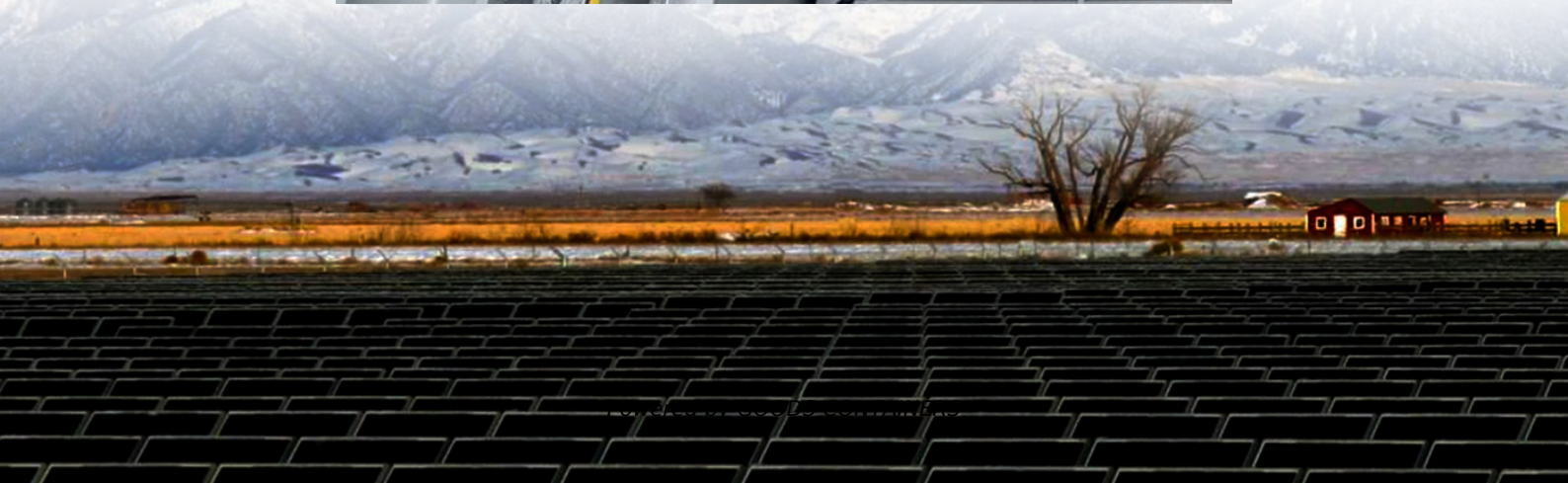
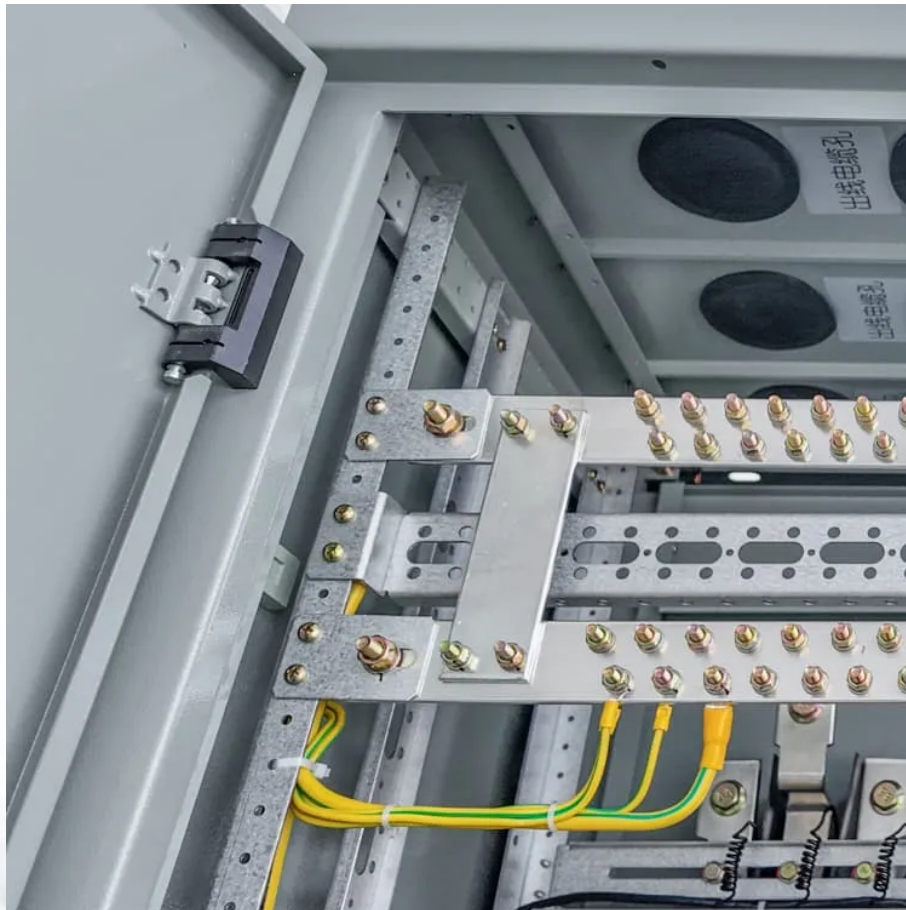


The relationship between monocrystalline silicon and solar glass





Overview

The growing solar photovoltaic (PV) installations have raised concerns about the life cycle carbon impact of PV manufacturing. While silicon PV modules share a similar framed glass-backsheet structure, the ma.

