆少数民族农民工" [Li Shuibin in visited Xinjiang ethnic minority migrant workers before the festival] Municipal Ethnic and Religious Affairs Committee, September 15 2021, [Online](#). (See section on Joyson in the electronics chapter of this report.)
15. Mekonnen Asmare Fentahun and Mahmut Ashen Savaş, "Materials used in automotive manufacture and material selections using Ashby charts," *International Journal of Materials Engineering*, 8(3), 2018, [Online](#), p. 40-54.
16. Drive Sustainability, the Responsible Minerals Initiative and the Dragonfly Institute, "Material change: A study of risks and opportunities for collective action in the materials supply chains of the automotive and electronics industries," July 2018, [Online](#).
17. China Business Industry Research Institute, "2022年中国汽车零部件产业链全景图上中下游市场及企业分析" [2022 China auto parts industry chain panorama upstream, midstream and downstream markets and enterprise analysis], Dongchedi, June 28, 2022, [Online](#).
18. For weak environmental enforcement see: Yingming Zhu, Nian Wang and Ronghui Xie, "Exploring the role of heterogeneous environmental regulations in industrial agglomeration: A fresh evidence from China," *Sustainability*, 14, August 31, 2022, [Online](#), p. 1-17. For weak labor law enforcement when the Chinese state favors businesses see: Raymond Fisman and Yongxiang Wang, "The mortality cost of political connections," *The Review of Economic Studies*, 82(4), October 2015, [Online](#), p. 1346-1382.
19. "新疆维吾尔自治区国民经济和社会发展第十三个五年规划纲要" [Outline of the 13<sup>th</sup> Five-Year Plan for the national economic and social development of the XUAR] National Development and Reform Commission, May 2016, [Online](#), p. 48-49; "新疆生产建设兵团国民经济和社会发展第十四个五年规划和2035年远景目标纲要" [Xinjiang Production and Construction Corps national economic and social development 14th Five-Year Plan and 2035 vision outline] *National Development and Reform Commission*, March 31, 2021, [Online](#), p. 41, 42.
20. Jin Wei, "新疆打造西北汽车制造出口基地" Xinjiang builds northwest automotive manufacturing

and export base], *China Business Times*, November 18, 2014, [Online](#).

21. “关于印发中国制造2025新疆行动方案的通知” [Notice on publication of the Made in China 2025 Xinjiang action plan] State Council Information Office of the People’s Republic of China, June 2, 2016, [Online](#).

22. See, for example, Ministry of Finance State Tax Administration, “关于新疆困难地区新办企业所得 税优惠政策的通知” (“Notice regarding preferential income tax policies for newly established enterprises in hardship areas in Xinjiang”), No. 53, June 24, 2011, [Online](#); People’s Government of Xinjiang Uyghur Autonomous Region, “新疆维吾尔自治区人民政府关于促进我区出口生产企业发展的税收政策的通知” (“Notice of the People’s Government of the Xinjiang Uyghur Autonomous Region on the tax policy for promoting the development of export production enterprises in our region”), No. 117, November 10, 2010, [Online](#); “兵团石河子国家高新区技术产业开发区 关于鼓励创新创业发展的若干规定” (“Several provisions on encouraging innovation and entrepreneurship development in the Technology Industry Development Zone of the Shihezi National High-tech Zone of the Corps”), EmTown, June 19, 2018, [Online](#); Turpan Municipal Bureau of Human Resources and Social Security, “吐鲁番市职业技能提升行动实施方案（2019-2021年）” [Turpan city vocational skills upgrading action implementation plan (2019-2021)], Turpan Executive Office (2019) No. 53, September 17, 2020, [Online](#); “减税降费助力新疆脱贫攻坚” [Tax cuts and fee reductions to help Xinjiang fight poverty], Xinjiang Autonomous Region Tax Service, State Taxation Administration, 2020, [Online](#); “新疆：让扶贫举措更细 让脱贫效果更实” [Xinjiang: Making poverty alleviation measures more detailed, making poverty alleviation more effective], 2019, [Online](#); “和田纺织服装产业投资政策” [Hotan textile and apparel industry investment policy], Hotan District Investment Promotion Bureau, May 23, 2017, [Online](#); “新疆：重点支持南疆纺织服装产业发展” [Xinjiang: Focus on supporting the development of textile and garment industry in southern Xinjiang], China Business News Network, April 17, 2018, [Online](#); Wang Yuzhao, “新疆‘千企帮千村’惠及26万余名贫困农牧民” [Xinjiang’s ‘Thousands of Enterprises Helping Thousands of Villages’ benefited more than 260,000 poor farmers and herdsmen], Ministry of Agriculture and Rural Affairs of the People’s Republic of China, August, 19, 2020, [Online](#).

23. “刚刚！乌鲁木齐公布2022年优化营商环境 87项措施！” [Breaking! Ürümchi announces 87 measures to optimize the business environment in 2022!], *Ürümchi Housing Market* via *NetEase*, March 6, 2022, [Online](#); “乌鲁木齐：2022年 87项优化营商环境措施刚刚公布，年内全部落地见效！” [Ürümchi: 87 measures to optimize the business environment in 2022 have just been announced, and all of them will be effective within the year!], *Tencent.com*, March 2022, [Online](#).

24. See section on Guanghui Group in the Interiors, Tires, and Other Parts chapter of this report.

25. Citic Dicastal and Wikiway both reportedly considered operating in Korla as a result of a 2019 Counterpart Support Cooperation Agreement with Qinhuangdao Economic and Technological Development Zone (Hebei), per state media announcements. It is unclear whether the companies subsequently expanded into the Uyghur Region. See Liang Shuang, “新疆巴州考察团到开发区考察” [Xinjiang Bazhou delegation visits the development zone], Qinhuangdao Economic and Technological Development Zone (QETDZ) Management Committee website, April 24, 2019, [Online](#); Wu Wenchao, “库尔勒经济技术开发区与秦皇岛经开区签订对口支援合作协议” [Korla Economic and Technological Development Zone signs counterpart support cooperation agreement with Qinhuangdao Economic Development Zone], *Silk Road Loulan Network* via *Sohu News*, April 21, 2019, [Online](#).

26. Zhao Shanbin, “玛纳斯县举行千万只锻造铝轮毂及新能源项目签约仪式” [Manas County held ‘ten million forged aluminum wheels and new energy project’ signing ceremony], *Tianshan Net News*, August 12, 2022, [Online](#). The footprint is adjacent to the Jiarun Aluminum Smelter, covered in the aluminum chapter in this report, and operated by Ningbo Hengyang Machinery Co., Ltd (宁波经济技术开发区恒阳机械有限公司). It was referred to as the “3366 Development Direction,” in Government of Xinjiang. “Economic Development Zone (Toutunhe District) entity industrial park investment manual” [经开区（头屯河区）实体产业园招商手册], September 2021, [Online](#), p. 1-2.

27. “携手共建和平繁荣开放创新文明之路” [Join hands to build a peaceful, prosperous, open, innovative and civilized road], *Xinjiang Uyghur Autonomous Region People’s Government* via *Sina News*, May 16, 2017, [Online](#). Khorghos Che Mach Aluminum Casting (also called Cermak E-Automotive Tech (Khorghos)) established the “largest-scale lost foam automatic production line in China” in Khorghos and was “expected to supply the first batch of samples to France’s Peugeot Citroen Group, Germany’s BMW Group and Mercedes Benz Group” by end-of-January 2021. “【快讯】博奥镁铝加速生产镁合金压铸部件：森森集团启动上市辅导：国盛车马赫1月底为国际车企提供铝铸件样品” [[Special News] Boao Magnesium and Aluminum accelerates the production of magnesium alloy die casting parts; Sensen Group starts listing guidance; Guosheng Che Mach provides aluminum casting samples for international car companies at the end of January], *001CNDC*, January 21, 2021, [Online](#). Other automotive sector operators in the Khorghos Qingshuihe Industrial Park (在清水河千亿级产业园区内), within the XPCC’s National Khorghos Industrial Development Zone (霍尔果斯经济开发区兵团分区) include: Khorghos Dongchuan Optoelectronics Technology Co.; Khorghos Guosheng Caral Metal Technology Co., Ltd. (霍尔果斯雪人卡拉尔金属技术有限公司, a sister company

of Che Mach, producing automobile chassis), Khorghos Anda New Energy Electric Vehicle (霍尔果斯安达新能源电动车科技有限公司); Shandong Haike Vehicle Technology Co., Ltd. Khorghos (山东海科车业科技有限公司); and Khorghos Ferret New Energy Vehicle Co Ltd (霍尔果斯菲瑞特新能源汽车股份有限公司). See also: “两霍两伊”一体化战略实施一年——千亿级产业园区阔步走来” [One-year implementation of the “2 Huo’s, 2 Yi’s” integration strategy—industrial parks of 100 billion level are striding forward], *Tianshan Net- Xinjiang Daily*, March 22, 2022, [Online](#); Chen Qiangwei, “新疆霍尔果斯20个项目同时开工 总投资24.62亿元全部为社会资本” [20 projects in Khorghos, Xinjiang, start at the same time, with a total investment of 2.462 billion yuan, all of which are social capital], *China Daily*, July 20, 2019, [Online](#); “新能源汽车生产基地项目落户霍尔果斯” [New energy electric vehicle production base project settled in Khorghos], *Tianshan* via *Sohu*, March 24, 2017, [Online](#).

28. See Toutunhe section of this chapter.

29. “汽车特种零部件项目” [Automobile special parts project], *Xinjiang Merchants Network*, [Online](#).

30. Office of the Administrative Committee of Ürümchi Economic and Technological Development Zone (Toutunhe District People’s Government), “关于加快推动乌鲁木齐经济技术开发区（头屯河区）汽车产业链招商引智工作的若干支持政策（试行）” [Several supporting policies on accelerating the promotion of investment promotion of the automobile industry chain of the Ürümchi Economic and Technological Development Zone (Toutunhe District) (for Trial Implementation)], May 9, 2022, [Online](#).

31. “霍尔果斯吹响招商引智冲锋号” [Khorghos sounds the charge of attracting investment], *Tianshan*, March 2, 2022, [Online](#).

32. “新疆塔城：到2025年，汽车新车销售总量的20%应为新能源汽车” [Xinjiang Tacheng: By 2025, 20% all new car sales should be new energy vehicles], *Tram Resources*, May 13, 2022, [Online](#).

33. “上半年中欧班列再创历史新高” [China-Europe freight train hits record high in first half of year], *Xinhua* via *Taizhang*, July 5, 2022, [Online](#).

34. This brief section detailing the scope, scale, and severity of forced labor in the Uyghur Region has appeared in previous reports written by this research team and the evidence of the claims here are expanded upon in all of our previous reports on the crisis in the Uyghur Region. Evidence of the claims that follow can be found in the following: Amy Lehr and Mariefaye Bechrakis, “Connecting the dots in Xinjiang: forced labor, forced assimilation, and Western supply chains,” Center for Strategic and International Studies, 2019, [Online](#), p. 4-8; Amy Lehr, “Addressing forced labor in the Xinjiang Uyghur Autonomous Region: Toward a shared agenda,” Center for Strategic and International Studies, July 2020, [Online](#); Vicky Xiuzhong

- Xu et al., "Uyghurs for sale: 'Re-education', forced labor, and surveillance beyond Xinjiang," Australian Strategic Policy Institute, 2020, [Online](#); Adrian Zenz, "Coercive labor and forced displacement in Xinjiang's cross-regional labor transfer program: A process-oriented evaluation," Jamestown Foundation, 2021, [Online](#), p. 19-21 and 24-25; Adrian Zenz, "Beyond the camps: Beijing's long-term scheme of coercive labor, poverty alleviation and social control in Xinjiang," *Journal of Political Risk*, 7(12), December 2019, [Online](#); Alison Killing and Megha Rajagopalan, "The factories in the camps," *Buzz-Feed News*, December 28, 2020 (updated January 4, 2021), [Online](#); Laura T. Murphy and Nyrola Elimä, "In broad daylight: Uyghur forced labour in global solar supply chains," Sheffield Hallam University Helena Kennedy Centre for International Justice, May 2021, [Online](#); and Laura T. Murphy et al., "Laudering cotton: How Xinjiang cotton is obscured in international supply chains," Sheffield Hallam University Helena Kennedy Centre for International Justice, November 2021, [Online](#); Laura T. Murphy, Jim Vallette and Nyrola Elimä, "Built on repression: PVC building materials' reliance on labor and environmental abuses in the Uyghur Region," Sheffield Hallam University Helena Kennedy Centre for International Justice, February 2022, [Online](#); Laura T. Murphy, Nyrola Elimä and David Tobin, "Until nothing is left: China's settler corporation and its human rights violations in the Uyghur Region. A report on the Xinjiang Production and Construction Corps," Sheffield Hallam University Helena Kennedy Centre for International Justice, July 2022, [Online](#).
35. "Uyghur Forced Labor Prevention Act," *U.S. Government Publishing Office*, 117<sup>th</sup> Congress, 2021-2022, [Online](#).
36. See "Hundred Questions and Hundred Examples: Cadre Handbooks in the *Fanghuiju* Campaign," *The University of British Columbia*, [Online](#); "China: Visiting officials occupy homes in Muslim region 'becoming family' campaign intensifies repression in Xinjiang," *Human Rights Watch*, May 13, 2018, [Online](#); Dake Kang and Yanan Wang, "China's Uighurs told to share beds, meals with party members," *AP News*, November 30, 2018, [Online](#); Nyrola Elimä, "China cannot silence me," *The New Yorker*, December 2021, [Online](#); Peter Goff, "Become family: China sends officials to stay with Xinjiang minorities," *The Irish Times*, December 17, 2019, [Online](#); Darren Byler, "Why Chinese civil servants are happy to occupy Uyghur homes in Xinjiang," *CNN*, November 10, 2018, [Online](#); Shohret Hoshur, "Male Chinese 'relatives' assigned to Uyghur homes co-sleep with female 'hosts,'" *Radio Free Asia*, October 31, 2019, [Online](#).
37. "访民情、惠民生、聚民心"新疆20万机关干部深入基层住万村" [Visit the People, Benefit the People, and Bring Together the Hearts of the People] 200,000 government officials in Xinjiang live in tens of thousands of villages at the grassroots level], *People.cn*, 2014, [Online](#).
38. James Leibold, "Surveillance in China's Xinjiang region: Ethnic sorting, coercion, and inducement," *Journal of Contemporary China*, 29(121), 2020, [Online](#), p. 46-60.
39. Darren Byler, "As if you've spent your whole life in prison: Starving and subdued in Xinjiang detention centers," *SupChina*, December 5, 2018; Julia Famularo, "Fighting the enemy with fists and daggers: The Chinese Communist Party's counter-terrorism policy in the Xinjiang Uyghur Autonomous Region," *Terrorism and counter-terrorism in China: Domestic and foreign policy dimensions*, Oxford University Press, 2018; Maya Wang, "Eradicating ideological viruses: China's campaign of repression against Xinjiang's Muslims," *Human Rights Watch*, 2018, [Online](#).
40. "Apartheid with Chinese characteristics: China has turned Xinjiang into a police state like no other," *The Economist*, May 31, 2018, [Online](#); Maya Wang, "Eradicating ideological viruses: China's campaign of repression against Xinjiang's Muslims," *Human Rights Watch*, 2018, [Online](#).
41. "新疆局地组织民众识别75种宗教极端活动" [Xinjiang organizes people to identify 75 kinds of religious extremist activities], *Sina*, December 24, 2014, [Online](#); see also: Cao Siqi, "Xinjiang counties identify 75 forms of religious extremism," *Global Times*, December 25, 2014, [Online](#).
42. See Xinjiang Victims Database, [Online](#).
43. "Volkswagen CEO Diess 'not aware' of China's Uyghur Camps," *DW News Asia*, April 17, 2019, [Online](#).
44. Monica Raymunt and Michael Nienaber, "Volkswagen faces mounting scrutiny over Xinjiang Presence," *Bloomberg News*, June 17, 2022, [Online](#); John Sudworth, "China Muslims: Volkswagen says 'no forced labour' at Xinjiang plant," *BBC News*, November 12, 2020, [Online](#).
45. SAIC Volkswagen, "Plants," [volkswangroup-china.com.cn](#), [Online](#); "上海大众新疆工厂正式奠基," [Shanghai Volkswagen Xinjiang Plant officially lays foundation stone], *First Financial Daily*, May 30, 2012, [Online](#); See also: SAIC Motor, "上海汽车集团股份有限公司2021年年度报告" [SAIC Motor Cooperation Limited annual report 2021], April 28, 2022, [Online](#), p. 13.
46. "2015-2020年新疆维吾尔自治区汽车产量及月均产量对比分析" [Comparative analysis of automobile production and monthly average production in Xinjiang Uyghur Autonomous Region from 2015 to 2020] *Sohu*, May 1, 2021, [Online](#).
47. "2021年6月上汽大众汽车（新疆）有限公司轿车产量统计分析" [Statistical analysis of car production of SAIC Volkswagen (Xinjiang) Co., Ltd. in June 2021], *Sohu*, September 8, 2021, [Online](#); "2022年6月上汽大众汽车（新疆）有限公司轿车产量统计分析" [Statistical analysis of car production of SAIC Volkswagen (Xinjiang) Co., Ltd. in June 2022], *Huaon*, August 9, 2022, [Online](#).
48. "上汽大众汽车（新疆）有限公司" [SAIC Volkswagen (Xinjiang) Co., Ltd.] *Aiqicha*, [Online](#); "上汽大众汽车有限公司仪征分公司" [SAIC Volkswagen Co., Ltd. Yizheng branch] *Qixin*, [Online](#); "上汽大众汽车有限公司宁波分公司" [SAIC Volkswagen Co., Ltd. Ningbo branch] *Aiqicha*, [Online](#).
49. "China: Volkswagen defends Xinjiang operations amid reports of human rights abuses," *DW News*, May 30, 2022, [Online](#); Monica Raymunt and Michael Nienaber, "Volkswagen faces mounting scrutiny over Xinjiang Presence," *Bloomberg News*, June 17, 2022, [Online](#); "Volkswagen CEO defends operations in China's Xinjiang," *Handelsblatt reports*, *Reuters*, May 30, 2022, [Online](#).
50. Selina Cheng, "Volkswagen to keep factory running in China's Xinjiang region," *The Wall Street Journal*, July 15, 2022, [Online](#).
51. I'm Someone Who Loves to Share, "开工不足，人员流失，上汽大众新疆基地员工的去留担" [Underemployment, staff turnover, concerns of employees at SAIC Volkswagen's Xinjiang base] *Dongchedi*, June 8, 2020, [Online](#).
52. Selina Cheng, "Volkswagen to keep factory running in China's Xinjiang region," *The Wall Street Journal*, July 15, 2022, [Online](#).
53. John Sudworth, "China Muslims: Volkswagen says 'no forced labour' at Xinjiang plant," *BBC News*, November 12, 2020, [Online](#).
54. I'm Someone Who Loves to Share, "开工不足，人员流失，上汽大众新疆基地员工的去留担忧" [Underemployment, staff turnover, concerns of employees at SAIC Volkswagen's Xinjiang base] *Dongchedi*, June 8, 2020, [Online](#).
55. "GT Voice: VW CEO shows courage in rejecting political pressure on Xinjiang plant," *Global Times*, September 5, 2022, [Online](#).
56. Xinjiang Job Fair, "上汽大众新疆招聘（年薪10万左右）" [SAIC Volkswagen Xinjiang recruitment (annual salary of about 100,000)], *WeChat*, April 27, 2018, [Online](#).
57. "Base problem: Forced labor risks in China's aluminum sector," *Horizon Advisory*, April 2022, [Online](#); David Stringer, "BMW, Volkswagen suppliers face scrutiny over ties to Xinjiang," *Bloomberg*, April 8, 2022, [Online](#).
58. Ana Swanson and Chris Buckley, "Red flags for forced labor found in China's car battery supply chain," *New York Times*, June 20, 2022, [Online](#).
59. McKinsey & Co., "Reimagining industrial supply chains," McKinsey website, August 11, 2020, [Online](#).
60. "Uyghur Forced Labor Prevention Act: U.S. Cus-

