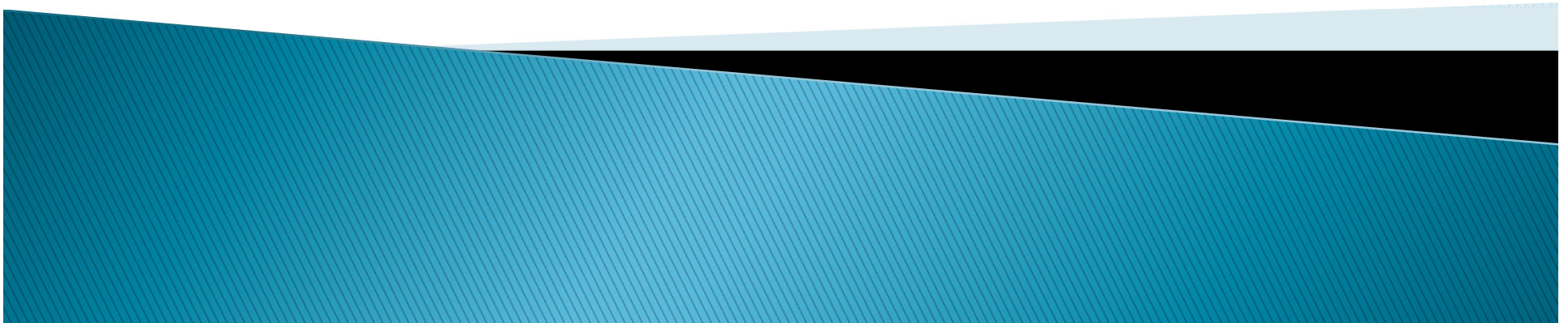
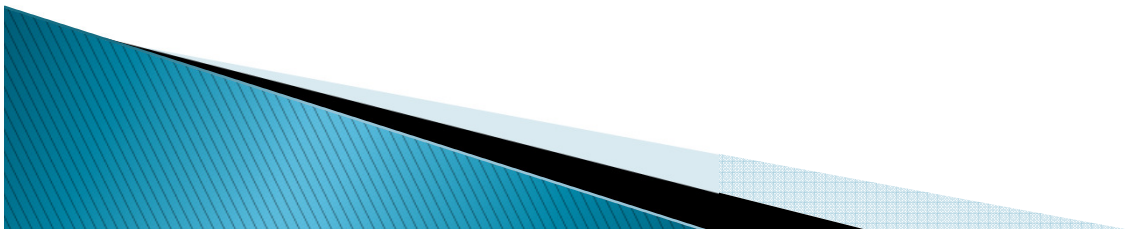


GRID-INTEGRATION OF SMALL SCALE DECENTRALIZED RENEWABLE ENERGY (DRE) SYSTEM-SOME ISSUES

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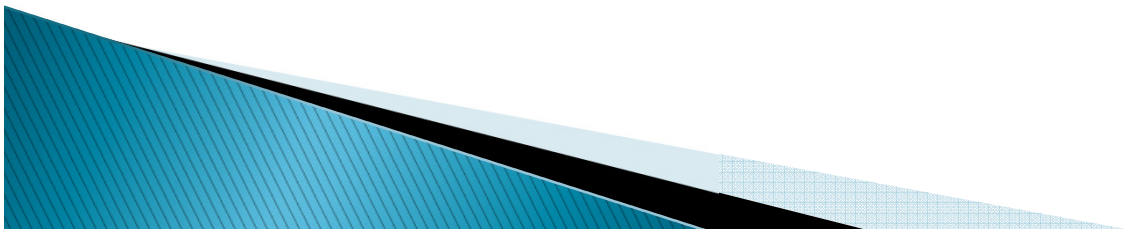
- ▶ Adequate availability of energy is one of the basic requirements for faster economic growth.
- ▶ 40% of rural population of India do not have access to electricity.



