

GOAL 7 : AFFORDABLE AND CLEAN ENERGY



ANDHRA PRADESH

1. SRI SATHYA SAI CENTRAL TRUST SOLAR POWER PROJECTS, AP AND KARNATAKA - (CLOSELY TIES IN WITH **SDG 11** AND **SDG 13**)

To create a sustainable energy security environment and mitigate the effects of the high cost and intermittent shortages of conventional energy sources, the Trust undertook to diversify its reliance on such sources, and implemented solar power technology at its various institutions, including hospitals, schools and university campuses. As per the cost/benefit analysis, savings achieved by the use of solar power can be utilised to further develop and run other free humanitarian programs that directly benefit the beneficiaries. The entire hospital lighting system was replaced with 3000 LED bulbs, reducing the concomitant carbon footprint and the lighting power load by 60%. In scaling up its solar initiatives, the Trust in 2018 set up a further 1 mWp solar plant at its Sri Sathya Sai Institute of Higher Medical Sciences in Puttaparthi, Karnataka. After further installing other solar power plants at its numerous other sites, the total power generated as of date is 6,100 kWp. Its renewable energy production and its power conservation measures prevented 8,144 tons of carbon emission annually. The use of sustainable power at all the Trust's institutions contribute directly towards fulfilling the requirements under SDGs 11, 12 and 13, little to no waste, reduced carbon footprint, economic improvements, and less overall maintenance thus saving resources.

Apart from aforementioned best practices, Andhra Pradesh's SDG Vision Document "ACHIEVING SUSTAINABLE DEVELOPMENT GOALS 2030", details further major policies and strategies to achieve benchmarks for, SDG 7 - AFFORDABLE AND CLEAN ENERGY, provided as follows-

- Distribution of LPG packages consisting of 5 kg LPG cylinder connection, ISI standard stove, regulator, pass book, and hose pipe, which is worth INR 2480, free of cost to women from BPL (Below Poverty Line) households.
- Power Grid Mission to ensure uninterrupted power and reliable 24X7 power supply for households and industry including 9 hours of power supply to farms.

- APTRANSCO for 24x7 power for all schemes, LED street lights and UJALA program for energy efficiency
- Clean and universal energy supply (Gas Grid) - DEEPAM program will provide access to clean cooking fuel to all households.
- Dedicated Land Bank for Power Projects and infrastructure fund to develop renewable energy infrastructure
- New and Renewable Energy Delivery Corporation of Andhra Pradesh (NREDCAP) for promotion of Renewable Energy. And Solar pump sets for new agriculture connections
- Deen Dayal Upadhyaya Gram Jyoti Yojana, Jagjeevan Jyoti Scheme, and Nation Solar Mission etc.
- Electrification of borewells for SC and ST communities
- The state has taken up 4 ultra-mega solar parks at Kurnool, Anantapur, and Kadapa with a capacity of 4,000 MW. It is promoting solar pump sets for new agricultural connections, out of which 22,955 have already been installed.
- The government has initiated a 160 MW Wind Solar Hybrid project with storage, which is postulated to be the world's largest wind solar hybrid project with energy storage.

KARNATAKA

2. MUKYA MANTRI ANILA BHAGYA YOJANA (MMABY) -

The main objective of the scheme was to make Karnataka a cooking kerosene-free state to avoid environmental pollution and keep the citizens free from related diseases. It provides free LPG connections, a double burner gas stove with an ISI mark and two free cylinders to the beneficiaries.

A district-level selection and monitoring committee is in charge of selecting the beneficiaries. State level empowered committee, under the chairmanship of the Chief Secretary, takes decisions regarding the scheme and reviews its overall implementation. District level committees monitor and supervise implementation of the scheme. The State has trained volunteers to assist and advise first time LPG users on stove installations and LPG usage. Safety clinics are organized at regular intervals for newly selected beneficiaries.