- toms And Border Protection operational guidance for importers,” CBP Publication No. 1793-0522, US CBP DHS, June 13, 2022, [Online](#).
61. “Just and sustainable economy: Commission lays down rules for companies to respect human rights and environment in global value chains,” Press Release, European Commission, February 23, 2022, [Online](#); “A new EU regulatory framework for batteries,” European Parliament, March 2022, [Online](#); “Commission moves to ban products made with forced labour on the EU market,” Press Release, European Commission, September 14, 2022, [Online](#).
62. Drive Sustainability, the Responsible Minerals Initiative and the Dragonfly Institute, “Material change: A study of risks and opportunities for collective action in the materials supply chains of the automotive and electronics industries,” July 2018, [Online](#).
63. “经开区（头屯河区）实体产业园招商手册” [Economic Development Zone (Toutunhe District) entity industrial park investment manual], Government of Xinjiang, September 2021, [Online](#). See reference to the “3366 Development Direction” within the Manual on p. 1-2. This manual has been archived in full on the website for this report, in case it is removed from the internet.
64. “Ürümchi Economic and Technological Development Zone (Toutunhe District),” *Investinchina.org* via *China Daily*, February 20, 2019, [Online](#).
65. “乌鲁木齐经开区（头屯河区）将建新能源汽车项目” [Ürümchi Economic Development Zone (Toutunhe District) will build a new energy vehicle project], *Tianshan*, October 8, 2018, [Online](#).
66. “「抓好兩統籌 實作開門紅」經開區(頭屯河區)2022年春季首批重點項目複工複產” [Doing a good job of coordinating the implementation of the two: Economic Development Zone (Toutunhe District) first batch of key projects to resume work and production in the spring of 2022]. *Xinjiang Net*, March 4, 2022, [Online](#).
67. Sun Tingwen, “2022年乌鲁木齐经开区（头屯河区）500万元以上投资项目共计194项” [In 2022, there will be a total of 194 investment projects of more than 5 million yuan in Ürümchi Economic and Technological Development Zone], *China News Service Xinjiang*, March 4, 2022, [Online](#). “「抓好兩統籌 實作開門紅」經開區(頭屯河區)2022年春季首批重點項目複工複產” [Doing a good job of coordinating the implementation of the two: Economic Development Zone (Toutunhe District) first batch of key projects to resume work and production in the spring of 2022], *Xinjiang Net*, March 4, 2022, [Online](#).
68. Xie Long, “两河高端制造科技产业园建设项目有序推进” [The construction project of Lianghe High-end Manufacturing Technology Industrial Park is progressing in an orderly manner], *Xinjiang Daily*, June 17, 2022, [Online](#).
69. Xinjiang Government, 新疆今年一季度近40万人次就业 [Nearly 400,000 people employed in Xinjiang in the first quarter of this year]. *Xinjiang Government Network*, June 20, 2016, [Online](#); Sun Yuanyuan, “皮山富余劳动力来乌鲁木齐经开区上班了” [Guma’s surplus labor came to work in Ürümchi Economic Development Zone], *Xinjiang Toutiao News*, March 15, 2020, [Online](#).
70. Laura T. Murphy, Nyrola Elimä, and David Tobin, “Until nothing is left: China’s settler corporation and its human rights violations in the Uyghur Region: A report on the Xinjiang Production and Construction Corps,” Sheffield Hallam University Helena Kennedy Centre for International Justice, July 2022, [Online](#), p. 33-35.
71. Gao Di, Zhang Yiping, Qu Xinping, Li Zhixian, Dong Juanjuan, Liu Yang, Ma Liying, Chen Hui, and Bai Ping, “精准扶贫放大招！来看看十二师各团场都怎么做？” [Targeted poverty alleviation is a big move! Let’s see how the 12th Division’s group field is doing?] *Tianshan Times*, February 22, 2017, [Online](#); Of the 229, 53 took up “welfare positions” while 176 were employed after “training in enterprises,” see: Tian Huichao and Du Dongling, “【民族团结一家亲】短短一个月，他家的月收入为啥增长了3倍” [[National unity one family] Why did his family’s monthly income triple in just one month?] *Zero Distance Economic Development Zone*, July 17, 2017, [Online](#).
72. Sun Yuanyuan, “皮山富余劳动力来乌鲁木齐经开区上班了” [Guma’s surplus labor came to work in Ürümchi Economic Development Zone] *Xinjiang Toutiao News*, March 15, 2020, [Online](#).
73. Li Chunxia, Zhao Chunhua, Fu Xianglong, Gai Youjun, Zuo Xiaoyu, “留得下 稳得住 有收入——1800余名和田地区贫困劳动力转移乌昌地区就业侧记” [Remaining, Stable and Earning Income——Over 1,800 impoverished laborers in Hotan area transferred to Wuchang area for employment], *Xinjiang Daily*, March 15, 2020, [Online](#).
74. “乌鲁木齐经济技术开发区（头屯河区）2020年扶贫类资金公开（上半年）” [Ürümchi Economic and Technological Development Zone (Toutunhe District) 2020 poverty alleviation funds disclosure (first half of year)], Ürümchi Economic and Technological Development Zone (Toutunhe District), May 7, 2020, [Online](#). See also: “中共中央國務院關於表彰全國脫貧攻堅先進個人和先進集體的决定” [Decision of the Central Committee of the Communist Party of China and the State Council on commending the national advanced individuals and advanced collectives in poverty alleviation] China Central Committee via *Xinhua News Agency*, February 25, 2021, [Online](#).
75. “乌鲁木齐经开区（头屯河区）将建新能源汽车项目” [Ürümchi Economic Development Zone (Toutunhe District) will build a new energy vehicle project], *Tianshan*, October 8, 2018, [Online](#).
76. The Xinjiang subsidiary’s name is 新疆丰华神州汽车配件股份有限公司地. See: Xinjiang Fenghua Shenzhou Auto Parts Co. (新疆丰华神州汽车配件股份有限公司地), *Aiqicha*, [Online](#); “公司简介” [Company profile], Fenva Corporate Website, Accessed September 28, 2022, [Online](#); “WXQP Fenghua Shenzhou Auto Parts Co. Ltd,” Solid Prof Group Wholesale Auto Parts website, [Online](#); “SAP Auto Parts Customer—Fenva Auto Parts Co., Ltd.,” MTC, [Online](#). Note: The archived version of the Fenva site from which we have quoted does not show all components of the dynamic website. Screenshots available upon request.
77. Amazon US search results for “Fenva,” Accessed September 24, 2022, [Online](#); “WXQP Auto Parts,” Amazon.com, Accessed September 24, 2022, [Online](#); Amazon UK search results for “WXQP,” Accessed September 24, 2022, [Online](#).
78. “新疆众合汽车配件制造有限公司” [Xinjiang Zhonghe Auto Parts Manufacturing Co., Ltd.], *Aiqicha*, [Online](#).
79. “乌鲁木齐经开区（头屯河区）将建新能源汽车项目” [Ürümchi Economic Development Zone (Toutunhe District) will build a new energy vehicle project], *Tianshan*, October 8, 2018, [Online](#); “Zhengwei group Xinjiang new material industrial park has an annual output of 250,000 tons of low oxygen bright copper rod continuous casting and rolling production line put into operation,” *Equal Ocean*, April 2, 2022, [Online](#).
80. “头屯河农场城市化进程中的美丽蜕变” [The beautiful transformation in the urbanization process of Toutunhe Farm], *Sohu News*, October 15, 2015, [Online](#); “八一钢铁：八一钢铁收购金属制品资产评估报告” [Bayi Iron and Steel: Asset evaluation report of Bayi Iron and Steel’s acquisition of metal products], *Beijing Zhongtonghua Assets Appraisal Co., Ltd.*, May 21, 2021, [Online](#).
81. “新疆司拓汽车零部件制造有限公司” [Xinjiang Situo Auto Parts Manufacturing Co., Ltd.], EC Plaza, [Online](#); “Xinjiang Situo Auto Parts Manufacture Co., Ltd.” *Made-in-China*, [Online](#); “新疆斯拓汽车零部件制造有限公司” [Xinjiang Situo Auto Parts Manufacturing Co., Ltd.], *Xinjiang Talent Network*, [Online](#).
82. “新疆仁奥汽车零部件有限公司” [Xinjiang Renao Auto Parts], *Aiqicha*, [Online](#).
83. “新疆仁奥汽车部件有限公司” [Xinjiang Renao Auto Parts Co., Ltd.] *Shunqi*, [Online](#).
84. “About us,” Xinjiang Xinye Auto Parts Co., Ltd. website, [Online](#). Xinye’s international brand, Truckman, is actively working to “increase the volume of business in the field of Japanese, Korean, German cars.”
85. “新疆浙新汽车科技有限公司” [Xinjiang Zhexin Automobile Technology Co., Ltd.], *Qichacha*, [Online](#).
86. “新疆同风汽车零部件再制造科技有限公司”

- [Xinjiang Tongfeng Auto Parts Remanufacturing Technology Co., Ltd.], *Aiqicha*, [Online](#).
87. “广汽乘用车有限公司(新疆分公司)详情” [GAC Passenger Vehicle Co., Ltd. Xinjiang branch], *Xinjiang Talent Network*, [Online](#). It is unclear whether the Toutunhe facility manufactures cars for domestic or international consumption.
88. World Steel Association, “Global steel market overview,” Global Forum on Steel Excess Capacity, Tokyo, October 2019, [Online](#), p. 4.
89. Abey Abraham, Richard Schultz, Bertrand Rakoto, and James Murphy, “2020 North America light vehicle aluminum content and outlook: Final report summary,” *Ducker Frontier*, July 2020, [Online](#), p. 14.
90. World Steel Association, “Steel in automotive,” [Online](#); WorldSteel estimates 900kg, using 2015 data; 2020 estimates are closer to 831kg. See: Abey Abraham, Richard Schultz, Bertrand Rakoto, and James Murphy, “2020 North America light vehicle aluminum content and outlook: Final Report Summary,” *Ducker Frontier*, July 2020, [Online](#), p. 14.
91. World Steel Association, “World steel in figures: 2022,” April 2022, [Online](#).
92. David Uren, “Editors’ picks for 2021: ‘No end in sight for China’s dependence on Australian iron ore,’” ASPI Strategist, January 6, 2022, [Online](#); James Holloway, Ivan Roberts, and Anthony Rush, “China’s steel industry,” Reserve Bank of Australia, December 2010, 21, [Online](#); Su-Lin Tan, “Australian iron imports to China slow but ‘roaring’ demand likely to return, analysts say,” *South China Morning Post*, February 4, 2022, [Online](#).
93. “新疆维吾尔自治区国民经济和社会发展: 第十三个五年规划纲要” [National economic and social development of the Xinjiang Uygur Autonomous Region: Outline of the 13<sup>th</sup> Five-Year Plan], May 2016, [Online](#), p. 47.
94. “新疆维吾尔自治区国民经济和社会发展: 第十三个五年规划纲要” [National economic and social development of the Xinjiang Uygur Autonomous Region: Outline of the 13<sup>th</sup> Five-Year Plan], May 2016, [Online](#), p. 44, 47.
95. “钢铁行业点评报告: 基建爆发钢价大涨, 新疆钢铁业再迎上升期” [Steel industry review report: Steel prices soar as infrastructure breaks out, Xinjiang steel industry ushers in another upswing], Soochow Securities Research Institute, July 11, 2020, [Online](#), p. 4-5.
96. “2021年4月宝钢集团新疆八一钢铁有限公司钢材、粗钢、生铁产量分别为81.7万吨、79.6万吨和72.9万吨” [In April 2021, the output of steel, crude steel and pig iron of Baosteel Group Xinjiang Bayi Iron and Steel Co., Ltd. were 817,000 tons, 796,000 tons and 729,000 tons respectively], Zhiyan Consulting, July 9, 2021, [Online](#).
97. See section on Baowu below.
98. “新疆奎屯对口支援喀什塔什库尔干就业扶贫” [Xinjiang Kuytun counterpart supports Kashgar Tashqorghhan employment and poverty alleviation in counterpart capacity], *Central Radio Network*, November 3, 2016, [Online](#); Chen Pei, “徐州援疆工作组帮助奎屯市少数民族就业” [Xuzhou Aid Xinjiang working group helps minority employment in Kuytun City], *Yaxin Net News*, December 28, 2018, [Online](#).
99. Shougang Yili Steel Co., Ltd. “一手抓疫情防控 一手抓脱贫攻坚 首钢伊钢公司克服困难接收安置南疆深贫劳动力再就业” [Focus on epidemic prevention and control on the one hand and poverty alleviation on the other], *Weixin*, March 28, 2020, [Online](#).
100. “新疆天山钢铁巴州有限公司” [Xinjiang Tianshan Iron and Steel Bazhou Co., Ltd.], *Qichacha*, [Online](#).
101. Xinxing Casting Pipe Co., “新兴铸管股份有限公司2021 年度社会责任报告” [2021 social responsibility report of Xinxing Casting Pipe Co.], April 2022, [Online](#).
102. World Steel Association, “World steel in figures: 2022,” April 2022, [Online](#).
103. Sinolink Securities Resource and Environment Resource Center, “八一钢铁 600581.SH 增持 首次评级” [Bayi Iron and Steel (600581.SH) increase holdings (maintain rating)], April 28, 2022, [Online](#).
104. “Global 500: China Baowu Steel Group,” *Fortune*, 2022, [Online](#).
105. “八一钢铁” [Bayi Steel], *Baidu*, [Online](#). For more on Wang Zhen’s accession of the Uyghur Region, his brutal rule there, and his development of the XPCC, see Jim Milward, *Eurasian Crossroads: A History of Xinjiang*, New York: Columbia University Press, 2007, p. 237-242; Donald H. McMillen, *Chinese Communist Power and Policy in Xinjiang: 1949-1977*, Boulder, CO: Westview Press, 1979, p. 31-32, 42, 59-67; and Tom Cliff, “Xinjiang today: Wang Zhen rides again?” *Made in China*, January 1, 2018, [Online](#).
106. “八一钢铁” [Bayi Steel], *Baidu*, [Online](#); Sinolink Securities Resource and Environment Resource Center, “八一钢铁 600581.SH 增持 首次评级” [Bayi Iron and Steel (600581.SH) increase holdings (maintain rating)], April 28, 2022, [Online](#). Calculations based on comparing Sinolink’s accounting of Bayi’s 2021 production against World Steel’s accounting of Baosteel’s total 2021 production.
107. Wang Chao and Mao Weihua, “Breaking new ground,” *China Daily*, July 13, 2012, [Online](#).
108. “Iron and steel: Baosteel Group Xinjiang Bayi Iron & Steel Co. Ltd.,” Baosteel website, [Online](#); Sinolink Securities Resource and Environment Resource Center, “八一钢铁 600581.SH 增持 首次评级” [Bayi Iron and Steel (600581.SH) increase holdings (maintain rating)], September 5, 2020, 3, [Online](#).
109. “八一钢铁” [Bayi Steel], *Baidu*, [Online](#); LXIYUN, “西域明珠 八一钢铁” [Bayi Steel, pearl of the western regions], China Iron Network, October 9, 2018, [Online](#).
110. “Company profile,” Baowu Steel website, [Online](#).
111. LXIYUN, “西域明珠 八一钢铁” [Bayi Steel, pearl of the western regions], China Iron Network, October 9, 2018, [Online](#).
112. Zhuang Jian, “拟出资14亿, 中国宝武旗下天山钢铁将控股新疆伊犁钢铁” [It is planned to invest 1.4 billion, and Tianshan Iron and Steel, a subsidiary of China Baowu, will hold Xinjiang Yili Iron and Steel], *Jiemian News*, November 25, 2020, [Online](#).
113. Zhuang Jian, “拟出资14亿, 中国宝武旗下天山钢铁将控股新疆伊犁钢铁” [It is planned to invest 1.4 billion, and Tianshan Iron and Steel, a subsidiary of China Baowu, will hold Xinjiang Yili Iron and Steel], *Jiemian News*, November 25, 2020, [Online](#).
114. Sinolink Securities Resource and Environment Resource Center, “八一钢铁600581.SH 增持 首次评级” [Bayi Iron and Steel (600581.SH) overweight (initial rating)], September 5, 2020, 7, [Online](#).
115. Baosteel News Centre, “Baosteel Group Xinjiang Bayi Iron & Steel Co., Ltd. successfully smelted the ultra-low carbon steel for automotive unexposed panel for the first time,” Baosteel website, September 18, 2009, [Online](#); Baosteel News Centre, “Baosteel Xinjiang Bayi Steel supplies automobile beam sheets to Shandong CNHTC’s components plant,” Baosteel website, October 26, 2010, [Online](#); Peng Linli, “宝钢面向全球发布汽车板超低碳零件” [Baosteel releases ultra-low carbon parts for automobile plates to the world], *Caijing Network*, September 22, 2022, [Online](#); “Baosteel is developing a low-carbon metallurgical path. There will be greater demand for hydrogen energy in the future,” *SMM News*, January 6, 2022, [Online](#).
116. Chen Yuqian, Chen Zhuo, Lu Lin, Lu Bing, Liu Jiajun, and Jia Linhai, “红色八钢的基因解码” [The genetic decoding of red Bayi], *China Metallurgical News*, January 21, 2022, [Online](#).
117. “八钢谱写脱贫攻坚动人篇章: 不信东风唤不回!” [Bayi Steel composes a moving chapter in poverty alleviation: I don’t believe the east wind can’t be called back!], China Baowu News, August 27, 2021, [Online](#).
118. Chen Yuqian, Chen Zhuo, Lu Lin, Lu Bing, Liu Jiajun, and Jia Linhai, “红色八钢的基因解码” [The genetic decoding of red Bayi], *China Metallurgical News*, January 21, 2022, [Online](#).
119. Chen Yuqian, Chen Zhuo, Lu Lin, Lu Bing, Liu Jiajun, and Jia Linhai, “红色八钢的基因解码” [The genetic decoding of red Bayi], *China Metallurgical*

News, January 21, 2022, [Online](#).

120. "Company profile," Baowu Steel website, [Online](#).

121. "[预告]八一钢铁2021年度业绩说明会将于5月9日在全景网举办" [[Preview] Bayi Steel's 2021 annual performance briefing will be held on May 9 on Panorama.com], *Panorama Network*, May 8, 2022, [Online](#). See introduction for more information on *fanghuiju*.

122. China Youth Network, "喀什,和田264名城乡富余劳动力转移国企就业" [264 urban and rural surplus laborers in Kashgar and Hotan are transferred to state-owned enterprises for employment], *People's Daily Online*, June 9, 2017, [Online](#).

123. Fu Xiaobo and Guo Yan, "上万名南疆富余劳动力在国企实现就业" [Over Ten thousand surplus laborers in southern Xinjiang find employment in state-owned enterprises], *Xinhuanet*, November 3, 2017, [Online](#).

124. "上万名南疆富余劳动力在国企实现就业" [Over ten thousand surplus laborers in southern Xinjiang find employment in state-owned enterprises], *Xinhuanet*, November 3, 2017, [Online](#); "万余喀什和田富余劳动力成为国企员工" [More than 10,000 surplus workers in Kashgar and Hotan have become employees of state-owned enterprises], *Xinjiang Daily*, September 20, 2017, [Online](#).

125. Chen Yuqian, Chen Zhuo, Lu Lin, Lu Bing, Liu Jiajun, and Jia Linhai, "红色八钢的基因解码" [The genetic decoding of red Bayi], *China Metallurgical News*, January 21, 2022, [Online](#).

126. Xinjiang Uyghur Autonomous Region Department of Transportation, "岳普湖县片区包村定点扶贫工作方案" [Designated poverty alleviation work plan for Bao Village in Yopurga County area], Autonomous Region Transportation Department, October 23, 2020, [Online](#); Cantonese People's Association, "关于'劳务派遣'·这些小知识你知道吗? [Do you know these little facts about 'labor dispatch?]", Chaozhou People's Association via Guangdong Weixin, April 6, 2022, [Online](#).

127. Baowu Steel, "2020 China Baowu corporate social responsibility report," [Online](#).

128. "[预告]八一钢铁2021年度业绩说明会将于5月9日在全景网举办" [[Preview] Bayi Steel's 2021 annual performance briefing will be held on May 9 on Panorama.com], *Panorama Network*, May 8, 2022, [Online](#).

129. Xinxing Casting Pipe Co., "新兴铸管股份有限公司2021年度社会责任报告" [2021 social responsibility report of Xinxing Casting Pipe Co.], April 2022, [Online](#).

130. Chen Yuqian, Chen Zhuo, Lu Lin, Lu Bing, Liu Jiajun, and Jia Linhai, "红色八钢的基因解码" [The genetic decoding of red Bayi], *China Metallurgical News*, January 21, 2022, [Online](#); Baosteel News

Centre, "Baosteel Group Xinjiang Bayi Iron & Steel Co., Ltd. successfully smelted the ultra-low carbon steel for automotive unexposed panel for the first time," Baosteel Website, September 18, 2009, [Online](#); Baosteel News Centre, "Baosteel Xinjiang Bayi Steel supplies automobile beam sheets to Shandong CNHTC's components plant," Baosteel website, October 26, 2010, [Online](#); "Ten major categories of steel products made by Bayi Steel Co., Ltd. were awarded with the title of 'Famous Brand of Xinjiang' several times in a row," Baosteel website, July 16, 2013, [Online](#).

131. All shipping information drawn from shipping records accessed via Panjiva Market Intelligence.

132. "八一钢铁" [Bayi Steel], *Baidu*, [Online](#); Sinolink Securities Resource and Environment Resource Center, "八一钢铁 600581.SH 增持 首次评级" [Bayi Iron and Steel (600581.SH) increase holdings (maintain rating)], April 28, 2022, [Online](#). Calculations based on comparing Sinolink's accounting of Bayi's 2021 production against World Steel's accounting of Baosteel's total 2021 production.

133. All shipping information drawn from shipping records accessed via Panjiva Market Intelligence.

134. "Toyota sources crucial steel product from China's Baowu," *Nikkei Asian Review*, July 13, 2020, [Online](#). There appears to be a patent dispute about this particular steel; See "'Nippon Steel sues Toyota, Baosteel for patent infringement," *Reuters*, October 14, 2021, [Online](#).

135. Baosteel Tailored Blanks, "Baosteel re-elected as GM's 'Supplier of the Year,'" *Facebook*, July 13, 2019, [Online](#). It appears that the most recent two awards were specifically to subsidiary Tailor Welded Blanks; See "Worthington Joint Venture, TWB Co, recognized by General Motors as a 2018 supplier of the year," Worthington Industries website, October 28, 2019, [Online](#); "TWB Company honored by GM," *Metal Center News*, August 3, 2020, [Online](#).

136. All customs records accessed via Panjiva Market Intelligence.

137. All customs records accessed via Panjiva Market Intelligence.

138. "Products and services," Kemeny Overseas Product Corp website, n.d. [Online](#).

139. "Corporate profile," Marubeni Itochu Steel website, [Online](#) (See 2015 tab under History).

140. Liao Shumin, "China Baowu, Japan's JFE Steel deepen ties to tap China's automotive steel market," *Yicai Daily*, January 17, 2020, [Online](#).

141. "About TWB," Tailor Welded Blanks Website, [Online](#).

142. "2018 annual report," China Baowu Steel Group Corporation Ltd. website, [Online](#), 2.

143. "Baosteel and SAIC join hands to develop lightweight technology for automotive steel," Baosteel News Center, September 20, 2010, [Online](#).

