



## Photovoltaic Manufacturing Cost and Throughput Improvements for Thin-Film Cigs-Based Modules: Phase II Technical Report

By National Renewable Energy Laboratory (NREL)

Bibliogov, United States, 2012. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book \*\*\*\*\* Print on Demand \*\*\*\*\*.Thin-film photovoltaics (PV) has expanded dramatically in the last five years, but commercial use remains limited by performance, cost, and reliability. Of all the thin-film systems, copper indium gallium diselenide (CIGS) has demonstrated the greatest potential for achieving high performance at a low cost. The highest-quality CIGS has been formed by multi-source co-evaporation, a technique pioneered in this country by researchers at NREL. Multi-source co-evaporation is also potentially the fastest and most cost-effective method of CIGS absorber deposition. Global Solar Energy (GSE) has adapted multi-source co-evaporation of CIGS to large-area, roll-to-roll processing on flexible substrates, enabling several manufacturing and product capability advantages. Roll-to-roll processing enables a low-cost, automated continuous manufacturing process. Flexible substrates enable product application in unique, as well as traditional, areas. The primary objectives of the GSE Photovoltaic Manufacturing Technology (PVMaT) subcontract are to reduce cost and expand the production rate of thin-film CIGS-based PV modules on flexible substrates. Improvements will be implemented in monolithic integration, CIGS deposition, contact deposition, and in-situ CIGS control and monitoring.

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