



ANNUAL REPORT 2024-25



Sardar Swaran Singh National Institute of Bio-Energy, Kapurthala
(An Autonomous Institution of Ministry of New and Renewable Energy)

Annual Report 2024-25



SARDAR SWARAN SINGH NATIONAL INSTITUTE OF BIO-ENERGY

**An Autonomous Institution of
Ministry of New and Renewable Energy
Kapurthala – 144603, India**

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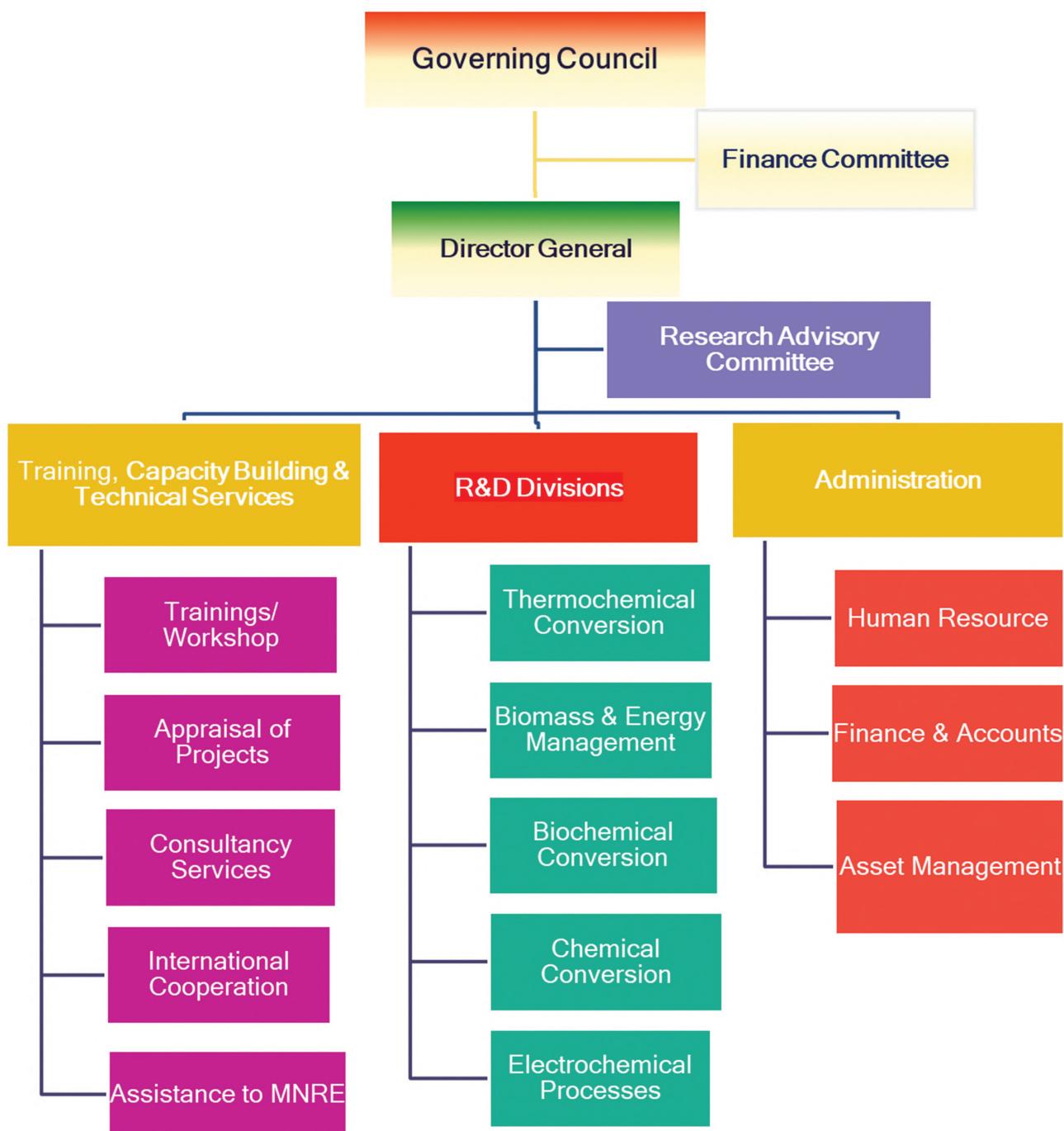
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PREAMBLE

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FUNCTIONAL STRUCTURE



Message from Secretary



संतोष सारंगी, भा.प्र.से.
सचिव

Santosh Sarangi, IAS
Secretary



International Year
of Cooperatives
Cooperatives Build
a Better World

भारत सरकार
नवीन और नवीकरणीय ऊर्जा मंत्रालय
Government of India
Ministry of New and Renewable Energy



As Chairman of the Governing Council of Sardar Swaran Singh National Institute of Bio-Energy (SSS NIBE), Kapurthala, Punjab it gives me immense pleasure to present this Annual Report of SSS NIBE, which highlights our collective efforts, achievements, and progress over the past year. The journey of advancing bioenergy is not only about scientific breakthroughs and technological innovations but also about addressing the pressing challenges of energy security, sustainability, and climate change.

This year has been particularly significant as we witnessed encouraging strides in research, demonstration, and deployment of bioenergy solutions. From laboratory-scale innovations reaching pilot plants to collaborative partnerships with industry and institutions, our work continues to bridge the gap between ideas and impact.

The successes documented in this Annual Report are a reflection of the dedication and commitment of our scientists, researchers and collaborators. They also reaffirm our belief that bioenergy, with its wide-ranging societal and environmental benefits, will play an increasingly important role in shaping a sustainable future.

I am optimistic that SSS NIBE, with its well-established infrastructure and state-of-the-art R&D facility, NABL certified testing facility and accompanied by well-qualified scientific staff and research fellows, is expected to play a significant role in the years to come and contribute towards the development of indigenous technological products for the benefit of the country.

I am delighted to release the annual report for 2024-25, highlighting the diverse activities carried out at the institute

Shri. Santosh Kumar Sarangi, IAS
Secretary, MNRE

Message from Director General



डॉ. जी. श्रीधर
महानिदेशक
Dr. G. Sridhar
Director General

सरदार स्वर्ण सिंह राष्ट्रीय जैव-ऊर्जा संस्थान
(नवीन और नवीकरणीय ऊर्जा मंत्रालय, भारत सरकार)
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In our pursuit of cleaner and renewable energy sources, biomass has emerged as a vital component of the energy transition. Derived largely from agricultural residues and other organic materials, biomass offers the potential to be a sustainable and carbon-neutral energy source. Its versatility allows it to generate electricity, heat, and transportation fuels—making it a flexible solution to diverse energy needs. However, realizing this potential requires addressing challenges such as ensuring a sustainable biomass supply, avoiding competition with food production, and managing the environmental impacts of harvesting. Through innovation, collaboration, and policy support, bioenergy can play a pivotal role in shaping a sustainable energy future



With strong policy thrust from the Government, the Sardar Swaran Singh National Institute of Bio-Energy (SSS-NIBE), Kapurthala is poised to play a leadership role in advancing India's bioenergy sector. Guided by a well-structured technology roadmap, the Institute's R&D activities continue to hold both societal and industrial relevance.

I am pleased to share that two in-house-developed technologies—Thermophilic Biogas Digester and 2G Ethanol—are progressing successfully from proof-of-concept (TRL 3) to system prototype demonstration (TRL 5 or higher) in collaboration with industry partners. Both demonstrations are expected to conclude by December 2025, paving the way for commercialization and revenue generation for the Institute.

On the applied research front, a Solid Oxide Fuel Cell (SOFC) test facility has been established in collaboration with NAL, Bengaluru, under an MoU signed in 2023. This facility will enable advanced research on gaseous biofuels, further strengthening the electrochemical division. Parallel efforts across other R&D divisions include the upgrade of the biomass atlas, upgrade of biogas, CO₂ sequestration through algal biorefineries, and innovations in bioproducts such as moisture-repellent fibers, bioplastics, and biochar. Collectively, these achievements have been disseminated through more than 45 journal papers, conference presentations, and book chapters.

On the academic front, the fourth batch of MTech (Renewable Energy) students graduated successfully with placements in industry and academia. However, enrolment for the fifth batch (2025) has seen a decline. Under the National Bioenergy Fellowship Program of MNRE, newly recruited JRFs/SRFs at the Institute are pursuing doctoral research in reputed institutions, including IIT Roorkee and NIT Jalandhar. During FY 2024–25, nine students enrolled for Ph.D. at IIT Roorkee through this initiative.

In capacity building and outreach, the Institute conducted targeted training programs and seminars aligned with industry needs. Highlights include a national seminar on biomass supply chain management for policymakers and entrepreneurs, and a hands-on workshop on agro-biomass sampling and characterization for NTPC officials under the SAMARTH Mission.

It is also heartening to share that SSS-NIBE has received NABL accreditation for Biogas/Bio-CNG and biomass testing (proximate and ultimate analysis). This recognition is expected to significantly enhance demand for quality-certified testing services and support upcoming biomass projects across the country.

The Institute has actively strengthened industry collaborations through MoUs with SMEs, large companies, and strategic partners such as Punjab Agricultural University, Ludhiana, and the Punjab State Council for Science & Technology, Chandigarh. These partnerships will enable technology field testing while addressing regional societal needs.

Further, SSS-NIBE continues to support MNRE by contributing to technical programs and serving as the Central Nodal Agency for the national biogas implementation program, as well as the nodal inspection agency under the National Bioenergy Program.

Looking ahead, the Institute is committed to consolidating its research strengths, advancing technologies with societal and industrial relevance, and fostering innovation, collaboration, and excellence. With these efforts, SSS-NIBE seeks to significantly enhance the role of bioenergy in India's journey toward achieving the net-zero target by 2070.

I extend my sincere gratitude to all who have contributed to our mission, and I am delighted to present the Annual Report 2024–25.



Dr. G. Sridhar
Director General

THE CHARTER

The Sardar Swaran Singh National Institute of Bio-Energy (SSS-NIBE), Kapurthala was established in 1998 as an autonomous R&D institute under MNRE, Government of India. SSS-NIBE is managed by a Governing Council headed by Secretary, MNRE and the Director General is the head of the institute. The Institute is situated in a campus of 75 acres with a unique solar passive structure office building at the 12th km Milestone, Jalandhar-Kapurthala national highway.

SSS-NIBE was established to serve as a focal point of excellence for carrying out R&D, testing, evaluation, and training in bio-energy. The Institute has five research divisions, which are Biomass and Energy Management, Thermochemical, Biochemical, Chemical, and Electrochemical conversion, and all the divisions are working on approaches to enhance the usage of biomass, creating the right awareness and technology demonstrations. The institute is well equipped with the research infrastructure and an eco-friendly research environment. The broad spectrum of these divisions includes biomass resource assessment & management, biomass characterization, gasification, combustion, pyrolysis, solid waste/solid-state bio-methanation, biohydrogen production, compressed biogas, municipal solid waste (MSW) to power generation, hybrid biomass systems, testing & standardization, and training for skill development in the bio-energy sector.

Vision

To become the leading global institution for bioenergy through cutting-edge applied research and technology commercialization. We aim to solve industry challenges, support Government of India initiatives, and inspire a sustainable future for all by collaborating with stakeholders globally.

Mission

- To imbibe “lab-to-land” culture and conduct high-impact applied research and innovation in bioenergy, collaborating with industries, academia, and communities.
- To empower individuals and organizations through capacity building and skill development to lead the clean energy transition.
- To support and implement Government of India’s initiatives on clean and Net Zero transition by 2070 by utilizing bioenergy solutions.
- To foster effective collaboration with stakeholders to address and solve bioenergy industry and national challenges.
- To promote standardization, knowledge transfer, technology development, and commercialization to advance a sustainable circular bioeconomy.

Objectives

To carry out and facilitate research, design, development, testing, standardization and technology demonstration eventually leading to commercialization of R&D output with a focus on:

- Bioenergy, biofuels and synthetic fuels in solid, liquid and gaseous forms for transportation, portable and stationary applications
- Development of new technologies for effective utilization of different type of wastes and production of value-added products
- To undertake and facilitate human resource development and training including doctoral and postdoctoral research in the area of bio-energy
- To create facilities for operationalization of the Institute

SSS NIBE's Committees

Governing Council

PRESIDENT OF THE SOCIETY & CHAIRMAN

Secretary

Ministry of New and Renewable Energy, New Delhi

MEMBERS

Joint Secretary / Finance Advisor

Ministry of New and Renewable Energy, New Delhi

Joint Secretary / Advisor

Ministry of New and Renewable Energy, New Delhi

Secretary

Department of Biotechnology, New Delhi

Secretary

Department of Science & Technology

Principal Secretary

Department of Science, Technology & Environment, Govt. of Punjab

Chief Executive Officer

Punjab Energy Development Agency, Chandigarh

Scientist-in-Charge

Centre of Excellence for Farm Machinery, CSIR-CMERI, Ludhiana

Chief Executive Officer

Punjab Energy Development Agency, Chandigarh

Vice Chancellor

Punjab Agriculture University, Ludhiana

Director General

Central Power Research Institute, Bangalore

Director

Dr. K. K. Pant, Indian Institute of Technology, Roorkee

Chairman

Indian Biogas Association, Gurugram

MEMBER SECRETARY

Director General

Sardar Swaran Singh National Institute of Bio-Energy, Kapurthala

SSS NIBE's Committees

Finance Committee

CHAIRMAN

Joint Secretary & Finance Advisor

Ministry of New and Renewable Energy, New Delhi

MEMBERS

Joint Secretary / Head, SSS-NIBE Division

Ministry of New and Renewable Energy, New Delhi

Director General

Sardar Swaran Singh National Institute of Bio-Energy, Kapurthala

Director/Scientist, SSS-NIBE Division

Ministry of New and Renewable Energy, New Delhi

Deputy Secretary/Under Secretary (Finance)

Ministry of New and Renewable Energy, New Delhi

Deputy Controller of Accounts, PAO

Ministry of New and Renewable Energy, New Delhi

Nominee of CMD

IREDA

MEMBER SECRETARY

Scientist (In-charge Finance and Accounts)

Sardar Swaran Singh National Institute of Bio-Energy, Kapurthala

SSS NIBE's Committees

Research Advisory Committee

CHAIRMAN

Director

Professor K. K. Pant, IIT Roorkee

MEMBERS

Director General

Sardar Swaran Singh National Institute of Bio-Energy, Kapurthala

Advisor, Bioenergy

Ministry of New and Renewable Energy, New Delhi

Chairman

Indian Biogas Association (IBA)

Director General

Indian Federation of Green Energy (IFGE)

Mission Director

SAMARTH

Dr. Thallada Bhaskar, Director

CSIR-AMPRI, Bhopal

Prof. K. A. Subramanian

DESE, IIT Delhi

Prof. Ajay K Dalai

University of Saskatchewan, Canada

Prof. Aravind Purushothaman Velayani

Groningen University, The Netherlands

Representative from DBT

Representative from DST

Representative from Science & Technology Dept.

Govt. of Punjab

Three representatives from the Industries / Registered Society / NGOs nominated by the DG, SSS-NIBE in consultation with the Chairman, RAC

MEMBER SECRETARY

Scientist

Sardar Swaran Singh National Institute of Bio-Energy, Kapurthala

SSS NIBE's Committees

Building & Works Committee

CHAIRMAN

Director General

Sardar Swaran Singh National Institute of Bio-Energy

MEMBERS

Director, (Biomass Program Division)

Ministry of New and Renewable Energy, New Delhi

Executive Engineer (Civil) or Nominee

RCF, Kapurthala

Executive Engineer (Electrical/Civil)

PWD, Kapurthala

Representative member from Director

NIT Jalandhar

Representative member from Registrar

IKGPTU, Kapurthala

Division Heads of Civil and Electrical

Sardar Swaran Singh National Institute of Bio-Energy

Representative nominated by IITR Director

Department of Architecture and Planning, IITR

MEMBER SECRETARY

Assistant Engineer (Civil)

Sardar Swaran Singh National Institute of Bio-Energy

TECHNOLOGICAL HIGHLIGHTS

- **Laboratory Facilities**
- **Division Wise Progress**
- **Funded Projects**
- **Research and Development**
- **Academic Program**



LABORATORY FACILITIES

A. Facilities in the Chemical Conversion Division & Electrochemical Conversion Division (R&D-I)

The equipment facilities available in the Chemical Conversion & Electrochemical Conversion Division are:

Gas Chromatograph	Electrochemical Work Station
Automatic Density Meter	Infrared Lamp
True Boiling Point Distillation Apparatus	pH & Conductivity Meter
Rams bottom Carbon Residue	Flashpoint apparatus (automatic open cup)
Oxidation Stability Apparatus	Rotary Vacuum Evaporator
Radleys Reactor	Computerized Diesel Engine Test Rig
FTIR Spectrometer	Exhaust gas analyzer
High-Pressure High-Temperature Reactor	Fuel analyzer for diesel index/Cetane No.

*Detailed specification on SSS NIBE'S website



Researchers working in R&D-I Division

B. Facilities in the Biochemical Conversion Division (R&D- II)

The Biochemical Conversion Division has been established in R&D-II with the facilities of Analytical, Bioprocess, Microbiology, and Molecular Biology Laboratories. The equipment facilities available in the Biochemical Conversion division include:

High Pressure Liquid Chromatography	Microscope with a camera
Gas Chromatography	Incubator
UV-vis spectrophotometer	CO ₂ Incubator-cum-shaker
Fibertech	BOD Incubator
Bioreactor (3.0 & 7.5 L)	Hot Air Oven
Refrigerated Centrifuge	Horizontal Laminar Flow
Water Purification System	Automatic Colony Counter
Lyophilizer	Deep Freezer
Micro-disintegrator	Refrigerators
Water Bath	Gradient PCR
Autoclaves	Real-Time PCR
Environmental Shaker	Horizontal Gel Electrophoresis
Bio photometer	Gel Documentation
SDS-PAGE	Electroporation Unit

*Detailed specification on SSS NIBE'S website



Researchers working in R&D-II Division

C. Facilities in the Thermochemical Conversion Division (R&D-III)

The Thermochemical Conversion Division has been established in R&D-III with the facilities for biomass characterization, biomass gasification, and Cookstove testing, etc. The available equipment facilities:

CHNS analyzer	TG-DTA
Online Gas Analyzer	Bomb Calorimeter
Stack Monitoring System (for SPM measurement)	Muffle Furnace
Testing Hood for biomass Cookstove	Multi Gas Analyser
Solar Concentrator Training System (Parabolic Trough Collector Based)	Solar PV Emulator
Solar PV Grid-Tied Training System (Alone System)	Solar PV Training & Research System (Stand Alone System)
Solar Thermal Training System (Flat Plate Collector Based System)	Wind Turbine Emulator
Differential Scanning Calorimeter	Wind Energy Training System
High Pressure Reactor	Fume Hood

*Detailed specification on SSS NIBE'S website



Researchers working in R&D-III Division

DIVISION WISE R&D PROGRESS

Biomass and Energy Management Division

The Biomass and Energy Management Division has launched various initiatives in the areas of biomass resource mapping, biomass supply chain management, and biomass valorisation over the last year. A consistent biomass supply is essential to the success of any commercial bioenergy operation. Recognizing the significance of biomass resource management, the division has concentrated on analysing surplus biomass from agricultural operations using an evaluation study conducted by the Administrative Staff College of India (ASCI) for the Ministry of New and Renewable Energy (MNRE), Government of India and updating it further. The Division has developed an open-access digitized National Biomass Atlas and a Livestock Waste based Energy Atlas hosted on SSS NIBE's website to help stakeholders understand the country's biomass availability scenario. The division is also in the process of updating the atlases.

1. Upgrading the National Biomass Atlas of India

Based on the study by ASCI for MNRE, Biomass and Energy Management Division had developed a National Biomass Atlas for easier understanding of the biomass availability scenario in the country. Some of the salient features of atlas were the graphical representations of the total and surplus biomass availability at the state-level in the country. The atlas also shows the availability of different residues per crop for the different important crops with surplus biomass in each state. The atlas provides useful information to all the concerned stakeholders in the biomass and bioenergy sector including academics, government officials, industry representatives, entrepreneurs, policymakers, and the general public at large.

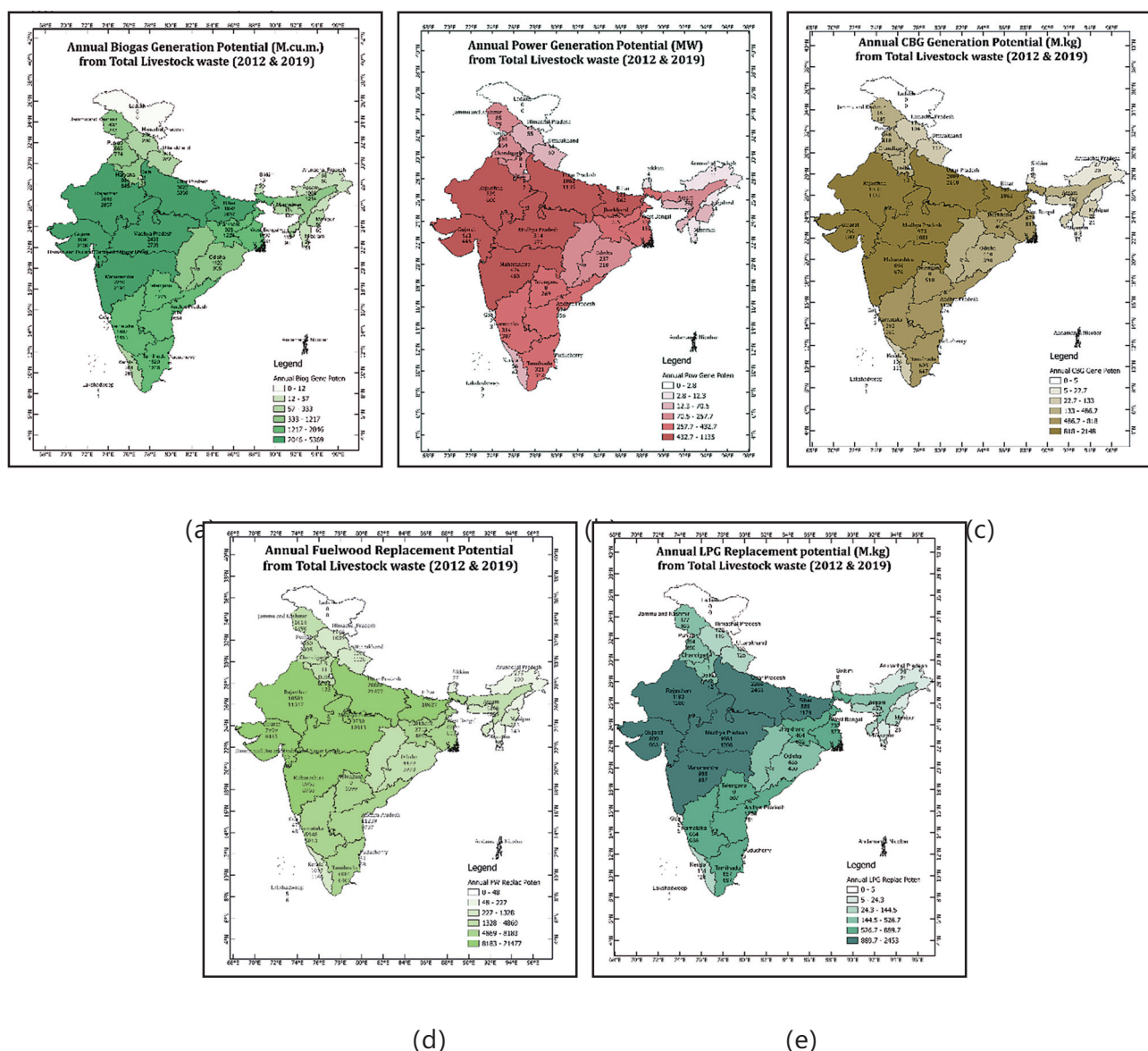
The division is working on upgrading the existing National Biomass Atlas and extending it to a district level. Initially, a study is being conducted to update the atlas with recent data at a District-level for the state of Punjab. The data has been collected for all the districts to gather information on crop statistics, including crop production, crop area, and crop yield. This data is being used to analyze the gross biomass and surplus biomass availability for each crop produced in the specific district until the year 2023-24. By analyzing the collected data, the study aims to determine the crop-wise gross and surplus bio-energy potential, as well as the biomass power potential.

These updates will provide valuable insights into the biomass resources present at the district level, enabling better planning and allocation of these resources for various applications. By incorporating district-level updates into the atlas, stakeholders will have access to localized information that can be used to make informed decisions regarding biomass utilization.

2. Development of Livestock-waste energy atlas of India

Livestock rearing has been one of the primary sources of income in the rural India, gradually finding its place in the semi-urban Indian locations as well. Consequently, the quantum of livestock waste generated in the country is also huge, which when underutilized leads to significant emissions in the atmosphere. To plan for the better and scientific utilisation of this critical waste stream which is spread across the country it is important to map the potential availability. In this study, the statewise

census of livestock: cattle, buffalo, piggery, poultry, sheep, and goat, has been captured from the Livestock census, 2012 and 2019. Thereafter, the state wise biogas generation from each of the above livestock category waste, has been calculated, followed by the estimation of power generation for electricity, CBG generation for transportation, and LPG and fuelwood replacement potential for cooking. It is observed that the annual biogas generation potential from total livestock for 2012 is 31,603 Mm³, and that for 2019 is 33,689 Mm³, contributed maximum by cattle waste. State wise contribution is observed to be the maximum from Uttar Pradesh, followed by Rajasthan, and Madhya Pradesh. The power generation potential, CBG generation potential, and LPG/fuelwood replacement potential from the total livestock for 2019 has been estimated as 7122 MW, 13.5 million ton, 15/13.5



Annual bio-energy generation potential from total livestock for the years 2012 and 2019:
(a) Biogas generation potential; (b) Power generation potential; (c) CBG generation potential; (d) Fuelwood replacement potential; (e) LPG replacement potential

3. Smart Hybrid Biogas Plant

SSS NIBE is working on the development of a Smart Hybrid Biogas Plant (SHBP). Maintaining constant temperatures in digesters is a critical yet underexplored aspect of anaerobic digestion which demands

significant thermal energy input. SHBP incorporates an in-house automation system powered by priority-based algorithms developed at SSS NIBE that can ensure precise temperature control and efficient energy management in biogas plants. It integrates renewable energy sources like solar, biomass, and waste heat, making the process sustainable and economical. The system employs advanced heating strategies, such as dual heating coils and PCM, among others, to minimize lag time and ensure an efficient thermal energy supply. The research is being conducted in two phases. Phase I (lab-scale model) has been successfully completed. The work on Phase II (pilot scale) is ongoing and the study is expected to result in enhanced biogas production efficiency with improved energy management, cost savings, and environmental sustainability.



(a)

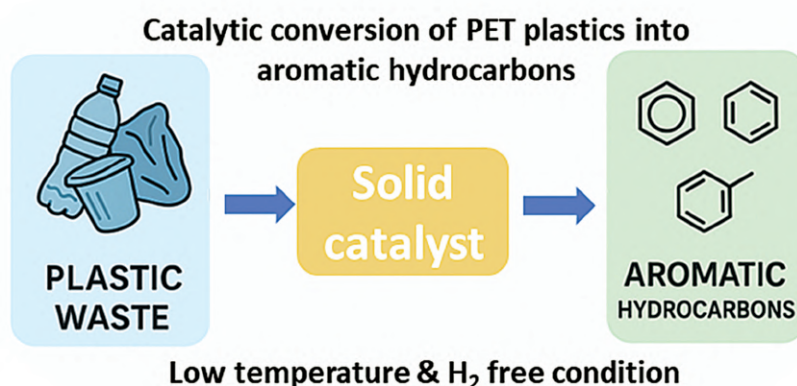


(b)

(a) Lab-scale model of smart hybrid anaerobic digester (Phase I); (b) Smart hybrid pilot-scale biogas plant (Phase II)

4. Catalytic Conversion of Plastic Waste into Aromatic Hydrocarbons

Plastic waste management is a major challenge in India as it annually generates around 9.3 million tonnes of plastic. There is a growing global interest in finding sustainable ways to reduce and also transform this waste into useful products such as fuels and chemicals. Recognizing the importance, SSS NIBE has recently started working on these aspects as the catalytic conversion of plastic waste into aromatic hydrocarbons is an innovative and sustainable approach to valorize post-consumer plastics into high-value chemicals such as benzene, toluene, and xylene (BTX). This method addresses two major challenges simultaneously: plastic pollution and the demand for petrochemical feedstocks. Polyethylene terephthalate (PET) is a widely used thermoplastic polymer commonly found in beverage bottles, food containers, and synthetic fibres. As a polyester, PET contains ester linkages and aromatic rings within its backbone, making it structurally different from polyolefins such as polyethylene (PE) and polypropylene (PP). Catalytic pyrolysis of PET in the presence of acid catalysts like HZSM-5 has shown potential to produce monoaromatics such as benzene, toluene, and xylene. Combining PET with hydrogen-rich plastics like PE or PP in co-pyrolysis can enhance hydrogen transfer reactions, improve aromatics yield, and suppress coke formation. While the catalytic valorization of PET is more complex due to its oxygen content, it remains a valuable route to recover aromatics and enable closed-loop recycling within the framework of a circular plastic economy.