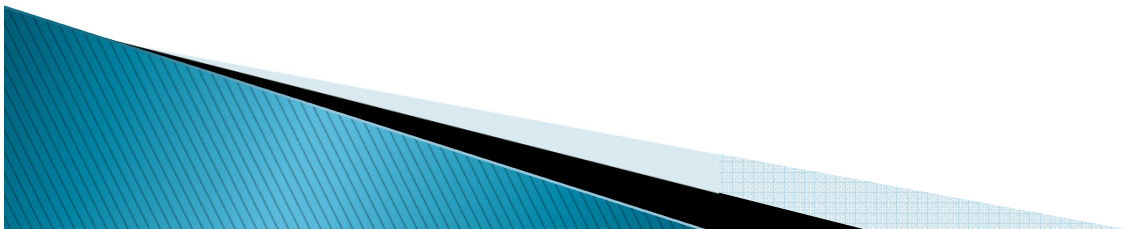
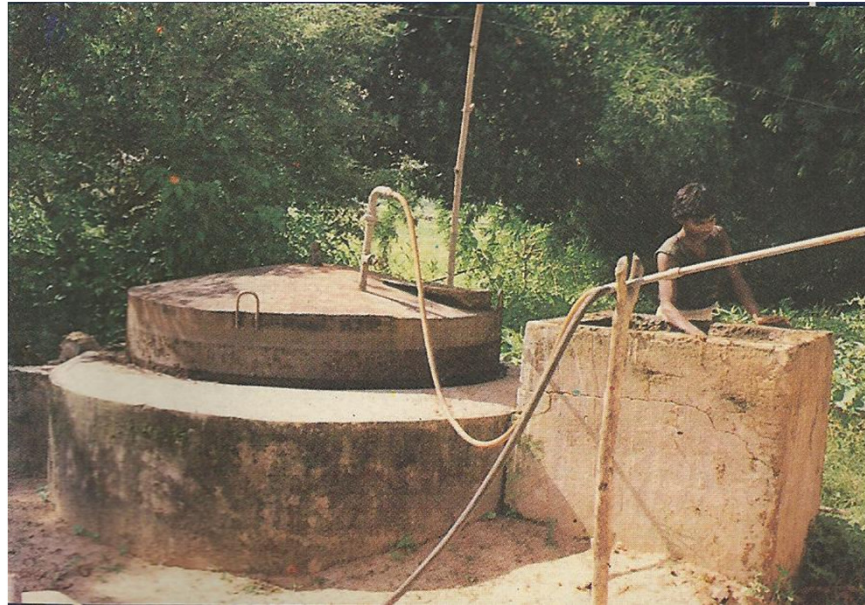
Half a billion people of India do not have access to electricity



- ▶ The scenario was worst before launching of RGGVY.
- ▶ The concept of DRE is an old idea. The thermal DRE systems are working in India for last 40 years (Example–Biogas Plant).



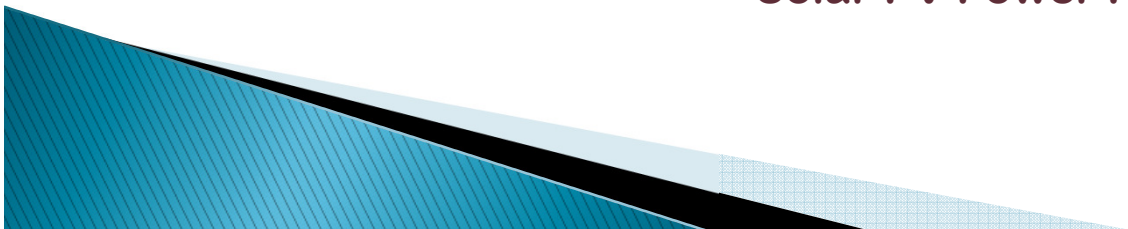
Bio Gas Plant



- ▶ However DRE (Elect) system started in India only from 1992. A 25 KW Solar PV Power Plant was installed at Sagar Island of West Bengal with mini grid and meter based tariff system. Probably that was the first large DRE System of the Country.



Solar PV Power Plant

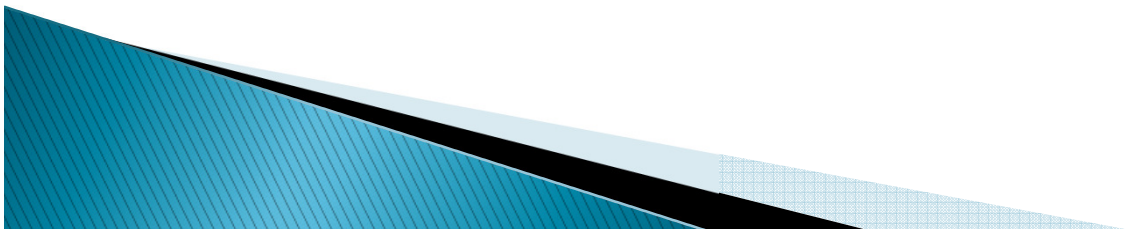


During that period grid connectivity was not thought of since MNRE condition was to put DRE electrical system only in off grid areas.