3. SOLAR E-SHALA - IMPROVING PUBLIC INFRASTRUCTURE THROUGH INTERVENTIONS IN GOVERNMENT SCHOOLS BY IMPLEMENTING DECENTRALISED RENEWABLE ENERGY SOLUTIONS -

The 'Transformation of Aspirational Districts' program aims to expedite the improvements in the socio-economic status of 117 districts across India's 28 states with core focus on :

- Convergence of Central & State Schemes,
- Collaboration among citizens and functionaries of Central and State Governments, and
- Competition among districts.

This initiative focuses on the strengths of each district and their attainable outcomes for improvement.

SELCO launched the digital education program 'E-shala', which aims to provide a holistic solution that improves the quality of classroom education and increases learning effectiveness by implementing digital educational content and digital tools powered by solar energy in rural schools. Modern energy efficient technology powered using solar has led to implementation of a sustainable solution that can be replicated at a national level. The system is an affordable energy-efficient model which replaces high cost and energy intensive laptop/computer with a micro computer.

Supplemented by a detailed teachers' training program to equip teachers to teach effectively using the implemented tools. The program has improved the quality of classroom teaching, increased attendance and reduced drop outs. It has enhanced learning effectiveness and visualisation of critical concepts leading to better understanding, acted as a resource material and facilitated lesson planning.

Relevant Case Stories:

- 1) Solar Smart Class Facility in 122 Government High Schools of Yadgir Funded Through The CSR Initiative of Bharat Electronics Limited
- 2) Digital Education Program (e-shala) Funded By MENDA Foundation in Multiple Districts of Karnataka Through Partnership With Policymakers

4. SOLAR SITE SELECTION USING GEOSPATIAL INFORMATION-

To determine the suitability of a location for generating solar energy, ISRO uses solar data derived in conjunction with global horizontal, direct normal and diffuse horizontal irradiance along with capacity utilization factors.

By identifying solar resources and temperature of specified locations, ISRO is able to map the potential of solar energy generation. In addition, ISRO employs the Digital Elevation model to find suitable slopes for energy extraction, a key

parameter for installing solar power plants. The integrated information is available through a GIS interface that can easily be accessed by users.

Apart from aforementioned practices the SRI SATHYA SAI CENTRAL TRUST SOLAR POWER PROJECTS have also been implemented in the Sri Sathya Sai Institute of Higher Medical Sciences, Bangalore to create a sustainable energy security environment and reduce its carbon footprint.

UTTARAKHAND

5. SUSTAINABLE ECO VILLAGE DEVELOPMENT -

The Eco Village Development (EVD) project started an integrated approach for creating low carbon communities of practice in existing villages. It comprises a combination of inexpensive renewable energy technology (RET) and capacity-building activities for climate change adaptation and mitigation in villages. The first step is to create awareness among local communities of climate change and to introduce them to contextually appropriate small scale adaptation and mitigation solutions. By taking a collaborative approach, it involves women and other community members in planning and implementing the development project by giving them tools to be climate resilient. Community members are organized into support groups and trained to use the new technologies and on organic agricultural methods. SHGs are set up for thrifts and credits so that women can have easy access to small credits in times of financial needs. Changing from traditional to improved cookstoves has curbed black carbon and GHG emissions due to reduced fuel-use and helped reduce deforestation in the hillsides. It has reduced indoor air pollution, contributing to better health conditions for local communities. Furthermore, it has left women and young girls in general with more time for educational and income generating entrepreneurship activities. Training community members in organic farming and kitchen gardening has ensured food security and improved soil quality.

