FACTSHEET #8

The objective of RESiLEX is to improve the resilience and sustainability of the entire Silicon value chain and reduce EU dependence on critical raw materials for solar panel and battery production. Silicon is considered a critical raw material for the EU due to its high supply risk and economic importance, mainly because of heavy reliance on imports

Shining a Light on the Social Impact of Solar PV Supply Chains in Europe and China



Resilex doesn't just look at the environmental side of photovoltaic (PV) panel production; it also delves into the human and social aspects. The analysis developed by the Imperial College London is a crucial step in this direction, analyzing how silicon and PV module production affects people and communities, with the ultimate goal of providing recommendations to EU policymakers

How is social impact measured?

To understand social impact, RESiLEX uses a methodology called Social Life Cycle Assessment (S-LCA). Imagine a lens that follows a product, in this case a solar panel, "from cradle to gate" (from raw material to the final factory), to see all the social implications for the people involved. This includes:

- Workers: Rights, wages, safety, working conditions.
- Local community: Engagement, job creation, impact on quality of life.
- Value chain actors: Fair competition, supplier relationships, wealth distribution.
- Society at large: Contribution to economic development, transparency, sustainability.
- Consumers: Health, safety, product end-of-life responsibility.
- Children: Health or marketing-related issues.

The study specifically analyzed two PV module production supply chains: one representing the majority of modules commercialized in Europe, entirely produced in China (called "Module A"), and a predominantly European one (called "Module B"), although cell production still occurs in China due to the lack of large facilities in Europe. The results presented here are still not comprehensive but can provide some very interesting insights.

Social "Hotspots": China vs. Europe

The generic analysis (hotspot assessment) shed light on areas of higher social risk. The results clearly indicate that the Chinese supply chain (Module A) presents much higher social risks compared to the European one (Module B). Here are some key examples:

- Freedom of Association and Collective Bargaining: For the Chinese Module A, the risk is significantly higher (791 "medium risk hours" or mrh) compared to the European Module B (135 mrh). This suggests large disparities in workers' ability to organize and negotiate.
- Fair Wage: Concerns about a "fair wage" are notably more serious in the Chinese supply chain (749 mrh for Module A vs. 168 mrh for Module B), reflecting significant wage inequalities.
- Other Major Impacts in China: Module A consistently shows higher risk levels for categories like "mineral consumption," "pollution," and "healthcare coverage."
- Alarming Risks: Particularly concerning are the risks related to "human trafficking" and "violations of labor laws and regulations" in the Chinese supply chain, where China is responsible for almost 98% of these risks.

These findings align with Human Rights Watch reports, which emphasize how the main social challenges in Chinese production stem from labor rights violations, insufficient employee benefits, and a lack of transparency in governance.

Strengths and Areas for Improvement in the European Supply Chain

The specific analysis of production sites in Europe (for Module B) generally showed a solid performance with more positive than negative social impacts across most indicators.
However, one key area emerged that needs improvement: "community involvement." European companies, particularly those involved in polysilicon, ingot, wafer, and module production, scored lowest in indicators such as:

- The existence of a written policy on community involvement.
- The engagement of a variety of community stakeholders.
- The inclusion of local stakeholders in decision-making processes.
- Organizational support (volunteer hours or financial) for community initiatives.

The report recommends that companies establish and implement comprehensive policies that promote active community participation and diversity inclusion to improve social impact. Furthermore, a lack of transparency or clear responses from European companies was noted on some important indicators, such as the distribution of wealth within the supply chain (e.g., contractual tools, investment in more capable suppliers, fair selling prices) and the hiring of local personnel, as well as spending towards local suppliers.



Preliminary conclusions and next steps

Preliminary assessments confirm that European supply chains are more socially responsible due to stricter regulations, but they need to improve dialogue and engagement with local communities. In contrast, Chinese supply chains present serious and widespread social risks that raise doubts about their long-term sustainability and compatibility with the EU's Sustainable Development Goals (SDGs).

For the future, the RESiLEX project is committed to:

- Continuing to evaluate European PV module technologies, including the social benefits of "eco-designed" cells that use less silver and indium tin oxide (ITO).
- Analyzing the social impact of silicon recycling scenarios.
- Using a "Quintuple Helix" model to present results and foster knowledge exchange among academia, industry, environment, the public, and political systems, promoting a more sustainable solar supply chain in the EU.

The full RESiLEX report by Imperial College London underscores the importance of PV production being not only green but also socially equitable and transparent, pushing Europe towards greater resilience and responsibility in its solar energy supply chain.

resilex-project.eu

RESiLEX Project

info@resilex-project.eu

Co-funded by the European Union

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or HADEA. Neither the European Union nor the granting authority can be held responsible for them

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

UK Research and Innovation