Making Xinjiang Sanctions Work

Policy Brief No. 9 – Solar

Based on *Making Xinjiang Sanctions Work*, July 2022[i]

Can economic sanctions address Xinjiang forced labour? The Xinjiang Sanctions research project seeks to answer this question. Drawing on 3 original datasets containing over 12,000 datapoints, confidential interviews and a year of research, this Policy Brief series summarises key findings from the research . For further analysis, and the references and authorities supporting the statements in these Policy Briefs, see the project's main research study at www.xinjiangsanctions.info.

The Xinjiang Sanctions Policy Brief series:

1. *Xinjiang forced labour*
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3. *Legal considerations*
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Key research findings

- China dominates global photovoltaic (PV) manufacturing. Chinese-headquartered companies dominate at each stage of production, making 77 per cent of the world's polysilicon, over 97 per cent of polysilicon wafers, 83 per cent of solar cells, and 74 per cent of solar modules.
- Around 45 per cent of global polysilicon capacity is now located in Xinjiang. Since 2017, 91 per cent of new polysilicon production capacity worldwide has been developed in China, much of it in Xinjiang.
- Xinjiang polysilicon appears to be used in the supply of around 95 per cent of on-grid photovoltaic energy produced in the top 30 solar producing countries in the world.
- Forced labour appears to enter the PV supply-chain at several points connected to XUAR: in mining silica, refining it into polysilicon and possibly in downstream wafer and module manufacturing. Forced labour is provided through the Poverty Alleviation through Labour Transfer programme, and possibly (though not certainly) through the VSETC system.
- Xinjiang solar sector firms partner in several ways with the XPCC, which often owns and manages industrial parks and zones where these firms are located. Many of these are co-located with VSETC detention centres.
- Western sanctions on the Xinjiang solar sector are to date quite limited. The US is the only country that has directly targeted the sector, imposing import bans on products from a major silica provider (Hoshine) and export controls on Hoshine and 3 polysilicon firms.
- US Customs and Border Protection (CBP) has reportedly detained hundreds of shipments of solar products, and this may have slowed imports into the US.
- The *Uyghur Forced Labor Prevention Act* (UFLPA) however now creates a rebuttable presumption that any solar product containing inputs from Xinjiang was made with forced labour.
- While Western industry actors warn of major disruptions worth billions of dollars in the US, there is little sign of concerted impact in Xinjiang, with prices for Chinese polysilicon reaching 10-year highs.
- There are as yet no signs of policy change away from use of forced labour; nor remedy for victims of forced labour in the sector.
- Cost asymmetries from sanctions strongly favour Xinjiang producers and work against Western importers. It is more costly for Western buyers to find new, 'slavery-free' sources of supply than it is for Xinjiang producers to find new buyers of their products. New polysilicon producing facilities typically cost more than USD 500 million and take 18 months to bring online.
- There is evidence of trade reallocation, some trade deflection (via South East Asia), and rapid product transformation leading to supply-chain bifurcation. Dominant (Chinese) firms in the middle of the supply-chain are increasingly using their know-how, business relationships and access to capital to develop new, 'slavery-free' supply-chains to serve Western markets, without however giving up forced labour production for some products for other markets. This raises serious cross-subsidization concerns.
- Sectoral bodies' policy stances respond to both positions in global value-chains and local regulatory signals. Globalized value-chains lead sectoral bodies to push for more open trade. Thin-film & ultra-low-carbon producers are more vocal in support of sanctions, as they may improve their competitive positions.
- Western investors remain significantly invested in the Xinjiang solar sector. Development finance bodies are the most engaged, with some signs of engagement by institutional investors and private equity. However there is no evidence of shareholder actions or delisting to date.

Why is this important?

- Sanctions could be strengthened by adding a focus on high-quality quartz exports from the US, where Xinjiang polysilicon producers may be vulnerable and cost asymmetries favour the sanctioning coalition.
- Another option is to more deliberately target industry leaders with influence over policy makers (e.g. firms with ties to the 'Zhejiang Clique' or those with ties to Deng Xiaoping's family and the PLA).
- The costs to Western business from solar sanctions could also be lowered through development of a coordinated, transnational industrial policy to increase alternative supply of slavery-free polysilicon.
- Policy-makers will need to consider how to address supply-chain bifurcation. One option is to focus not only on restricting market access for *goods* made with forced labour, but also for *firms* that use forced labour (even if it is not for products being imported into or sold in that market) (see further Policy Brief No. 10).

