# Improving Photovoltaic Systems Integration in Remote Diesel Networks

Fellowship Project Abstract, prepared by Martina Calais, 22 February 2014

## Abstract (for peer audiences)

With growing embedded photovoltaic (PV) generation, network service operators are increasingly confronted with the necessity that PV systems must play an active role in the control of electricity grids. This particularly applies for weaker networks with diesel generation. In this instance PV generation can lead to an increase in step load requirements for diesel generation, since a sudden loss of PV generation can be caused by rapid cloud movements or through the response of PV inverters to system faults.

This work aims to address these challenges and identify and analyse approaches to increase PV generation in small, remote, radial style distribution networks with diesel generation. The work will focus on existing and proposed local control strategies (without communication between distributed PV generation and the system control centre). These include strategies of PV inverters, with and without batteries, controlling their real power output and reactive power absorption. Specific PV inverter settings (such as under-voltage ride-through capabilities, voltage and frequency settings) in the context of step load constraints in networks with diesel generation and the role of On Line Tap Changing distribution transformers will also be considered. The work is relevant for remote networks with diesel generation and grid situations with low spatial distribution of PV systems, where a high concentration of PV systems becomes more critical in association with rapid cloud movements.