Some DRE (Elect) System cannot be connected with grid. Example– Lantern or Home System.



Solar Lantern



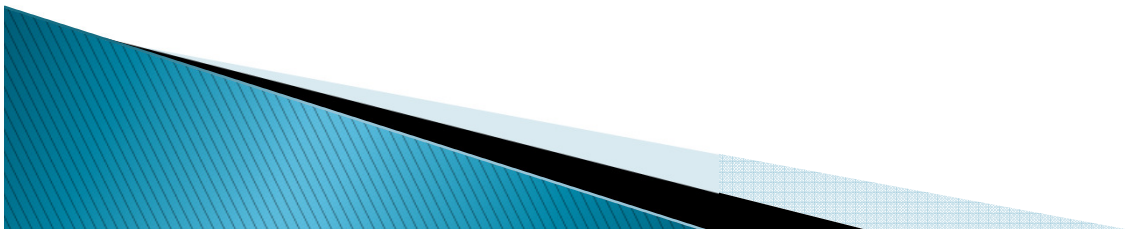
However, DRE (Elect) System which produces grid quality power can theoretically be connected with grid.



Operational Biomass plant at Sundarbans, West Bengal

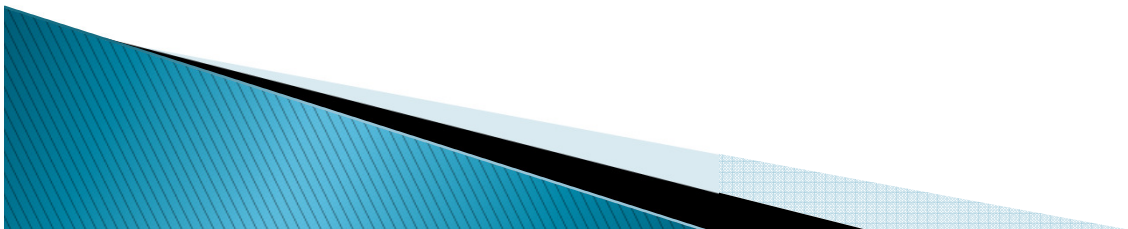
Why grid integration issue of DRE (Elect) System came for discussions.

- ✓ Small standalone DRE (Elect) System could satisfy the people partially.
- ✓ 24*7 electricity supply is practically difficult from small standalone DRE system.



- ✓ Grid power is cheaper than DRE system (Though it is not a Correct statement). This is only true due to high level of cross subsidy about which the people are not aware of.
- ✓ Lack of awareness of the political leader about long term benefits of DRE system.

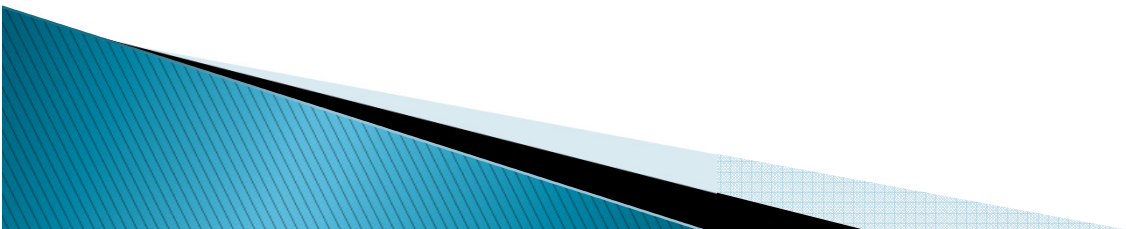
This resulted public pressure on extension of grid line in all remote areas with 90% subsidy.



Probable RE Scenario in 2014:-

All villages will have only access to distribution line but not to electricity which is controlled centrally.

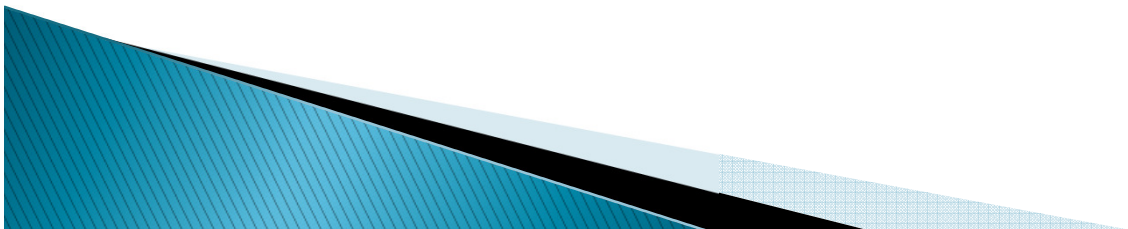
Installation and Integration of DRE system shall be absolutely essential to ensure supply of electricity in rural areas.