144. Zacks Equity Research, "NIO strengthens carbon-neutral goals on deal with Baosteel," *Nasdaq*, January 12, 2022, [Online](#).

145. "Setting sail after casting dreams for a century: 2020 China Baowu corporate social responsibility report," *China Baowu Steel Group Corporation Ltd. Website*, [Online](#), p. 9.

146. Chen Yuqian, Chen Zhuo, Lu Lin, Lu Bing, Liu Jiajun, and Jia Linhai, "China metallurgical news: High-quality development of Baowu practice," *CSteelNews.com*, [Online](#).

147. Peter Williams, "Fortescue celebrates number eight," *The West Australian*, May 15, 2016, [Online](#); Christopher Knaus, "Andrew Forrest's philanthropic foundation condemns China's treatment of Uighurs," *The Guardian*, February 8, 2021, [Online](#); "Co-Founders," *Minderoo Website*, [Online](#).

148. "Iron Bridge Project approval," *Fortescue Minerals Website*, April 2, 2019, [Online](#); "Fortescue 2019 annual report," [Online](#), p. 24; "Fortescue 2020 annual report, Appendix 4E," June 30 2020, [Online](#), p. 24; "Fortescue 2021 annual report, Appendix 4E," June 30, 2021, [Online](#), p. 41.

149. "Rio Tinto and Baowu agree to form joint venture to develop Western Range," Rio Tinto website, Press Release, September 14, 2022, [Online](#).

150. Paul Bartholomew and Sebastian Lewis, "China macro & metals: Steel output falls, but property creates bright spots," *S&P Global Commodity Insights*, December 6, 2019, [Online](#).

151. Li Zhennan, "【11】搬出穷山窝 迎来新生活—来自深度贫困县的一线调研" [[11] Moving out of the poor mountain nest to usher in a new life—front-line research from deeply impoverished counties], *Xinjiang Daily* via *Pengpai WeChat*, June 12, 2020, [Online](#). See also: "帕米尔高原上的扶贫路——鞍钢集团在塔县扶贫纪实" [Poverty alleviation road on the Pamir Plateau—A documentary of Ansteel Group's poverty alleviation in Ta County], National Energy Information Platform, November 11, 2019, [Online](#).

152. "塔县城乡寄宿制小学" [Tashqorghon Tajik Autonomous County Boarding Primary School], *Baidu Wiki*, [Online](#); Gao Han and Shang Sheng, "绝险500里共赴春天之约——帕米尔高原教育之变" [A Dangerous 500-mile journey to spring—Changes in education in the Pamir Plateau], *China Daily* and *Xinhua News Agency*, March 19, 2022, [Online](#); "塔什库尔干塔吉克自治县城乡寄宿制小学" [Urban and rural boarding school of Tashqorghan County], *Aiqicha*, [Online](#).

153. "社会各界对《国家中长期教育改革和发展规划纲要》反响积极" [All sectors of society have responded positively to the "Outline of the National

Medium- and Long-Term Education Reform and Development Plan"], *Economic Daily*, July 31, 2010, [Online](#); “我国塔吉克族学童彻底告别”马背小学” [My country's Tajik schoolchildren bid farewell to “horseback primary school”] *Xinhuanet*, June 16, 2009, [Online](#).

154. Adrian Zenz, “Parent-child separation in Yarkand County, Kashgar: Evidence from local government spreadsheets about the fate of thousands of students with one or both parents in internment camps,” *Adrian.Zenz.Medium.com*, October 15, 2020, [Online](#).

155. Andrea Svendsen, “Aluminum continues unprecedented growth in automotive applications,” *Light Metal Age*, October 20, 2020, [Online](#).

156. Jim Wormington, “Aluminum: The car industry’s blind spot: Why car companies should address the human rights impact of aluminum production,” *Human Rights Watch*, July 22, 2021, [Online](#), p. 11. HRW received this information via email correspondence with the IAI.

157. Jim Wormington, “Aluminum: The car industry’s blind spot: Why car companies should address the human rights impact of aluminum production,” *Human Rights Watch*, July 22, 2021, [Online](#).

158. Drive Sustainability, “Raw material outlook: Aluminum,” October 12, 2021, [Online](#). This resource is embraced by the automotive sector but only considers mining in the “value chain.”

159. See, for example, M. Authier-Martin, G. Forte, S. Ostap and J. See, “The mineralogy of bauxite for producing smelter-grade alumina,” *Journal of Mineralogy*, 53, 2001, [Online](#), p. 36-40.

160. Meenu Gautam, Bhanu Pandey, Madhoolika Agrawal, “Chapter 8 - Carbon footprint of aluminum production: Emissions and mitigation,” In *Environmental Carbon Footprints: Industrial Case Studies*, 2018, [Online](#). See also: “International aluminum: Statistics,” [Online](#), for the carbon footprint of electrolysis versus alumina refining.

161. The global average for emissions intensity is 16.1 t/t, weighted by China’s dominance of the sector. China does not publish national emissions intensity but the Chinese smelter certified by ASI and thus required to publish emission intensity was 17.8t/t. For regional breakdowns of emissions intensity in the aluminum sector see: Ali Hasanbeigi, Ph.D., Cecilia Springer, Dinah Shi, “Global aluminum industry’s GHG emissions,” *Global Efficiency Intelligence*, February, 2, 2022, [Online](#). For global average of emissions intensity (16.1t/t) see: International Aluminium Institute (IAI), “1.5 degrees scenario: A model to drive emissions reduction: IAI models 1.5-degree decarbonization scenario in a bid to drive greater emissions reductions,” October 2021, [Online](#). For Europe’s carbon intensity (4.46t/t in 2014) see: European Aluminium, “Vision 2050 European aluminium’s contribution to the

EU’s mid-century low-carbon roadmap” *European Aluminium*, March 2019, [Online](#); For Australian smelters’ carbon intensity (12.6t/t) see: “Statistics,” Australian Aluminium Council Ltd, [Online](#).

162. “Statistics,” International Aluminum Institute, [Online](#).

163. Yi Xiaobing, “Brief introduction of the primary aluminium industry of China,” Presentation: Joint Australia-China Aluminium Industry Technology Symposium 2013, [Online](#); Andy Home, “China, the aluminum giant that’s still growing,” *Reuters*, July 20, 2015, [Online](#). In 2008, Xinjiang produced only 64,000 tons of aluminum; by 2014 production boomed 75-fold, to 4.8 million tons. Horizon Advisory indicates that Xinjiang now produces 8 million tons annually. See “新疆维吾尔自治区国民经济和社会发展第十四个五年规划和2035年远景目标纲要” [The 14<sup>th</sup> Five-Year Plan for the national economic and social development of Xinjiang Uygur Autonomous Region and the outline of the vision for 2035], January 11, 2022, [Online](#), p. 51, 55; “新疆生产建设兵团国民经济和社会发展第十四个五年规划和2035年远景目标纲要” [The 14<sup>th</sup> Five-Year Plan for the Xinjiang Production and Construction Corps and outline of vision 2035], June 17, 2021, [Online](#) p. 41, 45. Horizon Advisory, “Base problem: Forced labor risks in China’s aluminum sector,” *Horizon Advisory*, April 2022, [Online](#).

164. “Base problem: Forced labor risks in China’s aluminum sector,” *Horizon Advisory*, April 2022, [Online](#); Melissa Pistilli, “Top 10 aluminum-producing countries (updated 2022),” *Investing News*, May 25, 2022, [Online](#). Note: Horizon Advisory places Xinjiang’s share of China’s aluminum production at 17%, but updated figures for China’s production suggest that Xinjiang accounts for as much as 20%. It’s possible that capacity limit changes could lead to fluctuations in this calculation.

165. Jorgen Sandstrom, Wen Zhang, Shaun Chau, Marc Huang, and Shelia Peng, “How China is decarbonizing the electricity supply for aluminum,” *World Economic Forum*, April 21, 2022, [Online](#).

166. The 12th Five-Year Plan for XPCC prioritized the “expansion of the mineral processing industry” (to explicitly include aluminum): “新疆生产建设兵团国民经济和社会发展第十二个五年规划纲要” [Xinjiang Production and Construction Corps outline of the 12th Five-Year Plan for national economic and social development] 10 December 2011, [Online](#). Likewise, the 12th Five-Year Plan for the XUAR identified aluminum as a “new materials industry” promoted in Chapter 2 as a “strategic emerging industry.” “新疆维吾尔自治区国民经济和社会发展第十二个五年规划纲要” [National economic and social development of Xinjiang Uygur Autonomous Region outline of 12th Five-Year Plan], [Online](#).

167. Qian Zhou and Zoey Zhang, “Investing in Xinjiang: Economy, industry, trade, and investment profile,” *China Briefing*, April 9, 2021, [Online](#).

168. The 14<sup>th</sup> Five-Year Plan for the XPCC calls for “promoting the healthy development of resource- and labor-intensive industries, including metal smelting and processing, primary aluminum for auto and aerospace applications, and the chemical, petroleum and natural gas industries” (p. 24). This should be done through “incremental revenue sharing, tax incentive policies, and increased fiscal and taxation support” (p. 56): “新疆维吾尔自治区国民经济和社会发展第十四个五年规划纲要” [14<sup>th</sup> Five-Year Plan], [Online](#). As implemented see e.g. “新疆准东经济技术开发区” [Xinjiang Zhundong Economic and Technological Development Zone], *Baidu Baike*, [Online](#).

169. Jorgen Sandstrom, Wen Zhang, Shaun Chau, Marc Huang, and Shelia Peng, “How China is decarbonizing the electricity supply for aluminum,” *World Economic Forum*, April 21, 2022, [Online](#).

170. “Cost pressures mount for China’s aluminum smelters as regions end discount power deals,” *S&P Global Commodity Insights*, October 28, 2021, [Online](#).

171. “Base problem: Forced labor risks in China’s aluminum sector,” *Horizon Advisory*, April 2022, [Online](#).

172. Note: many of the media and corporate websites *Horizon Advisory* cites have been removed from the internet, pointing to the challenges of conducting research and due diligence on these corporations. Where possible, we have reviewed the citations for that report. Where the sites have disappeared, we have conducted additional research to identify evidence of participation in labor transfers. In all cases, these companies are located in the Uyghur Region and would be presumed to be using forced labor under the U.S. Uyghur Forced Labor Prevention Act.

173. U.S. Department of Homeland Security, “UFL-PA Entity List,” Department of Homeland Security website, [Online](#), Accessed Aug 28, 2022.

174. Laura T. Murphy and Nyrola Elimä, “In broad daylight: Uyghur forced labour in global solar supply chains,” *Sheffield Hallam University Helena Kennedy Centre for International Justice*, May 2021, [Online](#).

175. Changjiang Nonferrous Metals Network Reporter, “新疆电解铝产能的天花板已然形成 中国铝产业”龙头”显现” [The ceiling of Xinjiang’s electrolytic aluminum production capacity has already formed the “leading” of China’s aluminum industry], *Sina Finance*, October 27, 2020, [Online](#); Tom Daly, “Aluminium smelters in China’s Xinjiang told to cut output,” *NASDAQ via Reuters*, August 26, 2011, [Online](#). These figures differ from capacity figures provided in *Horizon Advisory* because the Government of Xinjiang restricted production capacity for all non-XPCC smelters, substantially curtailing production at East Hope and other facilities.

176. Horizon Advisory references “五工台镇就业转移指导站信息发布啦！” [Information release of employment transfer guidance station in Wugongtai Town], *Sohu News*, June 26, 2020, [Online](#) and [Archived](#) as of August 22, 2022. According to Horizon Advisory, a Xinjiang 6th Division Aluminum advertisement sought 400 workers ages 18-45 “in good health for three months of work.” However, that site did not include an advertisement for 6th Division or Xinfa as of August 2022. It may have been deleted, but we cannot be sure. However, it is also unclear that the recruitment described on that site is connected to the state-sponsored labor transfers that we discuss here. However, the Xinjiang Production and Construction Corps is heavily involved in the implementation and dissemination of the labor transfer program, and as such, it is highly likely that the Sixth Division’s aluminum plant participates in that program. For more information on the XPCC’s engagement in labor transfer programs, see Murphy, Tobin, and Elimä, “Until nothing is left: China’s settler corporation and its human rights violations in the Uyghur Region. A report on the Xinjiang Production and Construction Corps,” Sheffield Hallam University Helena Kennedy Centre for International Justice, July 2022, [Online](#).

177. “劳动力就地转移开启破冰之旅” [The transfer of labor force to start the ice-breaking journey], *Wenmi*, May 17, 2019, [Online](#); The Horizon Advisory report cites at least two additional articles that indicate the company’s continued engagement in labor transfers, but those articles appear to have been removed from the internet.

178. East Hope holds a 10% share in the Wucai Vocational Training School in Zhudong Economic and Technological Development Zone, which trains transferred laborers. In 2016 it signed a “labor export cooperation framework agreement” with the Yarkand County government. See: “东方希望集团新疆铝业公司在莎车县召开专场招聘会” [Eastern Hope Group Xinjiang Aluminum Company holds special job fair in Yarkand County], Shanghai Aids Xinjiang via *Weixin*, [Online](#). Laotai Township, Jimsar County “organized connections between more than 240 people and East Hope, as well as Shendong Tianlong, Tianyu Huaxin and other companies” in 2017 – See: Zhang Yafang, “新疆吉木萨尔县老台乡劳动力转移工作显成效” [The labor transfer work in Laotai Township, Jimsar County, Xinjiang has achieved remarkable results], *Asia Heart Network*, October 27, 2017, [Online](#). In 2018, East Hope “absorbed five Uyghur youths” in addition to 16 Uyghur youths in a prior transfer – See: “东方希望集团为民族团结贡献正能量” [East Hope Group contributes positive energy to national unity], *Pudong Government Affairs Newspaper*, May 22, 2018, [Online](#). For more evidence of East Hope’s engagement in labor transfer programs, see Laura T. Murphy and Nyrola Elimä, “In broad daylight: Uyghur forced labour in global solar supply chains,” Sheffield Hallam University Helena Kennedy Centre for International Justice, May 2021, [Online](#).

179. Reference to residents of Quanzijie Town working in Qiya’s industrial park seasonally is available in: Ji Jiangtong, “吉木萨尔县泉子街镇：拓宽农牧民增收致富渠道” [Quanzijie Town, Jimsar County: Broaden the channels for farmers and herdsmen to increase their income and become rich], *China News Service Xinjiang*, August 15, 2019, [Online](#). For direct links to Qiya through these labor transfers, see: “新疆吉木萨尔县为农牧民‘定制’招聘会” [Jimsar County, Xinjiang “customized” job fair for farmers and herdsmen] *Asia Heart Network*, October 25, 2015, [Online](#). (“Ma Hongxia, head of the human resources department of Xinjiang Qiya Aluminum and Electric Co., Ltd., said: ‘Today, we mainly recruit electrolyzers, metallurgical workers, maintenance workers and other positions. We have a particularly large amount of labor.’”)

180. Horizon Advisory documented Shenhua’s 2017 coordination of a “special job fair for the transfer and employment of the surplus labor force” (Wu Xinlong and Wang Qian, “新疆吉木萨尔县吉木萨尔镇开专场招聘会” [Xinjiang, Jimsar Town, Jimsar County holds a special job fair], *Sina News*, March 31, 2017, [Online](#)).

181. Horizon Advisory reported that in a December 2020 employment fair, Jiarun and four other companies accepted 225 surplus laborers. In a similar March 2021 event, Jiarun and five other firms absorbed 238 additional surplus laborers. References to these transfers are no longer available online. Additional evidence of engagement in state-sponsored labor programs is available, however, from the March 2022 spring breeze recruitment fair, Jiarun provided 240 jobs “on the spot.” See: “新疆玛纳斯：春风送岗位 就业暖人心” [Xinjiang Manas: Spring breeze brings jobs and jobs to people’s hearts], *Xinhuanet*, March 2, 2022, [Online](#). For Jiarun’s participation in the 2021 job fair, see: Zhang Yifang and Ma Binqian, “新疆玛纳斯：春风送岗位 就业暖人心” [Manas, Xinjiang: Spring breeze sends jobs and jobs to warm people’s hearts], *Manas Zero Distance*, March 17, 2021, [Online](#).

182. Horizon Advisory notes that Tianlong manages a training classroom in Fukang city, where classes begin with a “Red song” competition; four-month courses teach Chinese language and skills in “work, life and other aspects.” In 2020 Tianlong “absorbed” 63 workers from “key employment groups” including poverty alleviation and ex-military. See: “年度用人单位吸纳重点就业群体就业奖励审核情况” [Review of employment incentives for employers to absorb key employment groups in 2020], *Fukang Municipal Government*, December 11, 2020, No longer available online.

183. Autonomous Region Party Committee, “自治区党委 自治区人民政府关于表彰自治区第八次民族团结进步模范集体和模范个人的决定” [Decision on commending the Eighth Model Collectives and Individuals of Ethnic Unity and Progress in the Autonomous Region], *Alashankou Zero Distance*, September 15, 2021, [Online](#); China Employment

Center, “新疆乌鲁木齐：启动职业技能提升行动” [Ürümchi, Xinjiang: Launch of professional skills improvement action], *Evening News*, October 14, 2019, [Online](#). This article specifies that “training objects of the vocational skills upgrading action” include: “Enterprise employees, rural migrant workers, especially the new generation of migrant workers, urban and rural junior high school graduates who have not continued their studies (referred to as “two young students”) and other young people, laid-off and unemployed people, retired soldiers, people with employment difficulties (including disabled people), and poor people.”

184. Chen Xue, “信发集团新疆分公司 甘肃有色冶金职业技术学院 联合招聘企业用工人员公告” [Xinfa Group Xinjiang branch Gansu Nonferrous Metallurgy Vocational and Technical College jointly recruiting enterprise employees announcement], *Sohu News*, June 2, 2021, [Online](#). See also: Peng Fei, “又一铝业巨头登顶山东首富 信发集团宋传英家族拥有近千亿财富” [Shandong’s richest man, another aluminum tycoon, Xinfa Group Song Chuanying’s family has nearly 100 billion fortune], *Daily Economic News*, November 28, 2019, [Online](#).

185. Chen Xue, “信发集团新疆分公司 甘肃有色冶金职业技术学院 联合招聘企业用工人员公告” [Xinfa Group Xinjiang branch Gansu Nonferrous Metallurgy Vocational and Technical College jointly recruiting enterprise employees announcement], *Sohu News*, June 2, 2021, [Online](#).

186. Wood Mackenzie, “Xinfa Aluminium electrical metals summary,” 2022, [Online](#).

187. Several sources cite 1.9 million tons for Xinfa’s Xinjiang production. See Tom Daly, “Aluminium smelters in China’s Xinjiang told to cut output,” *NASDAQ via Reuters*, August 26, 2011, [Online](#); “China’s Xinfa shut aluminum capacity in Xinjiang after blast—sources,” *Reuters*, August 20, 2019, [Online](#). There are fewer sources to provide a complete accounting of Xinfa’s total production across China. See Rusal, “Annual report 2021,” [Online](#).

188. “Results,” Amazon.com search results for *Americana Tire and Wheel*, [Online](#); “Results,” Amazon.co.uk search results for “Americana Tire and Wheel,” [Online](#); Walmart.com search results for “Americana Tire and Wheel,” [Online](#); All accessed September 25, 2022.

189. Wan Ziqin, “信发集团持股的云信铝业10万吨铝中间合金将于5月底投产” [The 100,000-ton aluminum master alloy of Yunxin Aluminum held by Xinfa Group will be put into production at the end of May], *Mysteel.com*, April 25, 2021, [Online](#). The joint venture is called YunXin Aluminum (云信铝).

190. We are not naming customers of Yunhai because it is yet unclear which of these companies are most exposed to Xinfa. However, all companies sourcing from Yunhai should be aware of this potential exposure. See: Niugekangu, “云海金子公司山东云信铝业2022年1-5月份累计出口

创汇100万美元 [“Shandong Yunxin Aluminium, a subsidiary of Yunhai Metal, will earn US\$1 million in foreign exchange from exports from January to May 2022”]. EastMoney.com, July 24, 2022, [Online](#). For reference to Tesla see: 云海金属:2019年年度报告 [Yunhai Metal: 2019 annual report], EastMoney, March 18, 2020, [Online](#); “Sea of Clouds: supply of magnesium alloys to Tesla’s first-tier suppliers,” *SMM News*. January 6, 2022, [Online](#). Baosteel joint venture: “南京云海特种金属股份有限公司 2021 年年度报告” [Nanjing YunHai Special Metals Co., Ltd. 2021 annual report], [Online](#), p. 11; “Sea of Clouds: supply of magnesium alloys to Tesla’s first-tier suppliers,” *SMM News*, January 6, 2022, [Online](#).

191. “山东隐形首富！信发集团完胜魏桥，若上市或超3000亿” [Shandong’s invisible richest man! Xinfu Group has completely defeated Weiqiao, and if it goes public, it may exceed 300 billion], *Tencent News*, April 23, 2022, [Online](#).

192. “Metro Mining inks three years of bauxite offtake agreements with Xinfu Group,” *Aluminium Insider*, June 12, 2021, [Online](#).

193. “Shandong Xinfu Group signed a Guinea bauxite supply contract,” November 26, 2019, Ministry of Commerce of PRC Website, reposted Dec 4, 2019, [Online](#).

194. “Subsidiary introduction,” Tianshan Aluminum website, [Online](#).

195. “Contact us,” Tianshan Aluminum website, [Online](#); Beijing Zhonglun Law Firm, “北京市中伦律师事务所关于新界泵业集团股份有限公司重” [Regarding New Territories Pump Group Co. Ltd: Major asset replacement and issue of shares to purchase assets and related party transactions. Supplementary legal opinion], *Sina Finance*, January 20, 2020, [Online](#).

