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SPRERI
Striving for Excellence

SPRERI NEWSLETTER

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Patron

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About Us

Sardar Patel Renewable Energy Research Institute (SPRERI) is an autonomous organization located in Anand, Gujarat. Since its inception in the year 1979, SPRERI is dedicated for renewable energy research, development, and commercialization and is well recognized both nationally and internationally for its innovative interventions in renewable energy technologies through fundamental research, pilot scale demonstration and technology commercialization.

Thrust Areas

The thrust areas include Renewable Energy, New and Alternative Energy technologies, Energy security and Environment. The four divisions of SPRERI viz the Solar energy division, Bio-chemical conversions division, Thermochemical conversions division and Technology transfer division are actively engaged in the research, development, demonstration and commercialization of cutting edge technologies in numerous areas of renewable energy, environment and climate change. These include hydrogen technologies, carbon mitigation, solar thermal, solar photovoltaic, water remediation, biofuels, biomass to electricity and useful commodities as byproducts of energy conversion and bioconversion of waste to value.

Divisions

Solar Energy

Bio-Chemical Conversions

Thermo-Chemical Conversions

Technology Transfer & Extension

Besides, SPRERI is also engaged in development of policies and programs for the government, training and capacity building, extension support and consultancies, business development and testing, evaluation and certification of renewable energy technologies.

Legendary founders, Late Dr. H. M. Patel and Late Mr. Nanunhai Amin

The institute is recognized as scientific and industrial research organization by Department of Scientific and Industrial Research (DSIR), Bureau of Indian Standards (BIS), National Accreditation Board for Testing and Calibration Laboratories (NABL) and empaneled with Tata Institute of Social Sciences (TISS).

Vision

SPRERI will be an organization that will develop environment friendly Renewable Energy Technologies that are efficient and economically viable for society.

Mission

To achieve excellence in research, development, and commercial deployment of renewable energy technologies including education and training for the promotion of environmentally sustainable technologies with public-private cooperation for India and developing global economies.

Board of Management

Dr. Amrita Patel Trustee, Charutar Arogya Mandal, Karamsad and Ex-Chairman, NDDB, Anand	**Chairman**
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Dr. Anil Kumar Dubey Director, SPRERI, Vallabh Vidyanagar, Anand, Gujarat	**Member Secretory**

Research and Development

Anti-bacterial films from agro-residues

Rice straw (RS) biomass was used to develop microcrystalline cellulose (MCC) for anti-bacterial film applications. The cellulosic fraction of rice straw residues was extracted using acid/alkali and heat steam explosion based pretreatments. The recovered cellulose was treated with series of size reduction methods like bleaching, sonication and acid hydrolysis to reduce the amorphous properties resulting in MCC production. The MCC was then characterized for particle size analysis (PSA) and found to be in the range of 80-250 µm. FTIR analysis was performed to detect the crystalline functional groups during depolymerization reactions. MCC was impregnated with silver nanoparticle (AGNPs) solution from 1-5 mM and composite films were prepared with 5% polyvinyl alcohol (PVA). MCC bio-composite film was investigated for anti-microbial activity against six different microbial strains. The results was found promising with a zone of inhibition in the range of 3-20 mm.

(a) MCC based composite films using PVA (b) AgNPs impregnated MCC powder (c) Antimicrobial activity of AgNP based MCC composite film

Quality Awareness Program for Biomass Briquettes & Pellets Manufacturers

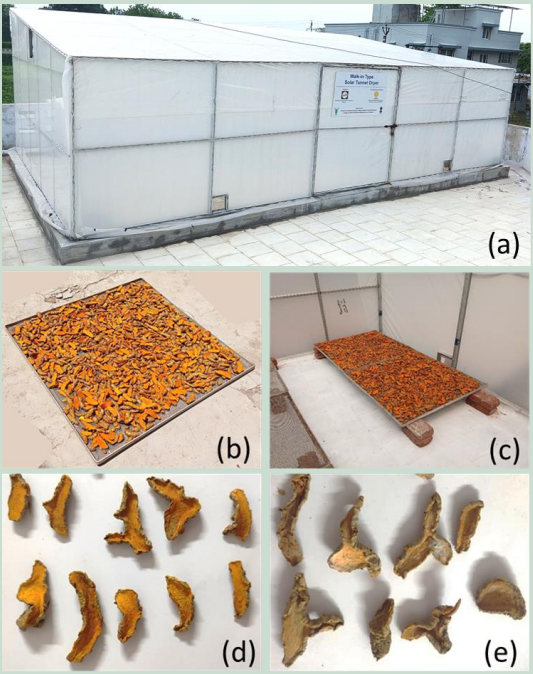
SPRERI organized a one-day “Quality Awareness Program for Biomass Briquettes & Pellets Manufacturers”, with support from the Indian Council of Agricultural Research (ICAR), Government of India, and the Department of Energy and Petroleum, Government of Gujarat.

