

## **Refinement of Solar PV System using Modular Grid Tied Inverter**

**Aristo Adi Kusuma**  
**Transmission and Distribution Department, PLN Research Institute**  
**Indonesia**

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### **Abstract**

Renewable energy has gained interest as the mean of providing energy supply in isolated island. Security of supply and environmental impact become the main drivers to reduce the use of fossil fuel in supplying electricity in remote area together with economic aspect. Tomia island is one of isolated islands (part of Wakatobi) in Indonesia which are supplied using diesel-solar PV microgrid system. However, currently solar PV system in Tomia facing problem in the existing Grid Tied Inverter (GTI) that is constructed with non modular concept (1x75kWp). Therefore, when a GTI module is damaged, all of solar PV system cannot be used. This paper explained about the refinement process of solar PV system in Tomia using GTI with a modular concept and connected to the AC busbar. The modular GTI consisted of four units from different manufacturers which is high available in the market. These GTI products have been selected to represent the GTI technology produced in Europe, Asia, and U.S. By using this modular GTI concept, solar-PV system in Tomia can resume the operation, but the measurement results show that not all of GTIs meet the allowable THD limit (THDv <3%, THD <5%) that potentially interfere with power quality. For this reason, a mechanism is needed to maintain the power quality of GTI that to be connected to the electrical system, especially it must have a test result that meets the limits permitted by the national standard.