

# IN BROAD DAYLIGHT

## Uyghur Forced Labour and Global Solar Supply Chains



LAURA T. MURPHY & NYROLA ELIMÄ

**Sheffield  
Hallam  
University**

Helena Kennedy  
Centre for  
International Justice

# EXECUTIVE SUMMARY

The People's Republic of China (PRC) has placed millions of indigenous Uyghur and Kazakh citizens from the Xinjiang Uyghur Autonomous Region (XUAR or Uyghur Region) into what the government calls “surplus labour” (富余劳动力) and “labour transfer” (劳动力转移) programmes. An official PRC government report published in November 2020 documents the “placement” of 2.6 million minoritised citizens in jobs in farms and factories within the Uyghur Region and across the country through these state-sponsored “surplus labour” and “labour transfer” initiatives. The government claims that these programmes are in accordance with PRC law and that workers are engaged voluntarily, in a concerted government-supported effort to alleviate poverty. However, significant evidence – largely drawn from government and corporate sources – reveals that labour transfers are deployed in the Uyghur Region within an environment of unprecedented coercion, undergirded by the constant threat of re-education and internment. Many indigenous workers are unable to refuse or walk away from these jobs, and thus the programmes are tantamount to forcible transfer of populations and enslavement.

It is critical that we examine the particular goods that are being produced as a result of this forced labour regime. This paper focuses on just one of those industries – the solar energy industry – and reveals the ways forced labour in the Uyghur Region can pervade an entire supply chain and reach deep into international markets. We concluded that the solar industry is particularly vulnerable to forced labour in the Uyghur Region because:

- 95% of solar modules rely on one primary material – solar-grade polysilicon.
- Polysilicon manufacturers in the Uyghur Region account for approximately 45% of the world's solar-grade polysilicon supply.

- Hoshine Silicon Industry, the metallurgical-grade silicon producer in the region with the highest production capacity, has participated in labour transfer programmes and has significant exposure to forced labour through its quartz supplier.
- All four of XUAR's polysilicon manufacturers – Daqo, TBEA (and subsidiary Xinte), Xinjiang GCL, and East Hope – have reported their participation in labour transfer or labour placement programmes and/or are supplied by raw materials companies that have.
- Daqo alone is a supplier to the four largest solar module manufacturers in the world – JinkoSolar, Trina Solar, LONGi Green Energy, and JA Solar.
- In 2020, China produced an additional 30% of the world's polysilicon on top of that produced in the Uyghur Region, a significant proportion of which may be affected by forced labour in the Uyghur Region as well.

In the course of this research, we identified

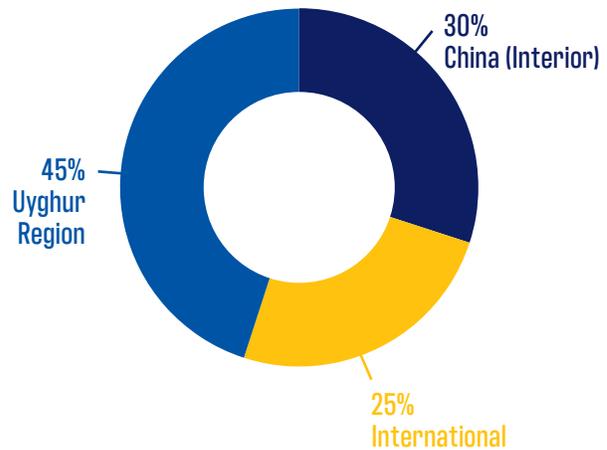
- 11 companies engaged in forced labour transfers
- 4 additional companies located within industrial parks that have accepted labour transfers
- 90 Chinese and international companies whose supply chains are affected

This report seeks to increase the knowledge base upon which the solar industry determines its exposures to forced labour in the Uyghur Region. We investigated the entire solar module supply chain from quartz to panel to better understand the extent to which forced labour in the Uyghur region affects international value chains. The examples of engagement in these programs are meant to provide stakeholders with the evidence base upon which to judge risk of exposure to forced labour in the solar supply chain.

While Xinjiang accounts for 45% of the world's solar-grade polysilicon supply, 35% more of it comes from other regions of China, and 20% from outside of China. Experts agree that this is enough to supply the United States and Europe's needs for solar modules. However, this does not account for the companies in the interior of China and internationally whose supply chains are likely affected by manufacturing in the Uyghur Region. The extent to which Xinjiang metallurgical-grade silicon and polysilicon pervades the market means that module manufacturers that want to avoid producing goods that are potentially tainted by forced labour in Xinjiang will have to scrutinise their supply chains thoroughly, all the way to the raw quartz materials, to determine if they are produced with forced labour or blended with affected materials. They will have to demand that the polysilicon that goes into the manufacture of their wafers is not sourced from companies engaged in forced labour transfers. This effectively leaves only a few Chinese alternatives with no confirmed exposure to forced labour in the Uyghur Region.

The solar supply chain is relatively easy to map, and identifying forced labour exposure in Xinjiang is less of a challenge than in industries such as textiles or agriculture. And doing so is critical, as it would not only address the forced labour issue in Xinjiang but would also substantially reduce the carbon emissions of the solar industry. From a human rights and climate perspective, the alternative of basing our green energy future on coal's high carbon emissions and on the forced labour of oppressed communities is a higher and longer-term price to pay.

## 2020 Polysilicon Market Share



### A Note on Sources

Wherever possible, we provide official corporate documentation as evidence of the claims made in this paper. In some instances, we have had to rely on other publicly available sources, including state media, corporate publicity, and social media (including Weixin). These reports tend to reflect the interests of the companies investigated in our research, and so may at times exaggerate successes and/or the facts. However, we take company representatives and company websites and advertisements at their word regarding their participation in surplus labour and state-sponsored labour transfer programmes in the Xinjiang Uyghur Autonomous Region.