The salient features of the developed catalyst:

1. A cost-effective catalytic system composed of copper and simple metal oxides was synthesized and applied to the upcycling of polyethylene terephthalate (PET) into fuel products. The catalyst demonstrated high activity and selectivity under relatively mild reaction conditions, operating effectively at 200/ °C without the need for an external hydrogen source. This lowers the operational costs and enhances process sustainability.
2. Catalytic evaluation revealed a predominant depolymerization pathway over hydrodeoxygenation (HDO), indicating the system's preference for cleaving ester linkages within the PET backbone while avoiding extensive hydrogenolysis.
3. Methanol was employed as the reaction medium and is hypothesized to act as an in-situ proton donor, facilitating hydrogen transfer processes. This dual functionality of methanol possibly provides both solvation for PET and reactive hydrogen species for mild chemical transformations.
4. The use of low-cost materials in the catalyst design combined with mild reaction conditions and solvent-driven hydrogen chemistry positions this system as a promising strategy for converting post-consumer plastics into valuable energy-dense products.

5. Improvement of catalytic activity towards HDO

To enhance hydrodeoxygenation (HDO) activity while keeping the catalyst cost-effective and efficient at low temperatures, incorporating a second metal like nickel, cobalt, or molybdenum can significantly improve hydrogen activation and C–O bond cleavage. Optimizing the oxide support with acidity or oxygen vacancies that promote HDO reactions. Nano structuring the catalyst to improve dispersion and tailoring metal-support interactions can further enhance performance. Additionally, adjusting reaction parameters like solvent ratio, pressure, and residence time can help drive deeper deoxygenation, yielding better fuel-range hydrocarbons.

The salient features on the catalyst development will be:

1. **High Selectivity and Efficiency:** Catalysts are being engineered to target specific chemical bonds in plastics—like C–C, C–O, and C–H—enabling precise breakdown into valuable monomers or fuels with minimal by-products.

2. **Low-Cost and Abundant Materials:** There's a strong push toward using earth-abundant metals (e.g., copper, iron) and natural supports (like clays or zeolites) to reduce costs and improve scalability.
3. **Mild Operating Conditions:** Innovations in photocatalysis and electrocatalysis allow plastic conversion under ambient or low-temperature conditions, reducing energy consumption and environmental impact.
4. **Reusability and Stability:** Modern catalysts are being designed for long-term use without significant loss in activity, which is crucial for industrial applications.
5. **Versatility Across Plastic Types:** Advanced catalysts are being tailored to handle a wide range of polymers, from PET and PE to mixed plastic waste streams.

Biochemical Conversion Division

During FY 2024-25, several externally funded and in-house R&D projects were taken up by the research team in the division. Major focused area includes biogas production from different feedstocks, biogas upgradation via microbial electromethanogenesis, development of enzyme cocktail for enhanced sugar recovery through enzymatic saccharification of various lignocellulosic biomass, 2G ethanol from different feedstocks, biohydrogen production from organic waste, lignocellulosic biorefinery, wastewater treatment using microalgae and algal biorefinery, etc. The details of these projects are discussed below:

1. Optimizing Biogas Production from Napier Grass using a Thermophilic Anaerobic Digestion Consortium

A research work has been carried out to further enhance the biogas production from Napier grass using a thermophilic consortium THERMI-NIBE V.1 at 52°C. The optimisation of solid loading and inoculum concentration has been done using the Biomethane Potential Analyser (BMP). Further, experiments have been conducted to check the impact of supplementation and voltage on biomethane production. The enhancement in the biomethane production has been observed in the experiments. Further, the Techno-economic analysis of the developed process on biogas production from Napier grass under thermophilic conditions using SuperPro software is ongoing.

2. Upgradation of Biogas via Microbial Electromethanogenesis

A jacketed double chambered bioreactor (H-type cell) has been designed and fabricated for the upgradation of biogas via microbial electromethanogenesis (ME). The study on ME is being conducted using an in-house developed thermophilic consortium, i.e., THERMI-NIBE V.1. In this process, carbon dioxide (CO₂), a major component of raw biogas, is biologically converted into methane (CH₄) through the action of electroactive microbes under the influence of external potential. The consortium is showing potential in increasing the CH₄ content of biogas by utilizing CO₂ as a substrate. Current research efforts are focused on optimizing various operational parameters such as voltage, electrode, flow rate to achieve more efficient and stable conversion of CO₂ to CH₄. The ongoing optimization is expected to significantly improve the sustainability and economic feasibility of biogas purification through bioelectrochemical means.



Reactor set-up for biogas upgradation via microbial electromethanogenesis

3. Enhanced 2G-Bioethanol Production from Sugarcane Bagasse using simultaneous saccharification and co-fermentation (SSCF)

The research was focused on optimizing second-generation (2G) bioethanol production from sugarcane bagasse using a cost-effective and sustainable bioconversion strategy. The process began with an ammonia-based pre-treatment (10% v/v at 85°C for 24 h) to disrupt the lignocellulosic structure and enhance enzyme accessibility. This was followed by Simultaneous Saccharification and Co-Fermentation (SSCF) using both commercial enzymes (Cellic CTec2 and Htec2) and an in-house developed enzyme cocktail, along with a thermotolerant yeast strain *Kluyveromyces marxianus* FKS.A1 capable of fermenting both glucose and xylose.

Comparative analysis showed that the commercial enzyme system yielded a maximum ethanol concentration of 30.85 g/L and 263.53 L/ton after 72 h of SSCF. In contrast, the system using in-house enzymes (4 mL) combined with reduced doses of Cellic Ctec2 (166 µL) achieved an ethanol concentration of 28.44 g/L and a yield of 242.00 L/ton. Although slightly lower than the commercial setup, the in-house formulation demonstrated promising potential for reducing enzyme costs while maintaining high conversion efficiency. These findings support the feasibility of partially replacing commercial enzymes with indigenous formulations in large-scale 2G bioethanol production, contributing to the development of an economically viable and scalable biorefinery model.

4. Process development for fermentative biohydrogen production from organic waste using sequential dark and photo fermentations

A bioreactor of 2-L has been designed to carry out dark and photo fermentation. The in-house developed thermophilic consortium THERMI-NIBE V.1 has been used to produce H₂ using dark fermentation. The yield obtained is 33 L/ kg of dry waste. Two commercial cultures *Rhodospseudomonas* sp. (MTCC 8756) and *Rhodobacter johrii* (MTCC 8172) have been procured from MTCC, IMTech, Chandigarh for photo-fermentation of digested slurry after dark fermentation. The photo fermentation development work is going on.

5. CO₂ sequestration using Algal Biorefinery

The experiments on understanding the relation between pH and dissolved CO₂ in water and BG-11 media have been studied. The key observations are that the pH decreases with the increasing dissolved CO₂ concentration in water. The dissolved CO₂ concentration is very crucial for the algal cultivation. The experiments for testing the CO₂ sequestration performance of *Dunaliella* and *Chlorella* species were done. The *Dunaliella* is a halotolerant species usually found in highly saline water, while *Chlorella* is a freshwater alga. Both are distinct in nature. It has been found that *Chlorella* in the flask suspended culture has high CO₂ sequestration efficiency. The recent experiment was designed based on the results of the previous experiments, in which suspended cultures of both *Dunaliella* and *Chlorella* were compared with cultures in which polyurethanesponge was added to the culture to investigate the effects of the availability of the support material under the same conditions. The *Dunaliella* and *Chlorella* showed positive results in attachment to the carrier surface. The *Dunaliella* supported biofilm formation much more robustly than *Chlorella*. About two-fold biomass was obtained in the case of *Dunaliella* with sponge than in the control suspended culture. On the other hand, about 25-30% more biomass was obtained for *Chlorella* with sponge carrier in contrast with the suspended culture of *Chlorella*. Translating that enhanced biomass growth in the sponge carrier to CO₂ consumption, which is also directly linked to the biomass growth. This also results in twice the CO₂ sequestered in cases of *Dunaliella*, while 25-30% more CO₂ is sequestered in the case of *Chlorella*.

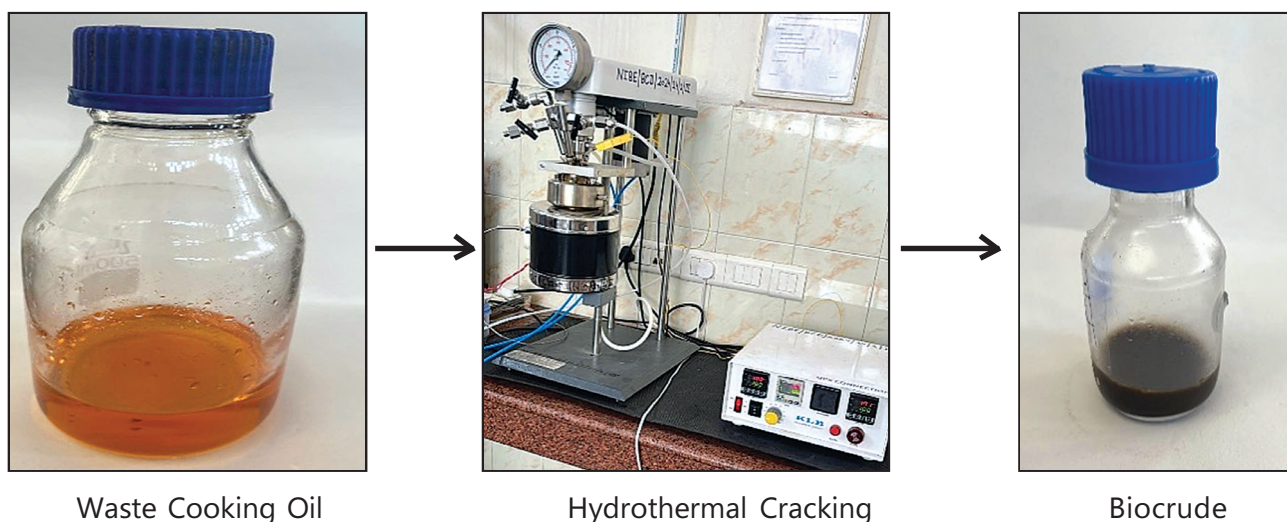


Biomass growth and attachment resulting in biofilm formation in the sponge media

6. Hydrothermal cracking of used cooking oil into sustainable aviation fuel

The increasing demand for sustainable aviation fuel (SAF) has driven the exploration of renewable feedstocks and innovative conversion technologies. Current work investigates the hydrothermal cracking of used cooking oil (UCO) as a viable pathway for producing SAF, utilizing its high triglyceride content. Hydrothermal cracking, conducted under subcritical water conditions, facilitates the breakdown of long-chain fatty acids in UCO into shorter hydrocarbons suitable for jet fuel applications. The process offers advantages such as minimal catalyst requirements, reduced hydrogen

dependency, and the ability to process high-moisture feedstocks without extensive pretreatment. Key reaction parameters including temperature, pressure, and residence time are being optimized to maximize jet-range hydrocarbon yields and fuel quality. The study underscores valorisation of used cooking oil into Sustainable aviation fuel by using it with or without hydrogen, using various catalysts.



Conversion of waste cooking oil into biocrude using hydrothermal cracking reaction in a high-temperature high-pressure reactor

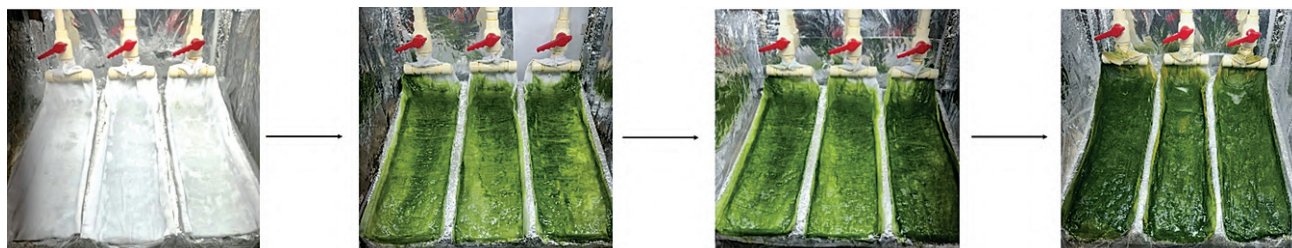
7. Biomass to biohythane production from bioenergy plant effluent

Liquid anaerobic digestate, a nutrient-rich byproduct of the anaerobic digestion process, with high nutrient concentration, was utilized for the sustainable microalgae cultivation, replacing culture medium-based nutrient supply. Liquid anaerobic digestate was collected from the PEDAs biogas plant, Ludhiana, and also native microalgae consortium was isolated from the plant site. To assess its potential for sustainable reuse, a detailed physicochemical characterization was performed, including pH, chemical oxygen demand, ammoniacal nitrogen, phosphate, nitrate, and total Kjeldahl nitrogen. This measurement recommends the use of liquid anaerobic digestate as a nutrient source. Based on the findings, preliminary cultivation trials were performed using different concentrations of liquid anaerobic digestate, which suggests that 30-40% is more suitable for superior biomass yield. Further optimization for enhancing biomass yield is in progress.

8. Design and Development of Microalgal Biofilm Bioreactor

Presently, our research team is designing and developing a Microalgal Biofilm Bioreactor (MBB) for an integrated wastewater treatment and biomass conversion into biohydrogen under a biorefinery approach. Under this, project, a lab-scale MBB reactor is designed that has double layered cotton fabric (Muslin cloth) as a carrier material. To study the biofilm growth and nutrient removal profile *Chlorella* sp. has been selected and studied. For comparison in growth and biomass productivity, batch studies of the strain were also conducted in flasks and tubular photobioreactors. The study showed 80% nitrate and 95% phosphate removal in the biofilm system, with dried biomass productivity up to 3.98g/m² in a 10-day study period. The biofilm formation efficiency of the isolated

native microalgal strains from the Industrial area canal, based on nutrient removal efficiency and biomass yield in the developed MBB, is in progress.



Algal culture on biofilm at different culture durations

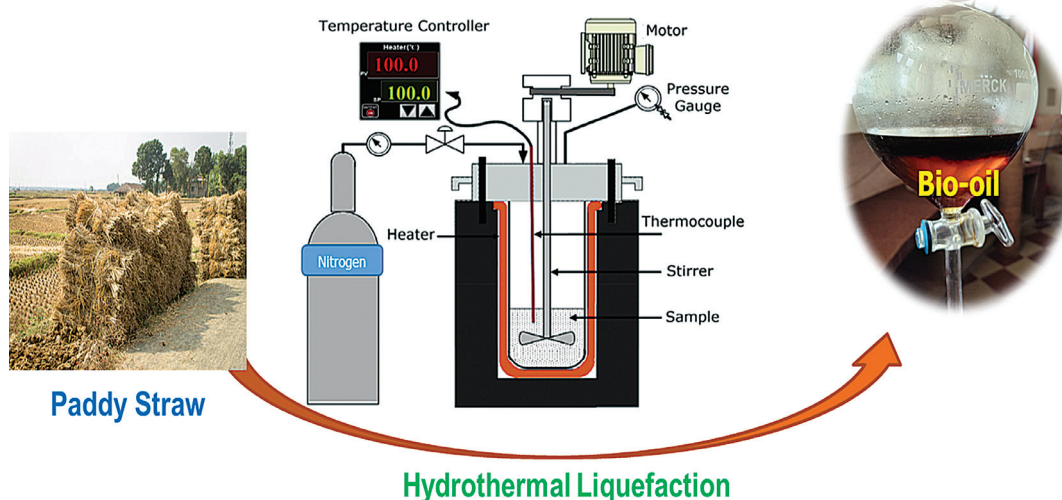
Biofilm-supported algal culture for industrial wastewater treatment

Chemical Conversion Division

The Chemical Conversion Division at SSS NIBE aims to transform waste lignocellulosic biomass into valuable chemicals through various processes. These include Slow Pyrolysis to produce biochar, Hydrothermal carbonization (HTC) / Hydrothermal Liquefaction (HTL) for biomass conversion to biochar and Biochar activation for diverse applications, Bio-oil production and its conversion into high-value chemicals. Additionally, the division conducts catalytic transformations of different lignocellulosic biomass components (Cellulose, Hemicellulose, Lignin) into high-value chemicals. Feasibility studies are also underway for upgrading Biogas to Hydrogen via catalytic steam or dry methane reforming. In the FY 2024-25 Chemical Conversion Division has initiated the following research activities:

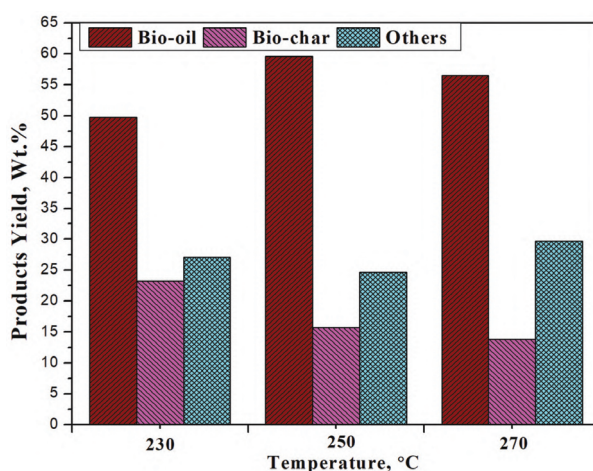
1. Paddy straw valorisation through hydrothermal liquefaction processes for the production of bio-oil

After China, India is the world's second-largest producer of paddy. India produces 98 million tonnes of paddy, yielding approximately 130 million tonnes of straw. Farmers in Punjab face the annual challenge of managing nearly 20 million tonnes of paddy straw (PS). It is estimated that over 15 million tonnes of PS are burnt in open fields to clear the land for wheat planting. The problem of PS in Punjab, India, primarily arises from stubble burning, which is a major contributor to air pollution in North India. The burning of PS releases trace gases such as carbon dioxide, methane, carbon monoxide, nitrogen oxides, sulfur oxides, and large amounts of particulate matter, which adversely affect human health and the environment. Paddy straw contains composition such as cellulose, hemicellulose and lignin that could be utilized production biofuels/chemicals, and can be substituted the uses of fossil fuel. Furthermore, the PS biomass is renewable, sustainable, carbon neutral and it is abundant in the earth. In this study, hydrothermal liquefaction/carbonization of PS was investigated to produce bio-oil/value-added chemicals and biochar.



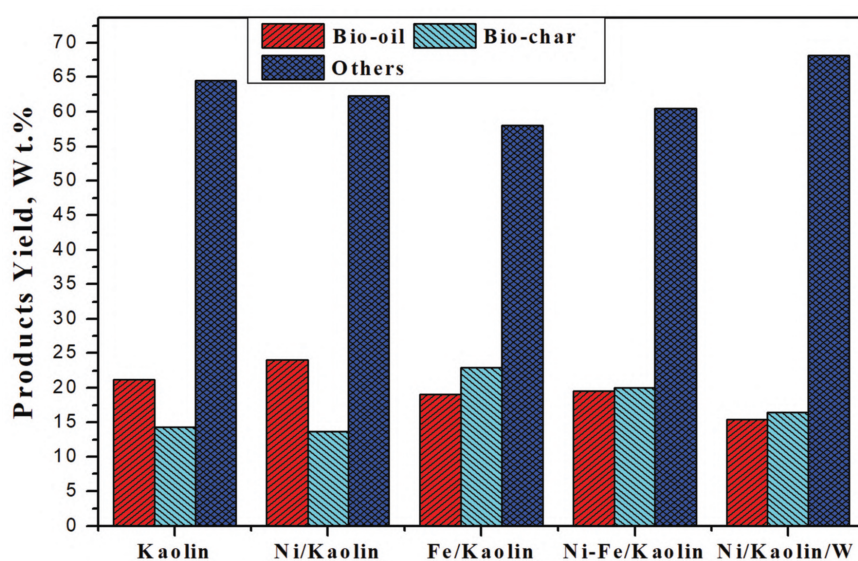
2. Hydrothermal liquefaction for bio-oil production:

In this study Silica-rich ash derived from PS was used as a catalyst. The PS ash, a low-cost agricultural byproduct, can serve as a catalyst in various applications. It is produced by heating paddy straw at 600°C for 5 hours, which removes the organic matrix from the silica backbone, leaving silica-rich ash containing approximately 78% silica with small amounts of impurities. A series of batch experiments were conducted at temperatures between 230-270°C for reaction times ranging from 15 to 45 minutes, with and without the silica-rich ash catalyst, using water and water-ethanol solvent mixtures. The catalytic HTL of PS was carried out in the presence of silica rich ash catalyst (10 wt.%) under H₂O-EtOH solvent mixture at different reaction temperature for reaction time 30, min. at different reaction temperature of 230, 250 and 270 °C (Fig.2). The presence of the ash catalyst significantly enhanced the bio-oil yield of 59.6 wt.% compared to 54.8 wt.% without the catalyst, at 250°C for 30 minutes. GC-MS analysis was employed to identify the compounds present in the bio-oil derived from the non-catalytic and catalytic HTL of PS. The bio-oil contained a range of compounds, including aldehydes, alcohols, ketones, phenols, acids, and heterocyclic organics. The carbohydrates in the RS biomass underwent depolymerization and rearrangement reactions, leading to the formation of acid and furan compounds. The bio-oil obtained with the catalyst displayed the highest area percentage of 4-ethyl phenol among all the samples.

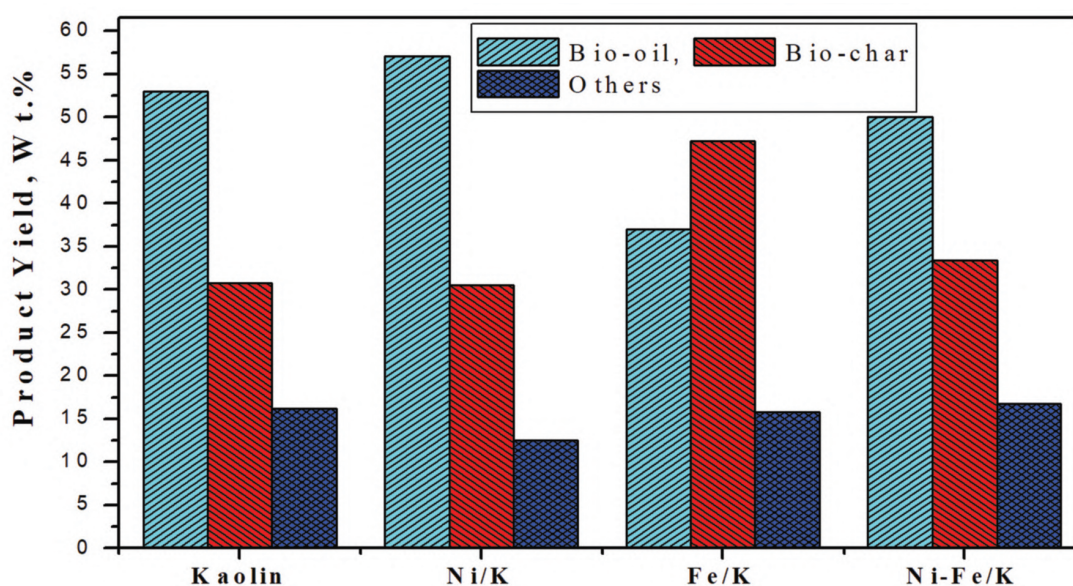


Effects of reaction temperature and silica rich ash catalyst on product yield distributions

In another study, PS hydrothermal liquefaction was carried out in subcritical and supercritical solvent (water and ethanol) media with K, CO_f base catalysts and Kaolin-supported Ni, Fe, and bimetallic Ni-Fe catalysts. The synthesized catalysts were characterized using BET, XRD, SEM, TPD, TGA and FT-IR analytical instruments. The reactions were performed at different temperatures (230-300°C), with reaction holding times ranging from 15 to 45 minutes and varying catalyst amounts (5 to 15 wt.%). Catalytic reactions in water at 270°C with K, CO_f and Ni/Kaolin catalysts promoted a bio-oil yield of 24.01 wt.% compared to 17.28 wt.% in non-catalytic reactions. These findings demonstrate that Ni/K was the most efficient catalyst for converting paddy straw using K, CO_f at 270°C. In ethanol solvent with Ni/Kaolin catalysts, the bio-oil yield significantly improved to 57.0 wt.% compared to 24.7 wt.% in non-catalytic reactions. GC-MS analysis revealed that the bio-oil was primarily composed of phenolic compounds, with smaller amounts of alcohols, ketones, and organic acids. This study demonstrates that use of catalysts and suitable solvent can improve liquefaction efficiency of PS and producing the high-quality bio-oil.



Effects of catalysts on product yield distributions



Effects of catalyst on product yield distributions

3. Biochar for Phosphorus and Nitrogen adsorption from wastewater

In this study in-situ base (K, CO₂) and acid (citric acid) conditions were used to prepare activated biochar (hydrochar) for phosphorus and nitrogen adsorption from wastewater, and its application as a fertilizer in soil. Moreover, biochar derived from different thermochemical processes, such as pyrolysis, hydrothermal liquefaction, and gasification was explored for understating the bio-char properties in the adsorption of phosphorus (P) and nitrogen (N) from wastewater. For the adsorption study, 0.1 to 0.5 g of adsorbent was used to evaluate phosphorus (P) and nitrogen (N) adsorption by varying process parameters such as the concentration of P and N, solution pH, contact time, temperature, and stirring speed (rpm). In the results and discussion section, we will analyze how the varying properties of different biochars influence P and N adsorption. Additionally, the effects of individual parameters on adsorption performance will be thoroughly examined. It will then explain the adsorption isotherms, determining whether the process involves multilayer or monolayer adsorption. Kinetic and thermodynamic changes during adsorption will also be explored in detail. Furthermore, the optimum adsorbent identified from the study will be tested for its efficiency in adsorbing P and N from real wastewater samples.

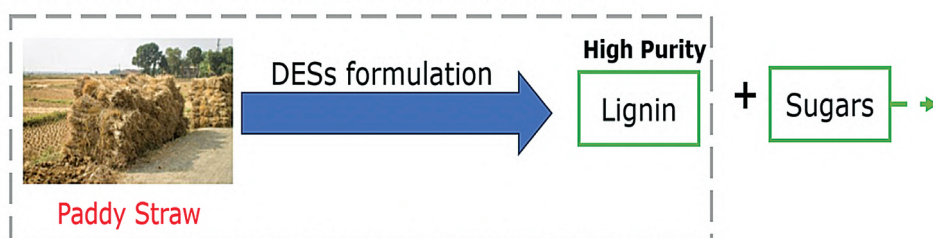
4. Comprehensive characterization of sawdust-derived biochar for energy applications

The potential of timber industry waste, sawdust, for producing porous, carbon-rich biochar was explored through carbonization for energy applications. This study optimized sawdust carbonization to achieve biochar with enhanced calorific value and yield. Using response surface methodology, carbonization conducted at 200–500°C for 30–180 minutes showed a maximum calorific value of 5893.29 kcal/kg (45% higher than raw biomass) and a biochar yield of 47.26% under optimized conditions of 500°C for 42 minutes. Compared to raw biomass, the biochar produced at these conditions had reduced moisture (9.18% to 6.01%) and volatile matter (73.32% to 21.94%), with increased ash content (1.95% to 9.02%) and fixed carbon (16.85% to 63.03%), demonstrating significant carbonization. Sawdust biochar demonstrates comparable stability with coal regarding thermal performance and reduced volatile content, making it a promising alternative to traditional coal for biomass-based energy systems and renewable energy applications.