196. “Subsidiary introduction,” Tianshan Aluminum website, [Online](#).

197. Tianshan Aluminum Group, “2020 annual report,” April 2021, [Online](#); Liu Jinsong, “阿拉尔经济技术开发区全力解决企业用工难题” [Aral Economic and Technological Development Zone makes every effort to solve the labor problem of enterprises], *Xinhua Net Xinjiang News*, March 10, 2022, [Online](#).

198. Bai Yulin, “货车客车双开通 新疆阿拉尔市未来可期” [Both truck and bus lines will be opened in Aral City, Xinjiang, and the future can be expected], *China Daily*, January 11, 2022, [Online](#).

199. “Subsidiary introduction,” Tianshan Aluminum website, [Online](#).

200. Beijing Zhonglun Law Firm, “北京市中伦律师事务所关于新界泵业集团股份有限公司重” [Regarding New Territories Pump Group Co. Ltd: Major asset replacement and issue of shares to purchase assets and related party transactions. Supplementary legal opinion], *Sina Finance*, January 20, 2020,

[Online](#), p. 45-47. Note: this data is from 2019, when the asset replacement notice was issued. Trading relationships may have changed.

201. Beijing Zhonglun Law Firm, “北京市中伦律师事务所关于新界泵业集团股份有限公司重” [Regarding New Territories Pump Group Co. Ltd: Major asset replacement and issue of shares to purchase assets and related party transactions. Supplementary legal opinion], *Sina Finance*, January 20, 2020, [Online](#), p. 98.

202. Beijing Zhonglun Law Firm, “北京市中伦律师事务所关于新界泵业集团股份有限公司重” [Regarding New Territories Pump Group Co. Ltd: Major asset replacement and issue of shares to purchase assets and related party transactions. Supplementary legal opinion], *Sina Finance*, January 20, 2020, [Online](#), p. 102.

203. Beijing Zhonglun Law Firm, “北京市中伦律师事务所关于新界泵业集团股份有限公司重” [Regarding New Territories Pump Group Co. Ltd: Major asset replacement and issue of shares to purchase assets and related party transactions. Supplementary legal opinion], *Sina Finance*, January 20, 2020, [Online](#), p. 103.

204. Trafigura, “Interim financial report,” 2021, [Online](#), p. 21.

205. Trafigura, “Annual report 2021,” [Online](#), p. 16.

206. Trafigura, “Annual report 2020,” [Online](#), p. 20.

207. Shenhua Group profile, March 26, 2021, [Online](#).

208. “关于同意河南神火煤电股份有限公司增加”如固“牌重熔用铝锭” [Regarding the approval of Henan Shenhua Coal and Electricity Co., Ltd. To add “Rugu” brand aluminum ingots for remelting], *Shanghai Futures Exchange*, April 22, 2019 [Online](#).

209. “新疆九华天物流有限公司” [Xinjiang Jiuhuatian Logistics Co., Ltd.], *Qixin*, [Online](#). For a full list of joint ventures see: Henan Shenhua, “河南神火煤电股份有限公司 2020 年年度报告全文” [Henan Shenhua Coal and Electricity Co., Ltd. 2020 annual report], April 2021, [Online](#).

210. “Annual report interpretation | 2021 net profit increased 8 times compared with the same period last year. Shenhua shares: aluminum price is expected to remain high,” *SMM News*, March 28, 2022, [Online](#).

211. Wang Wei and Guo Qing, “1-4月昌吉州实现农村劳动力转移就业4.78万人次” [From January to April, Sanji/Changji Prefecture achieved 47,800 instances of rural labor transfer employment], *Changji Daily News*, May 17, 2022, [Online](#).

212. Shenhua Group News, “《中国有色金属》杂志专访全国人大代表、集团党委书记、董事长李炜：主动转变能源结构将是解决电解铝行业碳排放问题的关键” [“China Nonferrous Metals” magazine

interviewed Li Wei, deputy to the National People’s Congress, secretary of the party committee and chairman of the group: Actively changing the energy structure will be the key to solving the carbon emission problem of the electrolytic aluminum industry”] Shenhua website, May 26, 2021, [Online](#).

213. “Shenlong Baoding successfully trial-produces aluminum foil 0.0045mm,” *Asian Metal*, April 16, 2021, [Online](#).

214. “Product classification,” Shenhua website, [Online](#).

215. “Shenlong Baoding New Material Co., Ltd.-Branch,” Shenhua website, [Online](#).

216. “Shenlong Baoding successfully trial-produces aluminum foil 0.0045mm,” *Asian Metal*, April 16, 2021, [Online](#).

217. “关于我们” [About us], Xinjiang Jiarun Resources Holdings Co., Ltd. Website, [Online](#). Its ownership structure is unclear. See: “新疆嘉润铝业” [Xinjiang Jiarun Aluminum Industry], *Kanzhun Company Reviews*, [Online](#).

218. “新疆嘉润资源控股有限公司” [Xinjiang Jiarun Resources Holdings Co., Ltd.], qcc.com, [Online](#).

219. Ding Ruilan, “新疆玛纳斯：多项技能培训惠民” [Xinjiang Manas: Multiple skills training benefit people’s livelihood], *China’s Employment*, October 17, 2016, [Online](#).

220. Zhao Shanbin, “自治区党委常委、昌吉州党委书记沙尔合提·阿汗来我县调研” [The Standing Committee of the Autonomous Region Party Committee and Secretary of the Changji Autonomous Prefecture Party Committee Sharghat Aghan came to our county for a visit], Manas Government official website, July 14, 2017, [Online](#).

221. “做好新疆富余劳动力转移就业安置工作的几点见解” [Some opinions on doing a good job in the transfer and employment of surplus labor in southern Xinjiang], gywlwh.com, July 26, 2021, [Online](#).

222. Zhang Yifang and Ma Binqian, “【工作动态】玛纳斯县：春风送岗位 就业暖民心” [Work news] Manas County: Spring breeze sends jobs and warms people’s hearts], *Manas Society*, March 18, 2021, [Online](#).

223. “新疆玛纳斯：春风送岗位 就业暖民心” [Manas County: Spring breeze sends jobs and warms people’s hearts], *China’s Employment*, March 02, 2022, [Online](#).

224. Xu Binlu, “D某某与新疆嘉润资源控股有限公司劳动争议一审民事判决书” [Civil judgment of first instance of labor dispute between D and Xinjiang Jiarun Resources Holding Co., Ltd.], *Aiqicha*, May 20, 2021, [Online](#).

225. Wallis Jiang, “新疆嘉润：防疫不松懈 生产不停歇” [Xinjiang Jiarun: Tough pandemic prevention,

yet production is not halted], Manas County Rong Media Center via *Manas Zero Distance Weixin*, August 20, 2022, [Online](#).

226. Wallis Jiang, “新疆嘉润：防疫不松懈 生产不停歇” [Xinjiang Jiarun: Tough pandemic prevention, yet production is not halted], Manas County Rong Media Center via *Manas Zero Distance Weixin*, August 20, 2022, [Online](#).

227. Wallis Jiang, “新疆嘉润：防疫不松懈 生产不停歇” [Xinjiang Jiarun: Tough Pandemic prevention, yet production is not halted], Manas County Rong Media Center via *Manas Zero Distance Weixin*, August 20, 2022, [Online](#).

228. Zhao Shanbin, “玛纳斯县举行千万只锻造铝轮毂及新能源项目签约仪式” [Manas County holds ten million forged aluminum wheels and new energy project signing ceremony], Tianshan Net News, August 12, 2022, [Online](#).

229. Xinjiang Zhonghe, “新疆众和股份有限公司 (600888)2021 年年度报告” [Xinjiang Joinworld Co. Ltd. 2021 annual report], March 29, 2022, [Online](#), p.24. Zhonghe produces over 22% of the global supply of high-purity aluminum.

230. Xinjiang Zhonghe, “新疆众和：新疆众和配股说明书” [Xinjiang Zhonghe allotment prospectus], *Hexun Stock Data*, 2021, [Online](#). Zhonghe credits its profit margin to high-end products, as it has no major outward advantage over other ingot producers, as explained on page 8 and 10 of Xie Honghe and Guo Zhongwei, “新疆众和 证券研究报告” [Xinjiang Zhonghe Securities Research Report], *Zhongtai Securities*, August 4, 2021, [Online](#).

231. Xinjiang Zhonghe, “新疆众和股份有限公司 (600888)2019 年年度报告” [Xinjiang Joinworld Co. Ltd. 2019 annual report], March 24, 2020, [Online](#).

232. Xinjiang Zhonghe, “新疆众和股份有限公司 (600888)2021 年年度报告” [Xinjiang Joinworld Co. Ltd. 2021 annual report], March 29, 2022, [Online](#). Xinjiang Zhonghe, “2020年度社会责任报告” [2020 annual social responsibility report], March 2021 (Release date October 11, 2021), [Online](#).

233. Xinjiang Zhonghe Alloy Material Company, “About Zhonghe [marketing material],” [Online](#), p. 2, 12.

234. Jingwei, “京威股份：2019年年度报告” [Annual report 2019], *Sina Finance*, April 29, 2020, [Online](#). Section (8) “主要销售客户和主要供应商情况” [Primary sales customers and suppliers]. Jingwei stopped publishing the names of its top five suppliers and customers in 2019. Prior to that, data was available in annual reports listed on *Sina Finance*. Jingwei, “京威股份：2019年年度报告” [Annual report 2019], *Sina Finance*, April 29, 2020 [Online](#); Jingwei, “京威股份：2018年年度报告” [Annual report 2018], *Sina Finance*, April 24, 2019, [Online](#); Jingwei, “京威股份：2017年年度报告” [Annual report 2017], *Sina Finance*, March 22, 2018, [Online](#);

Jingwei, “京威股份：2016年年度报告” [Annual report 2016], *Sina Finance*, March 8, 2017, [Online](#); Jingwei, “京威股份：2016年年度报告” [Annual report 2021], *Sina Finance*, March 24, 2021, [Online](#). In each report, see Section 8, “主要销售客户和主要供应商情况” [Primary sales customers and major suppliers]—In 2016, for example, FAW-Volkswagen was Jingwei’s largest customer and represented 29.33% of Jingwei’s business; In 2019, FAW-Volkswagen represented 29.55% of Jingwei’s business; In 2021, “Customer One” (客户一) represented 31.61% of Jingwei’s business

235. “首页 公司简介,” [Home/Company], Yacheng Jingwei Auto Parts Manufacturing, Co., Ltd., [Online](#).

236. “京威股份北京威卡威汽车零部件股份有限公司2021年年度报告” [Jingwei Co., Ltd. Beijing WKW Auto Parts Co Ltd. 2021 annual report], *Sina Finance*, March 24, 2022, [Online](#).

237. “京威股份北京威卡威汽车零部件股份有限公司2021年年度报告” [Jingwei Co., Ltd. Beijing WKW Auto Parts Co Ltd. 2021 annual report], *Sina Finance*, March 24, 2022, [Online](#).

238. Liang Shuang, “新疆巴州考察团到开发区考察” [Xinjiang Bazhou delegation visits the development zone], Qinhuangdao Economic and Technological Development Zone (QETDZ) Management Committee website, April 24, 2019, [Online](#)

239. Beijing WKW Auto Parts Co., Ltd., “北京威卡威汽车零部件股份有限公司 2016 年度报告” [Beijing Wikaway Auto Parts Co., Ltd. 2016 annual report], Beijing WKW website, March 8, 2017, [Online](#).

240. Xinjiang Zhonghe Alloy Material Company, “About Zhonghe,” Marketing material, [Online](#), p. 12.

241. “Global customers,” Minth website, [Online](#); “Governor Lee, Commissioner Rolfe announce Minth Group to expand in Lewisburg,” Press Release, Tennessee Department of Economic and Community Development, January 21, 2020, [Online](#).

242. Xinjiang Zhonghe Alloy Material Company, “About Zhonghe,” Marketing material [Online](#), p. 12.

243. “Product details: Automobile structure material,” Chinalco Southwest Aluminum Group, [Online](#); “Aluminum brazing material,” Chinalco Southwest Aluminum Group, [Online](#).

244. “Fabricated aluminum products,” Chinalco website, [Online](#).

245. “Chalco Ruimin Co., Ltd. Company information,” China Suppliers, [Online](#).

246. “新疆维吾尔自治区国民经济和社会发展第十三个五年规划纲要” [Outline of the 13<sup>th</sup> Five-Year Plan for the national economic and social development of the XUAR], National Development and Reform Commission, May 2016, [Online](#), p. 101.

247. For reference to labor transfers see: Xintou, “新疆新投经贸发展有限公司” [Xinjiang Xintou Economic and Trade Development Co., Ltd.], April 22, 2022, [Online](#); Xintou, “新疆投资发展（集团）有限责任公司 2020年公开发行公司债券（第二期）募集说明书” [Xinjiang Investment Development (Group) Co., Ltd. Fundraising instructions for the company’s publicly issued debt volume (second phase) 2020], [Online](#), p. 98. In the prospectus for this bond cycle, Xintou referred to aluminum as one of its “three major sectors,” see Xintou, “新疆投资发展（集团）有限责任公司2020 年度第二期中期票据募集说明书” [Xinjiang Investment Development (Group) Co., Ltd. Prospectus for the 2020 second phase medium-term notes], 2020, [Online](#), p. 78; Xintou, “新疆投资发展(集团)有限责任公司公司债券2021年半年度报告” [2021 semi-annual report on corporate bonds of Xinjiang Investment Development (Group) Co., Ltd.] August 18, 2021, [Online](#).

248. Xintou’s 48% equity ownership of Jiarun gave it operational control and “all other powers except ownership and disposal rights,” positioning it both to produce the aluminum and transport it across China to fabrication facilities. Xintou, “新疆投资发展（集团）有限责任公司2020 年度第二期中期票据募集说明书” [Xinjiang Investment Development (Group) Co., Ltd. Prospectus for the 2020 second phase medium-term notes], 2020, [Online](#), p. 135; “新疆投资发展（集团）有限责任公司公司债券2021 年年度报告” [Xinjiang Investment Development (Group) Co., Ltd. Corporate bond 2021 annual report], *JRJ Bonds*, April 28, 2022, [Online](#).

249. Xintou, “新疆投资发展（集团）有限责任公司公司债券半年度报告（2018 年上半年）” [Xinjiang Investment Development (Group) Co., Ltd. Corporate bond semi-annual report (first half of 2018)], *EastMoney*, August, [Online](#), p. 27.

250. “Company profile,” CITIC Dicastal website, [Online](#).

251. Liang Shuang, “新疆巴州考察团到开发区考察” [Xinjiang Bazhou delegation visits the development zone], Qinhuangdao Economic and Technological Development Zone (QETDZ) Management Committee website, April 24, 2019, [Online](#).

252. Xintou. 新疆投资发展（集团）有限责任公司 2020 年度第二期中期票据募集说明书 [Xinjiang Investment Development (Group) Co., Ltd. Prospectus for the 2020 second phase medium-term notes]. 2020, [Online](#), p. 79. Xintou, “新疆投资发展（集团）有限责任公司 2020年公开发行公司债券（第二期）募集说明书” [Xinjiang Investment Development (Group) Co., Ltd. Fundraising instructions for the company’s publicly issued debt volume (second phase) 2020], [Online](#), p. 98. Xinjiang Qiya and Xinjiang Shenhuo have developed at least two direct relationships with state-owned logistics companies to facilitate the aluminum supply and production links to eastern China. Xinjiang Shenhuo and Xinjiang Qiya have joint ownership (18% each) of a cargo company Xinjiang Jiuhuan Logistics Co. (新疆九华天物流有限公司) with the

state. See: “新疆九华天物流有限公司” [Xinjiang Jiuhuatian Logistics Co., Ltd.], *Qixin*, [Online](#). The national energy group and Xinjiang Tianyicheng Investment are larger owners, followed by Shenhua and Qiya, and Xinjiang Juizhou Hengchang Supply Chain Management (新疆九洲恒昌供应链管理股份有限公司), a major bulk logistics entity with more than 1,000 employees. It partners with TBEA, Xinye, Baosteel, Zhongtai Chemical and other major Chinese brands. See: XJJZHC.com website, [Online](#).

253. “新疆南山丝路商务服务有限公司” [Xinjiang Nanshan Silk Road Business Service Co., Ltd.], *Qixin*, [Online](#). Xinjiang Nanshan Silk Road Business Service Co. changed ownership in 2019, with an individual named Ren Fushuang becoming sole proprietor. Whether Shandong Nanshan Aluminum continues to receive XUAR aluminum at its Shandong fabrication plants today is unclear, but any company procuring aluminum products from the company would be well advised to conduct due diligence regarding these relationships. “新疆南山丝路商务服务有限公司” [Xinjiang Nanshan Silk Road Business Service Co., Ltd.], *QCC.com*, [Online](#).

254. “山东南山铝业股份有限公司 配股说明书” [Shandong Nanshan Aluminum Ltd rights issue prospectus], October 18, 2019, [Online](#), p. 90-91.

255. “关于新疆连桥物流有限责任公司铁路专用线项目环境影响报告书的批复” [Reply on the environmental impact report of Xinjiang Lianqiao Logistics Co., Ltd. Railway special line project] *Xinjiang Project Bidding Network* (xmztbw.com), December 6, 2017, [Online](#).

256. “新疆连桥物流有限责任公司” [Xinjiang Lian-Qiao Logistics Co., Ltd.], *Qixinbao APP Business Research*, [Online](#).

257. Xinjiang Nanshan Silk Road Business Service Co. changed ownership in 2019, with an individual named Ren Fushuang becoming sole proprietor. Whether Shandong Nanshan Aluminum continues to receive Xinjiang aluminum at its Shandong fabrication plants today is unclear, but any company procuring aluminum products from the company would be well advised to conduct due diligence regarding these relationships.

258. Ma Jinlong, “电解铝筑底，高端产品进入放量期——南山铝业深度报告” [Electrolytic aluminum builds the bottom, high-end products enter a period of heavy volume ——In-depth report of Nanshan Aluminum Industry], *Zheshang Securities Limited*, December 7, 2021, [Online](#), p. 40; “建成20万吨超大生产线，供货宝马，南山铝业领跑行业” [200,000-ton super-large production line built to supply BMW, Nanshan Aluminum leads the industry], *Flying Whale Investment Research*, July 10, 2021, [Online](#); In 2019 FAW signed a strategic cooperation agreement with Nanshan Aluminum as well as a JV “laying a foundation for supporting the lightweight development of FAW Group.” See: FAW SN, “Corporate Milestone—2019,” FAW SN website, [Online](#).

259. Frank Liu, “Nanshan Aluminum Co., Ltd. Aims at the continuous development of aluminum automobile plate industry and its long-term planned capacity can reach 70-800000 tons,” *SMM News*, November 23, 2021, [Online](#).

260. “The invisible leader of Tesla that really benefits from Nanshan Aluminum,” *DayDayNews*, January 1, 2020, [Online](#).

261. “Nanshan Aluminum Shanghai set up a subsidiary to increase sales of automotive steel, battery foil and aviation materials,” *Lai Times*, January 4, 2022, [Online](#). The subsidiary is Nanshan Aluminum (Shanghai) Co., and it is dedicated to selling Nanshan Aluminum products internationally.

262. Chinalco, “中铝国际 首次公开发行股票招股说明书” [Chinalco IPO prospectus], *Sina Finance*, July 30, 2018; [Online](#); Chinalco, “Industrialization News,” [Online](#); Chinalco, “铝钢结构工程” [Aluminum steel structure project news], [Online](#).

263. Chinalco, “中国铝业公司 2016 年社会责任报告” [Chinalco annual report 2016], [Online](#), p. 65, 69; Chinalco, “中铝国际首次公开发行股票招股说明书” [China Aluminum International IPO prospectus], *Sina Finance*, July 30, 2018, [Online](#). See also the Zhonghe/Joinworld section of this report.

264. Wang Tao, “新疆全力降低铁路运输成本力促经济稳增长” [Xinjiang makes every effort to reduce railway transportation costs to promote steady economic growth], State Council Information Office of the PRC. April 21, 2015, [Online](#); Sally Zhang, “15% freight rate cut to reduce costs for Xinjiang aluminum smelters,” *SMM News*, June 15, 2015, [Online](#); “新疆再出铁路货运优惠政策 PVC运价整体下调15% [The preferential policy of railway freight forwarding in Xinjiang reduces the PVC freight rate by 15% as a whole], *JC Transportation Magazine*, June 27, 2016, [Online](#). As noted in the article, Baosteel, PVC, and cotton exports were also subsidized that year.

265. “[SMM analysis] Dismal! Northern aluminum ingots can’t be sold!” *SMM News*, July 4, 2019, [Online](#).

266. East Hope, “中国铁路乌鲁木齐局集团董事长高金阳到访东方希望准东园区” [Gao Jinyang, Chairman of China Railway Ürümchi Bureau Group, visits East Hope Zhudong Park], *Aluminum Yunhui*, April 13, 2022, [Online](#).

267. “World copper factbook 2021,” International Copper Study Group, [Online](#), p. 5.

268. “中国铜矿行业现状深度研究与发展前景预测报告（2022-2029年）” [In-depth research and development prospect forecast report on the status quo of China’s copper mining industry (2022-2029)], *Insight and Info*, 2022, [Online](#).

269. “中国铜矿行业现状深度研究与发展前景预测报告（2022-2029年）” [In-depth research and devel-

opment prospect forecast report on the status quo of China’s copper mining industry (2022-2029)], *Insight and Info*, 2022, [Online](#).

270. “World copper factbook 2021,” International Copper Study Group, [Online](#), p. 20, 25

271. “World copper factbook 2021,” International Copper Study Group, [Online](#), p. 21, 26

272. “Copper wire ensures performance,” *Discover Copper Online*, 73, Spring 1992, [Online](#).