Research overview

Xinjiang's solar sector

China is the dominant player in global photovoltaic (PV) manufacturing. Chinese-headquartered companies dominate at each stage of production, making 77 per cent of the world's polysilicon, over 97 per cent of polysilicon wafers, 83 per cent of solar cells, and 74 per cent of solar modules.

Xinjiang is central to China's dominance of the first stages of the supply-chain – the production of silica from quartz, and polysilicon from silica. From around 2009, the CCP's 'Golden Sun' strategy pursued an aggressive industrial policy to attract investment by chemical and electrical manufacturing firms in eastern China – several of them with close ties to the CCP elite – to kickstart solar manufacturing in the country, including polysilicon production in Xinjiang. This policy mix included very high tariff walls, tax concessions, subsidies, cheap credit, public investment, access to extremely cheap electricity – and access to artificially cheap labour.

Around 45 per cent of global polysilicon capacity is now located in Xinjiang. Since 2017, 91 per cent of new polysilicon production capacity worldwide has been developed in China, much of it in Xinjiang. Xinjiang polysilicon appears to be used in the supply of around 95 per cent of on-grid photovoltaic energy produced in the top 30 solar producing countries in the world.

Research suggests that forced labour enters the PV supply-chain at several points connected to XUAR: in mining silica, refining it into polysilicon and possibly in downstream wafer and module manufacturing. Forced labour is provided through the Poverty Alleviation through Labour Transfer programmes, and possibly (though not certainly) through the VSETC scheme. Xinjiang solar sector firms partner in several ways with the XPCC, which often owns and manages industrial parks and zones where these firms are located. Many of these are co-located with VSETC detention centres.

Sanctions dynamics

Although they have received considerable media attention, Western sanctions on the Xinjiang solar sector are to date quite limited. The US is the only country to have directly targeted the sector, imposing import bans on products from a major silica provider (Hoshine) and export controls on Hoshine and 3 polysilicon firms (Daqo, East Hope and GCL). However, the *Uyghur Forced Labor Prevention Act* (UFLPA) now imposes a rebuttable presumption that all solar products with components or inputs from Xinjiang are made with forced labour, and thus subject to exclusion from the US market.

US Customs and Border Protection (US CBP) has reportedly detained hundreds of shipments of solar products, and this may have slowed imports into the US. However, some industry actors warn that solar projects worth around USD 2.2 billion, with a payroll of 3,000 construction workers, could be at risk, and the American Clean Power Association has warned that two thirds of planned projects for 2022 may be at risk. Some firms assess that these bans will have a material impact on their businesses: JinkoSolar, for example, has told the US Securities and Exchange Commission that this is the case. However, beyond these warnings the evidence of overall impact is mixed. Chinese polysilicon prices are at a 10-year high, suggesting the sanctions are not yet shrinking aggregate demand, even if they are leading to a reorganization of demand and supply.

The biggest obstacle to Western sanctions impacting this sector may be that Western buyers are more dependent on Xinjiang producers than vice versa – just 5 Chinese polysilicon firms supply around two thirds of the global market. Western firms face high costs from exiting relationships with Xinjiang polysilicon providers. New facilities typically cost more than USD 500 million and take 18 months or more to bring on line. According to insights from sanctions theory literature, this is the inverse of the conditions for success. Nonetheless, Xinjiang polysilicon producers may be vulnerable to export controls on the high-quality quartz they need for their polysilicon crucibles, most of which comes from North Carolina.

Solar sector firms appear to be adapting to Xinjiang sanctions by reallocating supply to new buyers, by deflecting trade through third countries, and increasingly through product transformation involving use of 'slavery-free' polysilicon to make products for Western markets. In February 2021, LONGi Solar signed a three-year contract with Korean polysilicon manufacturer OCI worth USD 844 million, and in August 2021, Jinko Solar signed a five-year contract with German polysilicon producer WackerChemie to feed wafer and cell manufacturing in Vietnam, with those wafers and cells in turn feeding module production in Malaysia.

