

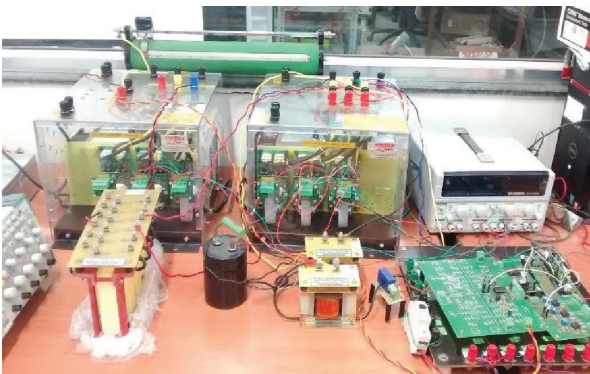
Reconfigurable distribution networks

Depleting fossil fuels and dangerous changes in environment makes renewable energy very attractive. Due to intermittent nature of the renewable energy resources (RES), energy storage systems (ESS) has to be used in conjunction with RESs. Most of these RESs and ESSs are more compatible with DC system and AC. Further, most of the modern electric loads like variable speed drive, LEDs, etc. are more efficient when it is connected to DC supply. So the DC system is dominating by its advantages over AC system in the modern era. The project investigates various aspects of influence of DC grid in modern electric system.

The main deliverable from the project is a novel multi-port converter (MPC) to interface solar PV panels and battery with DC grid. MPCs are more advantageous over conventional type converters due to reduced cost and

number of converter. Though the proposed MPC is using a high frequency transformer, it can bypass the power flow between solar PV and battery without involving transformer and thus it has reduced losses. This MPC has all other required features like maximum power point tracking of solar energy, state of charge control of battery, etc.

Analyses on faults related to DC grid are going on parallel. This will include faults on DC bus as well as effect of AC side faults on an interconnected DC grid. These studies will give an insight to design of protection systems in DC grid.



Experimental prototype