273. “Copper: Powering up the electric vehicle,” *Wood Mackenzie*, August 13, 2019, [Online](#).

274. Jon Lynch, “Copper’s role in growing electric vehicle production,” *Open Markets*, April 20, 2021, [Online](#).

275. “新疆有色集团公司简介” [About Xinjiang Nonferrous Metals Group], Xinjiang Nonferrous Metals website, [Online](#).

276. Xinjiang Nonferrous Group, “新疆有色金属工业(集团)有限责任公司2021年度第一期中期票据募集说明书” [Xinjiang Nonferrous Metals Industry (Group) Co., Ltd. Prospectus for the 2021 first phase medium-term notes], *Shanghai Clearing House*, August 8, 2021, [Online](#), p. 72-74.

277. Pang Xiaoying, “2019哈巴河桦林半程马拉松赞助商之一阿舍勒铜业” [Ashele Copper, one of the sponsors of the 2019 Habahe Birch Forest Half Marathon] Weixin, September 27, 2019, [Online](#).

278. “新疆有色金属工业(集团)有限责任公司2021年度第一期中期票据发行文件” [Xinjiang Nonferrous Metals Industry (Group) 2021 first phase medium-term notes issuance document] First Quarter Report, [Online](#), p. 58.

279. Zhang Shiwen, “新疆有色集团以新发展理念引领助力脱贫攻坚” [Xinjiang Nonferrous Metals Group leads poverty alleviation with new development concepts], *China Nonferrous Metals News*, December 7, 2020, [Online](#). An extended discussion of the relationship between Bostan Village and Chenguang can be found in Laura T. Murphy, Kendyl Salcito, and Nyrola Elimä, “Financing and genocide: Development finance and the crisis in the Uyghur Region,” *Sheffield Hallam University Helena Kennedy Centre for International Justice*, February 2022, [Online](#).

280. Cao Xinsai and Li Liang, “脱贫攻坚 | 新疆有色集团为于田县15个村开启“美颜”模式” [Poverty alleviation | Xinjiang Nonferrous Metals Group opened the “beauty” model for 15 villages in Keriya County], Xinjiang Nonferrous Metal Industry Group Co website, May 8, 2020, [Online](#).

281. “新疆有色集团第三批“访惠聚”驻村工作组纪实” [Documentary of the third batch of “Fanghuiju” village working group of Xinjiang Nonferrous Metals], *China Nonferrous Metals Industry*, August 8, 2016, [Online](#).

282. Cheng Hui, "脱贫路上新疆有色哈图金矿携手帮扶、倾囊相助" [On the road to poverty alleviation, Xinjiang Nonferrous Hatu Gold Mine joins hands and helps], *China Nonferrous Metals News*, October 19, 2020, [Online](#).
283. Western Region Gold Co., "西部黄金股份有限公司 2020 年半年度报告" [Western Region Gold Co., Ltd. 2020 semi-annual report], August 28, 2020, [Online](#); Zhang Shiwen, "新疆有色集团以新发展理念引领助力脱贫攻坚" [Xinjiang Nonferrous Metals Group leads poverty alleviation with new development concepts], *China Nonferrous Metals News*, December 7, 2020, [Online](#); Shi Xin, "国资国企助力于田播响脱贫攻坚战鼓" [State-owned assets and state-owned enterprises help Keriya sound the drum of poverty alleviation], *Xinjiang Daily*, May 1, 2018, [Online](#); Cheng Hui, "脱贫路上新疆有色哈图金矿携手帮扶、倾囊相助" [On the road to poverty alleviation, Xinjiang Nonferrous Hatu Gold Mine joins hands and helps], *China Nonferrous Metals News*, October 19, 2020, [Online](#); Xinjiang Nonferrous, "有色要闻 | 张国华在于田县督战督导有色集团脱贫攻坚工作" [Nonferrous news | Zhang Guohua supervises the poverty alleviation work of the non-ferrous group in Keriya County], *Xinjiang Nonferrous Weixin*, March 20, 2020, [Online](#); "新疆有色集团为104名群众开创新生活" [Xinjiang Nonferrous Metals Group creates a new non-ferrous life for 104 people], *Tianshan Net*, May 18, 2017, [Online](#); "于田104名富余劳动力到新疆有色集团就业" [104 surplus laborers in Keriya went to work in Xinjiang Nonferrous Metals Group], *Xinjiang Net*, May 23, 2017, [Online](#).
284. David Michaud, "Ball mill maintenance & installation procedure," 911 Metallurgist, October 19, 2016, [Online](#); "Frequently asked questions: Chloroethene," Delaware Health and Social Services Division of Public Health website, [Online](#).
285. Tursunjan Rozibatur, "不辱使命 润泽心田——集团公司南疆富余劳动力转移就业培训工作组纪事" [Fulfilling the mission and watering the fields of the heart—Chronicle of the Group's southern Xinjiang surplus labor transfer employment training working group], *Xinjiang Nonferrous Weixin*, December 13, 2017, [Online](#).
286. "重磅 | 喀什、和田地区就业报告" [Heavyweight | Kashgar and Hotan employment report], *Xinjiang Economic News*, December 21, 2017, [Online](#).
287. Zhongtai Chemical Huatai Zero Distance, "中泰集团接收南疆深度贫困县150名劳动力就业" [Zhongtai Group accepts employment of 150 laborers from deeply impoverished counties in southern Xinjiang], *Flush Finance*, March 17, 2020, [Online](#).
288. Liu Jinxia, "脱贫攻坚 | 新疆有色集团助力南疆新员工融入有色大家庭" [Poverty alleviation | Xinjiang Nonferrous Metals Group helps new employees in southern Xinjiang integrate into the big nonferrous family], *Xinjiang Nonferrous Weixin*, April 24, 2020, [Online](#).
289. Xinjiang Nonferrous, "有色责任 | 新疆有色集团对南疆深度贫困县转移就业人员开展培训" [Nonferrous Metals responsibility | Xinjiang Nonferrous Metals Group conducts training for transferred employees from deeply impoverished counties in southern Xinjiang], *Xinjiang Nonferrous Weixin*, March 23, 2020, [Online](#); Li Yong, "【有色责任】40名南疆富余劳动力转移就业人员抵达新疆有色集团" [Non-ferrous responsibility] 40 Southern Xinjiang surplus labor transfer workers arrived in Xinjiang Nonferrous Metals Group], *Xinjiang Xinxin Mining Weixin*, March 7, 2020, [Online](#).
290. Fukang Smelter Microplatform, "【有声责任】有色集团阜康片区转移就业培训人员召开民族团结座谈会" [Voiceful responsibility] Nonferrous Metals Group's Fukang area transfer employment training staff holds a symposium on ethnic unity], *Weixin*, April 3, 2020, [Online](#).
291. "新疆公开招标出让两个金属矿探矿权 中标总价达28亿元" [Xinjiang's public bidding for the sale of exploration rights for two metal mines has a total bid price of 2.8 billion yuan], *Xinhuanet*, October 26, 2019, [Online](#).
292. Xinjiang Nonferrous Group, "新疆有色金属工业(集团)有限责任公司2021年度第一期中期票据募集说明书" [Xinjiang Nonferrous Metals Industry (Group) Co., Ltd. Prospectus for the 2021 first phase medium-term notes], *Shanghai Clearing House*, August 8, 2021, [Online](#), p. 71.
293. Xinjiang Nonferrous Group, "新疆有色金属工业(集团)有限责任公司2021年度第一期中期票据募集说明书" [Xinjiang Nonferrous Metals Industry (Group) Co., Ltd. Prospectus for the 2021 first phase medium-term notes], *Shanghai Clearing House*, August 8, 2021, [Online](#), p. 71-95.
294. "阜康市瑞丰铜业有限公司" [Fukang Ruifeng Copper Industry Co., Ltd.], *Qichacha*, [Online](#).
295. "江西省工业和信息化厅关于下达2019年全省工业节能监察重点工作计划暨国家重大工业专项节能监察任务的通知" [Notice of the Jiangxi Provincial Department of Industry and Information Technology on the release of the key work plan for the province's industrial energy conservation supervision in 2019 and the national major industrial special energy conservation supervision tasks], Law 689, July 3, 2019, [Online](#); "江西华业精工有限公司" [Jiangxi Huaye Precision Industry Co., Ltd.], *Aiqicha*, [Online](#).
296. "靖江宏兴铜业制造有限公司" [Jingjiang Hongxing Copper Manufacturing Co.], *Aiqicha*, [Online](#).
297. "上海昊津金属材料有限公司" [Shanghai Haojin Metal Materials Co.], *Aiqicha*, [Online](#).
298. "★苏州凯丰铜业概述 (PPT)" [★Suzhou Kaifeng copper industry overview (PPT)], Suzhou Kaifeng Copper Co., Ltd., [Online](#).
299. "乌鲁木齐新珠江铜缆有限公司" [Ürümchi New Pearl River Copper Cable Co.], *Aiqicha*, [Online](#).
300. "新疆博源铜业有限公司" [Xinjiang Boyuan Copper Industry Co., Ltd.], *Aiqicha*, [Online](#).
301. Xinjiang Nonferrous Group, "新疆有色金属工业(集团)有限责任公司2021年度第一期中期票据募集说明书" [Xinjiang Nonferrous Metals Industry (Group) Co., Ltd. Prospectus for the 2021 first phase medium-term notes], *Shanghai Clearing House*, August 8, 2021, [Online](#), p. 81.
302. "渤海汽车系统公司报告" [Bohai Automotive Systems corporate report], *Shanghai Stock Exchange*, [Online](#), p. 48.
303. "以客户为中心、诚信、责任、创新" [Customer focused, integrity, responsibility, innovation] Bohai Auto corporate website, [Online](#).
304. See Bohai's own description of this partnership arrangement: "关于我们" [About us] Bohai Automotive Systems Co., Ltd corporate website, [Online](#).
305. "【精品】北京鑫鼎顺泽高科技有限责任公司有色金属工业产品研发、仓储基地...36" [(Boutique) Beijing Xinding Shunze High-tech Co., Ltd. Non-ferrous metal industrial product research and development, housing base...36], *Beijing Xinding High-tech 2013 Corporate Annual Report*, 2013, [Online](#), p. 2.
306. Xinjiang Nonferrous Group, "新疆有色金属工业(集团)有限责任公司2021年度第一期中期票据募集说明书" [Xinjiang Nonferrous Metals Industry (Group) Co., Ltd. prospectus for the 2021 first phase medium-term notes], *Shanghai Clearing House*, August 8, 2021, [Online](#), p. 46.
307. Financial Union, "International nickel price soars 20% Xinjiang Xinxin Mining Industry soars 13% in the afternoon," *SMM News*, March 7, 2022, [Online](#).
308. Xinjiang Nonferrous Group, "新疆有色金属工业(集团)有限责任公司2021年度第一期中期票据募集说明书" [Xinjiang Nonferrous Metals Industry (Group) Co., Ltd. prospectus for the 2021 first phase medium-term notes], *Shanghai Clearing House*, August 8, 2021, [Online](#), p. 81-82.
309. "新疆亚克斯资源开发股份有限公司" [Xinjiang Yakesi Resources Development Co.], XJHR.com, July 18, 2022, [Online](#); "新疆亚克斯资源开发股份有限公司" [Xinjiang Yakesi Resources Development Co.], *Qixin*, [Online](#).
310. Xinjiang Nonferrous Group, "新疆有色金属工业(集团)有限责任公司2021年度第一期中期票据募集说明书" [Xinjiang Nonferrous Metals Industry (Group) Co., Ltd. prospectus for the 2021 first phase medium-term notes], *Shanghai Clearing House*, August 8, 2021, [Online](#), p. 71.
311. International Copper Study Group, "The world

copper factbook 2021,” [Online](#), p. 26.

312. These include a 2010 acid waste spill at its Zijinshan Copper Mine in Shanghang, Fujian. Yan Youliang, “紫金矿业被指瞒报污染事故38天?” [Zijin Mining accused of concealing pollution accident for 38 days?], *Times Weekly*, July 15, 2010, [Online](#). More recently, its Serbian operations have faced repeated protests since Zijin’s 2018 takeover of the Rudarsko-Topioničarski Basen copper operations in eastern Serbia. See: CINS, “Serbian court fines Zijin Copper for pollution” *N1*, February 10, 2020, [Online](#); “RERI filed a criminal complaint against ZIJIN and the responsible director for environmental pollution,” Renewables and Environmental Regulatory Institute, January 2021, [Online](#); “Zijin Copper continues illegal construction in Bor,” Renewables and Environmental Regulatory Institute, June 2022, [Online](#); “Zijin Mining sued for \$26 million after dam breach—Xinhua,” *Reuters*, February 17, 2011, [Online](#); The allegations have continued to mount. See: “Pressure at PNG’s Porgera mine to act on human rights redress,” *Radio New Zealand*, February 6, 2019, [Online](#); “Gold’s costly dividend Human rights impacts of Papua New Guinea’s Porgera Gold Mine,” Human Rights Watch, February 1, 2011, [Online](#); Tanya Todd, “Ivanhoe mines reports fatality at the Kamo-a-Kakula Mining Complex,” *Newsfile Corp*, September 9, 2022, [Online](#); “Chinese national killed at Zijin mining camp in Congo, company says,” *Reuters*, August 12, 2020, [Online](#); “Ivanhoe reports fatality at new Kakula mine,” *Mining Journal*, June 8, 2021, [Online](#); Peter Arendas, “Nevsun Resources: Has the bidding war only started, or is this the end?” *Seeking Alpha*, Sept 6, 2018, [Online](#); Neo Lithium Corp, “Zijin Mining to acquire Neo Lithium Corp. in all-cash offer,” *Cision Newswire*, October 8, 2021, [Online](#); “Zijin Mining to acquire Continental Gold in friendly, all-cash offer for C\$1.4 billion,” Continental Gold website, December 2, 2019, [Online](#); “Zijin Mining acquires 50% of Barrick Gold’s interest in Porgera project for US\$298 million,” Fasken Martineau website, August 2015, [Online](#); “Zijin Mining to buy stake in DR Congo’s Kolwezi Copper Mine with \$77.92 Mln,” *SMM News*, November 3, 2014, [Online](#); Guyana Goldfields, “Zijin Mining to acquire Guyana Goldfields Inc. in an all-cash offer for \$323 million,” *Cision Newswire*, June 12, 2020, [Online](#).

313. “紫金矿业集团股份有限公司2021年年度报告” [Zijin Mining Group Company Limited annual report 2021], [Online](#), p. 20.

314. “紫金矿业集团股份有限公司2021年年度报告” [Zijin Mining Group Company Limited annual report 2021],

[Online](#), p. 20-23; “紫金矿业集团” [Zijin Mining Group], *Aiqicha*, [Online](#).

315. “紫金矿业” [Zijin Mining], Zijin Mining Group Co., Ltd. Zijin News, May 11, 2022, [Online](#); “紫金矿业集团股份有限公司2021年年度报告” [Zijin Mining Group Company Limited annual report 2021], [Online](#), p. 10.

316. “紫金矿业集团股份有限公司2021年年度报告” [Zijin Mining Group Company Limited annual report 2021], [Online](#), p. 177.

317. “阿舍勒铜业获新疆‘千企帮千村’精准扶贫行动先进企业” [Ashele Copper wins Advanced Enterprise of Xinjiang’s “Thousands of Enterprises Helping Thousands of Villages” targeted poverty alleviation action], Zijin Mining News, December 17, 2020, [Online](#).

318. “走向我们的小康生活·重点扶贫工程巡礼】南疆天然气利民工程：430万群众生产生活变了样” [Towards our well-off life · Key poverty alleviation project tour], *Xinjiang Daily*, October 12, 2020, [Online](#).

319. “阿舍勒铜业获新疆‘千企帮千村’精准扶贫行动先进企业” [Ashele Copper wins Advanced Enterprise of Xinjiang’s “Thousands of Enterprises Helping Thousands of Villages” targeted poverty alleviation action], Zijin Mining News, December 17, 2020, [Online](#).

320. “农民转身变工人 哈巴河县农民就业进入新时代” [Farmers turned into workers, farmers in Habah County have entered a new era of employment], *Tianshan News*, March 15, 2012, [Online](#).

321. “紫金矿业集团股份有限公司2021年年度报告” [Zijin Mining Group Company Limited annual report 2021], [Online](#), p. 46.

322. David Stanway, “Insight: China’s losing battle against state-backed polluters,” *Reuters*, March 31, 2013, [Online](#).

323. “紫金矿业集团股份有限公司2021年年度报告” [Zijin Mining Group Company Limited annual report 2021], [Online](#), p. 61.

324. “电动汽车热潮点燃铜矿争夺战 紫金矿业刚果买矿收获‘超值买卖’” [Electric vehicle boom ignites battle for copper mines Zijin Mining Congo buys mines], *Sohu*, February 13, 2019, [Online](#).

325. Drawn in part from Xinjiang copper mine resources investigation report: “新疆铜矿资源调查报告 2016” [Xinjiang copper mine resources investigation report 2016], CGS News, [Online](#). Based on initial information from that site, we searched for large mines in the Uyghur Region and edited the list based on updated findings regarding currently operational mines and corporate registrations.

326. However, its largest stakeholder Baoli Jiangshan (保利江山资源有限公司) is state-owned: “保利江山资源有限公司” [Poly Jiangshan Resources Co., Ltd.], *Baidu Baike*, [Online](#).

327. “新疆且末县：学用结合 扎实推进国语学习见成效” [Qiemo County, Xinjiang: Combining learning with use, solidly promoting Mandarin learning and seeing results], *Sohu*, April 24, 2019, [Online](#).

328. “十三五’期间自治区区属高校毕业生就业率总体保持在88%以上” [During the 13th Five-Year Plan

period, the overall employment rate of graduates from colleges and universities in the autonomous region remained above 88%], Qinghe County Party Member and Cadre Modern Distance Education Management Center, October 21, 2020, [Online](#); Yang Guang, “新疆有色集团：砥砺前行七十年 而今迈向新征程” [Xinjiang Nonferrous Metals Group: Forging ahead for 70 years and now heading for a new journey] *Xinjiang Daily*, December 14, 2020, [Online](#); “【决战决胜脱贫攻坚】发展产业促就业 助力脱贫奔小康” [Decisive battle to win the fight against poverty] Develop industries, promote employment, help get rid of poverty and strive to become well-off] Fukang Municipal People’s Government website, June 23, 2020, [Online](#).

329. However, its second largest stakeholder is China Railway 19th Bureau Group Co., Ltd. (中铁十九局集团有限公司), which is state-owned (and among the top 500 companies in the world): “哈密焱鑫铜业有限公司” [Hami Yanxin Copper Industry Co., Ltd], *Qixin*, [Online](#).

330. Rashida and Zhang Ruiqi, “哈密拧紧农业节水‘阀门’之后” [After Hami tightened the agricultural water-saving ‘valve’], *Xinjiang Daily*, April 22, 2020, [Online](#).

331. However, a state-owned enterprise Xinjiang Baoke Nonferrous (新疆宝凯有色矿业有限责任公司) is among its major stakeholders: “新疆怡宝矿产资源勘查开发有限责任公司” [Xinjiang Yibao Mineral Resources Exploration and Development Co. Ltd.], *Qixin*, [Online](#).

332. The parent company Zhaojin Mining is engaged in labor transfers. “招金矿业：天山南北打造百年精品” [Zhaojin Mining: To build quality products that last a century in the north and south of Tianshan], *China Nonferrous Metals News*, August 26, 2014, [Online](#).

333. “新疆喀拉通克矿业” [Xinjiang Kalatongke Mining], *Green Mine Newsletter*, September 8, 2014, [Online](#).

334. People’s Republic of China, 《电池行业污染物排放标准》(GB30484-2013) [“Battery industry pollutant emission standard” (GB30484-2013)], December 27, 2013, [Online](#); See for example, “China shuts most lead acid battery producers to curb pollution and poisoning,” *Bloomberg News*, May 30, 2011, [Online](#); “淘汰落后产能”重伤“骆驼股份风帆股份” [Eliminating outdated production capacity “severely hurts” Camel Fengfan Co., Ltd.], *International Finance News*, July 12, 2012, [Online](#); “为废旧铅酸蓄电池污染治理与回收利用”把脉开方”——自治区政协视察废旧铅酸蓄电池污染治理与回收工作座谈会现场小记” [Check the pulse and write a “prescription” for pollution control and recycling of used lead-acid battery—s - A small on-site note on the Autonomous Region CPPCC meeting on inspecting pollution control and recycling of used lead-acid batteries], The Xinjiang Uyghur Autonomous Region Committee of the Chinese People’s Political Consultative Conference, December 21,

2018, [Online](#); “新疆八部门联合专项整治废铅酸电池收集转运处置” [Eight departments in Xinjiang jointly conduct special rectification of waste lead-acid battery collection, trans-shipment and disposal], Northwest Inspection Bureau, Ministry of Ecology and Environment, August 4, 2020, [Online](#).

335. “新疆维吾尔自治区国民经济和社会发展第十三个五年规划纲要” [Outline of the 13<sup>th</sup> Five-Year Plan for the national economic and social development of the XUAR], National Development and Reform Commission, May 2016, [Online](#), p. 49

336. Alvin J. Salkind, Anthony G. Cannone, Forrest A. Trumbure, “Chapter 23: Lead-acid batteries,” In David Linden and Thomas B. Reddy (eds.), *Handbook of Batteries*, 3<sup>rd</sup> Ed., McGraw-Hill, 2002, [Online](#), p. 610.

337. “Lead poisoning and health factsheet,” *World Health Organization*, October 11, 2021, [Online](#); Charles Xintaras, CDC Prevention Guidelines Database, “Impact of lead-contaminated soil on public health. US Dept of Health and Human Services, Public Health Service, Centers for Disease Control (CDC), Agency for Toxic Substances and Disease Registry,” May 1, 1992, [Online](#).

