

**RENEWABLE ENERGY INITIATIVES AT THE
DAYALBAGH EDUCATIONAL INSTITUTE (DEEMED UNIVERSITY),
AGRA**

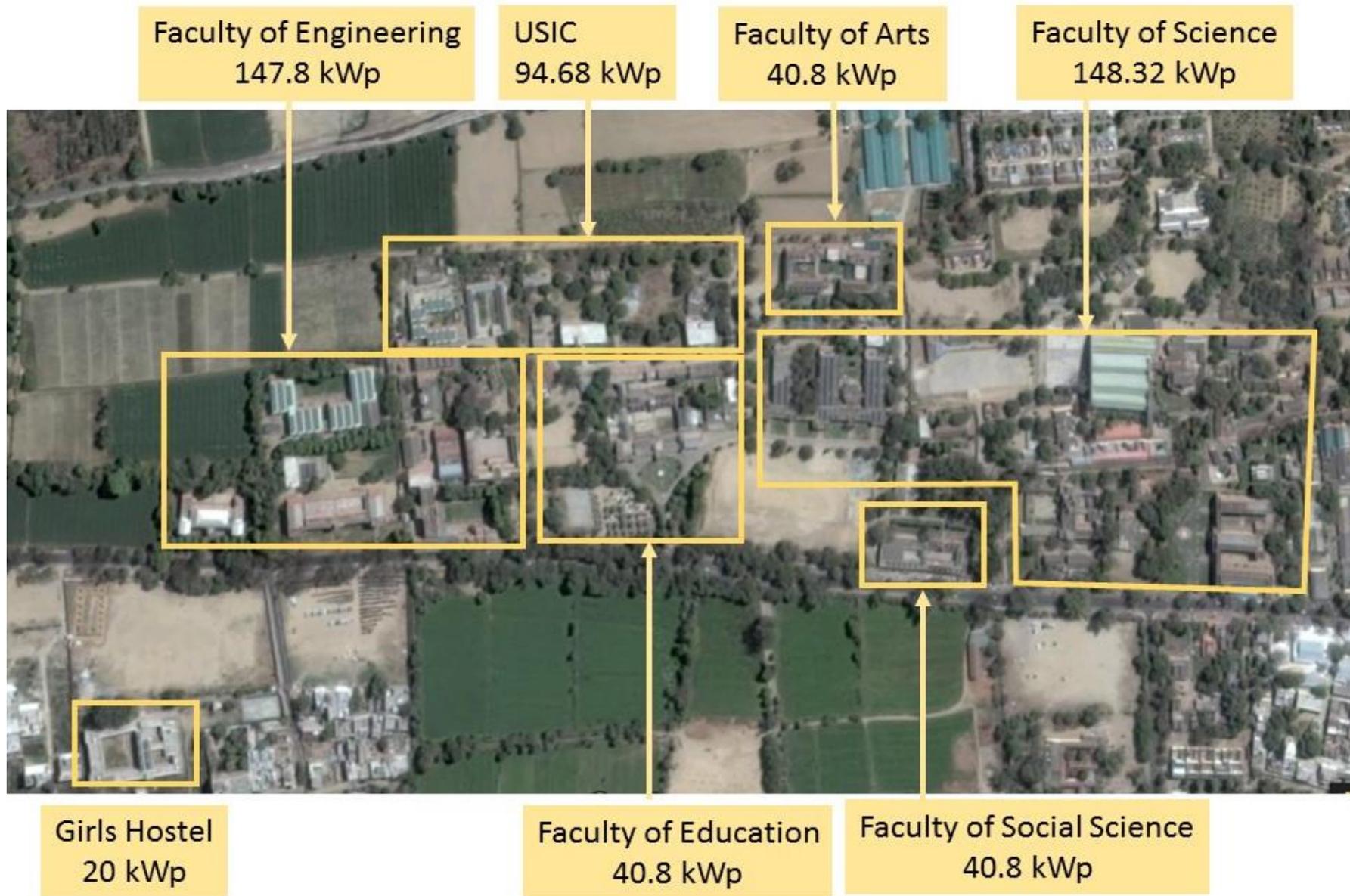
DAYALBAGH EDUCATIONAL INSTITUTE

- In order to attain the lofty vision through sustainable developmental activities in agreement with the concept of Eco-Village, Dayalbagh Educational Institute has taken initiatives in harnessing the non-conventional and renewable energy through Solar thermal and Solar Photovoltaic power plants with projects costing over 12 Crores already installed and an elaborate future roadmap.
- The institute is unique in its commitment toward the cause of protection of environment and self-sufficiency in renewable energy through Gracious Vision, Initiative, Guidance and Encouragement of Revered Chairman, Advisory Committee on Education, **Prof. Prem Saran Satsangi Sahab**