If sanctions do bite, the close ties between some of these solar firms and CCP leadership in Beijing suggests that they may have a more direct impact on actors with policy influence than sanctions on Xinjiang's cotton and tomato sectors do (see Policy Briefs Nos 7 and 8). Several of the firms that have invested in Xinjiang solar have ties to Zhejiang, where President Xi was Party Secretary from 2002 to 2006. GCL-Poly, one of the main polysilicon producers, has ties to the People's Liberation Army (PLA) and Deng Xiaoping's family, and Xinjiang East Hope Nonferrous Metals Co., another polysilicon producer, was founded by a family that have served in the National People's Congress and met directly with President Xi Jinping. Yet to date none of these leaders have been directly targeted by Western sanctions.

Sectoral bodies

Sectoral bodies have adopted a variety of stances on Western sanctions, reflecting the interests of their members. The Chinese Photovoltaic Industry Association has repudiated claims of forced labour. The Solar Energy Industries Association, which includes members from multiple countries including the US and China, has acknowledged forced labour concerns, instituted a voluntary pledge against forced labour, and encouraged its members to withdraw from Xinjiang. Yet the association has also argued for relatively light-touch implementation of import bans, allowing solar firms to rely on workplace audits and traceability systems as sources of evidence that their products have not been made with forced labour. The American Clean Power Association has adopted a similar position. The Ultra-Low Carbon Solar Alliance and the International Thin-Film Solar Industry Association, both of which prefer technologies which do not rely on Xinjiang solar products, unsurprisingly favour robust enforcement of import bans. Meanwhile, SolarPower Europe and SolarEnergy UK both seem to favour a greater focus on standards certification, which is in line with regulatory signals from European regulators. Sectoral bodies' positions thus appear to be shaped not only by where their members are situated within global value-chains, but also by the ways in which local regulation shape member preferences.

Capital markets

Western sanctions do not yet appear to have an impact on costs of capital in the solar sector. Western investors are invested in many of the leading firms, including Xinte. Private and public investors appear to be undertaking due diligence and heightened engagement, both through groups such as Investor Alliance for Human Rights, as well as bilaterally. Development finance institutions and multilateral development banks are reported to be developing joint approaches to work with investees to address these risks.

Nevertheless, such efforts are voluntary and sporadic – not systematic. There is no evidence of shareholder action forcing solar power firms to address their ties to forced labour. Consideration has been given in US Congress to requiring systematic disclosure to the SEC of reporting entities' ties to Xinjiang. These rules have, however, not yet been put in place, and to date there has been no effort to de-list firms with reported ties to Xinjiang forced labour, with both JinkoSolar and Daqo remaining listed on the New York Stock Exchange.

Implications

Strengthening the impact of Western sanctions on the Xinjiang solar sector will require improved target selection. Target selection to date seems (presumably unintentionally) to have exacerbated Western vulnerability. A better approach might be to target export of high-quality quartz to Chinese firms, to de-list firms, or to de-certify their leaders. (For example, the CEO of Daqo and the CFO of GCL-Poly are both members of foreign accounting standards professional organizations, which could consider revoking their membership or certification based on their ties to forced labour.)

One unexpected effect of import bans on Xinjiang solar products is supply-chain bifurcation. Evidence suggests that it is the same firms that reportedly rely on forced labour to make components for some products that are developing new 'slavery-free' product lines for Western markets. They have the technical know-how, business relationships and capital to gain first mover advantage in this new market. There is nothing in the current sanctions mix that prevents this approach, nor anything that prevents Western investors or buyers from benefiting from these firms' new or existing business lines. The unintended result may be that Western consumers pay a premium for 'slavery-free' products that cross-subsidises those firms' continued use of forced labour to make other products sold in other markets.