338. “Recycling used lead-acid batteries: health considerations,” *World Health Organization*, 2017, [Online](#).

339. “Xinjiang Renewable Resources Group to build an eco-industrial chain for lead-acid batteries in Xinjiang,” *Shanghai Metals Market (SMM)*, September 9, 2015, [Online](#).

340. Solid Waste and Chemicals Division, “关于拟决定向骆驼集团新疆蓄电池有限公司等5家单位颁发废铅蓄电池收集许可证的公示” [Announcement on the decision to issue waste lead-acid battery collection licenses to 5 units including Camel Group Xinjiang Battery Co., Ltd.], Department of Ecology and Environment of the Xinjiang Uyghur Autonomous Region, September 27, 2019, [Online](#)

341. Material in the Camel Group section first appeared in Laura T. Murphy, Kendyl Salcito, and Nyrola Elimä, “Financing and genocide: Development finance and the crisis in the Uyghur Region,” *Sheffield Hallam University Helena Kennedy Centre for International Justice*, February 2022, [Online](#).

Since Sheffield Hallam’s report on Camel was published in February of 2022, Camel has changed its website to remove almost all mentions of its XUAR manufacturing. As of November 2022, only one mention of the XUAR facilities seemed to remain. See “Company Profile | Subsidiaries,” Camel Group website, [Online](#).

342. Material in the Camel Group section first appeared in Laura T. Murphy, Kendyl Salcito, and Nyrola Elimä, “Financing and genocide: Development finance and the crisis in the Uyghur Region,” *Sheffield Hallam University Helena Kennedy Centre for International Justice*, February 2022, [Online](#).

343. Laura T. Murphy, Kendyl Salcito, and Nyrola Elimä, “Financing and genocide: Development finance and the crisis in the Uyghur Region,” *Sheffield Hallam University Helena Kennedy Centre for International Justice*, February 2022, [Online](#).

344. Lei Chuang, “血铅事件频繁爆发 骆驼集团因污染被责令整改” [Frequent blood lead incidents break out, Camel Group ordered to rectify due to environmental pollution], *Yangtze River Commercial Daily*, June 23, 2011, [Online](#).

345. China Nonferrous Metals Industry Network, “新疆最大废旧铅酸蓄电池加工项目开工” [Construction starts on Xinjiang’s largest lead-acid battery waste processing project], September 14, 2016, [Online](#). The article references the consolidation of Xinjiang’s lead-acid battery operations under two firms now owned by Camel, representing a shift away from small-scale battery recyclers and a new business stream for Xinjiang Renewable Resources Group (新疆再生资源集团).

346. “关于印发《自治州推进喀什和田地区城乡富余劳动力有组织转移就业三年规划（2017—2019年）》的通知” [Notice on the publication of the “Three-Year Plan for promoting the organized transfer of urban and rural surplus labor forces in Kashgar and Hotan region to employment in the autonomous prefecture (2017-2019)”, People’s Government Office of Bayingoleng Mongolian Autonomous Prefecture website, June 15, 2017, [Online](#). Note: this is a copy of the plan that was issued by the Bayingoleng Mongolian Autonomous Prefecture government. The citation authored by Li Neng indicates that this plan was also issued in Turpan.

347. Li Neng, “托克逊县举行喀什、和田地区城乡富余劳动力企业上岗交接仪式” [Toksun County holds the handover ceremony for the urban and rural surplus labor enterprises in Kashgar and Hotan areas], *Weixin*, July 10, 2017, [Online](#).

348. “骆驼集团新疆蓄电池有限公司年产400万KVAh 蓄电池项目” [Camel Group Xinjiang Storage Battery Co., Ltd. annual production of 4 million kVAh battery project environmental impact report], *Xinjiang Chemical Design and Research Institute Co., Ltd.* ii National Environmental Assessment No. [4003], 2017, p. 35-36, 278. [Submitted by IFC to Kendyl Salcito in response to document request; Available on report website.]

349. *Xinjiang Chemical Design and Research Institute Co., Ltd.* “骆驼集团新疆蓄电池有限公司年产400万KVAh 蓄电池项目” [Camel Group Xinjiang Storage Battery Co., Ltd. annual production of 4 million kVAh battery project environmental impact report” National environmental assessment No. [4003]] (“EIR”), EIR Section 3.1.7.

350. Camel Group, “About— Cooperative partners,” *Camelbatt.com*, [Online](#).

351. According to customs records accessed via

Panjiva Market Intelligence platform.

352. Camel Energy US, “Home,” *Camelenergyus.com*, [Online](#).

353. James Fernyhough, “Electric vehicles tipped to reach 58pct of new car sales in China by 2030,” *The Driven*, March 3, 2021, [Online](#).

354. Giulia Interesse, “China considers extending its EV subsidies to 2023,” *Dezan Shira China Briefing*, June 13, 2022, [Online](#).

355. The White House, “Building resilient supply chains, revitalizing American manufacturing, and fostering broad-based growth: 100-Day reviews under Executive Order 14017,” June 2021, [Online](#), p. 90, 94-95.

356. Simon Flowers, “How electric cars will move from niche to disruptor, Industrial-scale production is the coming gamechanger,” *Wood Mackenzie*, January 13, 2022, [Online](#).

357. National Development and Reform Commission, “新疆维吾尔自治区国民经济和社会发展第十四个五年规划和2035年远景目标纲要” [The 14<sup>th</sup> Five-Year Plan for the national economic and social development of Xinjiang Uyghur Autonomous Region and the outline of the vision for 2035], June 11, 2021, [Online](#), p. 26

358. The White House, “Building resilient supply chains, revitalizing American manufacturing, and fostering broad-based growth: 100-Day reviews under Executive Order 14017,” June 2021, [Online](#), p. 124.

359. Benchmark Mineral Intelligence, “Infographic: China’s lithium ion battery supply chain dominance,” October 3, 2022, [Online](#).

360. “国务院关于印发《中国制造2025》的通知” [State Council notice on the publication of “Made in China 2025”], State Department of China, Guo Fa No. 28, May 8, 2015, [Online](#); Amit Kawala, “The world can’t wean itself off Chinese lithium,” *Wired.com*, July 1, 2022, [Online](#). See also: Godfrey Yeung, “Made in China 2025: The development of a new energy vehicle industry in China,” *Area Development and Policy*, September 5, 2018, [Online](#).

361. “中华人民共和国国民经济和社会发展第十四个五年规划和2035年远景目标纲要” [Outline of the People’s Republic of China 14<sup>th</sup> Five-Year Plan for national economic and social development and long-range objectives for 2035], *Xinhua News Agency*, March 12, 2021, [Online](#) [Translation from the Georgetown Center for Security and Emerging Technology, [Online](#)] Table 4, Increase in manufacturing core competitiveness, Row 6. See also: Article IX, “Develop and expand strategic emerging industries” aiming to “build new pillars of the industrial system” including “new energy vehicles.”

362. “Infographic: China’s lithium ion battery supply chain dominance,” *Benchmark Mineral Intelligence*,

October 3, 2022, [Online](#).

363. Heejin Kim and Hongcheol Kim, "CATL retains top position as world's biggest EV battery maker," *Bloomberg*, May 2, 2022, [Online](#).

364. Joseph White and Ben Klayman, "Ford to buy CATL EV batteries to catch Tesla," *Reuters*, July 21, 2022, [Online](#).

365. Yang Wanli, "World-class' deposit of lithium found, could ease reliance on imports," *China Daily*, Jun 5, 2019, [Online](#).

366. Gao Feng, "亚欧稀有公司：自主技术催生‘绿色工厂’" [Asia-Europe Rare Metals Co: "Green Factory" with independent technology], *Tianshan N-t - Xinjiang Daily*, January 5, 2022, [Online](#).

367. "乌鲁木齐米东区"春风行动"百家企业送岗进农村" ["Spring breeze action" in Midong District, Ürümchi Sends 100 enterprises to rural areas], *Central Radio Network*, April 20, 2018, [Online](#). It is important to note that the company is hiring low-skilled workers through the labor transfer schemes because many companies claim that they cannot be using transferred or forced laborers because their workforce is highly skilled.

368. Han Qinyan, "【援疆工作巡礼】这些“看得见、摸得着”的实惠，让这里发生了巨大变化....." [[Xinjiang Aid work tour] These "visible and tangible" benefits have brought great changes here...], *Xinjiang Daily*, July 4, 2017, [Online](#).

369. Xinjiang Nonferrous Group, "新疆有色金属工业(集团)有限责任公司2021年度第一期中期票据募集说明书" [Xinjiang Nonferrous Metals Industry (Group) Co., Ltd. prospectus for the 2021 first phase medium-term notes], *Shanghai Clearing House*, August 8, 2021, [Online](#), p. 93.

370. The company also lists as its corporate "partners" Swatch, LG Chem, Panasonic, and Samsung. "天津中能锂业有限公司" [Tianjin Zhongneng Lithium Industry Co., Ltd. (CEL Lithium)], Corporate website, [Online](#)

371. Wu Yixuan and Wu Jixia, "天铁股份加码锂电产业 子公司拟10亿元投建锂盐等项目" [Tiantie Co., Ltd. plans to invest 1 billion yuan to build lithium salt and other projects], *Securities Daily*, July 21, 2021, [Online](#); Tiantie, "下属企业：江苏昌吉利新能源科技有限公司" [Affiliated companies: Jiangsu Changjili New Energy Technology Co., Ltd.], *Tiantie Corporate Website*, [Online](#); "产品介绍" [Product descriptions], *Changjili Corporate Website*, [Online](#).

372. Wang Jiechao, Zhu Jin, "轨交减振降噪龙头天铁股份研究报告" [Research report on Tiantie Group, the leader in vibration and noise reduction of rail transit], *East Money and CITIC Construction Investment Securities*, February 8, 2022, [Online](#).

373. Xinjiang Nonferrous Group, "新疆有色金属工业(集团)有限责任公司2021年度第一期中期票据募集说明书" [Xinjiang Nonferrous Metals Industry

(Group) Co., Ltd. prospectus for the 2021 first phase medium-term notes], *Shanghai Clearing House*, August 8, 2021, [Online](#), p. 93, 94.

374. "兴化市远红外元件厂" [Xinghua Far Infrared Component Factory], *Aiqicha*, [Online](#); "广西睿奕新能源股份有限公司2017 半年度报告" [Guangxi Ramway Energy Corp., Ltd 2017 semi-annual report], *Guangxi Ramway*, July 31, 2017, [Online](#).

375. Xinjiang Nonferrous Group, "新疆有色金属工业(集团)有限责任公司2021年度第一期中期票据募集说明书" [Xinjiang Nonferrous Metals Industry (Group) Co., Ltd. prospectus for the 2021 first phase medium-term notes], *Shanghai Clearing House*, August 8, 2021, [Online](#), p. 93.

376. Customs data accessed via Panjiva Market Intelligence.

377. Ana Swanson and Chris Buckley, "Red flags for forced labor found in China's car battery supply chain," *The New York Times*, June 20, 2022, [Online](#).

378. "Impact Report 2021," *Tesla Website*, Online, p. 103; Fred Lambert, "GM secures long-term supply of lithium from Livent and cathode from LG for 1 million EVs," *ElecTrek*, July 26, 2022, [Online](#).

379. Heejin Kim and Hongcheol Kim, "CATL retains top position as world's biggest EV battery maker," *Bloomberg*, May 2, 2022, [Online](#). See also: Chang Che, "Faced with CATL battery dominance, US trade experts mull a China-like tech transfer," *The China Project*, March 30, 2022, [Online](#); "Battery giant CATL flags \$9 billion share placement plan," *Bloomberg News*, August 13, 2021, [Online](#); Pete Pattison and Febriana Firdaus, "Battery arms race: How China has monopolised the electric vehicle industry," *The Guardian*, November 25, 2021, [Online](#)

380. Keith Bradsher and Michael Forsythe, "Why a Chinese company dominates electric car batteries," *New York Times*, December 22, 2021, [Online](#).

381. "新疆国网时代储能发展有限公司" [Company profile: Xinjiang State Grid Times Energy Storage Development Co., Ltd.], *Shunqi.com*, [Online](#); "继新疆合资公司之后，宁德时代与国网综能集团再次出手！" [Following the Xinjiang joint venture, Ningde Times and State Grid Comprehensive Energy Group shoot again!], *Sohu News, Battery Industry Network*, April 9, 2020, [Online](#).

382. "宁德时代投资成立新公司，加码原材料" [Ningde Times invests in the establishment of a new company to increase raw materials!], *OF Week Lithium Grid*, July 11, 2022, [Online](#); "江西志存锂业有限公司" [Jiangxi Zhicun Lithium Industry Co., Ltd.], *Aiqicha*, [Online](#). Customs data accessed via Panjiva Market Intelligence.

383. "新疆志存新能源材料有限公司2022校园招聘" [Xinjiang Zhicun New Energy Materials Co., Ltd. 2022 campus recruitment], *Fujian Talent Recruitment Network*, April 28, 2022, [Online](#).

384. "今日字母哥解析特变电工在若羌县夺得锂矿资源，用事实和数据论证" [Today, Antetokounmpo explained that TBEA won lithium ore resources in Chaqiliq County, and demonstrated with facts and data], *EastMoney*, August 7, 2022, [Online](#).

385. "新疆志存新能源材料有限公司2022校园招聘" [Xinjiang Zhicun New Energy Materials Co., Ltd. 2022 campus recruitment], *Fujian Talent Recruitment Network*, April 28, 2022, [Online](#). "新疆志存新能源材料有限公司及大唐若羌风电场招聘1000人简章" [Xinjiang Zhicun New Energy Materials Co., Ltd. and Datang Ruoqiang Wind Farm recruitment brochure for 1,000 people], *Business Unit Recruitment, Fenbi*, July 1, 2022, [Online](#).

386. "若羌吸纳近千名南疆籍富余劳动力就业" [Chaqiliq attracts nearly 1,000 surplus laborers from southern Xinjiang], *China Daily*, April 8, 2017, [Online](#).

387. "今日字母哥解析特变电工在若羌县夺得锂矿资源，用事实和数据论证" [Today, Antetokounmpo explained that TBEA won lithium ore resources in Chaqiliq County, and demonstrated with facts and data], *EastMoney*, August 7, 2022, [Online](#).

388. Laura T. Murphy and Nyrola Elima, "In broad daylight: Uyghur forced labor and global solar supply chains," Sheffield Hallam University Helena Kennedy Centre for International Justice, May 2021, [Online](#).

389. Reimujiang Kerimu, "2022年若羌县政府工作报告" [2022 Chaqiliq County Government work report], *Quyushuju*, January 3, 2022, [Online](#); Huang Xiping (Interview), "走进县城看发展·访谈 | 若羌县"委书记黄新平：推进新能源和新材料产业高质量发展" [Entering the county to see the development, Interview, Huang Xiping, Secretary of the Chaqiliq County Party Committee: Promoting the high-quality development of new energy and new material industries] *Tianshan Net-Xinjiang Daily*, July 4, 2022, [Online](#).

390. "Chinese firm CATL to supply lithium-ion batteries to Tesla," *Global Times*, June 28, 2021, [Online](#); Arjun Kharpal, "China's CATL, a Tesla supplier, considers expanding battery swapping business overseas," *CNBC*, September 22, 2022, [Online](#).

391. Cheng Yu, "Ford Motor creates partnership with Chinese battery giant CATL," *China Daily*, July 22, 2022, [Online](#).

392. "SAIC-GM, CATL sign strategic cooperation agreement to research, develop NEV batteries," *Gasgoo China Automotive News*, September 04, 2018 [Online](#); Yilei Sun and Brenda Goh, "GM to work closely with CATL in its China EV push: Executive," *Reuters*, June 4, 2020, [Online](#).

393. "CATL and BMW reach framework agreement on cylindrical battery supply," *Cision PR Newswire*, September 9, 2022, [Online](#).

394. "Mercedes-Benz expands battery supply

partnership with CATL on its way towards going Electric-Only: New production site in Hungary,” *Mercedes-Benz Group Media*, August 12, 2022, [Online](#).

395. “CATL and Honda sign agreement to form comprehensive strategic alliance on batteries for new energy vehicles,” *Honda Global Website*, July 10, 2020, [Online](#).

396. “CATL and Hyundai MOBIS sign CTP technology licensing and partnership agreement,” *Cision PR Newswire*, October 27, 2021, [Online](#).

397. “CATL becomes the first cell manufacturer received [sic] Volkswagen Group’s test lab qualification certificate in the world,” CATL via *PR Newswire*, June 1, 2021, [Online](#).

398. “ZF and CATL join forces for an optimal after-market service in e-mobility and energy storage,” ZF Press Center, November 19, 2021, [Online](#).

399. “CATL and Bosch automotive aftermarket open the first co-authorized NEV service center,” CATL News website, July 25, 2022, [Online](#).

400. “赣锋锂业·霸气不？” [Ganfeng Lithium Industry, is it dominating?] *XueQiu.com*, July 25, 2022, [Online](#); “新矿赣锋(新疆)锂业有限公司” [New Mine Ganfeng (Xinjiang) Lithium Industry Co., Ltd.], *QichaMao*, [Online](#); New Mine Investment Group, “新矿赣锋(新疆)锂业有限公司注册成立” [Xinmine Ganfeng (Xinjiang) Lithium Industry Co., Ltd. registered and established], *Weixin*, May 20, 2022, [Online](#); “Lithium giant Ganfeng pulls EVs deeper into forced labor glare,” *Bloomberg Law*, July 17, 2022, [Online](#); Harry Dempsey and Edward White, “China’s lithium champion Ganfeng mints money but walks a fine line,” *Financial Times*, August 18, 2022, [Online](#); David Stringer and Annie Lee, “Plan to extract lithium from Xinjiang raises forced-labor questions for EV industry,” *Los Angeles Times*, July 17, 2022, [Online](#). See also Gao, Bagas, Li, Jin, Liu, and Teng, “Newly discovered Triassic lithium deposits in the Dahongliutan area, Northwest China: A case study for the detection of lithium-bearing pegmatite deposits in rugged terrains using remote-sensing data and images,” *Earth Science*, 10, 2020, [Online](#).

401. “赣锋锂业于新疆投资成立矿产资源勘查公司，注册资本9000万” [Ganfeng Lithium invests to establish a mineral resource exploration company in Xinjiang with a registered capital of 90 million], *QQ News*, [Online](#); “智慧农业(SZ000816)5月20日，新矿赣锋(新疆)锂业有限公司(以下简称新)” [Smart Agriculture (SZ000816) \$ On the 20th of June, Xinkuang Ganfeng (Xinjiang) Lithium Industry Co., Ltd. (hereinafter referred to as the new)], *EastMoney Securities*, May 31, 2022, [Online](#).

402. “发展历程” [Development path] *Ganfeng Lithium Website*, [Online](#); “China’s Ganfeng wins deal to supply Tesla with lithium products,” *Bloomberg News*, November 1, 2021, [Online](#); “Impact report 2021,” *Tesla*, [Online](#), p. 103.

403. “Ganfeng Lithium and BMW signed a ‘long-term supply agreement’ to accelerate the progress of vehicle electrification,” *Ganfeng Lithium News*, June 28, 2020, [Online](#); Harry Dempsey and Edward White, “China’s lithium champion Ganfeng mints money but walks a fine line,” *Financial Times*, August 18, 2022, [Online](#).

404. Zhou Yantao and Zhao Haizhong, “【来自师市重点项目一线的报道】新疆天宏基：科技创新让企业焕发勃勃生机” [Report from the front line of key projects in Shishi City] Xinjiang Tianhongji: Technological innovation makes enterprises revitalized], *Sohu News*, March 29, 2021, [Online](#); “新疆这个‘小巨人’企业有底气 进击锂电池大市场” [In Xinjiang, a ‘little giant’ enterprise has the confidence to attack the big lithium battery market], *Sohu News*, *Huatong Baiyin*, November 4, 2021, [Online](#).

405. “和田瑞福矿业有限公司” [Hetian Ruifu Mining Co., Ltd.], *Aiqicha*, [Online](#); “原股东高位套现几近‘清仓’！瑞福锂业九成股权被出售 亿纬锂能、\*ST未来接盘” [The original shareholder’s high cash-out is almost ‘clearing’! Ninety percent of Ruifu Lithium’s equity was sold by Yiwei Lithium Energy, \*ST will take over in the future], *21st Century Business Herald*, September 28, 2022, [Online](#); “公司于2022年7月1日披露了拟收购山东瑞福锂业有限公司、新疆东力矿业投资有限公” [The company disclosed on July 1, 2022 that it intends to acquire Shandong Ruifu Lithium Industry Co., Ltd. and Xinjiang Dongli Mining Investment Co., Ltd.], *East Money*, September 19, 2022, [Online](#); Mido Energy Co., Ltd., “关于现金收购山东瑞福锂业有限公司股权的公告” [Announcement on the cash acquisition of equity interests in Shandong Ruifu Lithium Industry Co., Ltd.], Mido Energy, March 8, 2018, [Online](#).

406. “储能材料 | Altura矿业与山东瑞福锂业签署锂材料包销协议” [Energy Storage Materials | Altura Mining signs lithium material underwriting agreement with Shandong Ruifu Lithium Industry], *Shanghai Nonferrous*, July 11, 2019, [Online](#).

407. Mido Energy Co., Ltd., “关于现金收购山东瑞福锂业有限公司股权的公告” [Announcement on the cash acquisition of equity interests in Shandong Ruifu Lithium Industry Co., Ltd.], Mido Energy, March 8, 2018, [Online](#). More recent customer information was not found. We contacted all of the companies named here for information regarding current sourcing but did not receive a response.