5. Lignocellulosic Biomass Fractionation Using Green Chemistry

Rice straw, an abundant but underutilized agricultural residue, is typically managed by open burning in Punjab, Haryana, and Uttar Pradesh—contributing to severe air pollution. Its complex, recalcitrant structure demands high energy and chemical inputs for conventional fractionation methods (alkali pulping, organosolv, kraft), which rely on fossil derived reagents and generate significant waste. This project proposes a greener, cost effective biorefinery route leveraging **Deep Eutectic Solvents (DESs)**—mixtures of renewable hydrogen bond acceptors (HBAs) and donors (HBDs) with low toxicity, 100% atom economy, minimal volatility, and easy recyclability—to selectively dissolve and remove lignin while preserving cellulose and hemicellulose.

Sustainable and Efficient Biomass Fractionation



Sustainable & Efficient Biomass Fractionation

A comprehensive literature review on DES formulations has led to the design of **ternary DES systems**. To enhance acidity and catalytic activity, metal chlorides (e.g., FeCl₃, ZnCl₂) are incorporated as HBAs, promoting lignocellulose swelling and hemicellulose solubilization. Polyols (ethylene glycol, glycerol) act as HBDs to ensure thermal stability, recyclability, and reduced solvent viscosity. Alpha-hydroxy acids (lactic, malic, citric acid) supply Brønsted acidity for targeted cleavage of lignin-carbohydrate bonds. An aqueous co-solvent phase is also introduced to fine-tune viscosity, polarity, and mass transfer, optimizing fractionation kinetics.

6. Integrated Processing of Rice Straw for Moisture-Repellent Fibers

Rice straw, an abundant lignocellulosic residue with an estimated 184.5 million tonnes surplus in Northern India (2023–24), is commonly open-burned—emitting significant levels of CO, CO₂, N₂O, NO_x, and particulate matter that contribute to severe air pollution and climate change. With a composition of 30–40% cellulose, 20–30% hemicellulose, 10–15% lignin, and 15–20% ash, rice straw remains an underutilized resource with high potential for sustainable textile applications. This research project proposes a novel, integrated approach that extracts cellulose-rich fibers through alkaline delignification, valorizes hemicellulose and lignin coproducts, and utilizes ash-derived silica for sol-gel modification—imparting water repellency and durability to the regenerated fibers.

The process begins with the pre-treatment of rice straw, involving cleaning, drying, and mechanical size reduction to approximately 0.25 mm. This is followed by alkaline extraction using 1–5% NaOH or KOH solution, selectively dissolving lignin while preserving the cellulose and hemicellulose, shown in figure below. The resulting pulp is washed and neutralized to obtain a cellulose-rich fiber precursor suitable for wet-spinning.



Extracts cellulose-rich fibers, valorized hemicellulose & lignin coproducts

A portion of the rice straw is then combusted at 600 °C for four hours to generate silica-rich ash, which is digested in 1 N sodium hydroxide at 90 °C for two hours. Inductively coupled plasma (ICP) analysis across 15 replicates confirmed silicate concentrations ranging from 2,278 to 4,928 ppm (mean 3,436 ppm, 24% relative standard deviation), translating to roughly 600 g of SiO₂ per kilogram of ash. This sodium silicate is subsequently applied to the fibers using a sol-gel process, forming a conformal silica network that imparts water repellence and mechanical durability.

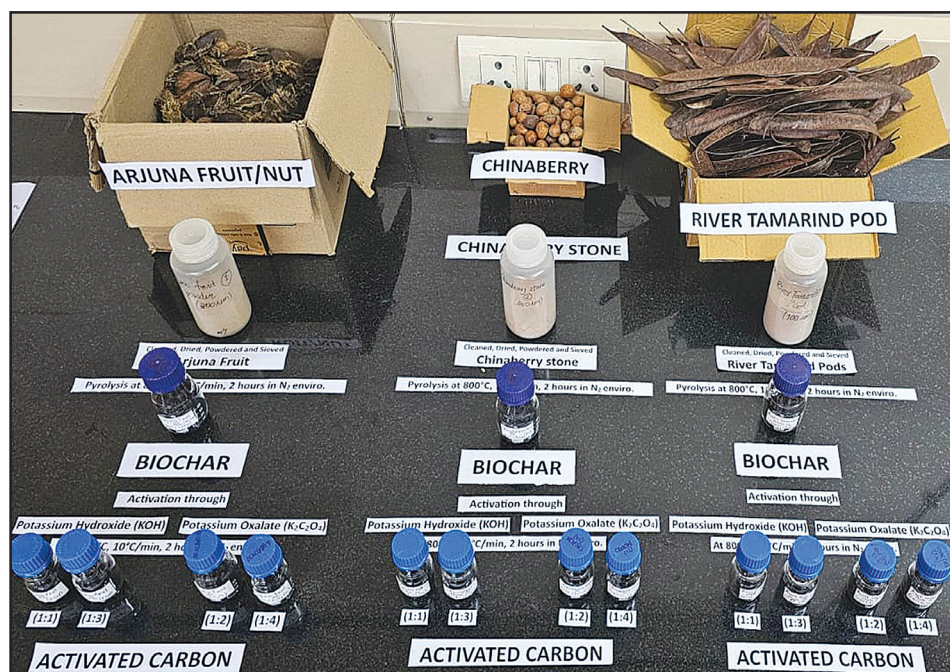
This integrated method minimizes waste, offsets fossil fuel dependence through partial biomass combustion, and creates multiple high-value streams including cellulose fibers, lignin-based co-products, and functional silica coatings. The high silica content in the ash validates its application for post-treatment modification, and the sol-gel coating process provides an environmentally friendly alternative to conventional fluorinated water-repellent treatments. Additionally, by offering an alternative to water- and energy-intensive cotton, this approach supports resource conservation and reduces the environmental burden of traditional textile crops.

Ongoing work focuses on optimizing the cellulose dissolution process—potentially involving NaOH/urea or ionic liquid systems—for improved wet spinning of continuous fibers. Concurrently, efforts are directed at refining sol-gel coating conditions to enhance surface hydrophobicity, mechanical strength, and durability, using contact-angle analysis and structural characterization. Overall, this circular bioeconomy model delivers a sustainable, scalable solution to rice straw management while producing high-performance, moisture-repellent fibers and supporting rural livelihoods.

Electrochemical Division

The Electrochemical Process Division at SSS-NIBE is actively conducting research on utilizing both conventional and underexplored biomass sources to synthesize carbon materials for energy device applications, such as supercapacitors.

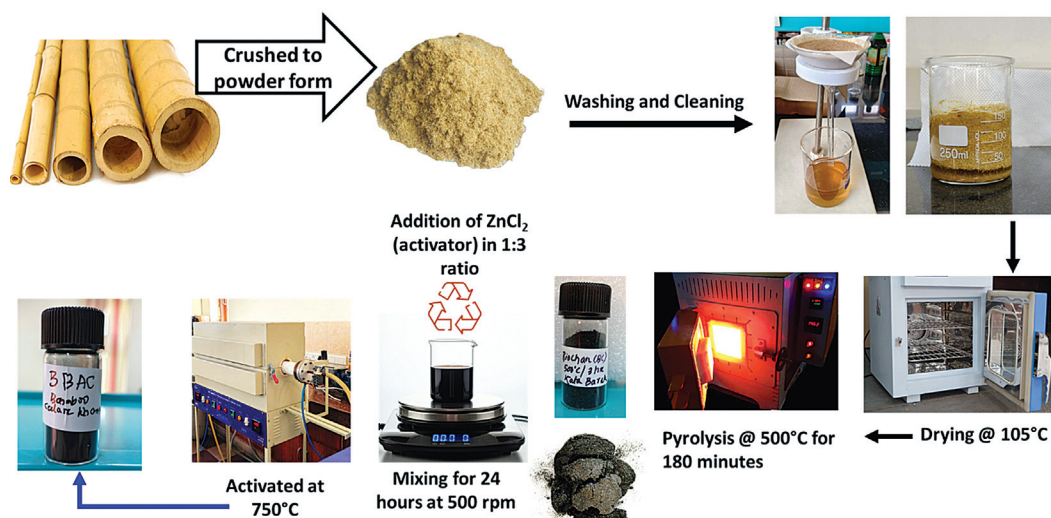
In addition to conventional biomass, the division is investigating the potential of less-explored sources, such as the fruit of *Terminalia arjuna* (Arjuna), the pods of *Leucaena leucocephala* (River Tamarind), and the stones of *Melia azedarach* (Chinaberry) for producing these carbon materials. The synthesis process employs a two-zone tubular furnace, enabling controlled carbonization and chemical activation of precursors. The resulting carbon materials possess unique characteristics, including high surface area, porosity, and heteroatom doping, significantly enhancing their electrochemical performance. The division aims to develop cost-effective, sustainable carbon materials for efficient energy devices like supercapacitors by exploring novel biomass sources and advanced synthesis techniques.



Biomass-derived Activated Carbon through Chemical Activation

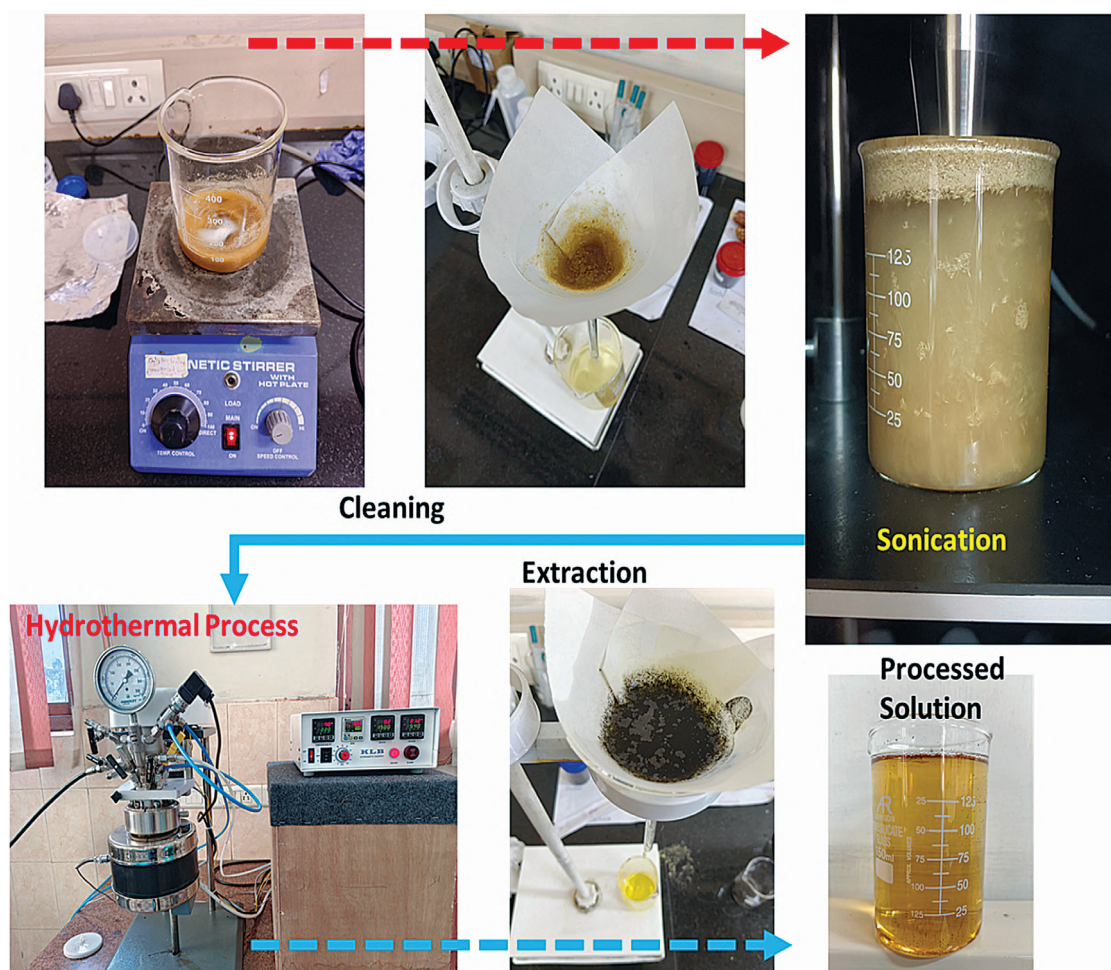
1. Synthesis of activated carbon from bamboo

The production of activated carbon (AC) from bamboo involves a structured process that ensures the transformation of bamboo into a highly porous material suitable for hydrogen storage. Initially, bamboo materials undergo preparation, which includes cleaning and cutting into suitable sizes. Following preparation, pyrolysis is conducted, which involves heating the bamboo in the absence of oxygen to break it down into char. The charred bamboo then undergoes carbonization at high temperatures, which further enhances its carbon content. The activation step follows, where the carbonized bamboo is exposed to activating agents. This stage is crucial as it develops the porosity and surface area of the AC. Steam or carbon dioxide can be used to activate the bamboo char. Alternatively, we can treat bamboo char with chemicals such as zinc chloride or phosphoric acid. This method is characterized by lower temperatures and shorter activation times. The activated carbon is cleaned thoroughly and dried for characterizations.



Synthesis of Carbon Quantum Dots from bamboo

Bamboo, a fast-growing and renewable biomass, contains a high carbon content, making it an ideal precursor for CQD production. The process begins with the preparation of bamboo, which typically involves washing, drying, and grinding it into fine powder to ensure uniformity. The powder undergoes hydrothermal treatments to synthesize CQDs. In a hydrothermal method, the powdered bamboo is dispersed in water or other solvents and heated in a sealed autoclave at high temperatures. The intense heat and pressure promote the breakdown of carbonaceous particles into nanoscale quantum dots. The resulting CQDs are then purified using techniques like filtration, centrifugation, or dialysis to remove larger particles and impurities. The purified CQDs are typically characterized by various analytical methods.



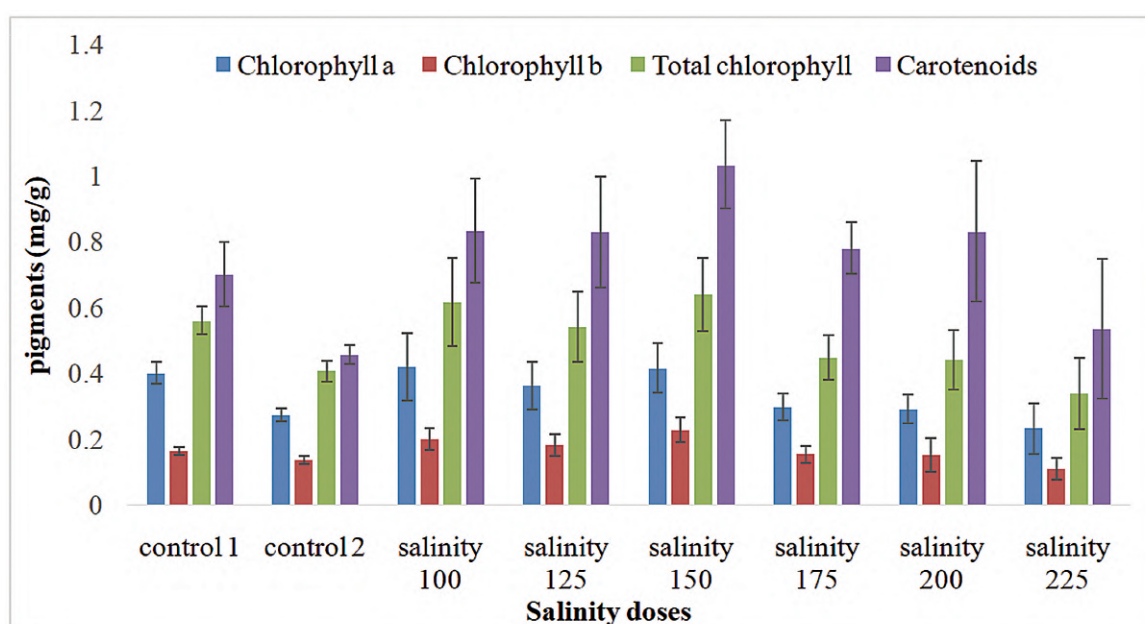
The Electro-chemical division (ECD) is also engaged in research activities mainly focussing on biorefinery based approaches. As huge amount of biomass is being generated which after targeted extraction of bioactive compounds eventually generates residual biomass. This residual biomass is enriched with exception nutritional profile in the form of lipid, proteins antioxidants, vitamins, minerals and polysaccharides, which if utilized efficiently can enhance the economic feasibility of microalgae for industrial applications. Considering the huge gap on underutilized residual biomass, it provides research opportunity to utilize the residual biomass in agriculture, feed and bioenergy sector. Based on these research opportunities, the electrochemical division is engaged in utilizing residual biomass for feed, bioplastic and biogas production.

2. Exploiting residual biomass for bioenergy and bioplastic production

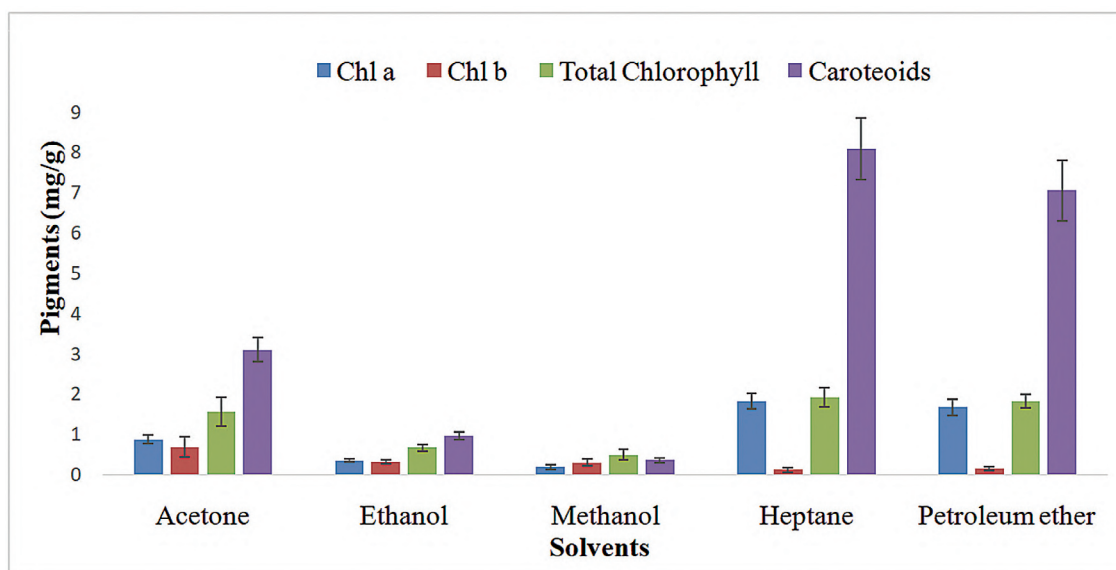
The residual biomass and raw biomass were examined for different parameters and it was observed that calorific value of the residual biomass (pigment extracted) was much higher (5303.384 Cal/gm) as compared to that of the raw biomass with pigments (4403.996 Cal/gm). Similarly, the CHNS(O) analysis demonstrated that residual biomass has higher C/N and C/H ratio. These results reflected superior lipid content in the residual biomass, thus can be used as promising substrate for bioenergy production. In order to reduce the dependence on plastic, the research was undertaken to utilize residual biomass for bioplastic production. Based on the preliminary experimentation, the residual biomass also showed promising result to produce bioplastic after specific alteration and modification. This approach based on utilization of residual biomass after pigment extraction will diversify the scope of microalgae and simultaneously ensure optimum resource utilization, zero waste discharge and eventually boost the model of biorefinery and circular bioeconomy.

3. Bioactive compound extraction through conventional solvents

ECD is also engaged in extraction of bioactive compounds such as β -Carotene from *Dunaliellasalina*. β -Carotene is a high-valued carotenoid pigment with wide applications in the cosmetic, pharmaceutical, and food industries. However, the supply of natural β -carotene still falls short of demand at present. *Dunaliella salina* has been regarded as one of the best candidates for β -carotene production due to its high β -carotene content (up to 10%). Despite multilevel advantages, the major factor hampering microalgae yield is cost intensive solvent, low recovery potential, time-consuming extraction and purification processes. Several experiments were carried out to induced synthesis of β -carotene in *Dunaliella salina*. Additionally, extraction using solvents like acetone, ethanol, methanol, heptane and petroleum ether were carried to extract different pigment from the fresh biomass as well as dried biomass. However, aim of the division is to develop selective green solvents (Deep Eutectic solvents) for maximum extraction of bioactive compounds from biomass. Moreover, adopting suitable approaches like β -carotene inducers and green solvents can certainly overcome economic feasibility of microalgae for industrial production and augment sustainable production of β -carotene.



Pigment yield of *Dunaliella* under different salinity stress conditions



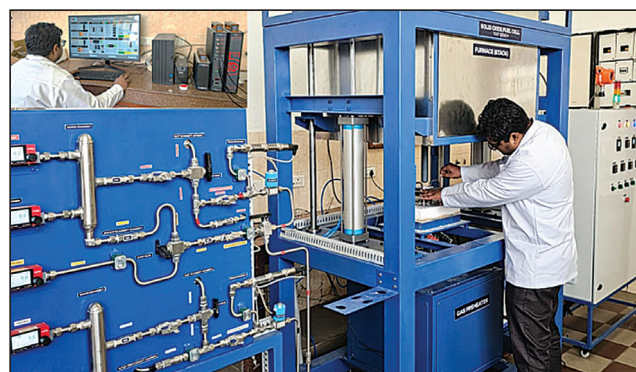
Pigment yield of *Dunaliella* extracted through different solvents

4. Solid Oxide Fuel Cell (SOFC) test bench - A futuristic, sustainable, decentralised power generation

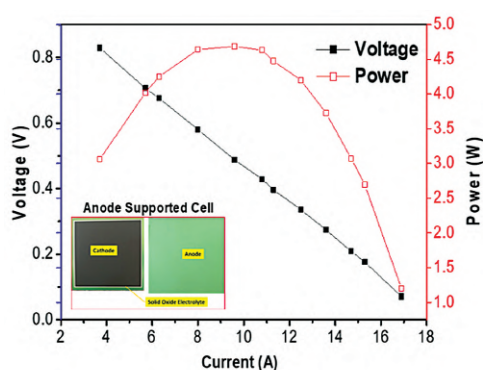
SOFC test bench was established in collaboration with CSIR-NAL, Bangalore, at SSS-NIBE for conducting research activities. This is one of SSS-NIBE's journey routes toward harnessing cutting-edge technology for clean and sustainable energy generation. The institute is working biofuels, such as biogas/producer gas, which are potential fuels for Solid Oxide Fuel Cells (SOFCs) instead of pure hydrogen. The R&D division is also exploring other areas of research in collaboration with CSIR-NAL, such as the preparation of anode-supported cells, preparation of electrolyte-supported cells, enhancement of oxygen vacancies in cathode electrode material, and modelling of fuel cell stacks.



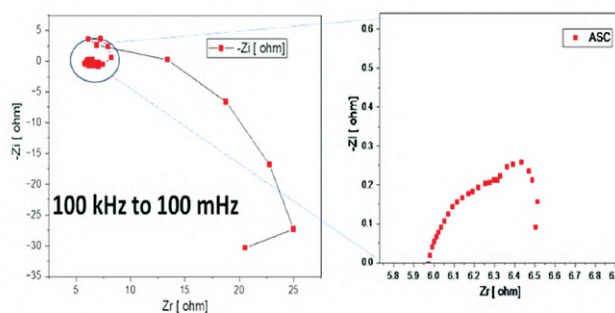
SOFC test bench



Testing of SOFC at different parameter



Polarisation curve and Impedance spectra of Anode-supported cell



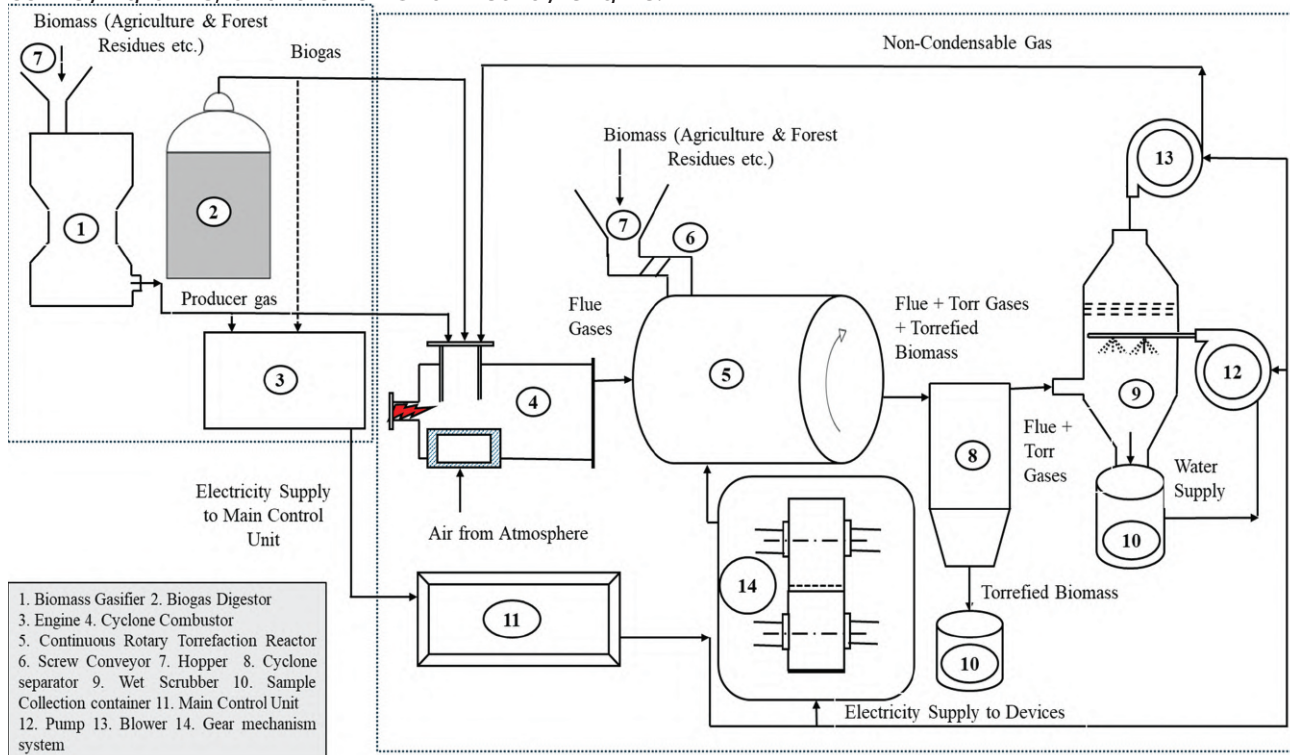
Thermo-Chemical Division

1. Design and Development of the laboratory-Scale Experimental Biomass (Agro Residue) Based Downdraft gasifier (1kg/hr)

A laboratory-scale downdraft biomass gasifier has been finalized based on detailed technical calculations to support experimental research in biomass-to-hydrogen conversion via gasification. The system is designed to facilitate controlled studies of the agro-residue based gasification process, enabling evaluation of key operational parameters, optimization of reaction conditions, and precise characterization of syngas composition. A Purchase Order (PO) has been released for its fabrication and installation. This setup will serve as a critical platform for generating insights essential for process scale-up and for advancing sustainable hydrogen production technologies.

