

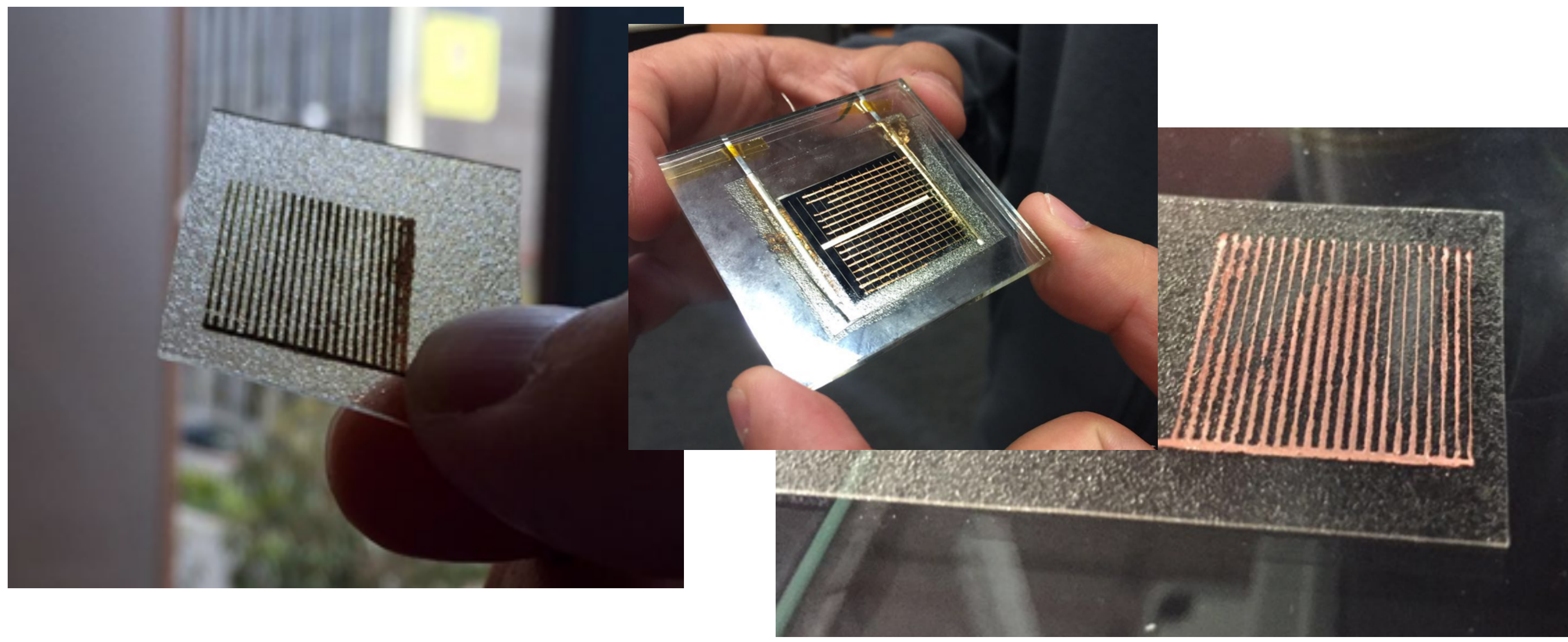
SmartSheet busbar-less interconnection technology: solution for the next generation PV modules

SmartSheet无主栅互联封装技术：下一代光伏组件的解决方案

Never Stand Still

Faculty of Engineering

School of Photovoltaic and Renewable Energy Engineering



- ✓ Limitations on fineness and alignment of screen printing, and high cost of silver are bottlenecks of conventional PV module. 丝网印刷的精度、对准和高昂的银浆价格是传统光伏组件发展的瓶颈。
- ✓ BB-less technologies are the solution with predicted market share of 30% by 2023. The requirement for revolutionary tool and process is the golden opportunity for equipment manufacturers. 无主栅技术将是最佳解决方案，预计将在2023年达到市场份额的30%。对革命性设备和工艺的需求是设备生产商的黄金机会。
- ✓ SmartSheet is the best BB-less solution, where the conductor-embedded encapsulant is directly applied to the cells; while other technologies require an additional wire-layering process in module fabrication. SmartSheet是无主栅线路的最佳解决方案，预先植入导电体的封装材料，可直接铺设于电池之上进行层压；而其他的无主栅技术需要在组件生产中额外的铺设金属线，提高了成本。

Fabrication flow of SmartSheet 导电封装膜Smartsheet的制备流程



Fabrication flow of homojunction PV module incorporating SmartSheet 集成SmartSheet工艺的常规组件制备流程



Fabrication flow of Si-HJT module incorporating SmartSheet 集成SmartSheet工艺的硅异质结组件制备流程



Advantages of SmartSheet 技术优点

- ✓ Less shading compared to thick ribbon. 减少电极阴影提高电池电流。
- ✓ No alignment required. 无对准要求低。
- ✓ Less usage of silver in solar cell metallisation. 银的用料大大降低。
- ✓ Compatible with both screen-printed and plated metal contacts. 与丝网印刷及电镀工艺兼容。
- ✓ Less processing steps compared to convectional solar cell interconnection. 减少组件工艺步骤。
- ✓ Compatible with the standard solar cell manufacturing routines. 与现有的电池制造工艺兼容。
- ✓ Extremely simple process for HJT cells. 极大简化HIT组件的制造工艺。

Why UNSW? 与UNSW的合作优势

- ✓ World's leading PV research. 世界顶尖的光伏研究。
- ✓ More than 30 years of record for the world's most efficient silicon solar cells. 硅基电池转换效率世界纪录30年。
- ✓ Zero-gap between lab technology to mass production by SRF. 拥有中试线，任何实验室技术推广前均得到产线验证。
- ✓ Decades of experiences in commercial metallisation technologies. 数十年金属化研发经验，并成功开发数款量产技术。
- ✓ Well-established network with Chinese cell and module manufacturers. Best platform to promote advanced processes and equipment. 与中国各大电池组件制造商具有良好的合作关系。是推广新工艺和新设备的最佳平台。
- ✓ First out-of-China TORCH Innovation Precinct backed by MOST and two national governments. 新南威尔士大学拥有第一个海外火炬科技园区，得到中华人民共和国科技部和澳中双方政府的高度支持。

Project plan and Budget 合作计划

- ✓ Year 1: Single-cell SmartSheet PV module with performance tests. 第一年：单电池组件封装和效率测试。
- ✓ Year 2: Two-cell interconnected SmartSheet PV module fabrication with performance and reliability tests at UNSW. 第二年：双电池互联组件的封装。通过效率、可靠性测试。
- ✓ Year 3: Assisting for tool development for full-size module production. 第三年：协助研发样机，制造常规组件。