

3-IN-1 BIPV (BUILDING-INTEGRATED PHOTOVOLTAIC) SYSTEM FOR GREEN FIELD PROJECT APPLICATION



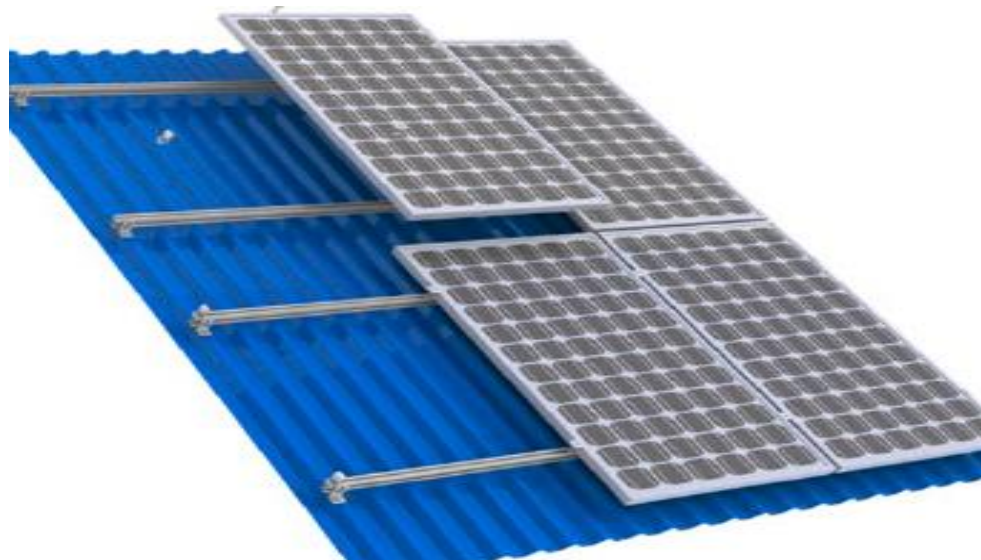
PROJECT SUMMARY

Singapore Green Plan 2030 envisions a target of at least 2 Gigawatts-peak of solar deployment by 2030. As a nation with scarce land area, it is essential to develop an optimised solar system suited for the Singapore landscape. Exploring untapped areas via new design approach, materials and installation method on greenfield projects as well as for brownfield retrofit purposes will be key to support Singapore's solar ambitions. Solar technologies such as Building Integrated Photovoltaic (BIPV) is one of the most efficient approach for mass scale solar implementation in urban cities.

This research project aims to develop a cost-effective and high energy yielding 3-in-1 BIPV turnkey solution for greenfield projects while achieving the optimal BIPV system investment returns. Our solution includes self-proprietary 2-in-1 solar roof building materials which integrates solar panel and conventional roof material into one component, and a state-of-the-art next generation GaN (Gallium Nitride) based micro-inverter.



Traditional Double Glass Solar Rooftop: Bulky system with comprehensive supporting metal structures. Low solar-to-roof space utilization.



Traditional Solar Panels on Metal Deck Roof: 2x layers of roof, material and labour required. Total weight on roof is high. Low solar-to-roof space utilization.

PROJECT OUTCOMES



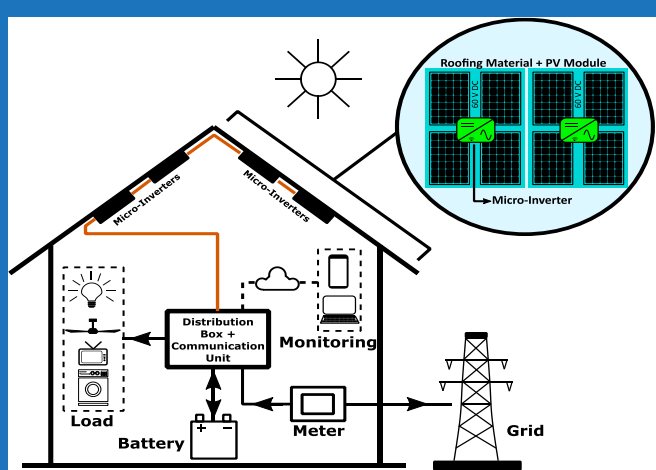
BIPV Transparent Double Glass Solar Rooftop



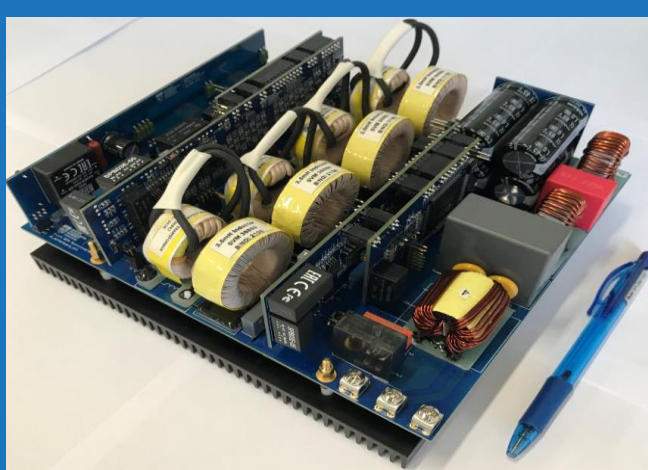
BIPV In-Transparent Metal Based Solar Rooftop

2-in-1 Solar Building Materials

1. Self proprietary BIPV panels with inter-module water tight features
 - Transparent glass based variant with Bi-Facial cell at 20.87% module efficiency.
 - In-Transparent metal based variant at 17.46% module efficiency
2. TUV certified, Class A Fire Rated Test
3. Solar-to-roof-space utilization +15%



3-in-1 BIPV system representation for Typical Household



GaN based Micro inverter

GaN Based Micro Inverter

1. State-of-the-art next generation GaN (Gallium Nitride) based 1.6kW micro inverter – high power density (1.8 times the benchmark system)
2. Micro inverter efficiency at 98% (+1.5% higher than industry Tier 1 products)
3. 4 Maximum Power Point Tracker (MPPT) input channels per inverter
4. Features Energy Communication Unit (ECU) for remote monitoring access



3-in-1 BIPV In-Transparent System with GaN Micro Inverter: Modular and scalable features, ideal for new construction greenfield projects and brownfield retrofit options



3-in-1 BIPV System

1. 95% solar-to-roof space utilization (+25% higher)
2. 84.5% system performance ratio (+1.5% higher)
3. 25% Energy Yield Improvement per sqm

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