408. We say “seems to” because the reports are all in the future tense. Ya Man, “‘10天9板’的\*ST未来，官宣拟跨界收购锂业资产，多方提示交易风险” [In the future of \*ST of ‘9 boards in 10 days,’ official announcement that it intends to acquire lithium assets across borders, and many parties have warned of transaction risks], *Yangzi Evening News*, [Online](#); Yi Shan, “官宣！又有A股公司跨界锂业” [Official announcement! Another A-share company crosses the border into the lithium industry], *China Fund News*, July 30, 2022, [Online](#).

409. “新疆威能环保电源科技有限公司” [Xinjiang

Weineng Environmental Protection Power Technology Co., Ltd.], *Xinbao APP*, [Online](#).

410. “总投资10亿元！新疆阿拉山口市与正通云极签约锂电池项目” [The total investment is 1 billion yuan! Alashankou City, Xinjiang signs a lithium battery project with Zhengtong Yunji], *Polaris Energy Storage*, July 19, 2022, [Online](#).

411. “新疆亿隆源环保科技有限公司” [Xinjiang Yilongyuan Environmental Protection Technology Co., Ltd.], *Aiqicha*, [Online](#); “新疆亿隆源环保科技有限公司储能及新能源项目公示” [Public announcement of energy storage and new energy projects of Xinjiang Yilongyuan Environmental Protection Technology Co., Ltd.], *Polaris Energy Storage Network*, January 13, 2016, [Online](#).

412. “英泰集团有限公司新疆分公司” [Yingtai Group Co., Ltd. Xinjiang Branch], *Aiqicha*, [Online](#). The parent company, Yingtai Group manufactures products for electric vehicles: “集团架构” [Group structure], *Intech Group corporate website*, [Online](#). Its partners include Volvo, Mercedes Benz etc.: “我们的合作伙伴” [Our business partners], *Yingtai Group corporate website*, [Online](#).

413. “霍尔果斯星石科技有限公司” [Khorgosh Star Stone Technology Co., Ltd.], *Aiqicha*, [Online](#).

414. Ma Yining, “巨变 | 新疆制造‘数’前行” [Great change | Made in Xinjiang is accelerating, going ‘digital’], *Xinjiang Daily*, July 5, 2022, [Online](#).

415. Cai Guodong, Du Bin, and Cao Kai, “新疆打造装备制造产业基地 开拓‘一带一路’新商机” [Xinjiang builds an equipment manufacturing industry base to open up new business opportunities along the ‘Belt and Road’], *Xinhua News Agency* via Embassy of the People’s Republic of China in the United States of America website, August 18, 2015, [Online](#); “迈好第一步 见到新气象” [‘14’期间 新疆电子产品制造业布局更加优化] [Take the first step to see the new weather] The layout of Xinjiang’s electronic product manufacturing industry will be more optimized during the “14th Five-Year Plan” period], *Xinjiang Net* via Ürümchi Economic and Technological Development Zone (Toutunhe District) website, February 5, 2021, [Online](#).

416. “迈好第一步 见到新气象” [‘14’期间 新疆电子产品制造业布局更加优化] [Take the first step to see the new weather] The layout of Xinjiang’s electronic product manufacturing industry will be more optimized during the “14th Five-Year Plan” period], *Xinjiang Net* via Ürümchi Economic and Technological Development Zone (Toutunhe District) website, February 5, 2021, [Online](#).

417. For more on this relationship, see Seaver Wang, Juzel Lloyd, and Guido Núñez-Mujica, “Sins of a Solar Empire,” *The Breakthrough Institute*, November 15, 2022, [Online](#).

418. Liu Xiang, “新疆：加快延链强链补链 推动产业集群化发展” [Xinjiang: Accelerate the extension

of the chain, strengthen the chain and supplement the chain to promote the development of industrial clusters], *Xinjiang Daily*, August 25, 2021, [Online](#).

419. Liu Xiang, “新疆：加快延链强链补链 推动产业集群化发展” [Xinjiang: Accelerate the extension of the chain, strengthen the chain and supplement the chain to promote the development of industrial clusters], *Xinjiang Daily*, August 25, 2021, [Online](#).

420. Liu Xiang, “新疆：加快延链强链补链 推动产业集群化发展” [Xinjiang: Accelerate the extension of the chain, strengthen the chain and supplement the chain to promote the development of industrial clusters], *Xinjiang Daily*, August 25, 2021, [Online](#).

421. See, for instance: Vicky Xiuzhong Xu, Danielle Cave, James Leibold et. al, “Uyghurs for sale,” Australian Strategic Policy Institute, February 28, 2020, [Online](#); Adrian Zenz, “Coercive labor and forced displacement in Xinjiang’s cross-regional labor transfer program,” *The Jamestown Foundation*, March 2021, [Online](#).

422. U.S. Departments of State, Treasury, Commerce, Homeland Security, and Labor and the Office of the United States Trade Representative, “Xinjiang supply chain business advisory: Risks and considerations for businesses and individuals with exposure to entities engaged in forced labor and other human rights abuses linked to Xinjiang, China,” U.S. Department of State website, July 13, 2021, [Online](#).

423. “待定控股（深圳）有限公司” [Pengding Holdings (Shenzhen) Co., Ltd.], Avary Holdings, [Online](#).

424. “战略合作伙伴” [Strategic partners], Avary Holdings, [Online](#).

425. “产品领域” [Product field], Avary Holdings, [Online](#).

426. “待定控股（深圳）有限公司” [Pending Holdings (Shenzhen) Co., Ltd.], Avary Holdings, [Online](#).

427. “董事长致辞” [Message from the chairman], Avary Holdings, [Online](#).

428. “夏特乡”五抓五强“全力推进就业扶贫” [Xia Te Township “Five Grasp and Five Strong” to fully promote employment and poverty alleviation], Ili Party Building Network Group, October, 15, 2019, [Online](#).

429. “鹏鼎控股：淮安超薄线路板产能达9.3万平方米/月” [Pengding Holdings: Huaian ultra-thin circuit board production capacity reaches 93,000 square meters / month], Aiji Micro APP Fujian, June 14, 2022, [Online](#); Cloud Contract, “再投资50亿，淮安经开区与鹏鼎控股”云签约” [Another 5 billion invested, Huaian Economic Development Zone and Pengding Holdings “cloud contract”] *China Taiwan Network*, July 6, 2020, [Online](#).

430. “武进援疆工作组：巧做“加法”冲刺收官年” [Wujin Aid Xinjiang Working Group: Skillfully do “addition” to sprint to the end of the year], *Wujin*

*Daily*, July, 29, 2019, [Online](#).

431. “尼勒克县人力资源和社会保障工作办公室” [Nilqa County Office of Human Resources and Social Security jobs] Nilek County Government Network, November 2, 2019, [Online](#); “新疆尼勒克：多措并举探索提升农村劳动力疆外有组织转移就业新模式” [Nilqa, Xinjiang: Take multiple measures to explore a new model for improving the organized transfer of rural labor outside Xinjiang], Ministry of Human Resources and Social Security of the People’s Republic of China website, June 24, 2019, [Online](#).

432. “尼勒克400余名农牧民赴内地就业” [More than 400 farmers and herdsmen from Nilqa go to inner China for employment], *Ili Daily*, March 12, 2019, [Online](#).

433. “新源县峰凌劳务派遣有限责任公司” [Xinyuan County Fengling Labor Dispatching Co., Ltd.], Ili Employment Network, September 3, 2019, [Online](#); Tech Transparency Project first identified this. See: Tech Transparency Project, Twitter Thread, TTP Updates, May 10, 2021, [Online](#).

434. “淮安伊犁：万里牵手助脱贫” [Huai’an Ili: Wanli hand in hand to help alleviate poverty], *Xiongmiao Times*, September 27, 2020, [Online](#).

435. “七家苹果供应商涉嫌维吾尔强迫劳动” [Seven Apple suppliers linked to Uyghur forced labor], *The Information*, May 19, 2021, [Online](#).

436. “人权与跨国公司和其他工商企业工作组的任务...” [Mandates of the working group on human rights and transnational corporations and other business enterprises...], Special Procedures Communications Reports of the Office of the High Commissioner for Human Rights of the United Nations, March 12, 2021, [Online](#).

437. “七家苹果供应商涉嫌维吾尔强迫劳动” [Seven Apple suppliers linked to Uyghur forced labor], *The Information*, May 19, 2021, [Online](#).

438. Customs records accessed via Panjiva Market Intelligence.

439. “公司简介” [Company profile], Joyson Electronics, [Online](#).

440. “均胜汽车安全系统（荆州）有限公司” [Joyson (Joyson Automotive Safety System (Jingzhou) Co., Ltd.)], *Aiqicha*, July 21, 2022, [Online](#).

441. Naomi Tajitsu, “Key Safety Systems completes deal to acquire air bag maker Takata,” *Reuters*, April 11, 2018, [Online](#).

442. “关于我们 推动移动出行服务 更智能、更安全、更环保” [About us Driving mobility services smarter, safer, greener], Joyson Electronics, [Online](#).

443. “李水斌节前看望新疆少数民族农民工” [Li Shuibin visited Xinjiang ethnic minority migrant workers before the festival], Municipal Ethnic and

Religious Affairs Committee, September 15, 2021, [Online](#).

444. Nathan Vanderklippe, “Thousands of Uyghur workers in China are being relocated in an effort to assimilate Muslims, documents show,” *The Globe and Mail*, March 2, 2021, [Online](#).

445. The United Front Work Department of the Hubei Provincial Committee of the Communist Party of China, “荆州市举行少数民族务工人员语言文化政策培训班启动及挂牌仪式” [Jingzhou City holds launch and listing ceremony of the language and culture policy training course for minority migrant workers], April 16, 2018, [Online](#).

446. “客户均胜” [Customers, Joyson], Joyson Electronics, [Online](#).

447. “关于均胜客户 OEM” [About Joyson customers: OEM] Joyson Electronics, [Online](#).

448. “公司简介” [Company profile], Joyson Electronics, [Online](#).

449. “特斯拉供应商均胜电子转让均胜群英51%股权·交易总额20.4亿元” [Tesla supplier Joyson Electronics transfers 51% shares of Joyson Quanying with a total transaction value of 2.04 billion yuan], Solsol Labs, December 17, 2020, [Online](#).

450. “欧菲光公司简介” [OFILM company profile], OFILM corporate website, [Online](#); “欧菲光集团股份有限公司公司简介” [Company profile of OFILM Co. Ltd.], YCJF360, [Online](#).

451. “欧菲光科技智能驾驶” [OFILM Tech intelligent driving], OFILM corporate website, [Online](#).

452. “新疆苏州商会为贫困地区铺就致富之路” [Xinjiang Suzhou Chamber of Commerce paves the way for poverty-stricken areas to become rich], China Industry and Commerce website, August 29, 2019, [Online](#).

453. “洛浦县1200余名城乡富余劳动力赴内地务工” [More than 1,200 surplus urban and rural laborers from Lop County go to work in inner China], *Hotan Daily*, via ChinaXinjiang.cn, May 11, 2017, [Online](#).

454. “【一枝一叶看民生】和田学生内地顶岗实习助家庭脱贫” [Seeing people’s livelihood in every branch and leaf] Hotan students do internships in inner China to help families get rid of poverty], *Xinjiang Economic Daily*, via Ts News, March 1, 2018, [Online](#); “新疆着力发展职业教育助力精准脱贫” [Xinjiang strives to develop vocational education to help targeted poverty alleviation], *Xinjiang Morning News*, December 25, 2018, [Online](#).

455. “和田外出务工人员在江西南昌高新企业就业掠影” [A glimpse of the employment of Hotan migrant workers in high-tech enterprises in Nanchang, Jiangxi], *Xinjiang Daily News*, April 8, 2019, [Online](#).

456. Vicky Xiuzhong Xu, Danielle Cave, James Leibold et. al., “Uyghurs for sale,” Australian Strategic

- Policy Institute, February 28, 2020, [Online](#).
457. Dake Kang and Yanan Wang “Gadgets for tech giants made with coerced Uighur labor,” *AP News*, March 5, 2020, [Online](#).
458. Mathew S. Borman, “Addition of entities, revision and correction of entries, and removal of entities from the entity list,” *National Archives and Records*, June 30, 2020, [Online](#).
459. “Nanchang O-Film is removed from US government entity list,” *Global Times*, June 29, 2022 [Online](#).
460. Mathew S. Borman, “Addition of entities, revision and correction of entries, and removal of entities from the entity list,” *National Archives and Records*, June 30, 2020, [Online](#); “Nanchang O-Film is removed from US government’ entity list,” *Global Times*, June 29, 2022, [Online](#).
461. “南昌欧菲光学技术有限公司” [Nanchang OFILM Optical Technology Co., Ltd.], QCC Firm, July 4, 2022, [Online](#)
462. “Product center: Automotive products,” JWD Technology website, [Online](#).
463. Wei Zhiyi, “阿瓦提县举行2018年第二批产业工人整建制赴内地就业欢送仪式” [Awat County held a farewell ceremony for the second batch of industrial workers to go to inner China for employment in 2018], *Sohu*, February 25, 2018, [Online](#).
464. “外出务工既鼓口袋又富脑袋 阿瓦提县组织劳务输出整建制转移就业扶贫效果好” [Going out to work fills your pockets and your minds: Labor export policy arranged by Awat county to transfer and employ workers and alleviate policy successful], *Xinjiang Daily*, July 27, 2018, [Online](#).
465. “来川务工两年家里盖上新房，新疆少数民族小伙找到‘第二故乡’” [After two years of working in Sichuan, the family built a new house, and the Xinjiang ethnic minority found a “second home”], *Cover News Sichuan*, May 27, 2020, [Online](#).
466. Vicky Xiuzhong Xu, Danielle Cave, James Leibold et. al., “Uyghurs for sale,” Australian Strategic Policy Institute, February 28, 2020, [Online](#).
467. “Partner,” JWD Technology website, Accessed September 29, 2022, [Online](#) (for first page of images of partners), [Online](#) (for second page of images of partners).
468. “Homepage,” EVTech website, [Online](#).
469. “Product application,” EVTech website, [Online](#).
470. “深圳市亿威源科技有限公司” [Shenzhen Yiweiyuan Technology Co., Ltd.], Qixin.com, [Online](#).
471. “关于德仁” [About Deren], Deren corporate website, [Online](#).
472. Wayne Ma, “Seven Apple suppliers accused of using Uyghur forced labor,” *The Information*, May 10, 2021, [Online](#).
473. “转移就业实现脱贫增收——麦盖提县赴内地企业就业信息简讯” [Transfer employment to achieve poverty alleviation and increase income—a briefing on employment information of enterprises going to the inner China in Makit County], Hao Job, November 19, 2018, [Online](#).
474. “重庆市璧山国家高新区：念好‘四字诀’‘炫起’团结风” [Bishan National High-tech Zone, Chongqing City: Recite the “Four Characters” to show off the “Unity Wind”], Central United Front Work Department website, April 26, 2018, [Online](#).
475. “关于德仁” [About Deren], Deren corporate website, [Online](#).
476. “广汇汽车—新疆天汇” [CGA - Xinjiang Tianhui], *Dajie Workplace Information Network*, [Online](#); “Contact Us,” Guanghui Group website, [Online](#).
477. “Global 500: Xinjiang Guanghui (#453),” *Fortune Rankings*, August 3, 2022, [Online](#).
478. “Profile: Sun Guangxin,” *Forbes*, April 4, 2022, [Online](#).
479. “行业概况” [Industry overview], Xinjiang Guanghui Industry corporate website, [Online](#).
480. “广汇集团力促内地合作伙伴落户和田” [Guanghui Group urges inner China partners to settle in Hotan], *Sina*, October 22, 2018, [Online](#).
481. “广汇集团力促内地合作伙伴落户和田” [Guanghui Group urges inner China partners to settle in Hotan], *Sina*, October 22, 2018, [Online](#).
482. “第十三届人民企业社会责任奖 候选企业：新疆广汇集团” [The 13<sup>th</sup> People’s corporate social responsibility award candidate company: Xinjiang Guanghui Group] *People’s Daily Online*, November 12, 2018, [Online](#); Liu Shucheng, “新疆广汇集团引进和田扶贫工厂组织收听报告” [Xinjiang Guanghui Group leads Hotan poverty alleviation factory to organize listening to the report], *China Daily*, March 6, 2019, [Online](#)
483. “第十三届人民企业社会责任奖 候选企业：新疆广汇集团” [The 13<sup>th</sup> People’s corporate social responsibility award candidate company: Xinjiang Guanghui Group], *People’s Daily Online*, November 12, 2018, [Online](#); “新疆2000富余劳动力‘安家’非公企业” [Xinjiang’s 2000 surplus labor “settle down” in non-public enterprises], *Business Times* via *China Finance*, July 4, 2017, [Online](#). Liu Xia, “新疆非公企业接收两千名喀什和田地区富余劳动力” [Non-public enterprises in Xinjiang accept 2,000 surplus laborers from Kashgar and Hotan areas], *Tianshan News* via *RMZXB.com*, June 22, 2017, [Online](#).
484. “第十三届人民企业社会责任奖 候选企业：新疆广汇集团” [The 13<sup>th</sup> People’s corporate social responsibility award candidate company: Xinjiang Guanghui Group], *People’s Daily Online—Charity Channel*, November 12, 2018, [Online](#).
485. “第十三届人民企业社会责任奖 候选企业：新疆广汇集团” [The 13<sup>th</sup> People’s corporate social responsibility award candidate company: Xinjiang Guanghui Group], *People’s Daily Online—Charity Channel*, November 12, 2018, [Online](#).
486. “广汇集团力促内地合作伙伴落户和田” [Guanghui Group urges inner China partners to settle in Hotan], *Sina*, October 22, 2018, [Online](#); “新疆广威汇昌汽车用品有限公司” [Xinjiang Guangwei Huichang Auto Accessories Co., Ltd.], *Aiqicha*, [Online](#).
487. “北京援疆扶贫车间托起群众致富梦” [The Beijing Aid Xinjiang Poverty Alleviation Workshop supports the people’s dream of becoming rich], *People’s Daily Online - Xinjiang Channel*, November 3, 2020, [Online](#).
488. “新疆广益汇佳电子科技有限公司” [Xinjiang Guangyi Huijia Electronic Technology Co., Ltd.], *QCC.com*, [Online](#).
489. “新疆广威汇昌汽车用品有限公司” [Xinjiang Guangwei Huichang Auto Accessories Co., Ltd.], *Aiqicha*, [Online](#).
490. “北京援疆扶贫车间托起群众致富梦” [The Beijing Aid Xinjiang Poverty Alleviation Workshop supports the people’s dream of becoming rich], November 3, 2020, *People’s Daily Online - Xinjiang Channel*, [Online](#).
491. “北京援疆扶贫车间托起群众致富梦” [The Beijing Aid Xinjiang Poverty Alleviation Workshop supports the people’s dream of becoming rich], November 3, 2020, *People’s Daily Online - Xinjiang Channel*, [Online](#).
492. “广汇集团力促内地合作伙伴落户和田” [Guanghui Group urges inner China partners to settle in Hotan], *Sina*, October 22, 2018, [Online](#); “新疆广威汇昌汽车用品有限公司” [Xinjiang Guangwei Huichang Auto Accessories Co., Ltd.], *Aiqicha*, [Online](#).
493. “和田西宝汽车用品有限公司” [Hetian Xibao Auto Products Co., Ltd.], *Aiqicha*, [Online](#); “和田西宝汽车用品有限公司” [Hetian Xibao Auto Products Co., Ltd.] *Zhipin*, [Online](#); “扶贫产业园助力脱贫” [Poverty Alleviation Industrial Park helps alleviate poverty], *Hotan Daily* via *QQ.com*, May 16, 2020, [Online](#). Note: the last article indicates that the company “moved” from the Beijing Industrial Park to the Poverty Alleviation Industrial Park, but the Poverty Alleviation Industrial Park shares an address with the Beijing Park, and the address of the company does not seem to have changed.
494. “和田西宝汽车用品有限公司” [Hetian Xibao Auto Products Co., Ltd.], *Zhipin*, [Online](#); US Customs and Border Protection, “DHS cracks down on goods produced by China’s state-sponsored forced labor,” *CBP Media*, September 14, 2020, [Online](#); Rebecca Wright, Ivan Watson and Isaac Yee, “Black Gold’ How global demand for hair products is

linked to forced labor in Xinjiang,” *CNN*, October 2020, [Online](#). Note that the locations of some of the camps are now identified as secondary vocational schools on online maps. It unclear whether these spaces are still detention centers or have been converted to legitimate vocational schools.

495. “广汇集团力促内地合作伙伴落户和田” [Guanghui Group urges inner China partners to settle in Hotan], *Sina*, October 22, 2018, [Online](#); “工厂建在贫困村 就近就业助脱贫” [Factories built in impoverished villages, nearby employment to help poverty alleviation], *Xinjiang Daily* via *Finance China*, March 19, 2019, [Online](#).

496. “工厂建在贫困村 就近就业助脱贫” [Factories built in impoverished villages, nearby employment to help poverty alleviation], *Xinjiang Daily* via *Finance China*, March 19, 2019, [Online](#).

497. “扶贫产业园助力脱贫” [Poverty Alleviation Industrial Park helps alleviate poverty], *Hotan Daily* via QQ.com, May 16, 2020, [Online](#).

498. “工厂建在贫困村 就近就业助脱贫” [Factories built in impoverished villages, nearby employment to help poverty alleviation], *Xinjiang Daily* via *Finance China*, March 19, 2019, [Online](#).

499. The information in the Hoshine section is drawn in large part from Murphy and Elimä, “In broad daylight.”

500. Hoshine Silicon Industry Co, “About Hoshine,” *Hoshine Silicon*, [Online](#).

501. “鄯善石材工业园” [Shanshan Stone Industrial Park], 1633.com, [Online](#).

