

Understanding the Global Solar Energy Supply Chain

PART 1: EXPOSURES TO FORCED
LABOUR IN THE SUPPLY CHAIN OF
CLEAN ENERGY

A recent report exposes the presence of forced labour in the world's dominant supply chain of solar panels. Australian companies should pay attention.

Australians are adopting renewables quickly, at around a celebrated ten times faster than the global average. Explanations point to rising domestic electricity costs, the benefits of lots of sunshine and high home ownership, lack of red-tape and falling cost of PV technology.

This domestic narrative of surging renewables belies a more complex reality.

On 14 May, Professor Laura T Murphy and Nyrola Elimä of Sheffield Hallam University [published a paper examining Uyghur forced labour and global solar supply chains.](#)

In this first of two papers, FairSupply discusses this research into the presence of forced labour in the global solar supply chain and the implications for Australian businesses. In the second, FairSupply will examine typically unaccounted for GHG emissions in the solar supply chain.

"A hidden cost of inexpensive carbon reduction is exposure to forced labour in supply chains."

Increased global demand for clean energy has catalysed the international market to make carbon reduction as inexpensive as possible. A hidden cost of inexpensive carbon reduction is exposure to forced labour in supply chains.

Made in China

If an Australian business were to buy a solar panel today, there is a high likelihood it was manufactured in China. If the components and materials are considered, the likelihood that they have their origins in China is higher still. China dominates the global solar energy supply chain.



In 2020, China produced around three-quarters of the world's polysilicon (*Murphy and Elimä report*)

95%

of solar modules rely on solar grade polysilicon as their primary material

71%

of the world's solar modules are manufactured by Chinese corporations

97%

of the wafers that go in all of the world's solar modules are manufactured by Chinese corporations

15 years ago, this was not the case.

Prior to 2005, the majority of polysilicon needed to manufacture the world's solar modules were made in US, Germany and Japan.

What explains this remarkable transformation?

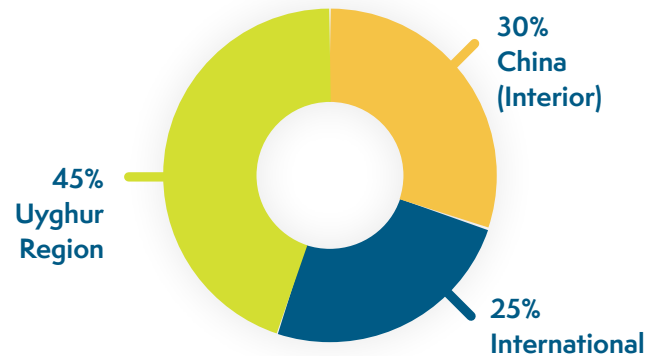
Murphy and Elimä note two things:

1. The importance of government-imposed duties on US polysilicon imports which currently remain in effect.
2. Chinese Government tax and financial incentives to corporations that move or build facilities in Xinjiang.

Xinjiang has become vital to the global supply chain of solar panels. 45% of the global supply of polysilicon is said to be traceable to the Xinjiang region of China, the report states.

For businesses around the world, including those in Australia, that's a significant problem.

2020 POLYSILICON MARKET SHARE*



* Murphy, L and Elimä, N. (2021). "In Broad Daylight: Uyghur Forced Labour and Global Solar Supply Chains"

The hidden cost of going green

Xinjiang is a region of China where there is significant international consensus about the prevalence of forced labour and other modern-slavery-related human rights abuses. Cheaper production costs drew companies to Xinjiang. However, it was not simply cheap coal and tax incentives, it was also the competitive advantage of forced labour, Murphy and Elimä argue.

The prevalence of forced labour throughout China (and well beyond the Xinjiang Uyghur Autonomous Region) is a human rights issue of most pressing concern. This year, the United States, Canada and the Netherlands declared the treatment of the Uyghur people genocide.

While the Australian government did not make the same declaration, in a joint statement on Human Rights Abuses in Xinjiang in March, Australia and New Zealand's Foreign Ministers declared,

"The Australian and New Zealand Governments today reiterate their grave concerns about the growing number of credible reports of severe human rights abuses against ethnic Uighurs and other Muslim minorities in Xinjiang.

*In particular, there is clear evidence of severe human rights abuses that include restrictions on freedom of religion, mass surveillance, large-scale extra-judicial detentions, as well as forced labour and forced birth control, including sterilisation."*¹

With regards to forced labour practices in Xinjiang, Murphy and Elima state, "Companies were 'encouraged and guided' to hire these surplus labourers and act as arbiters of ethnic unity in order to assist the government in its ambition of achieving 2.2 million 'transfers for employment' of rural surplus labour per year on average from 2016 to 2020"²

They note, all four of XUARs polysilicon manufacturers, "have reported their participation in labour transfer or labour placement programmes and/or are supplied by raw materials companies that have".