Can liquid phase crystallized silicon reduce material costs and environmental impact?

Liquid phase crystallized silicon on glass with a thickness of (10 - 40) μm has the potential to reduce material costs and the environmental impact of crystalline silicon solar cells.

Why do we need crystalline silicon for photovoltaic (PV) energy conversion?

Crystalline silicon is needed in large and ever-increasing amounts, in particular for photovoltaic (PV) energy conversion. Efficient thin-film absorbers, for example, based on abundant and stable compound semiconductors, were considered to reduce material consumption.

What is mc-Si crystalline silicon synthesis (CSS)?

A residual composite layer of mainly alumina and unreacted Al forms beneath the mc-Si thin film as the second product of the crystalline silicon synthesis (CSS) process, which can be used as rear contact in a vertical solar cell design.

What limits the efficiency of thin silicon solar cells?

The efficiency of thin silicon solar cells is limited by bulk and interface recombination, leading to a reduced saturation current density, and by series resistance causing a lower fill factor. Both are additionally limited by electrical shading and losses at grain boundaries and dislocations.



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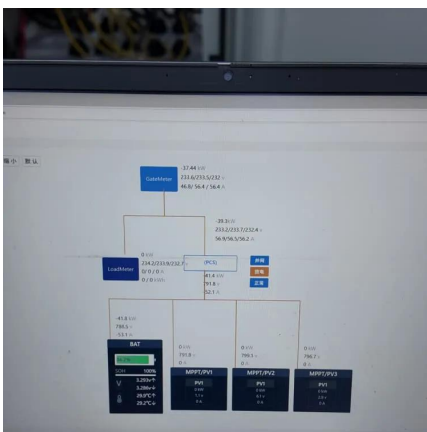


Material intensity and carbon footprint of crystalline silicon ...

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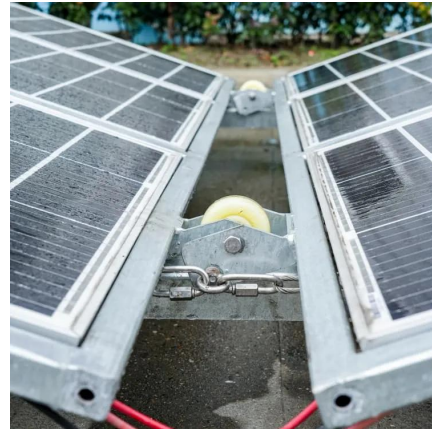


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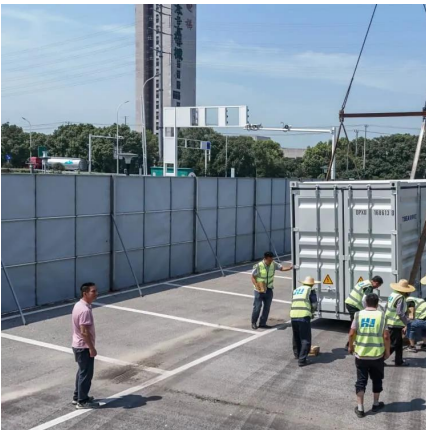
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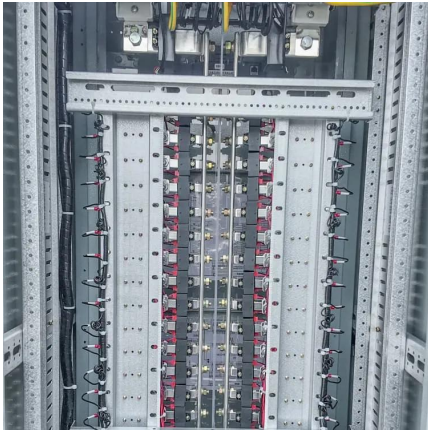
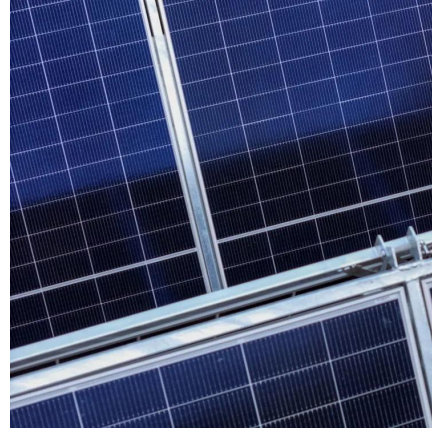
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