TELANGANA

As per Telangana's SDG Implementation Document 2018, the state's strategy to achieve benchmarks for SDG 7 - AFFORDABLE AND CLEAN ENERGY, the state has focused on the following major policies and strategies-

- Make the State power surplus state through increasing the production of thermal, hydro and renewable energy
- Externally aided projects for high voltage distribution system (HVDS) and energy efficiency program
- Solar pump-sets
- Commissioning of new power projects
- Total installed capacity of 23,912 MWs in coming 3 years

- Solar power policy

PUNJAB

As per the Punjab's SDG Vision Document, detailing the state's strategy to achieve benchmarks for SDG 7 - AFFORDABLE AND CLEAN ENERGY, the state has focused on the following major policies and strategies-

- **Implementation of New and Renewable Sources of Energy Policy (NRSE) 2006** - Key objectives of this scheme include maximization and improvement of the share of renewable energy sources to 10 % of the total installed power capacity in Punjab by 2022, promotion of renewable energy initiatives for meeting energy / lighting needs in rural areas and supplementing needs in urban/ industrial/ commercial sectors.
- **UDAY (Ujwal DISCOM Assurance Yojna) Scheme** - It provides for financial turnaround and revival of power distribution companies in order to provide a sustainable solution to power distribution companies. Key objectives include states taking over 75% of DISCOM debt and debt not being included in the fiscal deficit of states. The debt that isn't taken over by the state shall be converted by banks / financial institutions into loans or bonds with interest rate not exceeding the bank base rate plus 0.1%.
- **Use of unproductive land to promote development of Solar Parks by Private Sector Developers** (by purchasing agricultural land or acquiring government land). All possible incentives should be extended to companies setting up solar parks under the state's industrial policy and under investment promotion schemes. Projects that promote 'farm level solar power generation' where land-owning farmers can install solar power projects of 2-3 MW capacity projects can have multiple purposes of generating clean energy, tackling the issues of land scarcity, result in additional income for the farmer as well as foster skill development.
- **Introduction of scientific processing and treatment of municipal, urban and industrial solid waste** - Use of waste in energy projects can be developed to target additional power generation.

HARYANA

As per Haryana's 2030 Vision Document, the following programs promoting opportunities under SDG 7 - AFFORDABLE AND CLEAN ENERGY have met with success-

- **Ujjawal Discoms Assurance Yojana** - led to reduction in DISCOM losses and more reliable and efficient energy infrastructure
- **Deen Dayal Upadhyaya Gram Jyoti Yojana** and **Integrated Power Development Scheme** - integrated the use of IT systems to strengthen,

enable and automate the distribution of infrastructures in rural and urban spaces.

- **Mhara Gaon Jag Mag Gaon scheme** and the **Feeder Sanitization scheme** - have reduced energy losses and driven up rural supply hours

TRIPURA

As per the Draft Vision 2030 document, detailing Tripura's 7 year strategy to double the rate of improvement in energy efficiency, the state has focused on the following-

- Ensuring 24x7 quality, reliable and affordable power supply to all villages for domestic, commercial, agricultural and industrial consumers within a fixed time frame by providing full support to all utilities
- Covering maximum area by conventional energy and only remote areas will be covered by renewable energy sources
- Adopting new and advanced technologies to improve the rate of energy efficiency network
- Investing in renewable energy
- Reduction in aggregate technical and commercial (AT&C) losses
- Power purchase planning, and capacity addition in power infrastructure including transmission and distribution
- Following good governance practices and innovation and undertaking customer centric initiatives.

MADHYA PRADESH

6. STORAGE DEVELOPMENT THROUGH PUBLIC PRIVATE PARTNERSHIP - (CLOSELY TIES IN WITH **SDG 9)**

Madhya Pradesh has been the frontrunner in adoption of Public Private Partnership (PPP) as a means of augmenting investment in infrastructure. It is the first state to adopt PPPs in construction of sites to meet the storage requirement for food grains in the state. The state Government issued detailed guidelines including model concession agreements aimed at creating a conducive environment so as to utilize the efficiencies, innovativeness and exibility of the private sector. The state Government through its implementing agency, MP Warehousing & Logistics Corporation (MPWLC), awarded 9 Silo Projects under PPP. Under the PPP framework, the concessionaire is responsible for design, finance, construction, operation and maintenance of the silos. The Public Authority makes payments to the concessionaire in the form of storage charges, handling charges, etc. These Silo Projects are further eligible for support under the VGF scheme of Government of India, which helps in reducing storage charges and brings them at par with the costs of conventional storage.