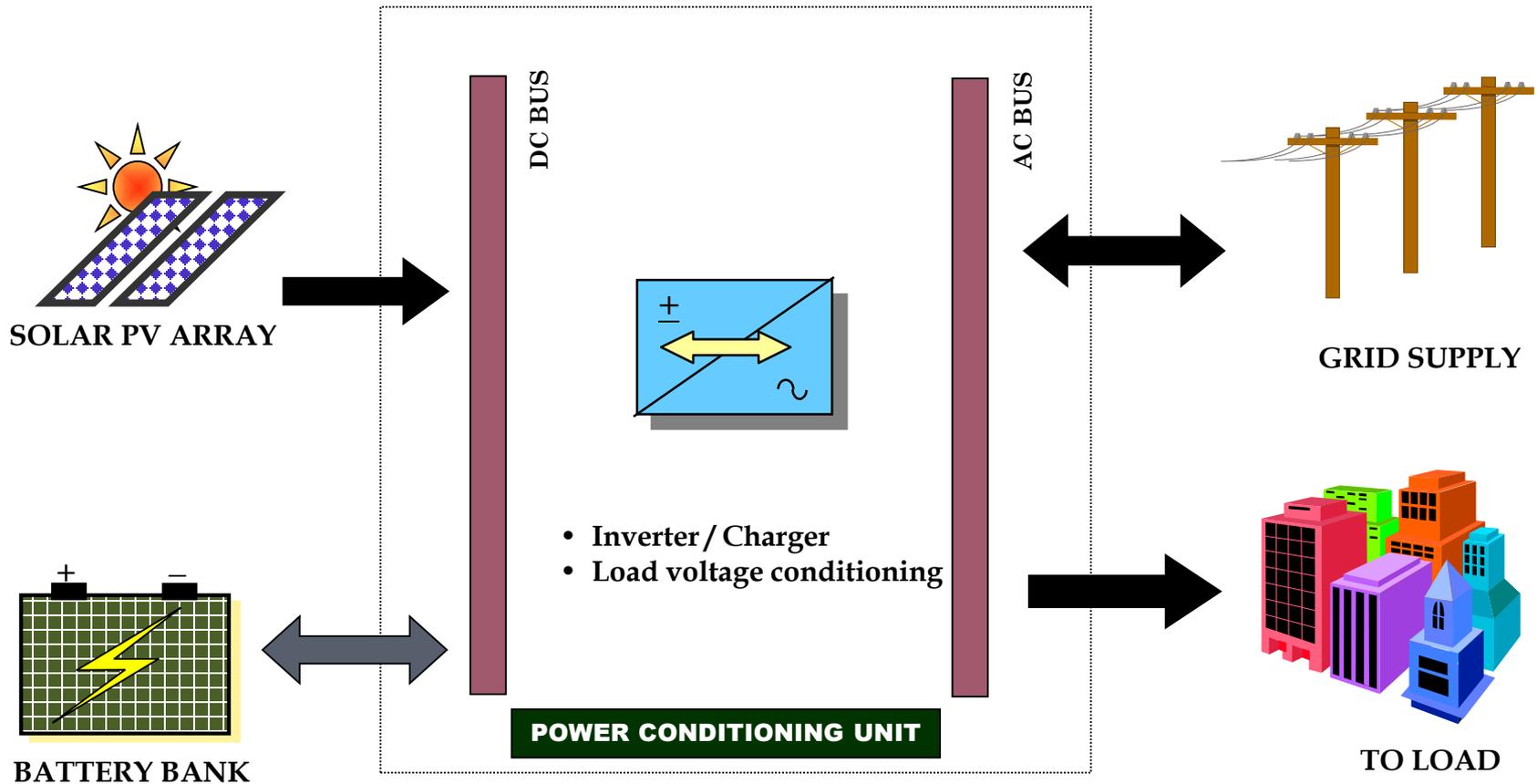
GREEN ENERGY INITIATIVES

- The whole university campus is powered by 11 Distributed Roof-Top Solar PV Power Plants aggregating to a total of 658.2kWp to ensure uninterrupted supply. On a clear day, all the electricity requirement of the institute is catered by solar power plants.
- The institute has Solar Thermal Cooking Systems in all the hostels (Two in pipeline) to provide low cost cooking solution.
- Solar Electric Vehicles
- Bio Gas Plant
- Solar and Wind systems in Distance Education Centers

DAYALBAGH EDUCATIONAL INSTITUTE



SOLAR ELECTRIC POWER PLANT



GRID SUPPORT CONDITIONING (GSC) SYSTEM

GLIMPSES : FACULTY OF SOCIAL SCIENCE



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GLIMPSES: FACULTY OF ENGINEERING



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SAN containers : Styrene Acrylo Nitrile polymer



GLIMPSES: FACULTY OF SCIENCE



SOLAR VAN (2009)



SOLAR COOKING

- Three systems in Hostels, One in pipeline
 - Number of Dish: 5 dishes of 16 sq. mt each
 - Used for boiling Emblica (Amla) and preparing decoction of herbs for Ayurvedic Pharmacy during lean hours
 - Also used for boiling wheat porridge for cattle in Dayalbagh Dairy
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- **Savings : 19 kg LPG gas per day for Hostel Mess**
 - **Saving : 80Kg of Coal per day for Ayurvedic Pharmacy**
 - **Increased yield of milk in Dairy**



DIRECT SOLAR COOKING

- Cost of LPG has increased from Rs. 400 to Rs. 1100 suddenly
- Budget of hostel mess had gone haywire
- Trying to solve the problem by minimizing the LPG and resorting to direct cooking early in the morning