The aim of the event was to educate the manufacturers on quality improvement and economic parameters in the production of biomass pellets and briquettes. Discussions during the event covered various topics that included biomass availability, types of biomass, upcoming regulatory norms, fuel properties, and cost-effective methods for scaling up the production. Specific issues relating to the sector’s value chain and ways to address them were also discussed. The program attracted more than 50 participants from manufacturers and suppliers.

Mr. Kishore Patel, the Vice President of Briquettes and Pellets Association of South Gujarat Region and Mr. Pankaj Parmar, South Gujarat representative and Convener for the Navsari Region expressed gratitude to the SPRERI team for organizing such informative program that could offer long-term benefits to manufacturers and end-users.

Demonstration of Walk-in-type Solar Dryer at Farmer's site

A walk-in-type solar tunnel dryer was installed on the terrace of a warehouse at M/s CZ Patel Sons, Boriavi village, Gujarat with 60% cost contribution from the user. The project was supported by AICRP on EAAI, ICAR and Government of Gujarat. The installed dryer is primarily used for drying of organic farm produce such as turmeric, ginger, potato chips, fenugreek leaves, garlic etc. The dryer is 7.0 m × 4.3 m × 2.0 m and is equipped with relative humidity-based controller for automatic fan operation to maintain the relative humidity inside the dryer during day time. For no-load condition the dryer was observed to achieve up to 50 ºC at an average GHI of 231 W/m^2 under no load conditions. The system was tested for drying of 270 kg single split turmeric grown by the farmer. Turmeric dried with solar dryer offered superior quality compared to the ones dried in open sun.



(a) Walk-in-type solar dryer installed at Boriavi farmer's site
(b) Freshly sliced turmeric spread on dryer tray
(c) Freshly sliced turmeric loaded on tray inside the dryer
(d) Turmeric slices dried under solar dryer
(e) Turmeric slices dried under open sun

Training Programmes on Renewable Energy and Energy Conservation

SPRERI organized training programs on ‘Renewable Energy and Energy Conservation’, supported by GEDA (Gujarat Energy Development Agency). The aim of this program was to raise awareness on the importance and benefits of renewable energy and energy conservation amongst youths, students, and farmers.

The awareness and training programme conducted were 35 in number. Each program comprised of three-sessions on different renewable energy technologies and one-session on energy conservation. The lectures were delivered by the certified energy auditors from local universities and scientists of SPRERI. Participants of the training programme were also exposed to live demonstration of SPRERI technologies. At the end of the training programme, Q&A session and feedback collection was done.

The total participants were 1700, which included 39% ITI students, 35% engineering students, 10% polytechnic college students, 9% farmers, and 7% women from self-help groups (SHGs). The feedback received from the participants were encouraging and multiple requests to conduct long term programs in future were also received.

Students attending the expert session

Demonstration of SPRERI technologies at SPRERI campus

New Initiative

Green Hydrogen Production Research Lab

SPRERI have established a dedicated Green Hydrogen Production Research Laboratory. This laboratory is intended to carry out advanced research in the entire hydrogen value chain i.e. from production to storage to transportation and end-use. Particular focus is given on the indigenization of various hydrogen technologies and their components. The aim of this lab is to contribute towards green energy transition through innovative technologies, föster interdisciplinary collaborations and provide training opportunities to young professionals.

Presently, the laboratory is equipped with three key technologies *viz.*

1. Biomass gasification integrated with water gas shift reaction for hydrogen generation
2. Bio-hydrogen through dark fermentation
3. Hydrogen generation from water electrolysis

Dark fermentation set-up for bio-hydrogen production

Let's work together to achieve net zero mission of country future!

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