2. Design and Development of Decentralized Continuous Torrefaction Reactor

The designed decentralized continuous torrefaction is an autothermal operation with no harmful emissions to the atmosphere. Figure below shows the torrefaction plant in which consists of sub-components namely, producer gas/biogas combustor, screw feeder, rotary drum, cyclone separator, wet scrubber, and gasifier engine genset. The raw biomass fed into the rotary drum through a screw feeder. The hot flue gas generated from the combustor is passed through the rotary reactor for heating and torrefying the biomass. At the outlet of the rotary drum a cyclone separator is used to separate the torrefied biomass from the volatiles released during torrefaction process. Further, the volatiles are passed through a wet scrubber to collect the condensable fractions, and the combustible non-condensable gases are recycled back to the combustor for heating the rotary drum. In addition, the surplus producer/biogas is passing into the engine genset rated at 20 kWh which produce electricity. The power required to existed components such as gear mechanism system, pump, screw conveying drive, and blower is fulfilled by engine.



Schematic of Decentralized Continuous Torrefaction Unit

2.1 CFD Modelling of Cyclone Combustor for Producer Gas/ Biogas

The cyclone combustor is designed to burn raw producer gas/biogas. The combustor has tangential fuel and air inlets that caused a swirling flow inside it in order to facilitate fuel-air mixing. The preliminary combustor simulation has been done to get insights over the temperature, velocity, and pressure drop along the length of the combustor. This system is designed to burn the producer gas and biogas produced from the thermal conversion of raw biomass. The diameters and length of the combustor are 147-207 mm and 1100 mm, respectively. A tube has been placed inside the combustor so that observe the heat transfer inside the tube to get the temperature distribution. Currently, the surrounding tube temperature distribution has been observed by applying the three oxidation reactions, namely, hydrogen oxidation, methane oxidation, and carbon monoxide oxidation reactions. This work describes the numerical 3-D Modeling and simulation of turbulent producer gas-air combustion using the commercial software ANSYS Fluent®.

The composition of the producer gas has been stated in Table below.

Producer gas composition

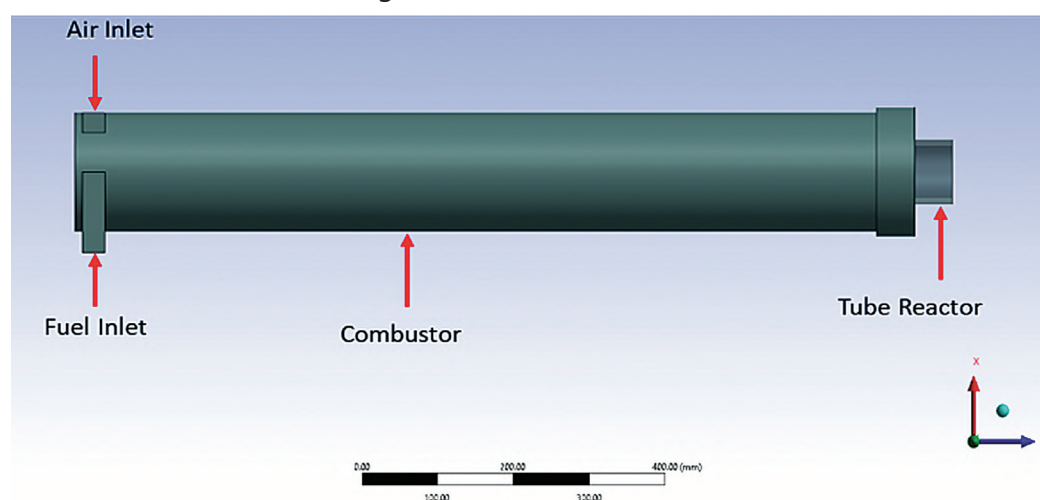
Species	H ₂	CO	CH ₄	CO ₂	H ₂ O	O ₂	N ₂
Mole Fraction	0.16	0.21	0.017	0.11	0.038	-	0.465

Objectives:

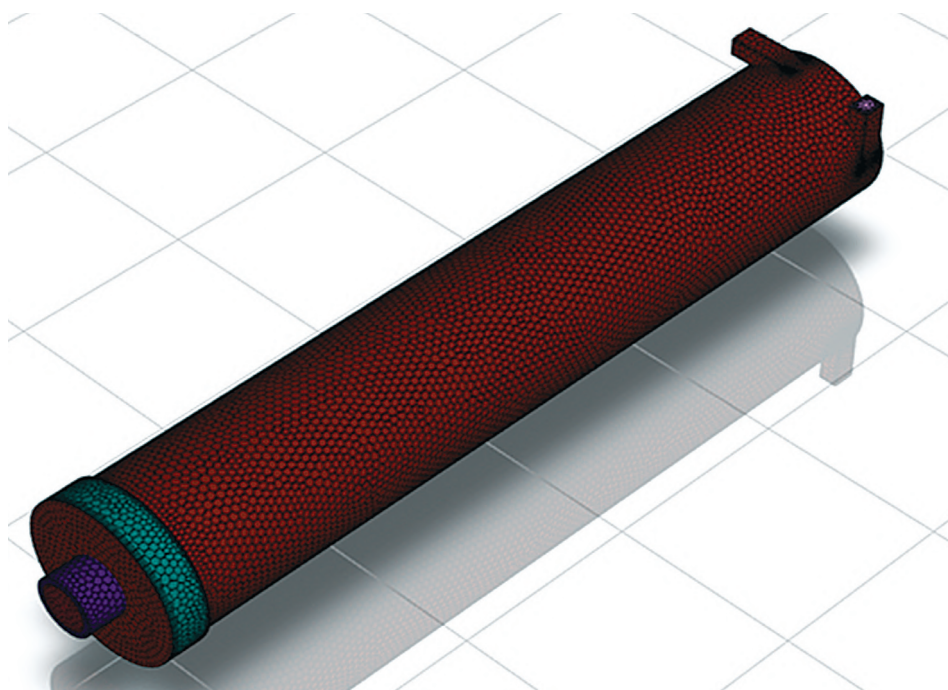
- I. To simulate the combustor of different sizes to ensure the proper mixing of producer gas throughout the combustor.
- II. To get the velocity profile, temperature profile, and pressure drop inside the combustor.
- III. To get the various variable contour such as velocity, temperature, and pressure in reacting flow inside the combustor.

Geometry and Meshing of the combustor:

Following figures show the structure of geometry and meshing of the combustor. The geometry dimensions have been given in Table below. The total number of poly-hexacore mesh used herein is 0.15 million for the 10 mm gap combustor whereas 0.24 million for the 40 mm gap combustor. The computational domain has two cell zones, viz., solid and fluid. A solid cell zone is given to the wall of the tube, and a fluid cell zone is given to the flow domain.



Producer Gas Combustor Geometry

**Meshed Geometry**

Geometry Dimensions

Dimensions	
Combustor Diameter	147 -207 mm
Combustor Length	1100 mm
Inlet fuel and air width	30 mm
Inlet fuel and air Height	25 mm
Inner Reactor Dimensions	D: 80 mm L: 1000 mm

Models and Boundary conditions

The RANS turbulent model has been used to proper mixing of the producer gas and air inside the combustor. The models and boundary conditions has been given in Table below. The three global oxidation reactions have been incorporated to view the temperature distribution inside the combustor can be seen in table below. Numerically ignite the producer gas air mixture, a spherical region of diameter 5 mm has been selected at the top of the combustor. This spherical region is patched with a high temperature equaling the adiabatic flame temperature for the mixture.

Models and Input conditions

Models and Input Conditions	
Models	Viscous: Turbulent (RNG); Enhanced wall Functions
	Energy
	Species Transport
	Reactions: Finite-Rate/Eddy Dissipation
Boundary Conditions	
Input Conditions	Fuel mass flow inlet: 5 kg/h; Temperature: 300 K
	Air mass flow inlet: 7.5 kg/h; Temperature: 300 K
Outlet Conditions	Pressure
Wall conditions	Adiabatic

Global Oxidation Reactions

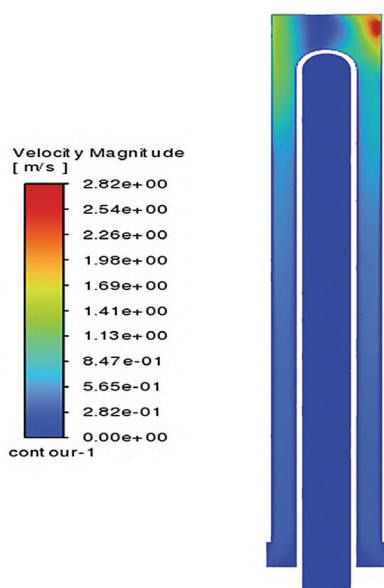
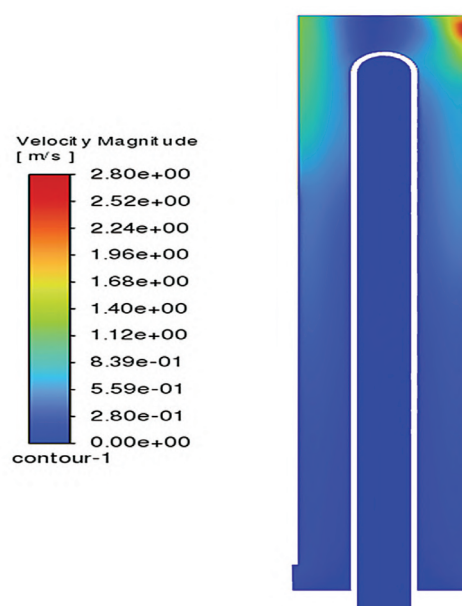
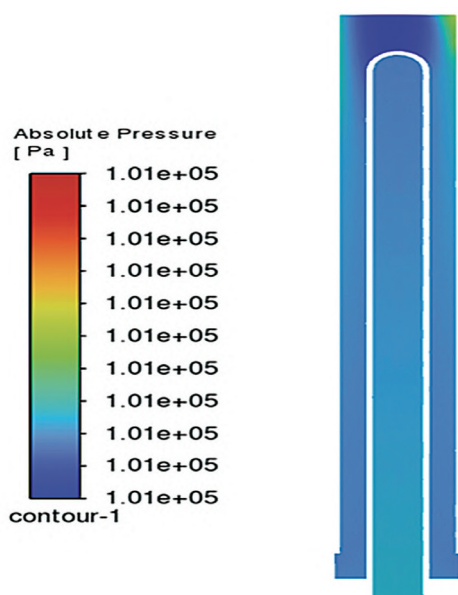
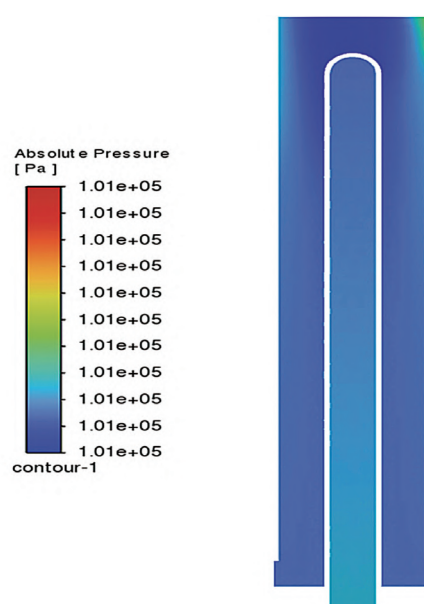
Sr. No	Reaction Name	Chemical Reaction	Rate Expression
R ₁	H ₂ Oxidation	$H_2 + 0.5 O_2 \rightarrow H_2O$	$R_1 = 1.8 * 10^{11.5} \exp\left(\frac{-17614}{T}\right) * [H_2] * [O_2]^{0.5}$
R ₂	CH ₄ Oxidation	$CH_4 + O_2 \rightarrow CO_2 + 2H_2O$	$R_2 = 8.3 * 10^8 \exp\left(\frac{-15098}{T}\right) * [O_2]^{1.3} * [CH_4]^{-0.3}$
R ₃	CO Oxidation	$CO + 0.5 O_2 \rightarrow CO_2$	$R_3 = 10^{12.35} \exp\left(\frac{-20000}{T}\right) * [CO] * [O_2]^{0.25} * [H_2O]^{0.5}$

Results

The mixing of the producer gas and air along the length of the combustor was modelled using commercial CFD software Fluent. The Reynolds Averaging Navier-Stokes (RANS) equations of turbulent flow have been solved numerically. The distribution of the variables has been shown on the mid-y-plane of the combustor for both cold and reacting flow. Case 1 is related to a 147 mm diameter, whereas case 2 is for a 207 mm diameter of the combustor.

Velocity and pressure drop in cold flow

Figures below have been shown the velocity and pressure distribution inside the combustor. It was found that the maximum velocity is reached at 2.82 m/s in cases 1 and 2. The velocity at the exit of the combustor in case 2 is almost negligible when compared with case 1. This is due to less viscous resistance at the trailing edge of the combustor when the diameter of the combustor is increased for the same input conditions. The atmospheric pressure variation is almost the same for each case, i.e., 1 atmosphere. The pressure drops inside the combustor are 8565.61 Pa and 4497.86 Pa for cases 1 and 2, respectively.

**Case 1- Velocity Distribution****Case 2- Velocity Distribution****Case 1- Pressure Distribution****Case 2- Pressure Distribution**

Temperature, velocity and pressure drop in reacting flow

The temperature distribution along the combustor length has been shown in figure below. The maximum temperature inside in case 1 is found to be 1910 K, whereas 1930 K in case 2, which is same as adiabatic flame temperature of producer gas at specified conditions. The temperature distribution is more uniform in case 2 due to better mixing of gaseous species. The average temperature on mid y-plane is 920 K in case 1 while 1189 K in case 2. However, the tube temperature which is constant i.e., 300 K due to assumption of adiabatic condition at the tube wall.

Static Temperature
[K]

1.91e+03
1.74e+03
1.58e+03
1.42e+03
1.26e+03
1.10e+03
9.42e+02
7.81e+02
6.21e+02
4.60e+02
2.99e+02

cont our-3



Case 1- Temperature Distribution

Static Temperature
[K]

1.93e+03
1.76e+03
1.60e+03
1.44e+03
1.27e+03
1.11e+03
9.47e+02
7.84e+02
6.21e+02
4.58e+02
2.95e+02

contour-1



Case 2- Temperature Distribution

Figures below have been shown the velocity distribution along the combustor length. It was found that the maximum velocity inside in both case 1 is found to be 2.78 m/s, which is almost the same when it compared with the cold flow simulation results. But the velocity distribution along the length has been increased because of oxidation reactions. The pressure distribution along the combustor length has been shown in figure below.

Velocity Magnitude
[m/s]

2.78e+00
2.50e+00
2.22e+00
1.95e+00
1.67e+00
1.39e+00
1.11e+00
8.34e-01
5.56e-01
2.78e-01
0.00e+00

cont our-3

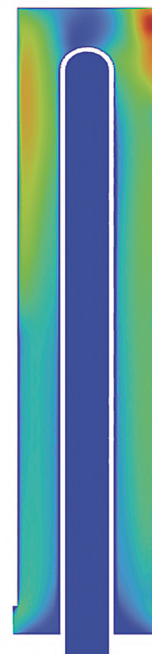


Case 1- Velocity Distribution

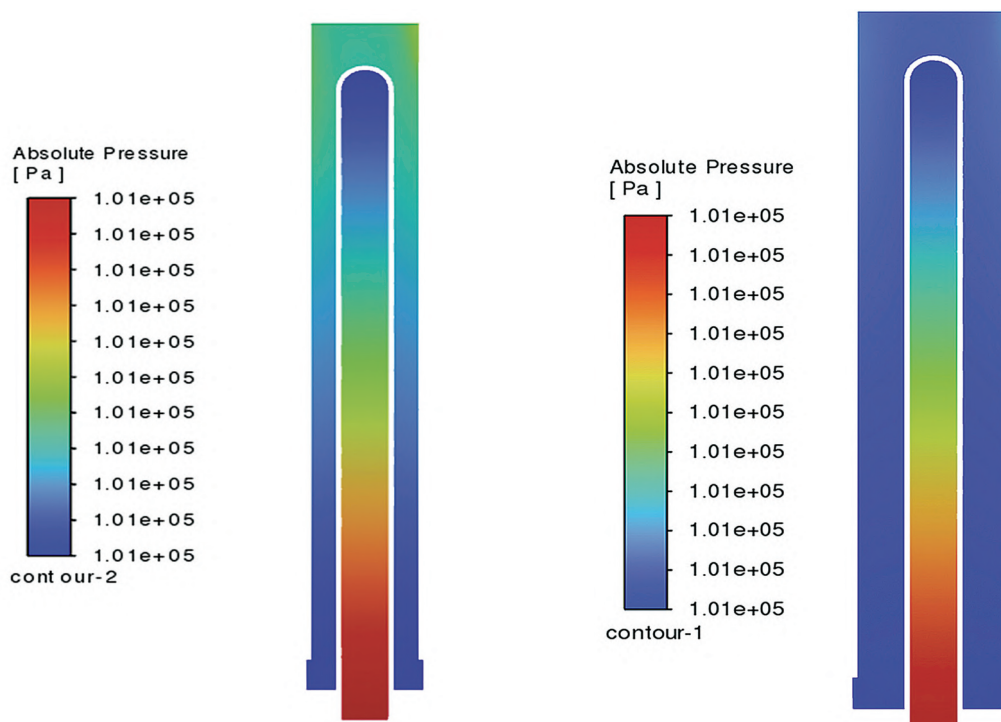
Velocity Magnitude
[m/s]

2.78e+00
2.50e+00
2.23e+00
1.95e+00
1.67e+00
1.39e+00
1.11e+00
8.35e-01
5.56e-01
2.78e-01
0.00e+00

contour-1



Case 2- Velocity Distribution

**Case 1- Pressure Distribution****Case 2- Pressure Distribution**

The compared variable magnitude inside the combustor

Variables		Case 1 Case 2
Temperature	920 K	1189 K
Axial Velocity	0.53 m/s	0.29 m/s
Pressure drop	8567.5 Pa	4498.3 Pa

In this simulation study, RNG turbulence model is used to observe the mixing of producer gas species by changing the diameter of the combustor. The results are reported in terms of velocity, temperature, and pressure drop distribution inside the reactor for given flow conditions and fuel. It was found that the distribution of velocity and pressure is more profound for smaller combustor sizes due to more resistance along the combustor length whereas temperature distribution is more uniform in case 2 due to better mixing of gaseous species.

3. Improved biomass cookstove testing and certification

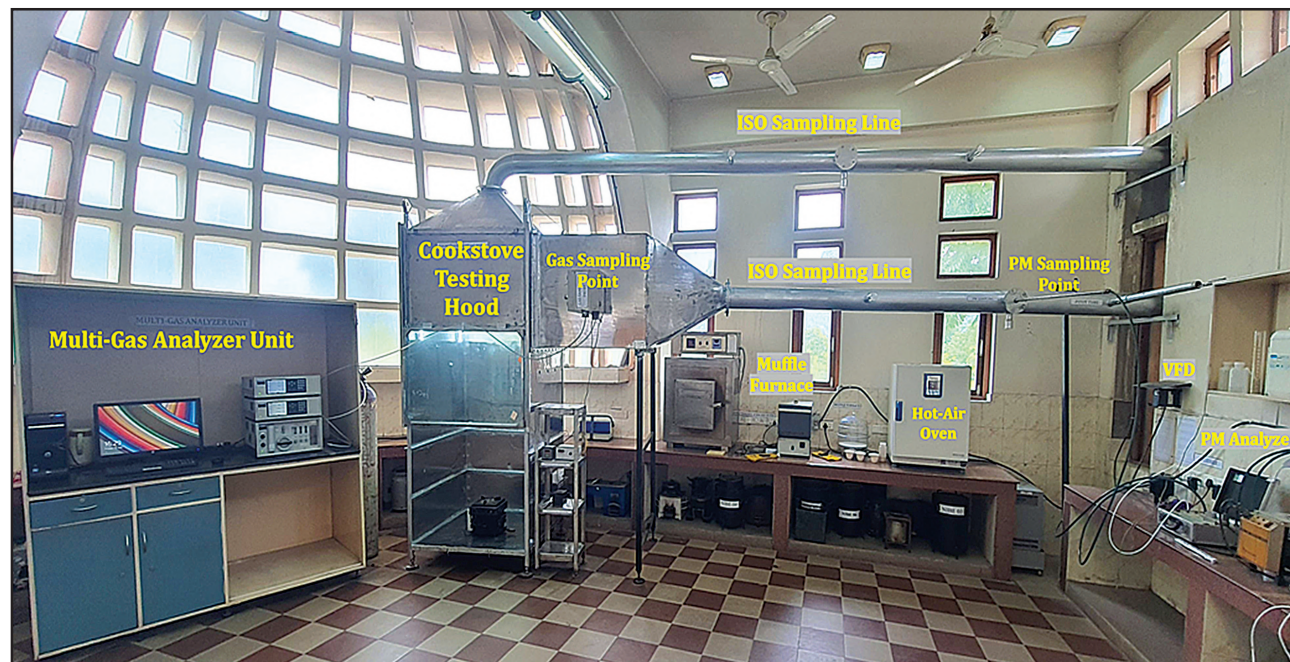
Institute have a well-equipped improved biomass cookstove test centre for cookstove manufacturers in Northern region of India and specially for the of Punjab, Haryana, Himachal Pradesh, Jammu & Kashmir and Uttarakhand region. The centre is providing the service to different cookstove manufacturers since 2013.

Overview of biomass cookstove testing and certification

Centre Stablished in year	2013
Approved by	MNRE, New Delhi
Current Status	Working
Testing Facility available	● Testing of Improved Biomass Cookstove as per BIS Standard (Available Since, 2013) ● Testing of Improved Biomass Cookstove as per ISO Standard (Available Since, 2024)
Measure Equipment Available	Multi Gas Analyzer, Particulate Matter Analyzer, Bomb Calorimeter, Hot Air Oven, Moisture analyzer, Microbalance, etc.

3.1 Upgradation of cookstove testing facility at TCD

The upgradation of cookstove testing facility has been carried out in Thermochemical Conversion Division and various equipment's such as particulate matter analyzer for gravimetric measurement of $PM_{2.5}$, hot air oven and muffle furnace for biomass characterization have been procured. The hybrid design of cookstove testing hood has been installed in order to facilitate cookstove testing as per both BIS and ISO standards. The pictorial view of the installed cookstove testing hood is shown below.



Upgraded Biomass cookstove testing facility at SSS-NIBE

3.2 Testing and certification of Improved Biomass Cookstove

Various cookstove models were received for testing and certification purpose at the laboratory. The testing was carried out following BIS 2013 protocol. The detail of the cookstove models tested and their performance can be found in the table below.

Biomass cookstove models received and tested out at SSS-NIBE cookstove Test Centre

S. No.	Name and address of manufacturer & cookstove specifications/type	Tested In
1.	Organization/Manufacturer Name: T – Works Foundation Address: Survey No. 83/1, Plot 1/D, 1E, 1F, Silpa Gram Craft Village, Rai Durg, Hyderabad, Telangana – 500081	
1.	i) Details of Cookstove Model-1: Natural Draft, Double Burner Biomass Cookstove with insulated metal body. Burning rate: 0.82kg/hr	Sept./Oct., 2024
1.	ii) Details of Cookstove Model-2: SHE Cookstove-Natural draft domestic size biomass cookstove with insulation: 0.96 kg/hr.	Jan./Feb., 2025
1.	iii) Details of Cookstove Model-3:SHE Cookstove, forced draft domestic size biomass cookstove with insulation: 0.59 kg/hr.	Feb./Mar.,2025
2.	Organization/Manufacturer Name: MaxfaithPvt. Ltd. Address: GI-708, Chopanki Industrial Area, Bhiwadi, Alwar, Rajasthan-301019 Cookstove Model Details: Natural Draft, Single Pot, Domestic Size, Metal Body cookstove, with Burning Capacity: 1.1 kg/hr	March/April, 2025

3.3 Cookstove Dissemination Activity**Advance biomass cookstove demonstration and dissemination in collaboration with Fire and Combustion Research Center (FCRC), Jain University Bengaluru:**

A MoU between SSS-NIBE and Jain University has been signed in Sept, 2022. Under this MoU SSS-NIBE, fifteen nos. of improved biomass cookstoves of different sizes (1.5 kg/h, and 3.5 kg/h) has been received from FCRC. During the year 2024-25, a total of 8 number of cookstoves have been disseminated as shown in table below. Training has been provided to concerned for proper operation and maintenance of improved cookstoves being disseminated as shown below.

Details of cookstove dissemination during the year 2024-25

S. No.	Place of Dissemination	No. of Stoves/ Capacity	Type of Use
1.	Gurudwara Singh Sabha, Rail Coach Factory, Kapurthala	1 – 3.5-6 kg/h	For community cooking at Gurudwara
2.	Government Elementary School, NurpurLubana, Kapurthala	1 – 3.5-6 kg/h	For community cooking (Mid-day-meal) at School level
3.	Government Senior Secondary School, NurpurLubana, Kapurthala	1 – 3.5-6 kg/h	For community cooking (Mid-day-meal) at School level
4.	The Unati Cooperative Marketing-cum- Processing Society Ltd, Talwara	1 – 3.5-6 kg/h3 – 1.5 kg/h	For community and domestic cooking applications
5.	Gurudwara Sant Baba Sarjan Singh Ji, Dhapai	1 – 3.5-6 kg/h	For community cooking at Gurudwara

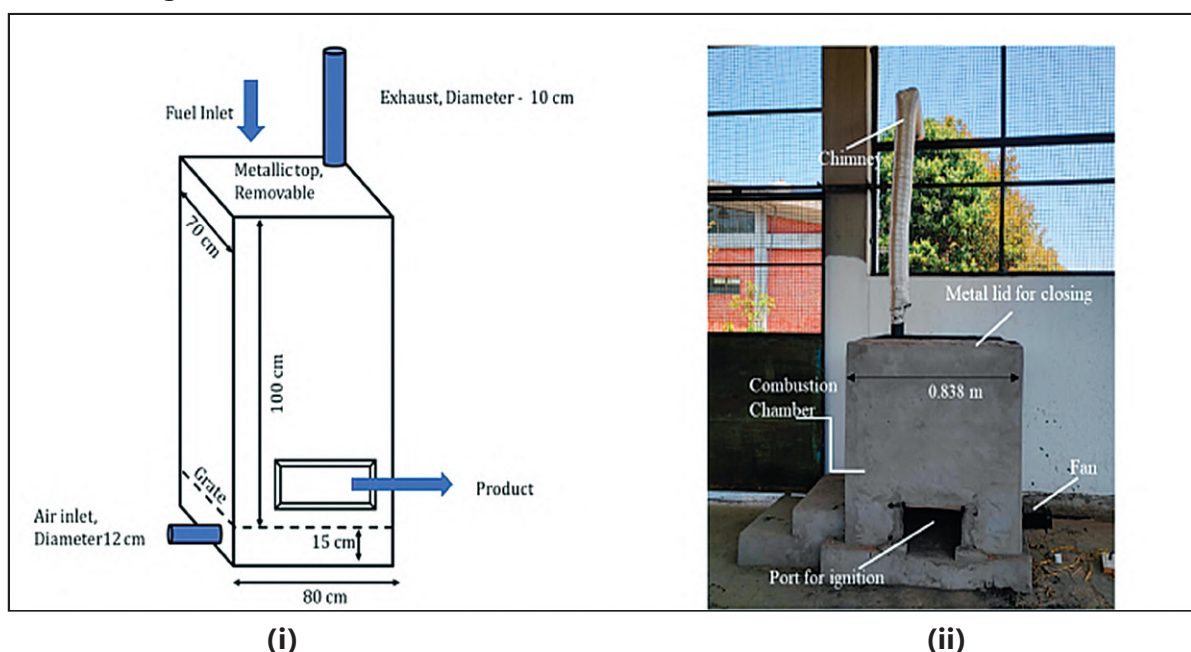
**RCF Kapurthala****Unati Co-operative Society****Sr. Sec. School, NurpurLubana****Primary School, Sheikhpur**

Advanced biomass cookstove dissemination carried out during the year 2024-25

4. Development of Biomass to biochar production Kiln

4.1 Biochar production from agricultural wastes as a soil amendment for improving soil fertility, nutrient retention and overall soil health

During the FY 2024-25, to curb stubble burning and manage waste generated from farming, these can be used as feedstock to produce biochar which helps reduce environmental pollution caused by the burning of stubble. Given its many potential advantages, biochar technology is regarded as sustainable. Following soil application, reduces the impact of climate change by sequestering carbon in the soil for hundreds or even thousands of years. It raises agricultural output and soil fertility. Because of its high surface area, it collects toxins from the environment.