- Also boiling milk for school children by 9:30 a.m.



CHALLENGES

To come up with an

- Efficient
- Reliable and
- Economically viable system

In the presence of

- Dynamic loading conditions
- Generation dependent on the vagaries of weather
- Unreliable Utility supply

SMART MICRO GRID : THE ROAD AHEAD

- Integrated operation, monitoring, communication, control and fault diagnosis of all the Solar Electric Power Plants, through a central control centre.
- Decision Support System to assist the operator for optimal efficiency, economy and reliability in system operation

R&D IN SOLAR PHOTOVOLTAIC SYSTEMS

- comprehensive **optimal operation, control, monitoring and security system** for Solar Photovoltaic Power Plants
 - Remote monitoring and control of Solar Inverters
 - Remote monitoring and control of Switchgear
 - Remote Metering and protection
 - Optimal Sun Tracking of Solar Panels
 - String Monitoring and Diagnosis
 - Smart Battery Storage System
 - Remote monitoring & Control of Water Pumping
 - Decision Support System for optimal operation



Decision Support System : development of a data driven goal programming environment

- Excel based warning/alerts and analytics
- Microsoft Azure based Analytics and Machine Learning tools
- R-environment based statistical analysis tools and machine learning tools
- Microsoft Power BI business intelligence tool



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Distance Education Centers

RAJABORARI (CLUSTER OF TRIBAL VILLAGES)



SOLAR POWER FOR 54KM WI-FI LINK AT RAJABORARI



RAJABORARI



Specifications :