WEST BENGAL

7. TURGA PUMPED STORAGE CONSTRUCTION PROJECT -

Implemented by the West Bengal State Electricity Distribution Company Limited, this project aims to strengthen peak power supply capacity and stabilize the power system for supplying modern and sustainable energy services. A variable speed pumped storage power plant operates at lower output than the conventional pumped storage systems and has a wider output power adjustment range between its minimum to maximum output.

CHHATTISGARH

8. SOLAR PV ELECTRIFICATION -

The Chhattisgarh State Renewable Energy Development Agency (CREDA) and the state Health Department collaborated to install, operate and maintain solar PV systems in 900 health centres across the state, improving health outcomes as a part of a much larger solar PV electrification program across the state.

ODISHA

As per Odisha's SDG Indicator Framework Document, some state-sponsored schemes implemented to achieve benchmarks for SDG 7 - AFFORDABLE AND CLEAN ENERGY include -

- Biju Gram Jyoti Yojana (BGJY)
- Biju Saharanchala Vidyutikaran Yojana (BSVY)
- Odisha Distribution System Strengthening program
- Grid Interactive Rooftop Solar, Solar parks and powerplants, GEDCOL
- Check Dams, Lift Irrigation Schemes and Minor Irrigation Projects.

UTTAR PRADESH

9. SOLAR CHARKHA AND SOLAR LOOM -

Manual Charkha and looms are being operated by using solar power in Varanasi. Awareness is generated regarding the use of solar power as an alternative energy source, followed by training related to the spinning and weaving and marketing arrangements. As a result, unemployed persons (especially women artisans) of the area get regular jobs through spinning and weaving. Women artisans used to come to the centre after finishing their household works and earning additional income working about 5 to 6 hours. This has helped in upgrading their social and economic status. Production has also increased and human efforts have been minimised.

JHARKHAND

As per the Jharkhand Vision & Action Plan 2021, Jharkhand's best practices, policies and strategies to achieve benchmarks for SDG 7 - AFFORDABLE AND CLEAN ENERGY, are mentioned as follows-

- Off-grid and rooftop solar systems for access to remote areas
- Demand side energy efficiency through ECBC/GFBC norms
- 'LITER OF LIGHT' PORTABLE LIGHTS, Ranchi - women of SHGs are trained to produce portable room lights, designed and developed by the students of Indian Institute of Technology (IIT), Mumbai. Recycled plastic bottles filled with water and bleach, and fitted into the roof to provide lighting during the day, while at night, the same is upgraded with an LED bulb, micro-solar panels and a battery to provide a low-cost night lighting system.
- Reduced Aggregate Technical & Commercial (AT&C) losses and full cost recovery for distribution utilities through measures such as feeder metering, feeder segregation and consumer metering under UDAY scheme, distribution network strengthening (IPDS scheme) and continuous monitoring for meeting targets.

BIHAR

10. **BHELDI RENEWABLE ENERGY ELECTRIFICATION** - (CLOSELY TIES IN WITH **SDGs 12 AND 13**)

To deliver clean energy for business purposes, TARA-DA supported the combined installation of solar photovoltaic system (PV) with a biogas mini grid. These interventions were supported by TARA Urja at Katsa, a local green entrepreneur for a solar pico grid. This model provided a solar-biogas installation to meet the energy needs of the local community businesses in Bheldi. This strategy puts into use at least three energy products generated by waste: biogas, solids and heat. Besides producing energy, it also acts as a part of the waste stream in the treatment of cow waste. Methane, a major component of the biogas, is converted to electricity to provide a sustainable source of power to the grid. Capturing methane contributes to climate change mitigation while the sludge or digestate can be applied as fertilizer or soil amendment.

The process addresses waste management issues where the cow manure can be found in the water streams and can thus reduce environmental and health risks by means of pollution reduction and methane emission management. It creates economic value by turning cow manure into more useful products, such as for cooking or fertilizer. Making use of the hybrid renewable products can help the local community gain economic and climate benefits, hence achieving the goal of win-win strategy.