Addressing this unintended outcome will require two significant policy fixes. First, ensuring that sanctions work not only to block *goods* made with forced labour, but also to target *firms* that use forced labour to make goods (see Policy Brief No. 10). Second, investing in and otherwise supporting new market entrants who have no ties to forced labour, to create alternative sources of slavery-free supply of silica and polysilicon. This requires transnational industrial policy, and a roadmap for a sectoral change (as discussed further in *The Energy of Freedom*). This will not be costless, with industry analyst Johannes Bernreuter estimating a roughly 10 per cent increase in solar prices. Yet in the medium and long-term there will be significant benefits. These include reduced forced labour; greater resilience to geopolitical shocks; as well as productivity, innovation and social welfare gains from the removal of forced labour from the supply-chain; not to mention ensuring the perceived 'justness' of the transition to renewable energy.

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Sectoral dynamics of Xinjiang sanctions

	Cotton	Tomatoes	Solar
Overall impacts to date	Significant impact on demand for Xinjiang cotton, price. Some targeted firms closing manufacturing plants, laying off workers. Western brands have lost market share (see Part 2). No sign of remediation to victims of forced labour.	Limited sanctions enforcement to date. No clear evidence of impacts. No sign of remedy for victims of forced labour.	Limited impact – prices at 10-year high. Possible supply-chain bifurcation. No clear roadmap for developing alternative supply means established firms capturing new 'slavery-free' demand. No sign of remedy for victims of forced labour.
Strengthen policy opponents?	Sanctions have responded to evidence of ties to forced labour, rather than sought to impact those with ties to policy makers. No differentiation of enforcement approach between XPCC firms and those with more direct influence in Beijing (eg Ruyi Group). Targeted sanctions on firms and leaders' foreign assets could increase impact.	Sanctions have responded to evidence of ties to forced labour, rather than sought to impact those with influence in policy processes. No differentiation of approach between XPCC firms and those with more direct influence in Beijing (eg COFCO Tunhe).	Sanctions not yet targeting industry leaders with influence over policy makers (eg those with ties to 'Zhejiang Clique', those with ties to Deng Xiaoping family & PLA).
Cost asymmetries	Asymmetries marginally favour sanctioning coalition because of Western share of demand and higher price Western consumers will pay. This could be further strengthened by broadening coalition to include Central Asian buyers of raw and spun cotton.	Asymmetries currently favour Xinjiang producers. This will change if: 1. EU import ban adopted, enforced; 2. African or Middle East countries recruited into the sanctioning coalition; 3. US takes more robust enforcement action eg against fast food companies; or 4. sanctions focused more on the broader COFCO group – though this risks being perceived as an attack on China's food security.	Asymmetries strongly favour Xinjiang producers and work against Western importers. This could be addressed by focusing sanctions on high-quartz quality exports from the US, and through industrial policy to increase alternative supply of slavery-free polysilicon.
Trade adaptation strategies	Evidence of reallocation, deflection and transformation. Clear risk of sanctions evasion – enforcement strategy will be determinative.	Evidence of deflection which may shade into evasion. Some reallocation / social dumping emerging. Enforcement strategy will shape firm-level adaptation.	Evidence of trade reallocation and some deflection (via South East Asia). Dominant firms in middle of supply-chain increasingly engaging in product transformation and supply-chain – without giving up forced labour production for some products. This raises cross-subsidization concerns.
Sectoral body conduct	Sectoral bodies representing globalized firms push for limits on import controls. Standards-oriented bodies provide norm amplification. Chinese government responds by politicizing standards processes.	No activity evident.	Sectoral bodies' policy stances respond to both positions in global value-chains and local regulatory signals. Globalized value-chains lead sectoral bodies to push for more open trade. Thin-film & ultra-low-carbon producers more vocal in support of sanctions, as they may improve their competitive positions.
Capital markets engaged?	Increasingly, but primarily through private active engagement, including via IAHR. Some emerging shareholder proposal activity.	Some impacts on XPCC family firms, eg removal from stock indices. Early signs of active engagement by IAST-APAC and IAHR. No shareholder actions to date.	Western investors remain invested in these firms. Development finance bodies most engaged, some signs of engagement by institutional investors, private equity. But no signs of shareholder actions or delisting to date.

[i] James Cockayne, *Making Xinjiang Sanctions Work: Addressing forced labour through coercive trade and finance measures* (Nottingham: University of Nottingham, 2022).

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