The schematic diagram (i) and actual setup (ii) illustrate the structural design and components of a biomass pyrolysis unit, including the combustion chamber, exhaust, fan, and product outlet.



The biomass feedstock before pyrolysis (iii), the resulting biochar product highlighting the unit's effectiveness in biomass-to-biochar conversion

A Biochar kiln that was earlier constructed in the FY 23-24 at the Research and Development III facility of SSS NIBE. Experiments have been carried out with Paddy Straw as the feedstock. It can easily accommodate approximately 45 kg of feedstock. The process begins with paddy straw, which has an initial moisture content of 10.05%, fixed carbon of 9.71%, volatile matter of 67.91%, and ash content of 22.08%, yielding a calorific value of 13.16 MJ/kg. Various experimental trials were conducted to evaluate performance. Experiment 1 yielded approximately 23% biochar with a calorific value of 18.10 MJ/kg, while Experiment 2 yielded around 21.5% with a value of 16.10 MJ/kg. Proximate analysis revealed notable differences in moisture, fixed carbon, volatile matter, and ash content between the two experiments. Ultimate analysis showed the carbon content ranged from 50.71% to 59.2%, hydrogen from 1.3% to 1.58%, sulfur from 0.12% to 0.17%, nitrogen from 1.52% to 1.73%, and pH values around 10, a highly alkaline biochar in nature, which are good for acidic soil amendment. The study highlights ongoing efforts in characterizing biochar for its application in soil improvement, marking progress from TRL-2 (2023–24) toward TRL-5 (2027–28). The work is being carried out at SSS-NIBE, Kapurthala, with a focus on the unique selling point (USP) of biochar's role in soil enhancement. Initial tests show biochar yields of around 21.5–23% with calorific values up to 18.10 MJ/kg. Key findings include high carbon content (up to 59.2%) and pH values close to 10, making it suitable for improving acidic soils. The project, developed at SSS-NIBE, Kapurthala, is currently at TRL-2 (2023–24) and is expected to reach TRL-5 by 2027–28. Further research is underway to enhance its application in soil amendment.

5. Development and fabrication of continuous biochar reactor

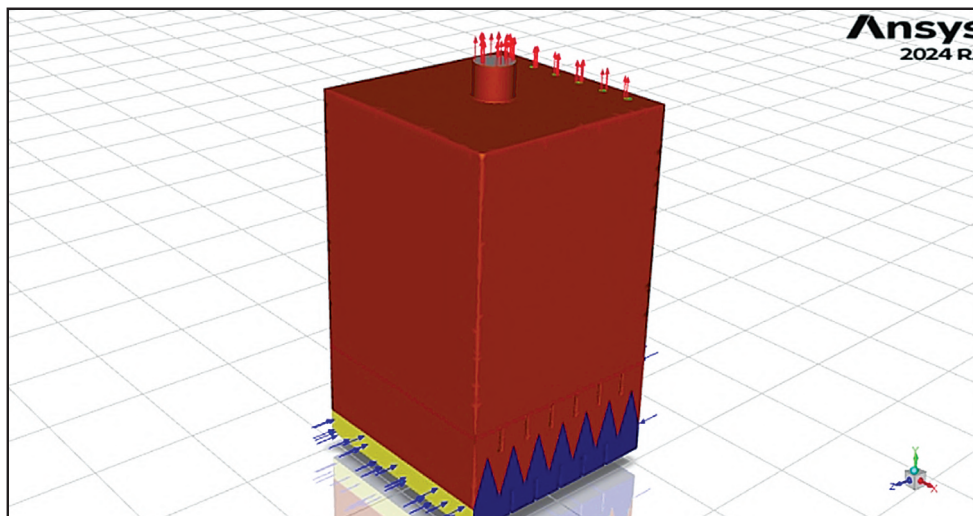
Thermochemical Conversion Division at SSS-NIBE is developing a continuous biochar reactor system based on the principle of gasification, aimed at efficiently converting paddy straw bales into high-quality biochar while simultaneously generating thermal energy to meet the operational demands of a dryer. This integrated system is designed to maximize energy utilization and waste valorization by routing the syngas produced during gasification through a cyclone separator, where particulate matter is removed before the cleaned syngas is combusted in a burner to supply consistent thermal energy to the drying unit. The major components of the setup include the main gasification reactor, a grate for controlled feedstock handling, a cyclone separator for particulate filtration, a burner for energy conversion, a biochar storage unit, and the dryer itself. The biochar produced will be systematically collected and characterized to assess its effectiveness for various value-added applications such as soil amendment, carbon sequestration through CO₂ absorption, and water purification, thus contributing to sustainable waste management and environmental conservation.

6. Development of Biomass-Based Dryer: An Efficient Solution for Agri-Products Drying Needs

The biomass-based dryer is an energy-efficient system designed to dry agricultural products such as fruits, vegetables, and other perishables in a shorter time while maintaining product quality. Leveraging renewable biomass fuel, this dryer provides a sustainable and cost-effective drying solution, especially beneficial for rural and agro-based industries.

The system has a biomass burner, which generates the necessary heat for the drying process. The system operates on both direct and indirect drying principles, enhancing overall drying efficiency. A

key highlight of the design is its fully automated control system, which monitors and optimizes the internal humidity and temperature in real time. This automation ensures that drying conditions remain optimal for the specific product being processed. The fuel feeding mechanism is also automated, allowing the system to adjust the amount of biomass fed into the burner based on the drying requirements, reducing both manual intervention and fuel wastage.



Computational model of biomass-based dryer for agricultural products

The dryer chamber has a triple-layered wall system, including an insulation layer and a Phase Change Material (PCM) layer. The insulation minimizes heat loss, while the PCM layer stores and gradually releases heat, ensuring uniform drying and extending the heating effect even when the burner is not active. This enhances energy efficiency and contributes to better drying consistency.

Internally, the drying trays are strategically placed to maximize exposure to heat and airflow. This placement ensures uniform drying across all layers and minimizes product clumping or uneven moisture removal. Multiple prototypes of this dryer have been simulated and optimized using ANSYS simulation software. These simulations have helped refine the burner capacity and airflow design to maintain the desired temperature inside the chamber consistently and effectively. It is an affordable solution for small and medium-scale agricultural operations, with significant savings in fuel costs and drying time.

SPONSORED / EXTERNAL FUNDED PROJECTS

1. Advanced microalgal biorefinery approach for recycling of domestic sewage/ waste water for cleaner and greener Himalayan region

A project has been funded by National Mission on Himalayan Studies (NMHS), Ministry of Environment, Forest & Climate Change, Govt. of India for 3 years starting in Jul 2023. The project cost is INR 96.75 Lakhs. NIT, Hamirpur and Jal Shakti Vibhag, Hamirpur are the collaborating partner in the project.

Microalgal strains were isolated from the wastewater samples using serial dilution and agar plating techniques, and pure cultures were obtained by streaking isolated colonies on agar plates and subsequent sub-culturing into the BG-11 Media. The pure cultures were initially identified by observing them under the microscope. The isolated strains were cultivated in 500 ml Erlenmeyer flasks set on

an algal culture rack in the Algal Biorefinery Lab. Isolated microalgal strains were inoculated into growth media (BG-11). The culture condition was maintained as follows: Temperature ($25^{\circ}\text{C} \pm 2^{\circ}\text{C}$), pH (7.00 – 8.00), and light intensity (7500 – 8000 Lux). The growth study of lab-scale cultures was assessed by monitoring optical density (OD) at 680 nm, followed by estimating the dry cell weight (DCW (g/L)). To enhance the growth, pH was maintained between 7-8 by periodic supply of pure CO_2 over the period of 15 days. The screening of the strains was done on the basis of their nutrient removal efficiency and biomass concentration. All the isolated strains and their consortium were cultivated in an upscaled volume of 1.5 L in a tubular photobioreactor under the controlled environment of Temperature ($25^{\circ}\text{C} \pm 2^{\circ}\text{C}$), pH (7.00 – 8.00), and light intensity (7500 – 8000 Lux).

Algal consortium of isolated strains was cultivated in an open raceway pond of 2,000 L capacity and its growth curve was observed for a period of 9 days. Biomass productivity of 0.145 g/l/day was achieved. Further, the biomass was harvested following auto-sedimentation and then filtering the biomass through muslin cloth.



Inoculum preparation algal consortium cultivation in raceway pond

Cultivation of mixed culture in Open raceway pond



DAY1



DAY2



DAY4



DAY5



DAY8

Cultivation of isolated algal consortia in open pond system



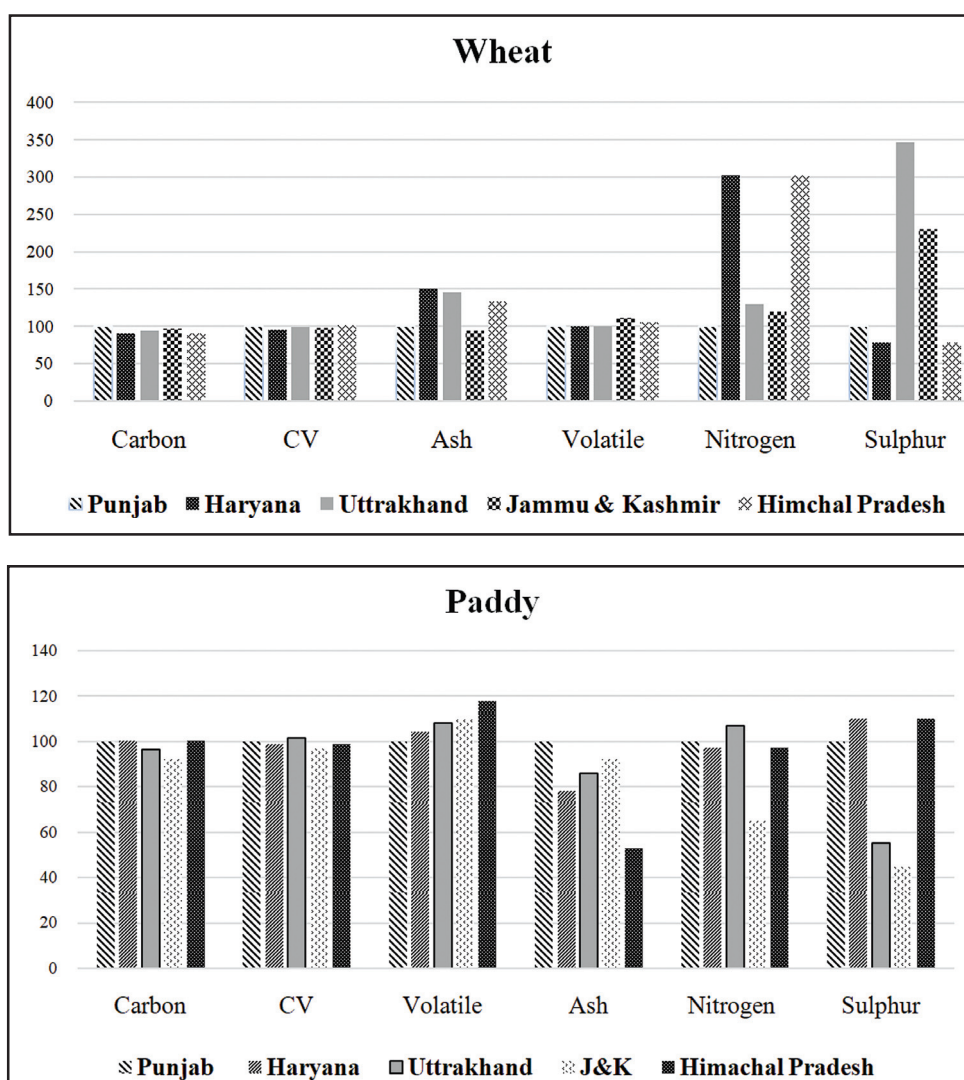
Algal biomass harvesting from the raceway pond and mixing of the harvested biomass

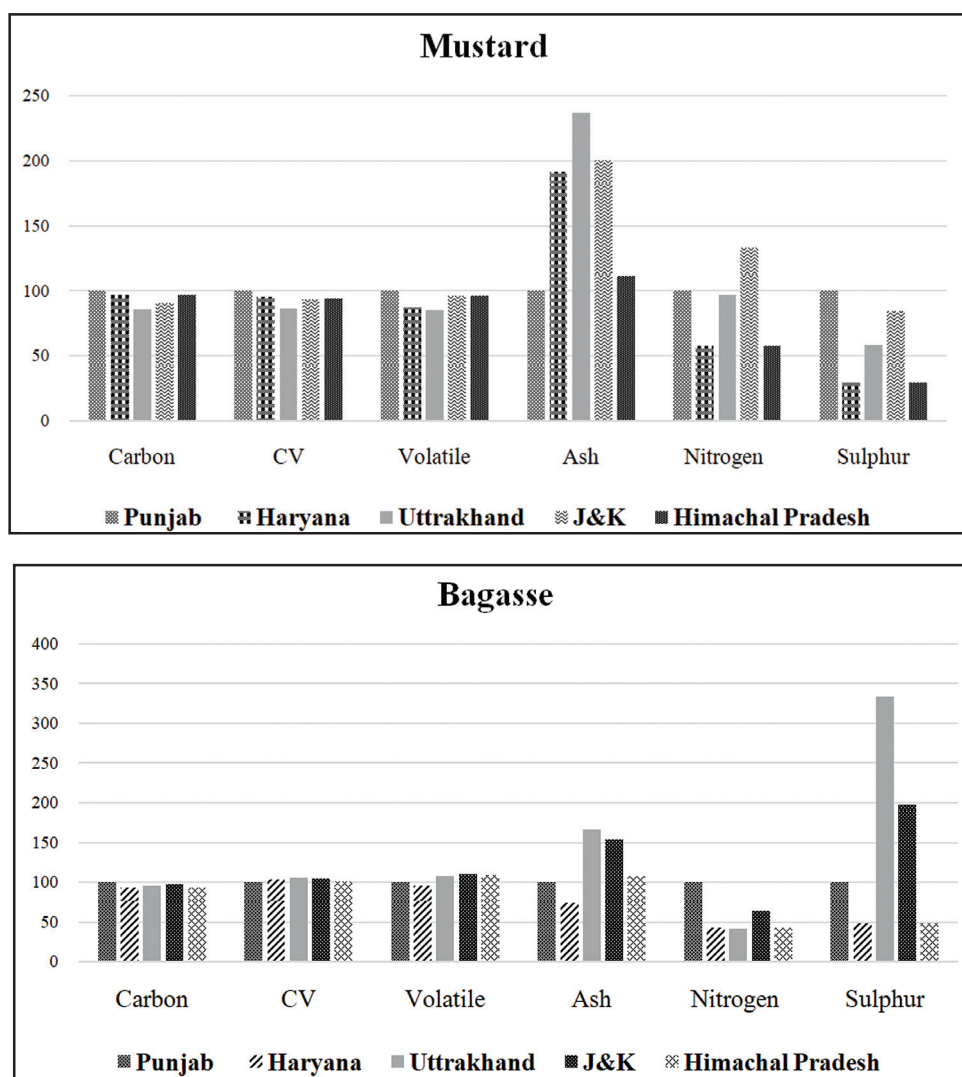
2. Exploration of Lignocellulolytic enzymes producing thermophiles from hot springs of Western Himalayan region for biorefinery applications

The project 'Exploration of Lignocellulolytic enzymes producing thermophiles from hot springs of Western Himalayan region for biorefinery applications' is funded by DST under KIRAN scheme. A thermophilic lignocellulolytic gram positive bacterium *Bacillus licheniformis* (NIBE – 23) has been screened out of all the isolates from Western Himalayan Region for its potential with the highest cellulolytic enzyme activity. The project has been bound up in Oct 2024.

3. Complete Heating and Emission Analysis of Raw Biomass and Pellets during Combustion (NMB-3 of SG-1)

The ongoing project titled "**Complete Heating and Emission Analysis of Raw Biomass and Pellets during Combustion**" (NMB-3 of SG-1), funded by the Central Power Research Institute (CPRI), aims to explore the thermal and emission performance of biomass feedstocks and coal blends for potential energy applications. The study covers a wide range of activities including biomass and coal sample collection, compositional characterization, pellet preparation, combustion testing, and heating value prediction.





Comparative analysis of biomass samples from different states

Biomass samples were collected from seven northern Indian states: Punjab, Haryana, Uttarakhand, Himachal Pradesh, Uttar Pradesh, Rajasthan and Jammu & Kashmir and characterized through proximate and ultimate analyses as per ASTM and DIN standards. These included determinations of moisture, ash, volatile matter, carbon, hydrogen, nitrogen, sulfur, oxygen, and gross calorific value. The results revealed significant inter-state variation in biomass quality due to climatic and soil differences. Findings showed significant regional variability in ash content, calorific value, and elemental composition due to differences in agro-climatic conditions. For instance, paddy biomass from Punjab had higher ash content compared to samples from Himachal Pradesh. Parallely, coal samples from multiple thermal power plants were analyzed, revealing that none met the ideal calorific value and ash standards, prompting a blending strategy using high-quality and low-quality coals. The optimal experimental blend was found to be 15% HQ and 85% LQ coal, achieving a calorific value of 14.64 MJ/kg with reduced ash content.



Biomass 10% Coal 90%



Biomass 20% Coal 80%



Biomass 40% Coal 60%



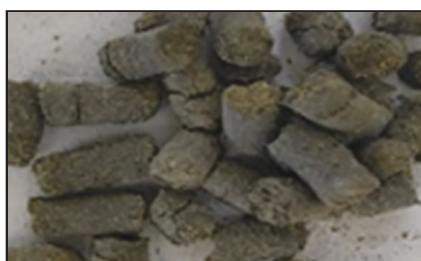
Biomass 50% Coal 50%



Biomass 60% Coal 40%



Biomass 70% Coal 30%



Biomass 80% Coal 20%



Biomass 90% Coal 10%



Biomass 100%

Different biomass and coal blend pellets

Composite pellets of biomass and coal were prepared with varying ratios (e.g., Paddy: Coal and Wheat: Coal in 90:10 to 10:90 ratios) and tested in a forced draft pellet-based cookstove for performance evaluation. The range from 50:50 to 70:30 paddy-coal blends emerged as a highly promising combinations with the highest thermal efficiency, while wheat-coal blends showed consistently stable burning rates and energy output across a wide range of compositions. These results have helped identify optimal blending strategies for improved combustion characteristics in low-emission energy systems. The optimal blend range identified for co-combustion in thermal power plants is 50:50 to 70:30 (Biomass:Coal) without Cow Dung as a binder. These blends demonstrate a significant reduction in harmful emissions, including SO_x , NO_x , CO , and $\text{PM}_{2.5}$, while maintaining moderate to high CO_2 output, indicating efficient combustion. Additionally, they offer mechanical stability and avoid the emission-related drawbacks introduced by cow dung, such as elevated CO and particulate matter. Furthermore, the blends in this range exhibit favorable burning rates and thermal efficiencies, making them suitable for practical application. Their overall performance aligns well with the requirements for partial biomass substitution in existing coal-fired boilers, as promoted under India's clean energy initiatives, including NTPC's co-firing program and the SAMARTH Mission. These blends thus represent a technically and environmentally viable option for cleaner thermal energy generation.

The insights gained from this objective are instrumental in guiding biomass co-firing strategies in thermal power plants under the SAMARTH mission, supporting India's clean energy transition goals. With the successful accomplishment of all four objectives, the project stands completed, delivering impactful outcomes for renewable energy and air quality management.

4. Dissemination of Improved Cookstoves Among SC Community of Punjab

A project has been sanctioned by PSCST during the year 2024-2025 for dissemination of improved cookstoves among SC community of Punjab in order to uplift the livelihood of people residing in rural areas. Site selection survey is carried out in two villages of district Jalandhar namely Fateh Jalal and Khaira Majha. Both sites have been taken into consideration due to their vicinity to SSS-NIBE that will facilitate the field testing of cookstoves being disseminated in the present project. Meetings were held between team from SSS-NIBE and Sarpanch along-with the other members of Gram Panchayat Fateh Jalal and Khaira Majha. Approximately 70 – 80% of the total population of Fateh Jalal belongs to SC community. During the meeting, a list of households (belonging to SC community) frequently using traditional cookstoves was sought from Gram Panchayat of each village. A total of 10 households are selected from each village depending on the frequency of utilizing traditional cookstoves.

Thermochemical Conversion Division at SSS-NIBE organized a cookstove dissemination program among SC community of Punjab with the support of Punjab State Council for Science and Technology on March 19, 2025. A total of twenty households were selected from two villages of district Jalandhar—Fateh Jalal and Khaira Majha—as part of this cookstove dissemination project. The dissemination of the improved cookstoves took place at SSS-NIBE, where the beneficiaries were accompanied by the Sarpanch of both villages. As part of this dissemination project, demonstration was organized at the institute to aware the beneficiaries of this project about the proper operation for efficient utilization of improved cookstoves. Further, the field performance of cookstoves will be monitored by SSS-NIBE.



Cookstove dissemination and demonstration activity

Impact Analysis through Improved Cookstove Dissemination

Impact analysis of various performance parameters such thermal efficiency, fuelwood saving, time saving, emission reduction potential, particulate matter & Indoor air quality and safety were carried out before and after the dissemination of Improved biomass cookstoves.

The use of household stoves plays a pivotal role in energy consumption and indoor air quality, particularly in rural and semi-urban communities. Traditional stoves, while widely used due to their low upfront cost and simplicity, are typically inefficient and produce harmful emissions. In contrast, improved cookstoves are designed to enhance fuel efficiency, reduce pollutant emissions, and mitigate environmental and health impacts. This report presents a comprehensive comparison between traditional cookstove generally used in the rural households and improved cookstove disseminated under this project. The comparison is based on key performance indicators such as thermal efficiency, carbon monoxide (CO) emissions, particulate matter (PM_{2.5}) emission, carbon dioxide (CO₂) emissions, and annual fuel usage per household as can be seen in table below.



Operational activity of Improved cookstoves in the field/rural household

Comparison of traditional cookstove with improved cookstove disseminated under the project

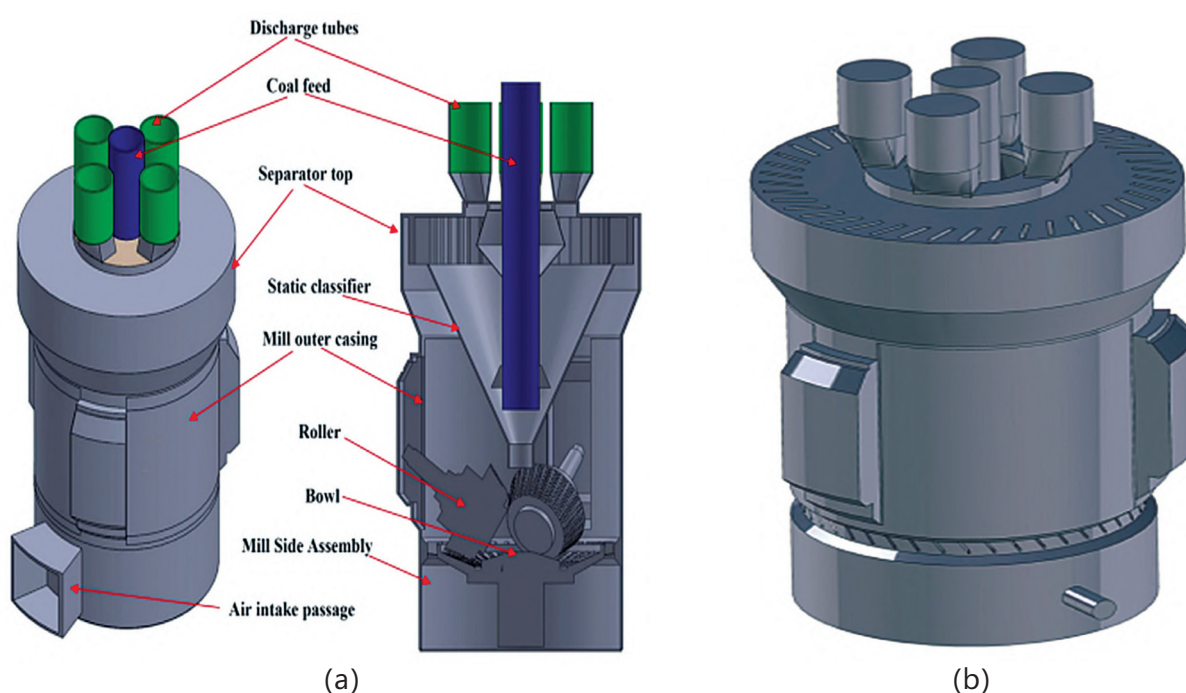
S No.	Parameter	Traditional Stove	Improved Stove
1.	Thermal Efficiency (%)	16.8	35.15
2.	CO emission (kg per household/year)	79.43	16.65
3.	PM _{2.5} emission (kg per household/year)	3.23	0.95
4.	Annual fuel consumption (kg per household)	1393.52	666.03

5. To Optimize Coal and Agro-Wastes Mixing and Feeding for Co-Milling for Thermal Power Plants with Minimum Changes to Installed Systems and Operations

During the year 2024-2025, a project has been sanctioned by Department of Science and Technology to Optimize Coal and Agro-Wastes Mixing and Feeding for Co-Milling for Thermal Power Plants with Minimum Changes to Installed Systems and Operations. The major objectives of this projects are given below:

- To collect co-milling performance and operational data from power plants and appropriate agencies (such as NTPC Dadri and other power plants, NETRA etc.)
- To develop a simulation facility inclusive of high powdered work station and DEM-CFD coupling.
- To collect and characterize coal and biomass samples from different power stations across India.
- To calibrate DEM model (using input data from power plant) and to carryout DEM simulation for different coal-agro-waste.
- To carryout CFD-DEM coupled simulation for different coal-biomass combination against air flow segregation in a mill and to predict the optimum design/process parameters.