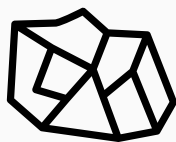
Compelling and comprehensive peer-reviewed research has very recently been released that further expands upon the nature and extent of human rights exploitation (primarily through forced labour) in the Xinjiang region in connection with the production of solar panel componentry.

This research places a large number of international companies on notice: Their solar panel modules may be slavery tainted.

¹ <https://www.foreignminister.gov.au/minister/marise-payne/media-release/joint-statement-human-rights-abuses-xinjiang>

² Murphy, L and Elimä, N. (2021). "In Broad Daylight: Uyghur Forced Labour and Global Solar Supply Chains." Sheffield, UK: Sheffield Hallam University Helena Kennedy Centre for International Justice.

The Supply Chain of Solar Panel Modules



1. Raw Materials



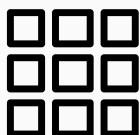
2. Polysilicon



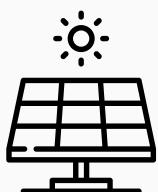
3. Ingots



4. Wafers



5. Cells



6. Modules

Quartz is in abundant supply in Xinjiang Uyghur Autonomous Region (XUAR). Polysilicon is derived from this mined quartz. China-based companies including GCL-Poly Energy Holdings Ltd. and Xinte Energy Co. bake the material in giant ovens and treat it with chemicals until it condenses into ingots of near-pure polysilicon. Those ingots are sliced into wafers using diamond-edged saws, and then cut into squares to make solar cells that transform sunlight into electricity.

What this means for international companies purchasing or investing in solar panel modules

Companies around the world purchasing or investing in solar modules are potentially exposed to forced labour hidden in their supply chains.

Legislation and regulations around the world have placed increasing importance on supply chain transparency. For example, Section 307 of the Tarrif Act of 1930, 19 U.S.C Section 1307 prohibits the importation of merchandise, mined, produced or manufactured wholly or in part in any foreign country by forced or indentured labour. Such merchandise is subject to the exclusion and/or seizure by the US government and may lead to criminal investigation of the importers.

In Australia, the Customs Amendment (Banning Goods Produced By Uyghur Forced Labour) Bill 2020 has been introduced which seeks "to prohibit the importation into Australia of goods from Xinjiang province in the People's Republic of China as well as goods from other parts of China that are produced by using forced labour".

The Modern Slavery Act 2018 (Cth), also requires reporting entities to identify, assess and address modern slavery risks in a mandatory modern slavery statement.

FairSupply's research indicates that AGL Limited was one of the few reporting entities who in their modern slavery statement specifically identified renewable energy and the purchasing of renewable certificates as an elevated modern slavery risk:

"The procurement of renewable technology is considered a high-risk industry for modern slavery due to risks present throughout the supply chain, from sourcing raw materials such as cobalt, to the manufacturing of batteries and solar panels."

AGL Modern Slavery Statement

Similarly, AGL Limited identified the renewable energy industry as being a relatively higher risk for modern slavery, specifically in the form of forced labour and debt bondage because of the "risks present throughout the supply chain, from sourcing raw materials to the manufacturing of solar panels."

There is movement within the solar industry to respond. Last month, as a response to the demand for assurance that products purchased are free of forced labour, the Solar Energy Industry Association developed the Solar Supply Chain Traceability Protocol 1.0. The Protocol sets recommended policies and procedures aimed at identifying a product's material inputs and tracing those inputs through the supply chain.

On 27 April 2021 the Senate Foreign Affairs, Defence and Trade Legislation Committee heard evidence during the public enquiry.

“Supply chains in China can be long, complicated and opaque. When corporations wish to take advantage of the cost benefits of manufacturing in China, they must be clear-eyed about the ethical risks they take in the knowledge that China is not a normal political environment,” explained one witness to the Committee during the enquiry.

International trade data indicates that two-way trade between Australia and Xinjiang is increasing, particularly in relation to the importation of construction materials, an industry which forms part of the supply chain of investment into infrastructure portfolios in Australia.

Given the responsibility placed on investors through the Modern Slavery Act to identify modern slavery risks in investment portfolios, the hidden risk of forced labour within an investee company’s supply chain should be adequately measured.

The report concludes, *“in the Uyghur region, companies create green energy by consuming cheap carbon-emitting coal. They aim to improve climate conditions but sacrifice humane labour conditions in the bargain.”*

Celebrating local gains without the context of supply chain transparency is flawed thinking. The solar industry is not alone in its rapid expansion into Xinjiang.

To receive Part 2: Understanding the Global Solar Energy Supply Chain in your inbox [sign up here](#).





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