502. “The Department of Homeland Security issues Withhold Release Order on silica-based products made by forced labor in Xinjiang,” U.S. Customs and Border Protection, June 24, 2021, [Online](#); “Hoshine WRO—Updated guidance document for industry,” U.S. Customs and Border Protection, CBP Publication No. 1679-0222, March 11, 2022, [Online](#).

503. “投资355亿元，多晶年产20万吨！合盛与乌鲁木齐市签署战略合作协议” [The investment is 35.5 billion yuan, and the annual output of polycrystalline is 200,000 tons! Hopson and Ürümqi Municipal Government sign a strategic cooperation agreement], *Ürümqi Radio and Television Financial Media*, December 13, 2021, [Online](#); Vincent Shaw and Max Hall, “Chinese PV industry brief: A 20 GW wafer factory under construction and more polysilicon capacity,” *PV Magazine*, December 14, 2021, [Online](#).

504. “投资355亿元，多晶年产20万吨！合盛与乌鲁木齐市签署战略合作协议” [The investment is 35.5 billion yuan, and the annual output of polycrystalline is 200,000 tons! Hopson and Ürümqi Municipal Government sign a strategic cooperation agreement], *Ürümqi Radio and Television Financial Media*, December 13, 2021, [Online](#).

505. “合盛硅业：合盛硅业关于与特定对象签订附条件生效的股份认购协议暨关联交易的公告” [Hoshine Silicon Industry: Announcement of Hoshine Silicon Industry on signing a conditional share subscription agreement with specific objects and related party transactions], Shanghai Stock Exchange, May 20, 2022, [Online](#). As of May 2022, Hoshine is the controlling shareholder with 46.34% equity; The Luo family (Hoshine founder Luo Ligu, his daughter Luo Yi, and his son Luo Yedong) hold 32.21%, giving the Luos over 75% ownership of the firm.

506. “新疆亿日铜箔科技股份有限公司年产20000吨高档电解铜箔工程环境影响评价公众参与第二次信息公开” [Xinjiang Yiri Copper Foil Technology Co., Ltd. annual output of 20,000 tons of high-grade electrolytic copper foil project environmental impact assessment public participation second information announcement] May 3, 2017, [Online](#).

507. “近日，随着新疆亿日铜箔科技有限公司年产2万吨电解铜箔项目一期3组18台电解机列的” [Recently, with Xinjiang Yiri Copper Foil Technology Co., Ltd.’s annual output of 20,000 tons of electrolytic copper foil project, three groups of 18 electrolytic machines have been put into operation], Guba.com, July 10, 2018, [Online](#).

508. “合盛硅业：合盛硅业2021年年度报告” [Hoshine Silicon Industry 2021 annual report], April 28, 2022, [Online](#).

509. “新疆税务：减税降费 政策活水滋养市场主体” [Taxation in Xinjiang: Tax and fee reduction policies nourish market players], Xinjiang Autonomous Region Tax Service via *Xinjiang Daily*, July 15, 2022, [Online](#). Note: This policy is also credited with driving Volkswagen’s decision to establish an extreme heat field testing site in Turpan in April 2022 and spurring a massive 40% increase in total exports from Xinjiang over the previous year.

510. “重磅！合盛硅业355亿投资落地” [Heavy! Hoshine Silicon Industry 35.5 billion investment landed], *OFWeek Solar PV Network*, December 13, 2021, [Online](#).

511. “新疆合盛铝合金特种材料项目将投产” [Xinjiang Hoshine aluminum alloy special material project will be put into production], Jiugang Group, September 17, 2019, [Online](#). No expansion date has been named, perhaps in part because the project is operating at a financial loss at present. See: “合盛硅业股份有限公司 2022 年度跟踪评级报告” [Hoshine Silicon Industry Co., Ltd. 2022 annual tracking rating report], CCXI, June 20, 2022, [Online](#).

512. Jiushang Yunhui, “新疆合盛年产2万吨铝合金特种材料项目将投产” [Xinjiang Hoshine aluminum alloy special material project with an annual output of 20,000 tons will be put into operation], *KK News*, September 10, 2019, [Online](#).

513. “合盛年产2万吨铝合金特种材料项目将投产” [Hoshine’s annual output of 20,000 tons of aluminum alloy special materials project will be put into

operation], *Shihezi Daily* via *Sina News*, September 10, 2019, [Online](#).

514. Magic Dikan, “迪坎乡组织富余劳动力到合盛硅业观摩并参加招聘会” [Dikan Township organizes surplus labour to go to Hoshine Silicon Industry to observe and participate in job fairs], *Weixin*, August 10, 2017, [Online](#).

515. *Ibid.*

516. *Ibid.*

517. “新疆维吾尔自治区主席就新疆反恐维稳情况及开展职业技能教育培训工作答记者问” [The Chairman of the Xinjiang Uygur Autonomous Region answers reporters’ questions on Xinjiang’s anti-terrorism and stability maintenance situation and the development of vocational skills education and training], *Xinhua News Agency*, October 16, 2018, [Online](#).

518. Turpan Municipal Bureau of Human Resources and Social Security, “Turpan city vocational skills upgrading.”

519. Zhao Xuefeng, “鄯善县合盛硅业系列项目开工建设” [Construction of Hoshine Silicon Industry series projects in Shanshan County started], *Turpan News*, April 13, 2017, [Online](#).

520. Pan-China Certified Public Accountants, “合盛硅业股份有限公司2019年度审计报告” [2019 annual audit report of Hoshine Silicon Industry Co., Ltd.], April 23, 2020, [Online](#), p. 75-77.

521. Turpan Municipal Bureau of Human Resources and Social Security, “Turpan city vocational skills upgrading.”

522. “Husband and wife coworkers;” For more on transfers of forced labourers’ land to the state, see Zenz, “Coercive labor,” 24-25.

523. Shanshan Government Affairs Information, “促进就业出实招 决胜脱贫奔小康——鄯善县开展建档立卡贫困户稳定就业脱贫典型 宣讲表彰和现场观摩招聘活动” [Effective efforts taken to promote employment, win against poverty and move towards a well-off society: Shanshan County launches talks on and awards for successful examples of registered impoverished households who have achieved stable employment and are no longer impoverished as well as on-site observation and recruitment activities], *Weixin*, December 28, 2019, [Online](#).

524. Hoshine Silicon Industry, “合盛硅业助力脱贫攻坚，荣获‘社会帮扶爱心企业称号’” [Hoshine Silicon Industry helped to fight poverty and was awarded the title of ‘Social Helping and Caring Enterprise’], *Weixin*, May 15, 2020, [Online](#).

525. Dongcheng Zhonghua Human Resources, “新疆西部合盛硅业招聘” [Western Xinjiang Hoshine Silicon Industry recruitment], November 17, 2020, [Online](#).

526. "Liquid silicone rubber," Hoshine website, [Online](#); "Products: Room temperature vulcanized silicone rubber (RTV-107/OH Polymer)," Hoshine website, [Online](#).
527. "新疆打造世界级硅基产业集群" [Xinjiang to build a world-class silicon-based industrial cluster], *Tianshan News*, February 28, 2022, [Online](#). Note: precipitated silica may be translated as "fumed silica." Hoshine also lists precipitated silica as a product on its website. See: "首页 - 产品与应用: 沉淀二氧化硅" [Products and applications: Precipitated silica], Hoshine Website, [Online](#).
528. "公司介绍" [Company profile], [Doublecoinholdings.com](#), [Online](#); "The leading global tyre manufacturers 2022," *Tyre Press*, May 20, 2022, [Online](#).
529. "公司介绍" [Company profile], [Doublecoinholdings.com](#), [Online](#); "集团下属公司" [Group subsidiaries], Double Coin Group (Xinjiang) Kunlun Tire Co., Ltd., [Online](#).
530. "自治区安全监管局协调首批劳动力就业精准助力帮脱贫" [The Autonomous Region Safety Supervision Bureau coordinates the first batch of labor force employment to assist in poverty alleviation], Personnel Training Office, Government of Xinjiang website, April 9, 2018, [Online](#).
531. "双钱集团（新疆）昆仑轮胎有限公司扩建年产120万条高性能全钢载重子午线轮胎项目子午胎车间及2号动力站安装工程" [Double Coin Group (Xinjiang) Kunlun Tire Co., Ltd. expands radial tire workshop and No. 2 power station installation project with an annual output of 1.2 million high-performance all-steel radial truck tires], Public Resource Trading Center of XPCC website, July 10, 2018, [Online](#); "【施工】双钱集团（新疆）昆仑轮胎有限公司扩建年产120万条高性能全钢载重子午线轮胎项目总图项目" [【Construction】Shuangqian Group (Xinjiang) Kunlun Tire Co., Ltd. to expand the project with an annual output of 1.2 million high-performance all-steel radial truck tires], Public Resource Trading Center of XPCC website, April 8, 2019, [Online](#).
532. See Google Earth satellite imagery for 44° 0'16.94"N, 87°44'42.67"E.
533. Yao Wenjie, "【访惠聚之星】真心为民带来'稳稳的幸福'" [Star of *Fanghuiju*] Sincerely bringing "steady happiness" to the people, *Tianshan News*, November 21, 2018, [Online](#).
534. Zhao Jun, Zhang Qing, and Li Jinglun, "节前慰问活动架起连心桥" [Pre-holiday visits to build a bridge of hearts], *Xinjiang Daily*, August 22, 2018, [Online](#).
535. "扶贫路上见真情 驻村干部'亚克西'" [Seeing the truth on the road of poverty alleviation, the village taskforce is "great"], *Yangguang Huayi Official Account* via WeChat, July 11, 2020, [Online](#).
536. "新疆维吾尔自治区脱贫攻坚先进集体名单 (797个)" [List of advanced collectives in poverty alleviation in Xinjiang Uygur Autonomous Region (797)], *Xinjiang Daily*, May 22, 2021, [Online](#).
537. Wang Shuli, "新昆公司举办'民族团结一家亲'座谈会" [Xinjiang Kunlun Company holds a symposium on "ethnic unity makes one family"], *DoubleCoin Account* via Weixin, January 2, 2018, [Online](#).
538. "自治区安全监管局协调首批劳动力就业精准助力帮脱贫" [The Autonomous Region Safety Supervision Bureau Coordinates the first batch of labor force employment to assist in poverty alleviation], Xinjiang Uygur Autonomous Region Emergency Management Department website, April 9, 2018, [Online](#).
539. "上海援疆前方指挥部领导毛昭胜慰问指导新昆公司驻村工作队" [Mao Zhaosheng, the leader of the Shanghai Aid Xinjiang Front Headquarters, visits and guides the Xinjiang Kunlun's taskforce in the village], *Kunlun Tire*, April 22, 2018, [Online](#).
540. Tian Jiangshan, "帮助南疆富余劳动力'转'出幸福生活" [Help the surplus labor force in southern Xinjiang "transfer" a happy life], *Huolexinjiang*, September 3, 2020, [Online](#).
541. "新昆公司举办'民族团结月'座谈会暨民族团结先进个人表彰会新昆公司举办'民族团结月'座谈会暨民族团结先进个人表彰会" [Xinjiang Kunlun Company holds "ethnic unity month" symposium and ethnic unity advanced individuals commendation meeting], *Kunlun Tire*, May 20, 2020, [Online](#); see also: "我们的约定" [Our promise], *Sohu*, September 23, 2020, [Online](#).
542. "上海华谊集团股份有限公司 2021 年半年度报告" [Shanghai Huayi Group Co., Ltd. 2021 semi-annual report], Hexun Stock Data, [Online](#), p. 130.
543. "从喀什来打工2年，夫妻俩在米东圆了安家梦" [Working from Kashgar for 2 years, the couple realized their dream of settling down in Midong], Rong Media Center via Kunlun Tyre website, November 2, 2021, [Online](#).
544. "公司介绍" [Company profile], [Doublecoinholdings.com](#), [Online](#).
545. "集团下属公司" [Group subsidiaries], Double Coin Group (Xinjiang) Kunlun Tire Co., Ltd., [Online](#); "Company profile," [Kunluntires.com](#), [Online](#).
546. Mike Manges, "Tough road ahead market forces squeeze truck tire manufacturers, marketers," *Modern Tire Dealer*, June 21, 2022, [Online](#).
547. All customs records accessed via Panjiva Market Intelligence.
548. "Double Coin Tires" search results, Walmart.com, [Online](#); "Double Coin Tires" search results, Amazon.com, [Online](#); "215/75R17.5 DOUBLE COIN RT600 TL (ALL POSITION) (135/133J)," Big Tyres website, [Online](#). All accessed on September 26, 2022.
549. "公司简介" [Company profile], [Jialuntire.com](#), [Online](#); "年产120万条高性能子午线轮胎项目落户新疆" [The project with an annual output of 1.2 million high-performance radial tires settles in Xinjiang], *Sohu News*, August 14, 2017, [Online](#); "新疆120万条轮胎项目，有望今年达产 恒锐" [Xinjiang's 1.2 million tire project is expected to reach production this year Hengrui], *Biben* via Irwinind.com, February 3, 2022, [Online](#).
550. "年产120万条高性能子午线轮胎项目落户新疆" [The project with an annual output of 1.2 million high-performance radial tires settled in Xinjiang], *Sohu*, August 14, 2017, [Online](#).
551. Chen Lulu, "滚滚车轮'转'出幸福生活" [Rolling wheels "turn" a happy life], *Aksu Daily*, July 13, 2020, [Online](#).
552. Zhang Jiashuo, "嘉轮轮胎解决当地居民就业问题" [Jialun tires solve the employment problem of local residents], [Tireworld.com.cn](#), July 13, 2020, [Online](#); "新疆深度贫困地区：升级传统作坊 发展现代产业" [Deeply impoverished areas in Xinjiang: Upgrading traditional workshops and developing modern industries], *Xinhuanet*, August 20, 2020, [Online](#).
553. Zhang Jiashuo, "嘉轮轮胎解决当地居民就业问题" [Jialun tires solve the employment problem of local residents], [Tireworld.com.cn](#), July 13, 2020, [Online](#).
554. "公司简介" [Company profile], [Jialuntire.com](#), [Online](#).
555. "中国石油天然气股份有限公司独山子石化分公司" [China National Petroleum Corporation Dushanzi Petrochemical Company], [Qixin.com](#), [Online](#).
556. "大干快上，独山子6万uSSBR项目年底投产！" [Let's work hard, and the Dushanzi 60,000-ton SSBR project will be put into production by the end of the year!], *China Rubber Magazine*, via *Sohu News*, May 20, 2021, [Online](#).
557. "独山子石化年产2.5万吨的官能化溶聚丁苯橡胶项目建设中" [Dushanzi Petrochemical functionalized solution-polymerized styrene-butadiene rubber project with an annual output of 25,000 tons under construction], *Carbon Black Industry Network* via *Tanhei*, September 28, 2022, [Online](#).
558. "独山子石化：遥远的地方不遥远 冲出一隅影响益大" [Dushanzi Petrochemical: Far away, not far away: Emerging from out of sight to make a positive impact], *China News Service Xinjiang*, August 6, 2021, [Online](#).
559. "独山子石化公司：助力环保轮胎驶向国际—搜狐" [Dushanzi Petrochemical Company: Helping environmentally friendly tires go international], *Sohu News*, December 5, 2017, [Online](#).
560. "创新驱动成为独石化科技利器——我市科技创

新工作系列报道之三”[Being innovation-driven has become a powerful tool for Dupec’s science and technology - the third report in the series of scientific and technological innovation work in our city], *Karamay Zero Distance*, March 16, 2021, [Online](#).

561. “Brochure,” *Wilson Engineering Website*, January 19, 2018, [Online](#), p. 26; The facility is controlled and partially owned by CNPC, Xinjiang Petroleum Administration, TBEA and others. “天利高新” [Tianli High-Tech], *Baidu Baike*, [Online](#). CNPC acquired ownership through the acquisition of Xinjiang Dushanzi Tianli High-tech Co., Ltd. In 2017, See: “新疆独山子天利高新技术股份有限公司简式权益变动报告书-新疆维吾尔自治区石油管理局” [Xinjiang Dushanzi Tianli High-tech Co., Ltd. brief report on changes in equity—Xinjiang Uyghur Autonomous Region Petroleum Administration], *Money 163*, January 20, 2010, [Online](#); “中国石油集团工程股份有限公司: 公司简介” [PetroChina Engineering: Company profile], *Sina Finance*, February 2, 2017, [Online](#).

562. “Global and China synthetic rubber industry report, 2021-2027,” *ASD Reports*, March 2022, [Online](#).

563. “Tire production: How a tire is made,” *Continental Tires website*, [Online](#).

564. “Styrene butadiene rubber (E-SBR and S-SBR) market: Global industry analysis and forecast 2027: By application and region,” *MMR*, January 2020, [Online](#); “Styrene butadiene rubber market size, share & trends analysis report by product (E-SBR, S-SBR), by application, by region, and segment forecasts, 2018–2025,” *Grandview Research*, [Online](#); “Styrene-butadiene rubber (SBR) market: Information by type (emulsion SBR (E-SBR) and solution SBR (S-SBR)), application (tires, industrial, footwear, polymer “modification and adhesives) and region (North America, Europe, Asia-Pacific, Latin America and Middle East & Africa) - forecast till 2030,” *Market Research Future*, October 2022, [Online](#). The tire market is the single largest user of butadiene; butadiene rubbers for tires are 40% of the entire butadiene market. See: “Polybutadiene rubber (PBR) market - Growth, trends, COVID-19 impact, and forecast (2016-2026),” *Mordor Intelligence*, 2021, [Online](#).

565. “Synthetic rubber market - Growth, trends, COVID-19 impact, and forecast (2022-2027),” *Mordor Intelligence*, 2021, [Online](#).

566. Shi Xiao and Peng Chenyang, “新疆油企”访惠聚”纪实” [Xinjiang oil companies “Fanghuiju” documentary], *PetroChina news website*, January 24, 2019, [Online](#).

567. “走进察布查尔锡伯自治县: 扶贫故事” [Into Chapchal Sibe Autonomous County: Poverty alleviation story], *PetroChina news website*, September 8, 2020, [Online](#).

568. “精准扶贫使新疆察布查尔县村民走上小康路” [Targeted poverty alleviation enables villagers in Qapqal County, Xinjiang to embark on a well-off

road], *China News Network*, July 3, 2020, [Online](#).

See also: “走进察布查尔锡伯自治县: 扶贫故事” [Into Chapchal Sibe Autonomous County: Poverty alleviation story], *PetroChina News Center*, September 8, 2020, [Online](#).

569. “PetroChina (PTR) unveils ethane-to-ethylene project in China” *Zacks Equity Research via Yahoo! Finance*, September 1, 2021, [Online](#); Shi Xiao and Peng Chenyang, “新疆油企”访惠聚”纪实” [Xinjiang oil companies “Fanghuiju” documentary] *PetroChina news website*, January 24, 2019, [Online](#).

570. “独山子石化：驻村帮扶用真情精准扶贫见成效” [Dushanzi Petrochemical: Village-based assistance and targeted poverty alleviation achieves results], *NetEase Home*, October 14, 2020, [Online](#). See also: *Tianshan Pioneer*, “自治区党委直属机关工委召开包村定点扶贫牵头联系协调会” [The Working Committee of the Organs directly under the Party Committee of the Autonomous Region held a coordination meeting led by the fixed-point poverty alleviation in Bao Village], *Weixin*, August 16, 2019, [Online](#); “新疆独山子石化产业扶贫激活贫困地区”造血”功能” [Xinjiang Dushanzi Petrochemical Industry poverty alleviation activates the “hematopoietic” function in poor areas], *China News Network*, August 18, 2019, [Online](#).

571. “克拉玛依市政府工作报告（2020年1月15日 王刚）” [Karamay Municipal Government Work Report (Wang Gang on January 15, 2020)], *Karamay Daily*, April 24, 2020, [Online](#).

572. “独山子石化：遥远的地方不遥远 冲出一隅影响益大” [Dushanzi Petrochemical: Far away, not far away—Emerging from out of sight to make a positive impact], *China News Service Xinjiang*, August 6, 2021, [Online](#); “创新驱动成为独石化科技利器——我市科技创新工作系列报道之三” [Being innovation-driven has become a powerful tool for Dupec’s science and technology - the third report in the series of scientific and technological innovation work in our city], *Karamay Zero Distance*, March 17, 2021, [Online](#). This article also notes that Whirlpool and Midea use Dushanzi materials in washing machines “exported to developed countries and regions such as North America and Japan.” See also: “Bridgestone to buy SSBR from China” *Tireworld*, May 3, 2016, [Online](#). Michelin is mentioned separately in this 2017 article: “独山子石化公司：助力环保轮胎驶向国际 - 搜狐” [Dushanzi Petrochemical Company: Helping environmentally friendly tires go international], *Sohu News*, December 5, 2017, [Online](#).

573. “独山子石化公司：助力环保轮胎驶向国际 - 搜狐” [Dushanzi Petrochemical Company: Helping environmentally friendly tires go international], *Sohu News*, December 5, 2017, [Online](#). State media named Pirelli as a customer of Dushanzi Petrochemical’s plant in Karamay. Both companies have denied the relationship, stating that the report was factually inaccurate. There is no other evidence to suggest a past or present relationship. See [Annex B](#)—Corporate Responses.

574. “我国攻克高性能轮胎胎面胶核心技术” [China has conquered the core technology of high-performance tire tread compound], *Official account of CNPC Weibo*, August 3, 2021 [Online](#). “高性能合成胶重点研发项目任务完成” [Key R&D projects of high-performance synthetic rubber completed], *Sinochem New Network via Sina Economic News*, October 18, 2021, [Online](#).

575. “Annual business review,” *CNPC 2020 Annual Report*, [Online](#), p. 47.

576. “Automotive parts through extrusion blow molding,” *Case Western Inc. website*, [Online](#).

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