

# Future Grid, Energy Security and Community Level Battery Storage with PVs

A disruption-proof and low-cost grid has been the primary aim in any electricity power grid. However, the changes in load characteristics since the invention of Power Electronics (PE) have gradually introduced disruptors at a pace unmatched within the last decade. Although the power grid is inherently vulnerable to disturbances, it reached to a state (after the high concentration of renewable energy sources) presenting systemic impacts affecting the wellbeing of societies and economies.

The transformation in the power grid indicates that we are now shifting from decentralised to more decentralised structures. The future is likely to involve autonomous multiple microgrids with distributed energy resources. Such systems can function either in the presence of grid, or as an independent/standalone isolated system, and it can provide power at a higher level of reliability while offering low variable cost and low maintenance cost. Moreover, it can offer higher capacity factor (suitable for future demand increase due to electric vehicles) and reducing overall electricity cost. Furthermore, this approach reduces fossil fuel usage, reduce carbon footprints, improve household level electricity affordability and sell excess solar electricity at a low price to attract industries and create jobs.

This keynote will address the above issues and present the status of developments and highlight the associated road blocks.

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