To achieve these above objectives, HGI tester and Workstation have been procured. In the numerical analysis, the structural model of bowl mill is developed in Solidworks. After developing the structural model, the fluid domain within bowl mill is developed. However, the size of fluid domain is very large that increase the computational time. Thus, only 120 deg. Portion of fluid domain of bowl mill is considered for the numerical analysis for obtaining the analysis results within less time. Currently, the CFD analysis is on-going based on the plant operating parameters. In addition, experimental characterization of several coal and biomass is done with multiple tests such as ultimate, proximate, bomb calorimeter and HGI. These results are required for the numerical analysis.



a) Structural model of bowl mill with section view & b) Fluid domain of bowl mill

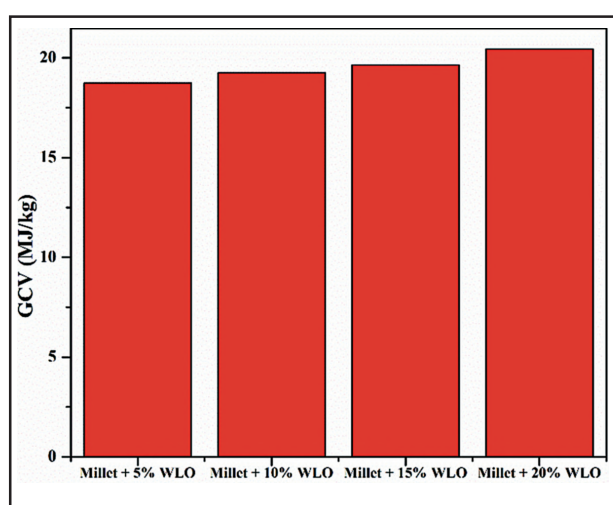
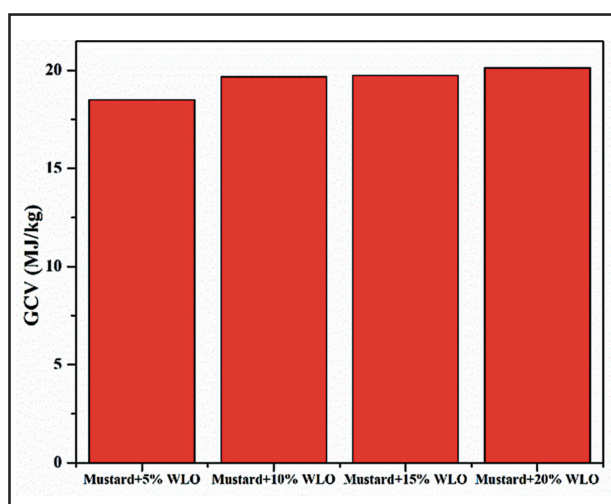
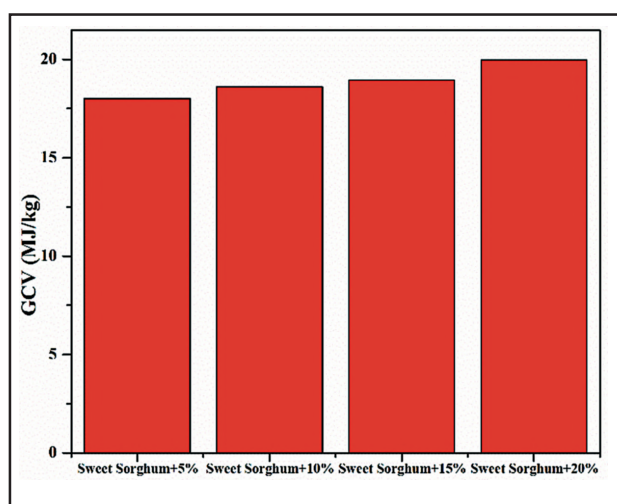
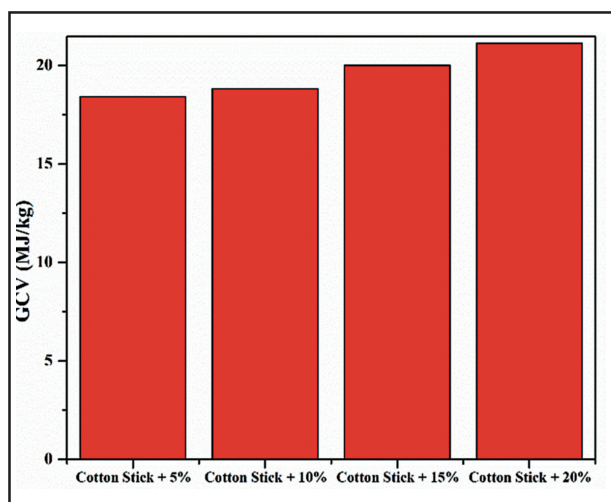
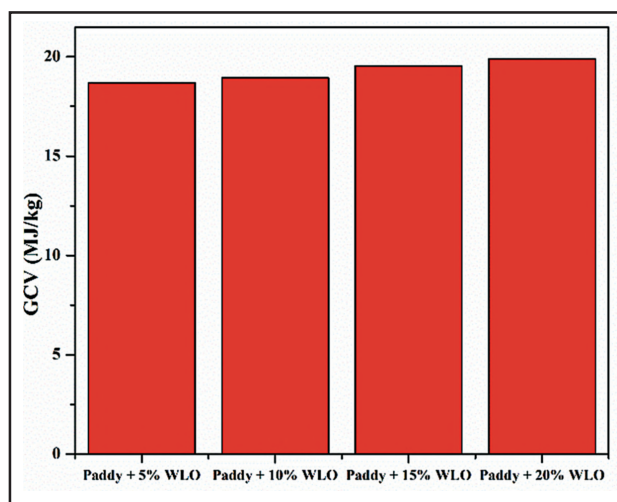
6. Project No. 223/2/2019-Waste To Energy-Part (2): Densification of agro-waste and assessment for its application in the gasifier

From the last report submission, in the year 2024-2025 significant work has been done for completion of the objectives of the project entitled 'Densification of agro-waste and assessment for its application in gasifier'. During this period objectives of the project were taken up by procurement and installation of the instruments for the project work. An agro residue-based downdraft gasifier with gen set has been installed and demonstrated by M/S Enersol biopower, Jaipur. The electrical output of the downdraft gasifier is 8 kW. Aside from procurement of these instruments pelletization of six biomasses (paddy straw, corn stover, sweet sorghum, millet, cotton stick, and mustard crop residue) in this project had been undergoing with three different organic binders (waste lubricant oil, oil cake and press mud). Methodology for doing the techno-economic analysis is finalized and will be done with actual data from experimentation. Aside from these few experimental studies were done on 8 kW downdraft gasifier with commercially available pellets to check the proficiency of the gasifier on agro-residue pellets. The preliminary results from the same showed significance for use of agro-residue pellets in gasifier. The images for pellet machine, portable gas analyzer and 8 kW agro-residue based downdraft gasifier are given below:

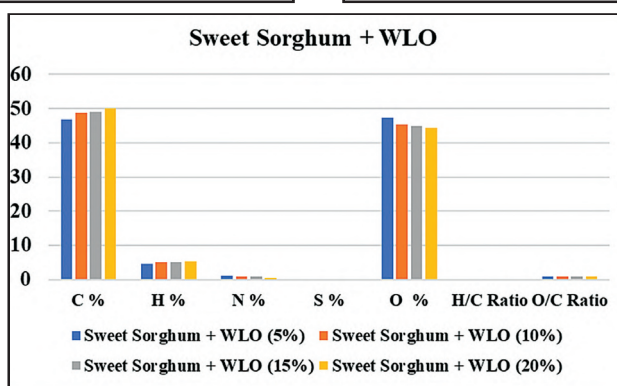
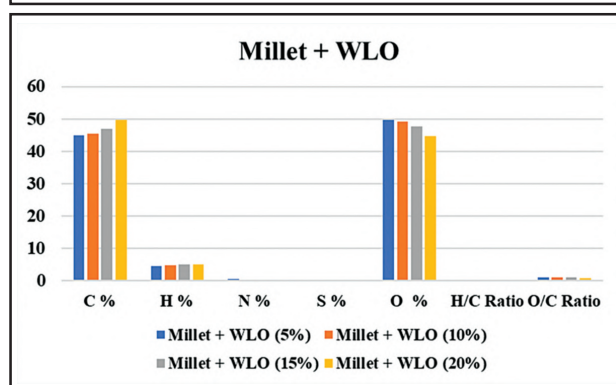
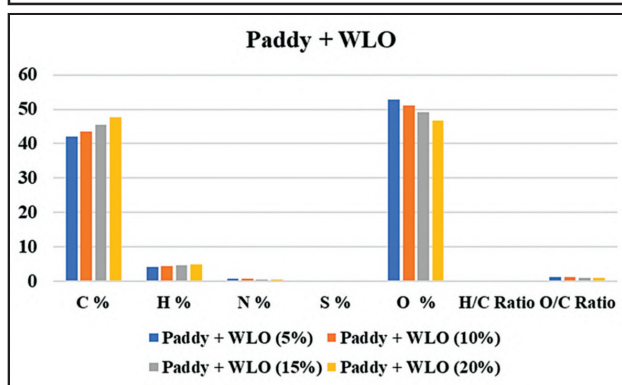
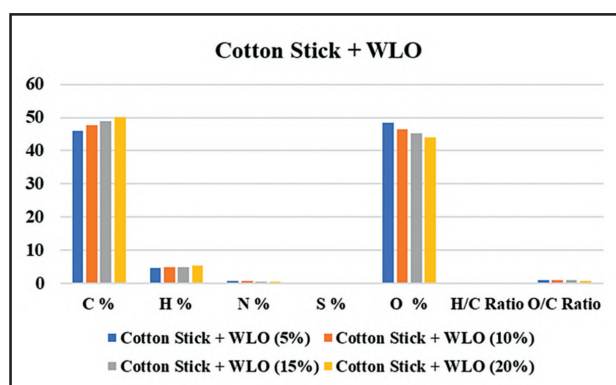
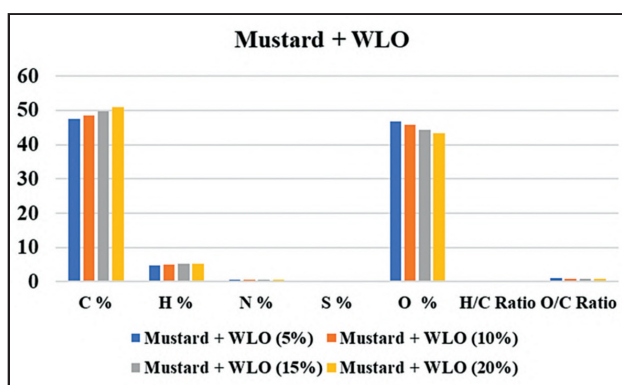


a) Biomass Pellet Machine; b) Portable Gas Analyzer; c) 10KVA downdraft agro-residue gasifier

Preliminary Characterization of the prepared pellets from Different agro-residue and Waste Lubricant oil (WLO) has been started the results for the same are provided below:



Gross Calorific Value of Different Agro residue pellets with WLO



Ultimate Analysis Values of Different Agro residue pellets with WLO

7. Complete Ash Analysis of Biomass Pellets and Co-Combusted Fuels

The study on the co-firing of biomass with coal in thermal power plants, with a focus on optimizing combustion efficiency and minimizing operational challenges. The study aimed to examine the chemical compositions of coal and various agro-residues, such as paddy straw, wheat straw, maize stalk, mustard straw, and bajra stalk, and evaluate how different blending ratios of biomass and coal affect boiler performance, emissions, and maintenance. Biomass co-firing is seen as a viable solution to reduce carbon emissions and enhance energy efficiency, but it also presents challenges like slagging, fouling, and corrosion, which can affect the long-term sustainability of power plants.

In this study, coal and agro-residues were blended at different ratios, ranging from 0% to 20% biomass. The chemical composition of the resulting blends was analyzed for key elements including chloride, sulphate, silica, sodium, and potassium. One of the main objectives was to assess how these elements impact the combustion process, ash fusion, and the risk of fouling or corrosion in boilers. The results revealed significant variations in the content of these elements across different biomass types. For instance, paddy straw had the lowest chloride content, making it less likely to

contribute to fouling, whereas bajra and maize stalks exhibited higher chloride levels, which could increase corrosion risks. Similarly, the study found that mustard straw and wheat straw contributed to higher sulphate and potassium content, leading to potential increases in sulphur dioxide emissions and ash fusion problems.

In terms of silica content, paddy straw and wheat straw were the major contributors, which could affect the ash fusion characteristics and pose challenges for ash handling systems. On the other hand, paddy straw's higher silica content might help control ash fusion, but it requires careful management to prevent operational issues in the boiler. Sodium content, which is associated with slagging and fouling, was notably high in bajra and mustard straw blends. These findings suggest that while biomass co-firing can contribute to sustainable power generation, careful consideration of biomass type and blending ratios is necessary to avoid operational disruptions.



Photograph of ion chromatograph used during analysis

The study also found that blending biomass with coal in varying proportions can optimize combustion processes, but each biomass type has its own distinct impact on emissions and boiler performance. For example, higher biomass blends led to increased sulphate and potassium content, which could result in more significant ash deposition and fouling. Conversely, lower blends of biomass reduced the likelihood of these issues but may not deliver the full environmental benefits. Therefore, power plants need to balance biomass type, blending ratio, and combustion conditions to optimize performance.

In conclusion, the study highlights the importance of carefully selecting biomass types and blending ratios for co-firing with coal in thermal power plants. By understanding the chemical composition of biomass and its effects on boiler performance, plant operators can mitigate risks such as fouling, slagging, and corrosion. The findings suggest that while biomass co-firing offers significant environmental benefits, ongoing monitoring and optimization are essential for ensuring long-term operational efficiency and sustainability. The study also calls for further research into the long-term effects of biomass co-firing to better understand its potential for reducing the carbon footprint and enhancing energy production.

ACADEMIC PROGRAM

The institute commenced an academic program, M. Tech (Renewable Energy), in collaboration with Dr. B. R. Ambedkar National Institute of Technology (NIT) Jalandhar in September 2020. This program includes a provision for the National Renewable Energy Fellowship for GATE-qualified students, which has been formally approved by MNRE. The first batch graduated in May 2022 and secured successful placements in both academia and industry. The program has been successfully continuing ever since as the renewable energy sector is growing and drawing widespread interest in young students.

Broad features of the program include:

- Coursework jointly delivered by Scientists from SSS-NIBE and Faculty of NIT Jalandhar
- Extensive coverage of topics such as renewable energy, bioenergy, biofuels, waste-to-energy, solar thermal, solar PV, wind, and hydro energy, with a range of relevant electives
- Option for students to undertake their final semester project at NIBE, NISE, NIWE, or in collaboration with industry
- Opportunities for internships in the renewable energy sector

In the current year 10 outgoing students have been awarded the M. Tech degree, and 07 new students have been enrolled in the program.

In addition to the M. Tech program, JRF/SRF at SSS NIBE also have the opportunity to pursue a Doctoral Research degree under the MoU with Indian Institute of Technology (IIT) Roorkee, NIT Jalandhar, and other reputed universities across India. Presently, 09 students have enrolled in the Ph.D. program at IIT Roorkee under this initiative.

The institute also provides a limited number of Post-Doctoral Fellowships for Ph.D. holders aiming to conduct advanced research in Bio-Energy, enhance their skill sets, and build their academic or research careers.

SKILL DEVELOPMENT AND OUTREACH

- i. Training/ Workshop program**
- ii. Collaboration**
- iii. Events**
- iv. Publications**



TRAININGS/WORKSHOPS PROGRAM

SSS NIBE is devoted to the promotion of bio-energy. With this aim, the institution organizes outreach programmes and events on many facets of bio-energy. In 2024-25, the institution organized a national training program and a workshop.

1. One day Workshop was conducted on 30th April, 2024 on the theme Idea, Research, Innovation, Intellectual Property Rights and Technology Transfer jointly supported by Punjab State Council for Science & Technology, Department of Science, Technology & Environment, Govt. of Punjab and Department of Science & Technology, Govt. of India. The workshop was inaugurated by Chief Guest Dr. G. Sridhar, Director General, SSS-NIBE. The workshop was aimed to help faculty, students, researchers, and startup enthusiasts understanding how to come up with ideas, conduct research, innovate, and protect their Intellectual Property Rights (IPR) and technology transfer. Moreover, the workshop delved into the translational research, highlighting its crucial function in bridging the gap between academia/research and industry.



2. Two days National Workshop was organized titled on "Specialized Hands-on-Training cum Workshop on Agro-Biomass Sampling and Characterization Techniques for Thermal Power Plant Applications" on July 04-05, 2024, for NTPC Officials. The event was inaugurated on 4th July, 2024 by Dr. G. Sridhar, Director General, SSS-NIBE, Chief Guest – Sh. Satish Upadhyay, Mission Director, SAMARTH Mission, Guest of Honour – Sh. V. Chandrasekharan, General Manager, NTPC.

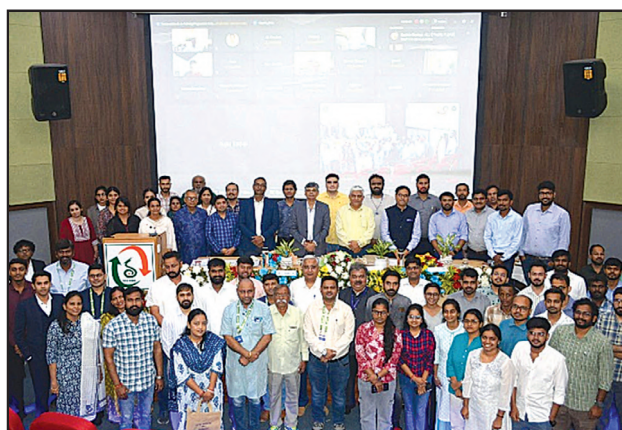




3. Two days Hands-on-Training program on “Leveraging Ansys Simulations for Bioenergy Applications” was conducted on July 15-16, 2024 at the Institute, for training of students and faculty members.
4. SSS-NIBE organized one-day National Seminar on “Biomass Supply Chain Management: Challenges, Opportunities and Developments” on 5th September, 2024 at MGSIPA Complex, Chandigarh. The event was inaugurated by Dr. G. Sridhar, Director General, SSS-NIBE, Chief Guest- Sh. Satish Upadhyay, Mission Director, SAMARTH, MoP, GoI; Guest of Honour- Er. Pritpal Singh Executive Director, PSCST and Sh. Anirudh Tewari (IAS), Director General, MGSIPA. The seminar brought together Government Officials, Industry Representative, Entrepreneurs, Policy makers and Researchers to share insights, experiences, and best practices in biomass supply chain management.



5. Five days National Hands-on Training Programme was jointly organized with Indian Biogas Association (IBA) on Biogas Technology and its Implementation from 21st – 25th October, 2024. The event was inaugurated by Dr. G. Sridhar, Director General, SSS-NIBE, Chief Guest – Sh. Adarsh Pal Vig, Chairman, Punjab Pollution Control Board, Sh. Gaurav Kedia, Chairman Indian Biogas Association, and Dr. Sachin Kumar, Scientist-C and Coordinator of the program, SSS-NIBE.



6. One day workshop was carried out for Rajbhasha, in compliance with the Official Language rules, a workshop was organized in the Institute on 26.11.2024 in the Dr. A.P.J. Abdul Kalam Auditorium, SSS-NIBE. Mr. Manoj Bhat, Deputy Director, Official Language, Lok Sabha delivered a talk on Rajbhasha Acts, Noting and Drafting, etc.

COLLABORATION

During the year 2024-25, SSS-NIBE signed MoU's with various institutions to facilitate collaborative research and exchange of students for academic work. The MoU's signed are:

1. MoU between SSS-NIBE and Organic Recycling System Limited (ORS) was signed on 8th April, 2024 to collaborate on sustainable technology development. SSS-NIBE and ORS joins hands to propel Napier Grass Based Anaerobic Digestion Process for Biogas Generation. Strategic partnership aims to maximize biogas potential of Napier Grass Advancing India's Renewable Energy Agenda.



2. NDA between SSS-NIBE and Bansco Energies LLP, Hisar has been signed on 30th April, 2024 to develop 30m³ biodigester for Napier grass to biogas on indigenous developed technology.
3. MoU between SSS-NIBE and MNRE: for Financial Year 2024-25 was signed between Secretary, MNRE and DG, SSS-NIBE.
4. MoU was signed between SSS-NIBE and CPWD on 11.12.2024.
5. MoU was signed with Energreen Technologies LLP, Chennai on 14.01.2025 for collaboration on the development of Bio-CNG plants across the country.
6. Mou with PSCST: In a significant step towards promoting sustainable energy solutions and fostering scientific collaboration, Sardar Swaran Singh National Institute of Bio-Energy (SSS-NIBE), Kapurthala, signed a Memorandum of Understanding (MoU) with Punjab State Council for Science & Technology (PSCST), Chandigarh. The MoU signing ceremony took place on 23.04.2025 at the premises of SSS-NIBE, Kapurthala.



7. MoU with PAU: SSS-NIBE, Kapurthala and PAU, Ludhiana have signed a MoU on 17.03.2025 at PAU, Ludhiana for collaboration on Bio-Energy Research, Academic programs and capacity building. This partnership aims to promote sustainable utilization of agricultural residue for energy production and soil nutrient amendment.

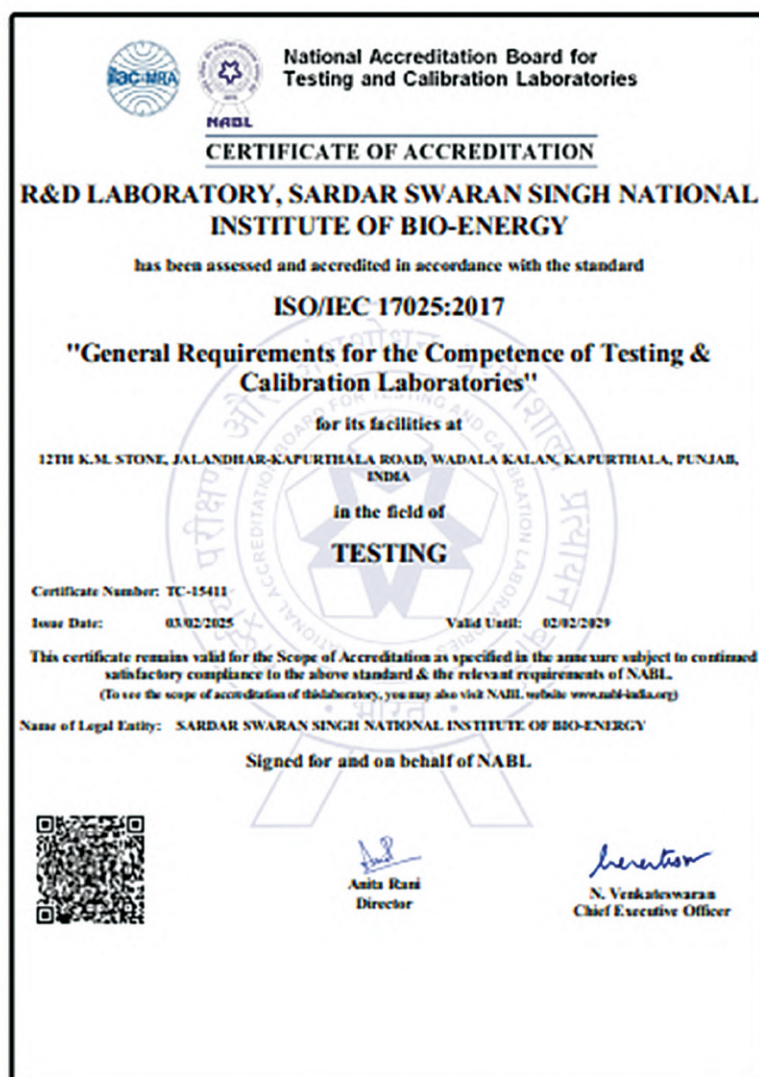


8. A tri-party Non-Disclosure Agreement (NDA) was signed among three parties, namely SSS-NIBE, Kapurthala; DCM Shriram Limited, New Delhi and Chem Process Systems Pvt. Ltd. Ahmedabad on 25.03.2025. DCM Shriram Ltd. and Chem Process Systems Pvt. Ltd. visited the Institute during March 24-25, 2025 for demonstrate 2G ethanol technology developed at SSS-NIBE.

EVENTS / ACHIEVEMENTS

1. NABL Accreditation

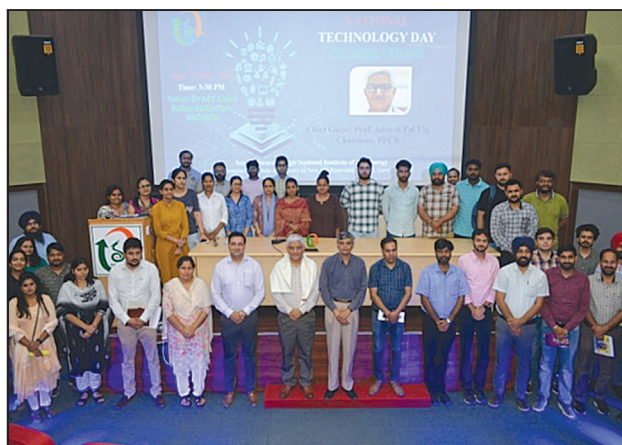
In a significant stride towards quality assurance and standardization, three characterization techniques (solid biofuels: bomb calorimeter and CHN analyzer and Gaseous biofuels: Biogas/BioCNG), received the NABL (National Accreditation Board for Testing and Calibration Laboratories) accreditation in January 2025. This accreditation validates the precision, reliability, and competence of our laboratory practices. This achievement marks a key milestone in ensuring that our laboratory continues to maintain excellence in testing and research infrastructure.



2. National Technology Day

National Technology Day was celebrated on 09th May 2024 to commemorate the successful conduct of India's nuclear tests in Pokhran on May 11, 1998, a significant milestone in the country's history.

In this regard, institute celebrated the National Technology Day on 09th May, 2024. During the event, a keynote Lecture was delivered by Chief Guest Prof. Adarsh Pal Vig, Chairman, Punjab Pollution Control Board (PPCB)



3. International Yoga Day:

SSS-NIBE celebrated International Yoga Day, 2024 on 21st June at 11:30 A.M. with the theme "Yoga for Wellness". On this occasion, Institute organized special 30 minutes yoga session to promote health and wellness.



4. 78th Independence Day Celebration

The 78th Independence Day was celebrated on 15th August, 2024 with enthusiasm in the institute. On this occasion, the Director General of the Institute hoisted the National flag. The flag hoisting was followed by tree plantation by DG NIBE. A brief cultural program was organized by researchers, staff and their families.



5. Tree Plantation

Under the #EKPEDMAAKE Naam Campaign, there was tree plantation on 27.09.2024 by Director General, SSS-NIBE, Dr. Sangita Kasure, Adviser, MNRE and Sh. Sanjay Shahi, Scientist-E in the premises of SSS-NIBE.

6. Swachta Divas

Swachta Divas was celebrated at Institute from 27.09.2024 to 01.10.2024 with greates enthusiasm and active participation from staff and research fellows. The event was organized in the compliance with the national Swachh Bharat Abhiyan initiative, emphasizing the importance of cleanliness, hygiene and sanitation. Various activities were conducted throughout the week like Swachhta Campaign, SwachhataSamvad, Slogan writing competition and Swachh Bharat Oath.



7. Hindi Pakhwada

On the occasion of Hindi Fortnight, various competitions were organized in the institute. Hindi essay competition, quiz competition and debate competition are prominent among the competitions. Employees of the institute participated in large numbers in all these competitions. On this occasion, Institute also organized Hindi Kavi Samellan on 17.09.2024 in which poet Mr. Rajesh Chetan and Dr. Rasik Gupta, who have given their presentations on several national and international platforms, were invited.



8. Vigilance Awareness Week

SSS NIBE observed "Vigilance Awareness Week-2024" (VAW) from 28.10.2024 to 03.11.2024. During this, all officers, staff, research scholars and other participated in the "Integrity Pledge" on 28.10.2024, and Quiz, Debate completion was held on 29.10.2024 at Dr. A.P.J. Abdul Kalam Auditorium, SSS-NIBE.



9. Deepawali Celebration

The Deepawali festival was celebrated on 30.10.2024 with great enthusiasm. The event included decoration, lighting of diyas and distribution of sweets among staff and research scholars.

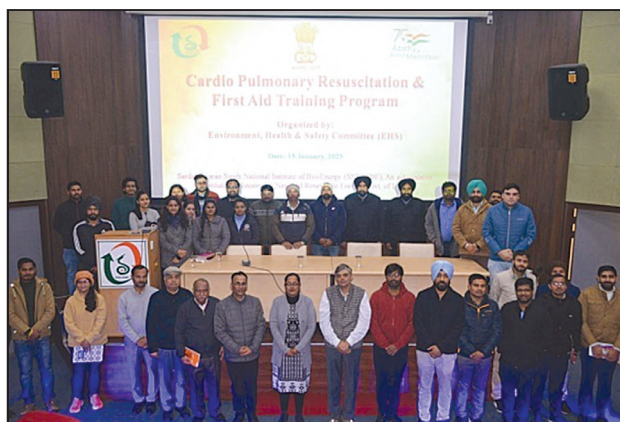
10. Constitution Day Celebration

The institute celebrated the Constitution Day on 26.11.2024 in Dr. A.P.J. Abdul Kalam Auditorium, SSS-NIBE. During the event a pledge ceremony was organized.



11. CPR and First Aid Training

(CPR) Cardiopulmonary Resuscitation and Basic First Aid Training session was conducted for all students and staff members by a doctor from Civil Hospital, Kapurthala on 15.01.2025. the session aimed to equip students and all staff members with life-saving skills and knowledge of emergency response techniques.



12. Republic Day Celebration

The 76th Republic Day was celebrated on 26th January, 2025 with enthusiasm in the institute. On this occasion, the Director General of the Institute hoisted the flag. The flag hoisting was followed by tree plantation from DG NIBE. A brief cultural program was conducted by researchers, staff and their families.