Three Major actions would be essential to integrate DRE with Grid.

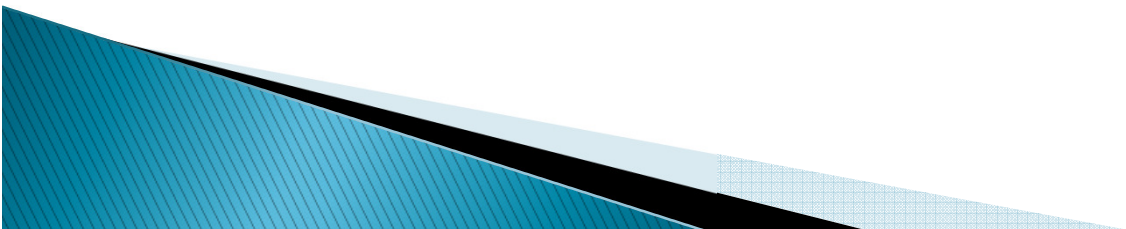
Social:–

- ▶ To educate local people and panchyat regarding benefits of DRE system.
- ▶ To educate local people on local energy security issues.
- ▶ To educate local people on limitation of conventional grid.



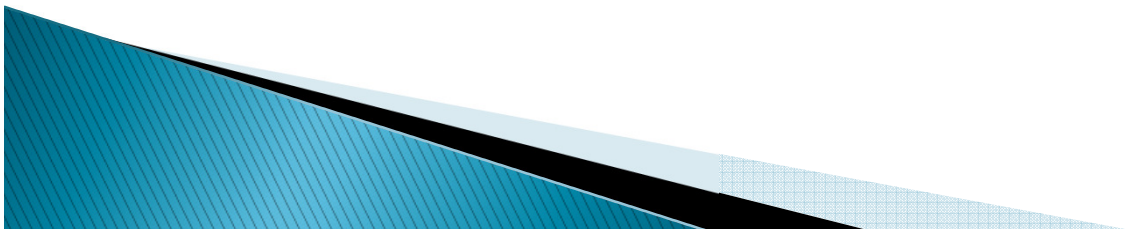
Commercial:-

- ▶ To launch various income generation programme in the village based on DRE system to prove its quality and reliability.
- ▶ To initiate action to reduce the tariff of DRE system to compete with grid.



Technical Challenges:–

- ▶ To keep connectivity provision with conventional grid having highly erratic voltage and frequency profile.
- ▶ Better option could be purchase of bulk energy from the grid and management of the local network with DRE system and grid power. However, management of such system shall be a complex task. Separate regulations shall have to be drawn.



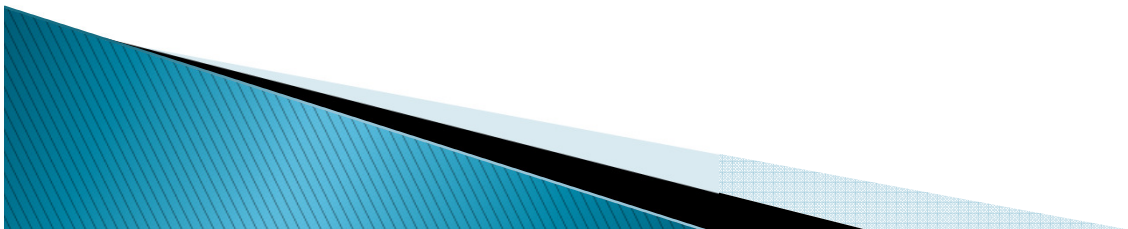
- ✓ Purulia Micro turbine project is a grid integrated DRE System. LT line has been extended from the 11/4 kV sub-station up to Micro-Turbine plant.



MICRO TURBINE

✓ Micro Turbine stops in absence of grid and again start supplying power to the village with the support of a small battery bank and inverter.

✓ Import and export meters have been installed in the Micro Turbine station.





THANK YOU