Solar Panels: Two 24V, 170W_p panels

Battery: 2x 12V, 120Ah batteries

Charge Controller : Morning Star 24V, 30A

Electric Shock Energizer : 6kV, 5mJ pulses

24V Electric Charger (SOS)

RAJABORARI

1. **Rajaborari High School** : 5kWp Solar, (3kVA+2kVA) inverters, 2x48V 900Ah Battery bank
2. **Hostel** : 2kWp Solar, 3kVA inverter, 48V 600Ah Battery bank (used for water pumping also)
3. **Hospital** : 5kWp Solar, 10kVA 3- Φ inverter, 48V 600Ah Battery bank (used for water pumping also)
4. **Rest House Complex**: 2kWp Solar, 2kVA inverter, 48V 600Ah Battery bank
5. **Rajaborari Office** : 1kWp Solar, 1kVA inverter, 48V 600Ah Battery bank
6. **Timarni High School**: 3kWp Solar, 3kVA inverter, 48V 900Ah Battery bank
7. **Timarni Office** : 2kWp Solar, 2kVA inverter, 48V 600Ah Battery bank

RAJABORARI



RAJABORARI



TIMARNI (MP)

1. **Timarni High School**: 3kWp Solar, 3kVA inverter, 48V 900Ah Battery bank
2. **Timarni Office** : 2kWp Solar, 2kVA inverter, 48V 600Ah Battery bank



MURAR, BIHAR

- 2kWp SPV system caters to DEI ICT CE Center, School, Satsang Hall



ROORKEE, UTTARAKHAND

- 2kWp SPV system caters to DEI ICT CE Center, School, Satsang Hall



MTV PURAM, TIRUNELVELI, TAMILNADU (2013)

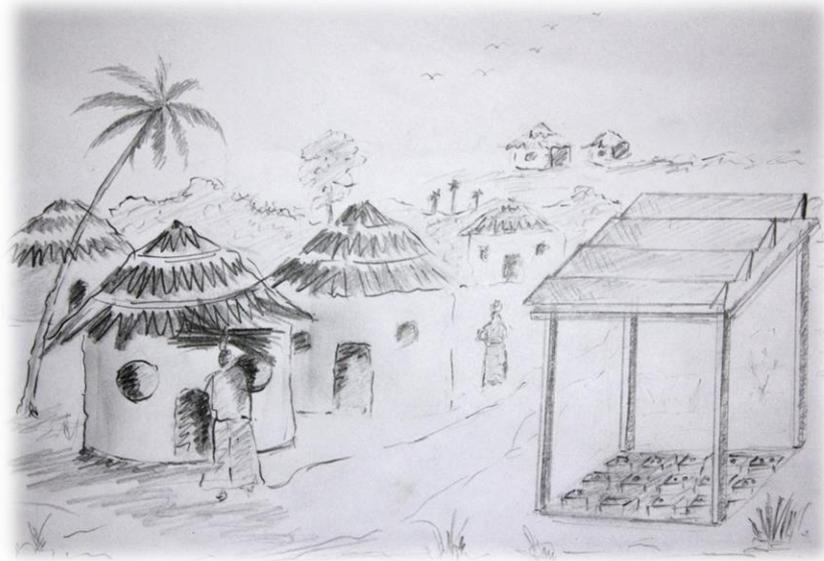
- 3kWp SPV + 2kW Wind Turbine integrated system
- Remote monitoring



NEW SYSTEMS IN PIPELINE

- 250 kWp capacity Solar systems, street lights, high mast lights, solar pumps etc. in the 10 hamlets and schools of Rajaborari, M.P.
- 150 Cubic-feet Bio Gas Plant in Dayalbagh Dairy Campus
- 20 kWp Solar System in Information-Cognitive-Neuro-Computing Technology Assisted Language Lab in DEI.
- 10 kWp Solar System at DEI DEC IC Center, Amritsar
- 5 kWp solar system at DEI IC Center, Murar.





THANK YOU