13. Meetings

a. 39th GC Meeting

39th Governing Council meeting was held on 29th May, 2024 at MNRE, New Delhi under the Chairmanship of Secretary, MNRE.

b. 9th Building Works Committee Meeting

9th Building Works Committee meeting was successfully conducted at SSS NIBE on 26th July, 2024 via hybrid mode.

c. 25th Finance Committee Meeting

The 25th Finance Committee Meeting was held on 21.08.2024 at MNRE, New Delhivia hybrid mode.

d. 2nd RAC Meeting

2nd Research Advisory Committee (RAC) meeting was held on 28/08/2024 at 10:00 A.M. at SSS-NIBE via hybrid mode under the Chairmanship of Dr. G. Sridhar, Director General, SSS-NIBE. The meeting was attended by committee members from India and Overseas.

e. 40th Governing Council Meeting and 6th AGM meeting

The 40th Governing Council and 6th AGM meeting was held under the Chairmanship of Secretary, MNRE on 26.09.2024 at 12:30 P.M. in the Committee Meeting Room, SSS-NIBE via hybrid mode.

f. 26th Finance Committee Meeting

26th Finance Committee Meeting was held at MNRE, New Delhi on 12.03.2025 via hybrid mode.

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- Gajera, Bhautik, Arghya Datta, Anil Kumar Sarma, and Mithilesh Kumar Jha. "Technical feasibility of estimation and extraction of pure nano-scale silica from mixed biomass ash." *Journal of Sol-Gel Science and Technology* (2025): 1-17.
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ENGAGEMENT WITH MNRE

- **Activities**
- **Central Nodal Agency**



ACTIVITIES

- Management of Biogas scheme of MNRE as Central Nodal Agency (total funds assigned Rs 57.86 crore in F.Y. 24-25)
- Inspection/verification of Biogas/CBG, waste to energy, briquetting/pellet/cogen plants by SSS NIBE scientists for release of CFA under National Bioenergy Programme.
- Member of the Scheme Review Committee (SRC) for evaluation of the implementation of sub component of the NBP Phase-I of MNRE
- Project Appraisal Committee member for Waste to Energy Programme implemented by IREDA under the umbrella scheme of National Bioenergy Programme
- Project Appraisal Committee member for evaluating and recommending Central Financial Assistance proposals received under Biomass Programme
- Participated in several events (exhibitions, workshops etc.) for promotion bioenergy in the country.
- Participated as expert in multiple meetings on the CBG plant related agitation and Evaluation of Impact of CBG plants in the State of Punjab
- Providing expert inputs to Biomass Program division, MNRE on specific technical queries including Parliamentary queries.

CENTRAL NODAL AGENCY

SSS-NIBE has been designated as a **Central Nodal Agency (CNA)** by **MNRE** since 2022 for effective implementation and fund management of various Bio Energy Programs.

Fund Management and Disbursement: During the financial year 2024-25, MNRE released a total of ₹ **57.86 crore** to SSS-NIBE through 78 sanction orders issued from time to time. These funds were successfully and promptly assigned to the concerned Program Implementing Agencies (PIAs) in strict accordance with the MNRE sanction orders. In addition, during the year, SSS-NIBE (CNA) earned ₹ 5.67 lakh as interest on above fund, which was duly transferred to Bharat Kosh in accordance with MNRE guidelines and financial norms. All fund management activities were carried out in a timely, transparent, and compliant manner, maintaining full accountability.

Monitoring and Coordination: SSS-NIBE ensured seamless coordination with all PIAs and continuously monitored the fund utilization and project progress. The Institute maintained transparent records and reporting mechanisms in line with the requirements of MNRE.

Grievance Redressal Mechanism: All grievances and operational issues raised by the PIAs were duly addressed by SSS-NIBE through effective communication and timely resolution. The Institute served as an efficient liaison between MNRE and the PIAs, ensuring smooth implementation of the projects.

Audit and Compliance: No audit objections have been reported regarding SSS-NIBE's role as CNA. All financial activities were undertaken in a transparent and compliant manner, adhering to MNRE guidelines.

Operational Highlights: SSS-NIBE did not face any significant difficulties in executing its CNA responsibilities during the year. The overall functioning remained efficient, responsive, and result-oriented, contributing significantly to the successful implementation of MNRE schemes at the ground level.

SUPPORT SERVICES

- **Finance & Administration**
- **Civil & Electrical**
- **Horticulture**
- **Hindi Division**



FINANCE & ADMINISTRATION

Serving as the artery connecting the scientific divisions of the institute, the activities of Finance & Administrative divisions are briefed as under:

- Budget & revised estimates for grant-in-aid, allocation & re-appropriation of funds, expenditure management & budget control, project financial management.
- Statutory compliances on GST and income tax etc., dealing with audits, drawing up balance sheet, laying of audited accounts on the table of Parliament.
- Framing of rules, schemes and grievance redressal, management of outsourcing agency, legal issues, court cases & RTI, recruitment, hiring of research staff and promotions.
- Statutory compliances on EPF, societies registration, bills of establishment, facility management, activities related to the official language, maintenance of vehicle, security, horticulture activities, and housekeeping.
- Store & purchase, procurement of goods and services, GEM, contracts etc.
- Serving as the Central Nodal Agency for biogas implementation program of MNRE.

CIVIL & ELECTRICAL

The Civil & Electrical Division of the National Institute of Bio-Energy (NIBE) is responsible for the planning, development, operation, and maintenance of all civil and electrical infrastructures within the campus. The Division plays a vital role in supporting the Institute's research and administrative functions by ensuring a safe, functional, and sustainable working environment.

This report outlines the key activities, projects, and achievements of the Civil and Electrical Division for the financial year 2024–2025.

Key Responsibilities

Construction and maintenance of buildings and associated civil infrastructure. Planning and execution of renovation and repair works. Design, installation, and maintenance of electrical systems and energy infrastructure. Coordination with CPWD/PWD and other external agencies for major civil and electrical projects. Implementation of green and sustainable infrastructure practices in line with MNRE goals.

Major Works Undertaken (2024–2025)

Civil Division

Boundary Wall Renovation: processed proposal for repair and raising of the front boundary wall to enhance security and appearance.

Processed proposal for up-gradation of Internal Roads and Drainage: Resurfacing and drainage improvements were carried out to mitigate water logging and ensure smooth campus mobility.

Guest House Renovation: Interior renovation and external repainting completed for the Institute's guest house, enhancing facilities for visiting scientists and guests.

Preparation of Master Plan: Participated in stakeholder meetings and surveys for finalizing the scope of work for the Institute's Master Plan in collaboration with IIT Roorkee and designated consultants.

Electrical Division

Campus Illumination: Installed new LED lighting in academic blocks, roads, and residential areas to enhance energy efficiency and visibility.

Substation Overhaul: Periodic maintenance and servicing of electrical transformers and HT/LT panels were carried out to ensure uninterrupted power supply.

Solar Power Integration: Facilitated feasibility assessment for integration of additional rooftop solar systems in line with MNRE's green energy goals.

DG Set Servicing and AMC: Comprehensive annual maintenance contracts (AMC) for DG sets were executed, ensuring backup power readiness.

Maintenance and Routine Activities

Regular upkeep of internal and external plumbing, sanitation, roadways, and electrical fittings. Daily inspection and fault rectification of electrical systems, including lighting, fans, air conditioners, and elevators. Housekeeping supervision in coordination with the administration for cleanliness and hygiene of the premises.

The Civil and Electrical Division remains committed to maintaining a safe, efficient, and sustainable infrastructure that supports the Institute's mission of research and innovation in bio-energy. The Division acknowledges the support of the DirectorGeneral, faculty members, and administrative staff in achieving the annual targets.



HORTICULTURE DIVISION

During the reporting year, the Horticulture division undertook a wide range of initiatives to promote horticulture activities inside the campus. Key activities included the expansion of area under fruit trees and preparation of inventory of trees in the campus. In short, horticulture division is working towards making campus look greener, cleaner and flawless with a well-maintained outdoor landscape to enhance the aesthetic face to institution. Horticulture division is also involved with R&D's in collaborative projects like Napier plantation reinforcing the SSS-NIBE's commitment to sustainable biomass resource development. Currently, 12 gardeners and 01 tractor-operator-cum-mechanic are taking care of the horticulture development and maintenance of campus spread over 75 acres.



Specific objectives of Horticulture Division:

- Growing local tree varieties so as to create a sustainable and thriving environment for animal and bird species within research settings.
- Supporting energy plantation to provide biomass for ongoing research activities in the field of bio-energy.

HINDI DIVISION

एसएसएस-नाईब में वित्तीय वर्ष (2024-2025)

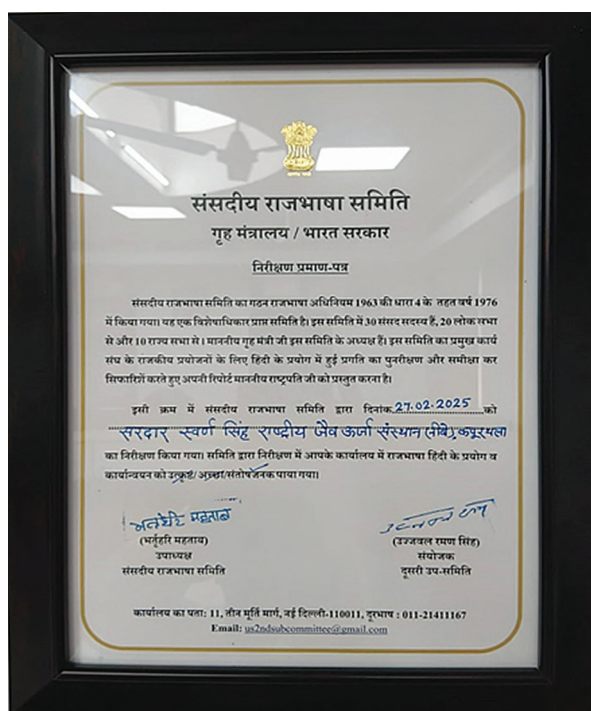
एसएसएस-नाईब में वित्तीय वर्ष 2024-2025 के दौरान राजभाषा हिंदी से संबंधित समस्त कार्य राजभाषा प्रभाग द्वारा सफलतापूर्वक संपन्न किए गए। संस्थान में राजभाषा कार्यान्वयन समिति की बैठकें तथा हिंदी कार्यशालाएँ प्रत्येक तिमाही में नियमित रूप से आयोजित की गईं। जिसमें संस्थान के सभी अधिकारियों/कर्मचारियों ने सक्रिय रूप से भाग लिया। इन कार्यशालाओं के माध्यम से संस्थान में

कार्यालयीन कार्यों में हिंदी के प्रयोग को बढ़ावा मिला। नवीन एवं नवीकरणीय ऊर्जा मंत्रालय के हिंदी अनुभाग द्वारा निर्धारित दिशानिर्देशों के अनुरूप संस्थानमें हिंदी पखवाड़ा आयोजित किया गया। इस अवधि में राजभाषा हिंदी के प्रति जागरूकता बढ़ाने और उसके प्रचार-प्रसार हेतु। कविता पाठ, संगोष्ठी, प्रश्नोत्तरी, निबंध लेखन, वाद-विवाद आदि प्रतियोगिताओं का सफल आयोजन किया गया। इन प्रतियोगिताओं में संस्थान के समस्त अधिकारियों एवं कर्मचारियों ने उत्साहपूर्वक भाग लिया। कवि सम्मेलन का शुभारंभ माननीय विशिष्ट अतिथि द्वारा माँ सरस्वती की प्रतिमा के समक्ष दीप प्रज्वलित कर किया गया। इस अवसर पर राष्ट्रीय और अंतर्राष्ट्रीय ख्याति प्राप्त कवि श्री राजेश चेतन एवं डॉ. रसिक गुप्ता ने अपनी हास्य कविताओं से श्रोताओं को मंत्रमुग्ध कर दिया। सभागार में उपस्थित दर्शकों ने करतल ध्वनि से कवियों की सराहना की और उत्साहवर्धन किया।



संसदीय राजभाषा समिति की दूसरी उपसमिति द्वारा संस्थान का निरीक्षण

संसदीय राजभाषा समिति की दूसरी उपसमिति द्वारा संस्थान का निरीक्षण संसदीय राजभाषा समिति की दूसरी उपसमिति ने 27 फरवरी 2025 को चंडीगढ़ के होटल हयात में संस्थान का राजभाषायी निरीक्षण किया। समिति द्वारा किए गए निरीक्षण में एसएसएस-एनआईबीई में राजभाषा हिंदी का प्रयोग एवं कार्यान्वयन संतोषजनक पाया गया। समीक्षा के पश्चात एमएनआरई राजभाषा अधिकारियों ने 28 फरवरी, 2025 को हिंदी कार्य की समीक्षा के संबंध में संस्थान का दौरा किया।



SSS-NIBE'STEAM

Director General Office

Dr. G. Sridhar	DG NIBE
Mr. Hitesh Sharma	PA to DG, NIBE
Ms. Purnima Verma	Multi-Tasking Staff

Chemical & Electro Chemical Conversion Divisions

Dr. Anil K Sarma	Scientist – E
Dr. Rawel Singh	Scientist – D
Dr. A. Senthil Nagappan	Scientist – D
Dr. Sandeep Kumar	Scientist – B
Mr. Vijay Bajala	Technical Assistant
Dr. Arghya Datta	Research Associate
Dr. Amlan Das	Post-Doctoral Fellow
Dr. Bijoy Biswas	Post-Doctoral Fellow
Dr. Kapil Mamtani	Post-Doctoral Fellow
Dr. Dig Vijay Singh	Post-Doctoral Fellow
Dr. Rifat Azam	Post-Doctoral Fellow
Dr. B. Raghavendra Babu	Post-Doctoral Fellow
Mr. Akash Deep Singh	Senior Research Fellow
Mr. BhautikGajera	Senior Research Fellow
Mr. Amit Dobhal	Junior Research Fellow
Ms. Shiloo Raj	Junior Research Fellow
Ms. Mridusmita Dutta	Junior Research Fellow
Mr. Pulkit Khullar	Junior Research Fellow
Ms. Komal Preet Kaur	Junior Research Fellow
Mr. Amrik Lal	Multi-Tasking Staff

Biochemical Conversion Division

Dr. Sachin Kumar	Scientist – C
Dr. Sanjeev Mishra	Scientist –D
Dr. Apurav Sharma	Post-Doctoral Fellow
Dr. Deepak Sharma	Post-Doctoral Fellow
Ms. Gaganpreet Kaur	Senior Research Fellow
Ms. Nisha Yadav	Senior Research Fellow
Mr. Subrata Maity	Junior Research Fellow
Ms. Swati Kumari	Junior Research Fellow

Mr. Palanivishwanath S.
 Ms. Saloni Verma
 Ms. Madhushree Das
 Smt. ShuchiSahu
 Ms. Shikha Bokadia
 Mr. Ajay Kumar

Junior Research Fellow
 Project Assistant
 Project Assistant
 Technical Assistant
 Technical Assistant
 Multi-Tasking Staff

Biomass & Energy Management Division

Dr. Ashish Bohre
 Dr. Vandit Vijay
 Dr. Gurkamal Nain Singh
 Dr. Banafsha Ahmed
 Dr. A. Senthil Murugan
 Mr. Rakesh Godara
 Mr. Avinash Bharti
 Mr. Ratanjeet Mani Tripathi
 Mr. Gaurav Dimri
 Mr. Arshdeep Singh

Scientist – D
 Scientist – C
 Research Associate
 Post-Doctoral Fellow
 Post-Doctoral Fellow
 Senior Research Fellow
 Junior Research Fellow
 Junior Research Fellow
 Junior Research Fellow
 Multi-Tasking Staff

Thermochemical Conversion Division

Dr. Tapas Kumar Patra
 Dr. Kunwar Pal
 Dr. Himanshu
 Mr. Manish Gupta
 Dr. Vishal Mourya
 Mr. Rachit Poddar
 Mr. Deepanshu Awasthi
 Ms. Deepti Hooda
 Ms. Anupma Saroj
 Mr. Gopal Sharma
 Mr. Manjeet Singh
 Ms. Rashpinder Kaur

Scientist - C
 Scientist - C
 Research Associate
 Research Associate
 Research Associate
 Research Associate
 Junior Research Fellow
 Junior Research Fellow
 Junior Research Fellow
 Technical Assistant
 Lab Technician
 Store Assistant

Civil and Electrical Division

Mr. Ram Anuj Singh
 Mr. Puneet Sharma
 Mr. Makhan Lal
 Mr. Manpreet Singh
 Mr. Avtar Singh

Assistant Engineer (Civil)
 Electrician
 Electrician
 Welder
 Carpenter

Mr. Jaswinder Singh

Mr. Amrik Singh

Mr. Amarjit Singh

Plumber

Multi-Tasking Staff

Tractor Driver

Administrative Division

Mr. Anand Kumar

Dr. Abhishek Gupta

Mr. Rupesh Kumar Verma

Mr. Mukesh Banga

Mr. Gurpreet Singh

Ms. Jatinderpreet Kaur

Mr. Parminder Singh

Mr. Sanju

Consultant (Admin)

Deputy Director

Junior Executive Assistant

IT Assistant

Admin Assistant

Librarian

Staff Car Driver

Multi-Tasking Staff

Finance & Accounts Division

Mr. Nanak Dev

Mr. Sanjay Chauhan

Mr. Aman Deep

Consultant (Accounts)

Junior Executive Assistant

Admin. Accounts Assistant

Hindi Division

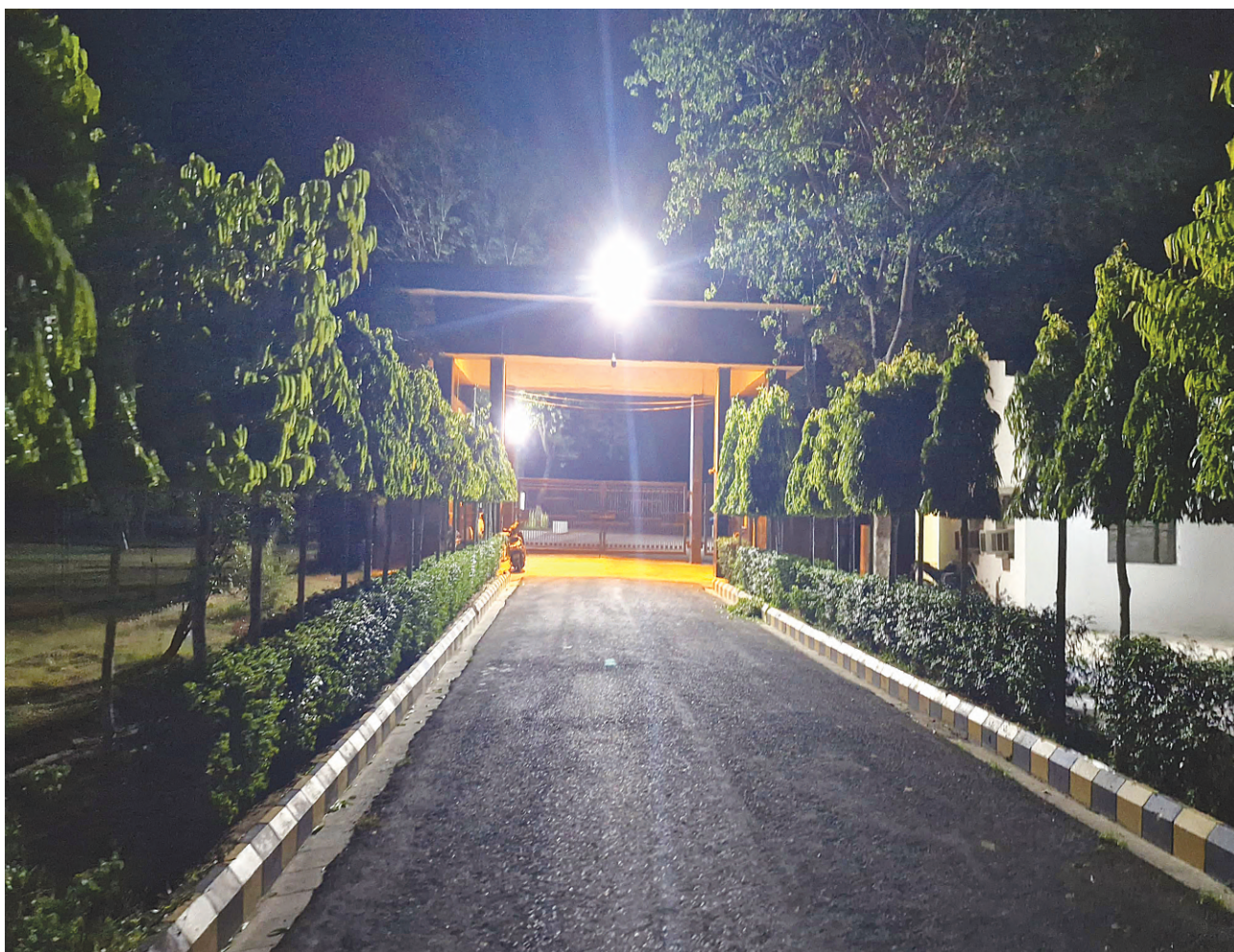
Mr. Vipin

Junior Hindi Translator



FINANCIAL REPORT

- **Balance Sheet**
- **Schedules / Annexures**
- **Auditor's Report**



BALANCE SHEET

The annual audited account of the Institute for the year 2024-25 has been prepared and duly audited by Anand Tarun & Co., Chartered Accountants, Jalandhar. The detailed Auditor's Report, Balance Sheet, Income, Expenditure, Receipts & Payments Accounts schedules are attached herewith.

SARDAR SWARAN SINGH NATIONAL INSTITUTE OF BIO-ENERGY

(An Autonomous Institution of Ministry of New & Renewable Energy)
Kapurthala (Punjab)- 144601

BALANCE SHEET AS AT 31ST MARCH, 2025

(Amount in Rs.)

FUND AND LIABILITIES	Schedule	31st March, 2025	31st March, 2024
CAPITAL ASSET FUND	1	451,871,691.62	417,655,081.99
RESERVES AND SURPLUS	2	152,634,997.20	185,671,397.37
CURRENT LIABILITIES AND PROVISIONS	3	9,919,134.85	10,861,142.53
TOTAL		614,425,823.67	614,187,621.89
ASSETS			
FIXED ASSETS			
(a) Created out of Central Governments Grants	4	189,187,859.78	177,519,914.58
(b) Out of Internal Generation Grants		0.00	0.00
INVESTMENTS		289,422,211.00	304,804,611.00
CURRENT ASSETS, LOANS AND ADVANCES	5	135,815,752.90	131,863,096.31
TOTAL		614,425,823.67	614,187,621.89
SIGNIFICANT ACCOUNTING POLICIES	13		
NOTES ON ACCOUNTS	14		

COMPILED FROM THE BOOKS OF ACCOUNTS PRODUCED TO US

For Sardar Swaran Singh National Institute Of Bio Energy

Date:11-08-2025
Place:Jalandhar
Udin:25573176BMIIIDY9091



FOR ANAND TARUN & CO.
CHARTERED ACCOUNTANTS

Gagan Arora
GAGAN ARORA
M.NO 573176
PARTNER

Anand Tarun Singh
Anand Tarun Singh

Finance & Accounts Officer Director General
ਸਰਦਾਰ ਸਵਰਨ ਸਿੰਘ ਰਾਸ਼ਟਰੀ ਨਵੇਂ ਊਰਜਾ ਸੰਸਥਾਨ
12 ਕਿ.ਮੀ ਪੱਥਰ, ਜਾਲੰਧਰ-ਕਪੂਰਥਲਾ ਰੋਡ,
ਬਡਾਲਾ ਕਲਾਂ, ਕਪੂਰਥਲਾ (ਪੰਜਾਬ) 144601
Sardar Swaran Singh National Inst. of Bio-Energy
12 Km. Stone, Jalandhar-Kapurthala Road
Wadala Kalan, Kapurthala (Punjab) 144601

SARDAR SWARAN SINGH NATIONAL INSTITUTE OF BIO-ENERGY
(An Autonomous Institution of Ministry of New & Renewable Energy)
Kapurthala (Punjab)- 144601

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH 2025

(Amount in Rs.)

INCOME	Schedule	31/03/2025	31/03/2024
Income from Services	6	2,760,383.23	2,800,813.19
Income from publication	7	-	-
Interest Earned	8	4,936,000.00	3,479,183.00
Other Income 9		11,199,758.70	9,425,605.21
Interest Earned & Other Income (Grant)	3.1	-	-
Grants from Government of India allocated for Revenue expenditure during the year		75,000,000.00	74,000,000.00
Grants - Adjustment previous year payment		2,004,724.67	-
Add:EMD,SD,PG Received		-	-
Closing stock	-	-	-
TOTAL (A)		91,891,417.26	89,705,601.40
EXPENDITURE -	-		
Opening stock	-	-	-
Establishment Expenses	10	34,392,874.00	27,642,747.00
Consultancy Project Expenses	11 (b)		-
Other Administrative Expenses	11 (a)	47,926,653.40	44,737,498.33
Expenditure from Grants		-	-
On Advances/Deposits/Prepaid /EMD,SD,PG's etc.,		-	-
Refunded to Ministry/Bharat Kosh		-	-
Depreciation		23,830,332.44	22,287,827.21
In house project expenditure		-	-
Expenditure out of Previous Year Advance		-	-
TOTAL (B)		106,149,859.84	94,668,072.54
Balance being excess of Income over Expenditure	(A-B)	(14,258,442.58)	(4,962,471.14)
EMD,Performenc Guarnatee,Security Deposit Returned		-	-
Add: Opening Balance B/f (C)	3.1	-	-
Prior period adjustment	12	-	-
Transfer to Capital Asset Fund (D)	4	-	-
Transfer to Welfare Fund		-	-
BALANCE BEING SURPLUS TRANSFERRED TO GENERAL RESERVE FUND {A- (B+D) }		(14,258,442.58)	(4,962,471.14)
UN-UTILIZED GRANTS OUT OF GOVT. GRANTS FOR REVENUE EXPENDITURE{ (C+A)-B }		-	-
SIGNIFICANT ACCOUNTING POLICIES	13	-	-
NOTES ON ACCOUNTS	14	-	-

COMPILED FROM THE BOOKS OF ACCOUNTS PRODUCED TO US

For Sardar Swaran Singh National Institute Of Bio Energy

Date:11-08-2025
Place:Jalandhar
Udin:25573176BMIIDY9091



FOR ANAND TARUN & CO.
CHARTERED ACCOUNTANTS

Gagan Arora
GAGAN ARORA
M.NO 573176
PARTNER

Anand T. Singh
Finance & Accounts Officer **Director General**

ਸਰਦਾਰ ਸਵਰਨ ਸਿੰਘ ਨੈਸ਼ਨਲ ਬਾਇਓ ਊਰਜੀ ਸੰਸਥਾਨ
12 ਕਿ.ਮੀ ਪੱਥਰ, ਜਾਲੰਧਰ-ਕਪੂਰਥਲਾ ਰੋਡ,
ਬਡਾਲਾ ਕਲਾਂ, ਕਪੂਰਥਲਾ (ਪੰਜਾਬ) 144601
Sardar Swaran Singh National Inst. of Bio-Energy
12 Km. Stone,Jalandhar-Kapurthala Road
Wadaia Kalan,Kapurthala (Punjab) 144601

M/S SARDAR SWARAN SINGH NATIONAL INSTITUTE OF BIO ENERGY**ANNEXURE-2 SIGNIFICANT ACCOUNTING POLICIES****1. BASIS OF PREPARATION OF FINANCIAL STATEMENTS**

The financial statements are prepared on accrual basis of Accounting under Historical cost convention in accordance with Generally Accepted Accounting Principles in India and relevant Accounting Standards issued by the Institute of Chartered Accountants of India. Assesse had used exclusive method of accounting during the reporting year.

2. USE OF ACCOUNTING ESTIMATES

The preparation of financial statements requires the use of accounting estimates and assumptions that affect the reported amounts of assets, liabilities, income and expenses during the reporting period. These estimates are made in accordance with applicable accounting standards and are based on management's best knowledge of current facts and circumstances. Key areas involving significant estimates includes, but are not limited to, the useful lives of fixed assets, provisions for employee benefits, impairment of assets, and contingent liabilities. As per Accounting Standard (AS) 5-Net Profit or loss for the period, Prior Period Items and Changes in Accounting Policies, any revision in the accounting estimate is recognized prospectively in the period in which estimate is revised and also in any future periods where such revision of estimate will have effect.

3. GOING CONCERN BASIS OF ACCOUNTING

The financial statements have been prepared on the assumption that the institution will continue its operations as a going concern for the foreseeable future. The institution has no intention or need to liquidate or significantly reduce the scale of its operations. Assets are presented based on the assumption that they will be utilized in the normal course of business, and liabilities will be settled as part of ordinary operations.

The members have evaluated all relevant information, including financial forecasts and the current operating environment, and are confident in the firm's ability to continue its operations. As on the date of the balance sheet or financial statements, no circumstances indicate the need to prepare the accounts on a liquidation basis.

4. REVENUE RECOGNITION

As per AS-9 Revenue recognition, revenue arising through various sources of income is recognized in the following given manner:

- i. Dividend Income is recognized when the right to receive payment is established.
- ii. Interest Income is recognized on a time proportion basis taking into account the amount outstanding and the Interest rate applicable.

- iii. Revenue from sale of materials is recognized when the significant risk and rewards of the ownership of the goods have passed to the buyer.
- iv. Service income is recognized based on the stage of completion of the contract work, determined through physical progress or as per the terms and conditions outlined in the contract or agreement entered into with the customer.
- v. Revenue from fixed price construction contracts is recognized on the percentage of completion method, measured by reference to the percentage of labor hours incurred up to the reporting date to estimated total labor hours for each contract.

5. VALUATION OF INVENTORIES

This clause is not applicable for this institution i.e. Sardar Swaran Singh National Institute of Bio Energy.

6. FIXED ASSETS AND DEPRECIATION

(a) Tangible Assets

Tangible Assets are stated at cost net of recoverable taxes, trade discounts and rebates and include amounts added on revaluation less accumulated depreciation and impairment loss, if any. The cost of tangible assets comprises its purchase price and any cost directly attributable to bringing the asset to its working condition for its intended use. Net charges on foreign exchange contracts and adjustments arising from exchange rate variations are also attributable to the assets.

Borrowing cost relating to acquisition of fixed assets which take substantial period of time to get ready for its intended use are also included to the extent they relate to the period till such assets are ready to be put to use. Subsequent expenditures related to an item of tangible assets are added to its Book value only if they increase the future benefits from the existing asset beyond its previously assessed standard of performance.

(b) Capital work-in-progress

All expenses incurred for acquiring, erecting and commissioning of fixed assets including interest on long term loans utilized for meeting capital expenditure and incidental expenditure incurred during construction of projects are shown under capital work-in-progress and are reflected in the fixed assets on the completion of the respective projects. The advances given for acquiring fixed assets are also shown along with capital work-in-progress.

(c) Intangible Assets

In line with the AS 26 – Intangible Assets, firm recognizes an intangible asset only when its cost can be measured reliably and it is probable that the asset will generate future economic benefits.

For separately acquired intangible assets, the cost is recognized based on the purchase price, inclusive of import duties and non-refundable taxes. Cost also include all directly attributable

costs necessary to bring the asset to its intended use—such as legal and professional fees—while deducting any trade discounts or rebates received.

In the case of internally generated intangible assets, such assets are recognized only when they have clearly moved into the development phase or are ready for use, and future economic benefits from their use can be reasonably expected. The cost capitalized includes directly attributable or reasonably allocated expenditures incurred during development. However, in strict compliance with AS 26, all costs related to the research phase are excluded, as these do not meet the recognition criteria under the standard.

(d) Depreciation

Depreciation on tangible fixed assets is provided on written down value method at the rates and in the manner prescribed in the Income Tax Act, 1961.

(e) Amortization of Intangible Fixed Assets

The institute amortises its intangible fixed assets using the diminishing balance method. The amortisation expense is recognised in the Profit and Loss Account for the reporting period.

As per the requirements of applicable accounting standards, the institution has reviewed the amortisation method and useful life of intangible fixed assets at the end of the relevant reporting period. Upon review, no changes have been made to the existing method or amortisation period.

In the event that any significant change is made in the amortisation method or useful life of the asset in the future, such change will be disclosed appropriately in accordance with Accounting Standard (AS) 5, along with its financial impact.

7. GOVERNMENT GRANTS

- i. Grants and subsidies yet to be received from the government are recognized when there is reasonable certainty that such grant/subsidy will be received and all underlying conditions will be complied with.
- ii. When the grant or subsidy relates to a specific expense item, at the time of receiving such grant, then such grant is adjusted with the related expenditure. In case Grant/subsidy received or yet to be received is not related to a specific expenditure it is treated as income in the profit & loss statement.
- iii. In case the Government Grant so received is subjected to specific fixed assets, such grant is deducted from the acquisition cost or the carrying cost of the such asset. However if any Government Grant/ subsidy received is not subject to a specific asset, it is then capitalized in the Capital reserve and is amortized over the useful life of such asset.
- iv. Government of India, Ministry of New & Renewable Energy has sanctioned the establishment of Sardar Swaran Singh National Institute of Renewable Energy (SSS-NIRE) as an autonomous Institute of Ministry under the Societies Registration Act 1860. During the year 2024-25, Rs

3,23,00,000/- has been received for Salary, Rs 3,50,00,000/- has been received for creation of Capital Asset and Rs 4,27,00,000/- has been received as a Grant for General Expenses. Total Grant Received during the year Rs 11,00,00,000/-. This makes a total grant of Rs 1,24,31,13,874/- received from ministry . Year wise Grants received along with Interest earned which had been converted from Capital Fund to Grant-In-Aid has been given in following table:

YEAR WISE DETAILS GRANT RELEASED FROM MNRE TO SSS-NIRE

Financial Year	Grant Received in Rs.	Cummulative Grant in Rs.
1998-99	7,50,00,000	7,50,00,000
1999-20	20,00,000	7,70,00,000
2000-01	-	7,70,00,000
2001-02	1,00,00,000	8,70,00,000
2002-03	2,00,00,000	10,70,00,000
2003-04	3,00,00,000	13,70,00,000
2004-05	2,83,00,000	16,53,00,000
2005-06	-	16,53,00,000
2006-07	-	16,53,00,000
2007-08	3,67,00,000	20,20,00,000
2008-09	3,50,00,000	23,70,00,000
2009-10	7,00,00,000	30,70,00,000
2010-11	4,00,00,000	34,70,00,000
2011-12	5,00,00,000	39,70,00,000
2011-12 (Intt. Utilized)	1,50,47,499	41,20,47,499
2012-13	15,00,00,000	56,20,47,499
2013-14 (Intt. Utilized)	74,66,375	56,95,13,874
2013-14	8,00,00,000	64,95,13,874
2014-15	12,00,00,000	76,95,13,874
2015-16	4,68,58,799	81,63,72,673
2016-17	91,41,201	82,55,13,874
2017-18	1,00,00,000	83,55,13,874
2018-19	1,00,00,000	84,55,13,874
2019-20	7,00,00,00	85,25,13,874
2020-21	4,70,00,000	89,95,13,874
2021-22	4,96,00,000	94,91,13,874
2022-23	7,00,00,000	101,91,13,874
2023-24	11,40,00,000	113,31,13,874
2024-25	11,00,00,000	124,31,13,874

- v. During the Year 2024-25 the Institute has received the grant of Rs 22,76,000/- for the Project CPRI 270L, NIL grant for the Project CPRI 37L & Rs 8,94,400/- for the Project 66L. Amount spent on these projects were Rs 25,46,545.64/- , Rs Nil & Rs 17,31,128.57/- for Project CPRI 270L, CPRI 37L & CPRI 66L respectively. Such amount was deducted from the Grant received using the Capital approach.

8. INVESTMENT

Investments that are readily realizable and intended to be held for not more than a year, at the time of making investments, are classified as Current Investments. All other investments are classified as Long term investments. Current investments are carried at lower of cost and fair value determined on an individual investment basis. Long term investments are carried at cost. However, Provision for diminution is made to recognize a decline, other than temporary in nature, in the carrying amount of such long term investments.

9. ACCOUNTING FOR PROVISIONS, CONTINGENT LIABILITIES AND CONTINGENT ASSETS

Contingent liabilities are disclosed in the financial statements unless the possibility of an outflow of resources is remote. A provision is recognized only when:

- the institute has a present obligation as a result of a past event,
- it is probable that an outflow of resources will be required to settle the obligation, and
- a reliable estimate can be made of the amount of the obligation.

Contingent liabilities are reviewed at each balance sheet date and are adjusted to reflect the current best estimate. If it becomes probable that an outflow of resources will be required, a provision is recognized in the accounts.

Contingent assets are not recognized in the financial statements. However, they are disclosed where an inflow of economic benefits is probable. Such assets are assessed continually to ensure that developments are appropriately reflected in the financial statements. If the realization of income becomes virtually certain, the related asset is recognized.

10. EMPLOYEE BENEFITS

Short-Term Employee Benefits: Short-term employee benefits such as salaries, wages, bonus, ex-gratia, and earned leave payable within twelve months are recognized as an expense on accrual basis in the period in which the employees render the related services.

Defined Contribution Plans: Contributions to defined contribution schemes like Provident Fund, Employee State Insurance (ESI), and Labor Welfare Fund are charged to the profit and loss account on an accrual basis. There is no further obligation beyond the monthly contribution.

Defined Benefit Plans – Gratuity: Gratuity liability is provided on the basis of actuarial valuation carried out at the year-end using the Projected Unit Credit Method. Actuarial gains or losses are recognized immediately in the profit and loss account.

Leave Encashment: The liability for leave encashment is provided based on management estimates if the amount is not material, or actuarial valuation where required. Leave benefits expected to be settled within 12 months are treated as short-term benefits.

Termination Benefits: Termination benefits are recognized as a liability when the company is demonstrably committed to terminate the employment of an employee or group of employees before the normal retirement date or when an offer is made to encourage voluntary retirement.

11. LEASES

Finance Leases: Assets acquired under finance leases are capitalized at the lower of the fair value of the leased asset and the present value of minimum lease payments at the inception of the lease. A corresponding liability is recognized as a lease obligation.

Lease payments are apportioned between finance charge and reduction of the lease liability using the implicit interest rate.

Depreciation on leased assets is charged in accordance with the Company's depreciation policy over the useful life of the asset or lease term, whichever is shorter.

Operating Leases: Lease payments under operating leases are recognized as an expense in the Statement of Profit and Loss on a straight-line basis over the lease term, unless another systematic basis is more representative of the time pattern of the benefit derived from the asset.

12. FOREIGN CURRENCY TRANSACTIONS

Foreign Currency Transactions: Foreign currency transactions are recorded at the exchange rate prevailing on the date of the transaction.

Monetary Items: Monetary assets and liabilities denominated in foreign currencies (such as trade receivables, trade payables, foreign currency loans, etc.) are translated at the exchange rate prevailing at the balance sheet date. The resultant exchange differences are recognized in the statement of profit and loss.

Non-Monetary Items: Non-monetary items (such as fixed assets, investments, and inventories) that are measured in terms of historical cost are recorded at the exchange rate on the date of the transaction. Non-monetary items carried at fair value are reported at the exchange rate that existed when such values were determined.

Export and Import Transactions:

Export sales are recorded at the rate on the date of transaction or at the forward contract rate if covered.

Import purchases are recorded at the transaction date rate or contracted forward rate.

The exchange difference arising on settlement or revaluation of export/import receivables/payables is recognized in the profit and loss account.

Forward Exchange Contracts: In respect of forward exchange contracts not intended for trading or speculation purposes:

The premium or discount arising at the inception of the contract is amortized over the period of the contract.

The exchange difference between the forward rate and the exchange rate on the date of transaction is recognized in the profit and loss account.

13. PRIOR PERIOD ITEMS

Prior period items are incomes or expenses that arise in the current period as a result of errors or omissions in the preparation of financial statements of one or more prior periods.

Such items are separately disclosed in the statement of profit and loss, in a manner that their impact on the current year's profit or loss can be clearly understood. The nature and amount of prior period items are disclosed in the notes to accounts.

Adjustments due to changes in accounting estimates or policies are not treated as prior period items.

14. EVENTS AFTER THE BALANCE SHEET DATE

Events occurring after the balance sheet date that provide additional information about conditions existing at the balance sheet date are considered as adjusting events. The institution has reviewed events that occurred after the balance sheet date and has made the necessary adjustments to the financial statements where required.

Events occurring after the balance sheet date that do not affect the financial position at that date, but are of material importance to users of the financial statements, are disclosed as non-adjusting events. As of the date of approval of these financial statements, no significant non-adjusting events have occurred that require disclosure.

15. ACCOUNTING FOR DONATIONS AND GRANTS OTHER THAN GOVERNMENT GRANTS

Donations and grants received by the institution are recognized in the financial statements based on the conditions attached to them and the timing of receipt. The treatment of donations and grants is as follows:

Donations:

- o Donations received are generally recognized as income in the year in which they are received, unless they are designated for specific purposes or future periods, in which case, they are recognized as **deferred income** until used for the intended purpose.
- o Donations with no specific conditions attached are recognized in the statement of profit and loss as **other income**.

Grants:

- o **Capital Grants:** Grants related to the acquisition of fixed assets are initially recognized as deferred income. The grant is subsequently recognized as income on a systematic and rational basis over the useful life of the related asset.
- o **Revenue Grants:** Grants intended to compensate for expenses or losses are recognized in the **statement of profit and loss** in the period in which the related expenses are incurred.
- o Grants received for specific projects or purposes are recognized as income only when the conditions attached to the grant have been met. If conditions have not been met by the end of the accounting period, the grant is recorded as **deferred income**.

16. IMPAIRMENT OF ASSETS

The carrying amounts of assets are reviewed at each balance sheet date to determine whether there is any indication of impairment. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of impairment loss, if any.

An impairment loss is recognized whenever the carrying amount of an asset exceeds its recoverable amount. The recoverable amount is the higher of the asset's net selling price and its value in use. Impairment losses are recognized in the statement of profit and loss.

Reversal of impairment loss, if any, is recognized in the profit and loss account to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined (net of depreciation) if no impairment loss had been recognized in earlier periods.

17. BORROWING COST

Borrowing costs that are directly attributable to the acquisition, construction, or production of a qualifying asset are capitalized as part of the cost of that asset. A qualifying asset is one that necessarily takes a substantial period of time to get ready for its intended use or sale.

All other borrowing costs are recognized as an expense in the period in which they are incurred.

Capitalization of borrowing costs ceases when substantially all the activities necessary to prepare the qualifying asset for its intended use or sale are complete.

Borrowing costs include interest expense, amortization of discounts or premiums on borrowings, ancillary costs incurred in connection with the arrangement of borrowings, and exchange differences to the extent regarded as an adjustment to interest costs.

NOTES TO ACCOUNTS

(For the Year Ended 31st March 2025)

1. CURRENCY OF PRESENTATION:

The financial statements have been prepared and presented in Indian Rupees (INR), which is the functional and reporting currency of the institution. All amounts have been rounded off to the nearest rupee unless otherwise stated. INR is the primary currency of the economic environment in which the Firm operates.

2. ARM'S LENGTH TRANSACTION

All transactions undertaken by the institution during the financial year have been conducted at arm's length basis. The terms and conditions of such transactions reflect fair market values, consistent with those which would apply between unrelated parties under similar circumstances.

3. CHANGES IN ACCOUNTING ESTIMATES

The institution periodically reviews the assumptions and estimates used in the preparation of its financial statements. Any changes in accounting estimates—such as provisions, depreciation, or useful life of fixed assets—are recognized prospectively in the financial statements, in accordance with the applicable Accounting Standards issued by the Institute of Chartered Accountants of India (ICAI). Adequate disclosures have been made in the notes wherever such changes have a material impact.

4. CLASSIFICATION AND PRESENTATION

All financial statement items have been appropriately classified and presented in accordance with the Generally Accepted Accounting Principles (GAAP) in India and the applicable Accounting Standards issued by ICAI. Assets and liabilities have been properly grouped and disclosed to reflect the true and fair view of the financial position. Prior period figures have been regrouped and/or reclassified wherever necessary to ensure comparability with the current year's classification, and the same has been adequately disclosed.

5. REGROUPING OF FIGURES

Previous year's figures have been regrouped, rearranged, or reclassified wherever necessary to conform to the current year's classification and presentation. Such regrouping has no material impact on the overall financial results of the institution.

SARDAR SWARAN SINGH NATIONAL INSTITUTE OF BIO-ENERGY

(An Autonomous Institution of Ministry of New & Renewable Energy)

Kapurthala (Punjab) - 144601

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR'2025

(Amount in Rs.)

SCHEDULE 1 - CAPITAL ASSET FUND	31.03.2025	31.03.2024
Opening Balance	-	-
Balance as at the beginning of the year	417,655,081.99	374,272,365.78
ADD : Prior period adjustment	-	-
ADD : Addition from Capital Grant (Amount Spent for Purchase of Fixed Assets)	35,498,277.63	24,722,172.21
Add : Addition from Internal Revenue Generation prior years	-	-
Add : Addition from Interest on FDR (CORPUS)	23,073,891.00	22,994,240.00
Add: IREDA NIBE Award	-	-
Add: Interest on IREDA Fund	-	960,000.00
Less: Deletion from Capital Grants	15,382,400	-
Less: Deletion from Internal Revenue Generation	-	-
Less: Deletion from Capital Grants SRRA	-	-
Less: Depreciation on assets purchased out of Grants MNRE	8,973,159.00	5,293,696
Less: Depreciation on assets purchased out of Internal Generation	-	-
Less: Depreciation on assets purchased out of Grants SRRA	-	-
TOTAL	451,871,691.62	417,655,081.99

COMPILED FROM THE BOOKS OF ACCOUNTS PRODUCED TO US

For Sardar Swaran Singh National Institute Of Bio Energy

Date:11-08-2025
Place:Jalandhar
Udin:25573176BMIIDY9091

FOR ANAND TARUN & CO.
CHARTERED ACCOUNTANTS

[Signature]
GAGAN ARORA
M.NO 573176
PARTNER

[Signature] *[Signature]*

Finance & Accounts Officer Director General
ਸਰਦਾਰ ਸਵਰਨ ਸਿੰਘ ਰਾਸ਼ਟਰੀ ਬਾਇਓ ਊਰਜਾ ਸੰਸਥਾਨ
12 ਕਿ.ਮੀ ਪੱਥਰ, ਜਾਲੰਧਰ-ਕਪੂਰਥਲਾ ਰੋਡ,
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SARDAR SWARAN SINGH NATIONAL INSTITUTE OF BIO-ENERGY

(An Autonomous Institution of Ministry of New & Renewable Energy)

Kapurthala (Punjab) - 144601

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR'2025

(Amount in Rs.)

SCHEDULE 2 - RESERVES AND SURPLUS	31st March, 2025	31st March, 2024
General Reserve Fund		
Balance at the beginning of the year	146,845,237.88	151,807,709.02
Less during the year being deficit	-14,258,442.58	4,962,471.14
Less : Grant Refunded		-
Sub total (A)	132,586,795.30	146,845,237.88
RESERVE & SURPLUS- COMPLETED PROJECTS		
Bio Diesel Project	4,472,153.00	4,472,153.00
ICRISAT Project	13,929.00	13,929.00
Bio Crude Project	2,383,061.00	2,383,061.00
National Renewable Energy Program Project	50,415.00	50,415.00
Bio Ethenol Project	5,441,996.70	5,441,996.70
Bio Gas Project	59,929.00	59,929.00
Sub Total (B)	12,421,483.70	12,421,483.70
Biorefinery Approach for generation of platform chemicals and bioethanol		
Opening Balance	153,075.00	153,075.00
Add: Grant Received from MNRE during the year		-
Less: Expenses Biorefinery Approach for generation of platform chemicals and bioethanol	-	-
Sub Total (C)	153,075.00	153,075.00
Fellowship Grant Dr. Sachin Kumar	220,300.00	220,300.00
Less: Advance Given to Dr. Sachin Kumar	220,300.00	-
Sub Total (D)	-	220,300.00
Indo Brazil project		
Opening Balance	1,581,051.00	1,581,051.00
Add: Grant Received from MNRE during the year		0.00
Add: Advance Recovered from Meenu Hans		-
Less: Expenses for Project (Excluding Fixed Assets)		-
Less: Advance to GNDU		-
Add: Advance Recovered from GNDU		-
Sub Total (E)	1,581,051.00	1,581,051.00

SCHEDULE 2 - RESERVES AND SURPLUS	31st March, 2025	31st March, 2024
RESERVE & SURPLUS - ON GOING PROJECTS		
Opening balance of Project MNRE(GIA)	276,868.00	23,568.00
Add: Grant Received from MNRE during the year	700,000.00	700,000.00
Less Expenditure	1,312,615.00	421,680.00
Less: Refunded back non utilised/interest		25,020.00
Add: Interest Earned		
Sub Total (F)	-335,747.00	276,868.00
Opening balance of Project MNRE (Capital)		54,880.00
Add: Grant Received from MNRE during the year		-
Less: Refunded back non utilised/interest		54,880.00
Add : Interest earned		-
Sub Total (G)	-	-
Opening balance of Project WOS	227,636.00	625,875.00
Add: Grant Received from MNRE during the year		-
Less : Expenses of Project	51,976.00	398,239.00
Add: Interest Earned		-
Sub Total (H)	175,660.00	227,636.00
Cpri 270 L		
Opening balance	2,922,348.00	20,748,922.00
Grant Received	2,276,000.00	2,036,000.00
Less : Expenditure	2,546,545.64	20,272,574.00
Add : Interest earned		410,000.00
Sub Total (I)	2,651,802.36	2,922,348.00
Cpri 37 L		
Opening balance	153,312.00	437,824.00
Grant Received		-
Less : Expenditure		304,512.00
Add : Interest earned		20,000.00
Sub Total (J)	153,312.00	153,312.00
Cpri 66 L		
Opening balance	1,682,310.00	2,856,688.00
Grant Received	894,400.00	2,243,000.00
Less : Expenditure	1,731,128.57	3,487,378.00
Add : Interest earned		70,000.00
Sub Total (K)	845,581.43	1,682,310.00
Advanced Microalgal Biorefinery Himalayan Project		
Opening balance	3,909,948.00	-
Grant Received		4,476,960.00

Less : Expenditure	3,247,135.00	627,956.00
Add : Interest earned	89,824.00	60,944.00
Sub Total (L)	752,637.00	3,909,948.00
Grant Received for Capital Asset		
Opening balance	15,277,827.79	
Grant Received	35,000,000.00	40,000,000.00
Less : Fixed Assets Purchased	35,498,277.63	24,722,172.21
Grant refunded	15,069,945.79	
Sub Total (M)	-290,395.63	15,277,827.79
Opening balance of Project SC COMMUNITY PSCST		
Add: Grant Received from MNRE during the year	400,000.00	
Less Expenditure	319,984.00	
Less: Refunded back non utilised/interest		
Add: Interest Earned		
Sub Total(N)		80,016.00
Opening balance of Project Thermal power Plant		
Add: Grant Received from MNRE during the year	4,717,280.00	
Less Expenditure	2,940,775.96	
Less: Refunded back non utilised/interest		
Add: Interest Earned	37,644.00	
Sub Total(o)	1,814,148.04	
Opening balance of Project MNRE(GIA)		
Add: Grant Received from MNRE during the year	1,700,000.00	
Less Expenditure	1,654,422.00	
Less: Refunded back non utilised/interest		
Add: Interest Earned		
Sub Total (P)	45,578.00	
Grand Total	152,634,997.20	185,671,397.37
Grand Total	152,634,997.20	185,671,397.37
Add: Interest Earned		-
Sub Total (H)	175,660.00	227,636.00

COMPILED FROM THE BOOKS OF ACCOUNTS PRODUCED TO US

For Sardar Swaran Singh National Institute Of Bio Energy

Date:11-08-2025
Place:Jalandhar
Udin:25573176BMMIDY9091



FOR ANAND TARUN & CO.
CHARTERED ACCOUNTANTS

GAGAN ARORA
M.NO 573176
PARTNER

[Signature]
Finance & Accounts Officer

Director General
ਸਰਦਾਰ ਸਵਰਨ ਸਿੰਘ ਰਾਸ਼ਟਰੀ ਜੀਵ ਊਰਜਾ ਸੰਸਥਾਨ
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SARDAR SWARAN SINGH NATIONAL INSTITUTE OF BIO-ENERGY

(An Autonomous Institution of Ministry of New & Renewable Energy)

Kapurthala (Punjab) - 144601

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR'2025

(Amount in Rs.)

SCHEDULE 3 - CURRENT LIABILITIES AND PROVISIONS:	SCHEDULE	31st March, 2025	31st March, 2024
A. CURRENT LIABILITIES			
Sundry Creditors for expenses:		6,359,197.18	7,118,346.48
Expenses payable		316,400.00	475,820.00
Salary Payable		2,127,637.00	1,997,051.00
Security Deposit, EMD & PG		607,895.00	607,895.00
Advances Received on Projects		-	
Statutory Liabilities		390,654.67	544,679.05
Other Current Liabilities		-	
Other Payables		117,351.00	117,351.00
NIWE-IREDA Award Fund		-	
Welfare Fund Payable		-	
Branch Division Payables		-	-
TOTAL (A)		9,919,134.85	10,861,142.53
UN UTILISED GRANTS			
a) Central Finance Assistance MNRE (Grants-in-Aid)	3.1	-	-
Earmarked Projects SRRA USP		-	-
IREDA NIBE FUND		-	-
TOTAL (B)		-	-
TOTAL { (A)+(B) }		9,919,134.85	10,861,142.53
B. PROVISIONS			
Gratuity		-	-
Leave Encashment		-	-
Bonus & Ex-gratia		-	-
TOTAL (C)		-	-
GRAND TOTAL { (A)+(B)+(C) }		9,919,134.85	10,861,142.53

COMPILED FROM THE BOOKS OF ACCOUNTS PRODUCED TO US

For Sardar Swaran Singh National Institute Of Bio Energy

Date:11-08-2025
Place:Jalandhar
Udin:25573176BMMIDY9091

FOR ANAND TARUN & CO.
CHARTERED ACCOUNTANTS

GAGAN ARORA
M.NO 573176
PARTNER

Signature of Finance & Accounts Officer
Finance & Accounts Officer
Signature of Director General
Director General
12 कि.मी पत्थर, जालंधर-कपूरथला रोड,
बडाला कला, कपूरथला (पंजाब) 144601
Sardar Swaran Singh National Inst. of Bio-Energy
12 Km. Stone, Jalandhar-Kapurthala Road
Wadala Kalan, Kapurthala (Punjab) 144601

SARDAR SWARAN SINGH NATIONAL INSTITUTE OF BIO-ENERGY

(An Autonomous Institution of Ministry of New & Renewable Energy)

Kapurthala (Punjab) - 144601

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR'2025

(Amount in Rs.)

SCHEDULE 3.1 - UNUTILISED GRANT - CFA	As on 31.03.2025	As on 31.03.2024
Funds		
Balance as at the beginning of the year	-	-
Add : Grants received during the year(GIA Capital)	35,000,000.00	40,000,000.00
Add : Grants received during the year(GIA General)	42,700,000.00	47,000,000.00
Add : Grants received during the year(GIA Salary)	32,300,000.00	27,000,000.00
Add :Misc. Income on Grants		-
Add :Interest Earned on Grants	-	-
Add: Interest Accrued on Grants	-	-
Add: Profit on Sale of Assets	-	-
Add: Transferred from Earmarked Projects	-	-
Add: SNA Refund	-	-
Add:EMD,SD,PG Received	-	-
Total (A)	110,000,000.00	114,000,000.00
Less : Refunds		
Interest earned on Grants refunded to Ministry	743,789.00	261,235.00
Other Income Earned refunded to Ministry	-	
Refund of Unutilized Grants	-	
Total (B)	743,789.00	
Total Fund Available (C= A-B)	109,256,211.00	113,738,765.00
Less: Expenditure		
Grants from Government of India allocated for Capital	-	-
Grants from Government of India allocated for Revenue expenditure	-	-
Grants from Government of India allocated for NER	-	-
Grants from Government of India allocated for SRRA	-	-
Expenditure relating to Grants from Government of India for the inhouseprojects during the year	-	-
Transfer to capital asset fund	35,000,000.00	40,000,000.00
Transfer to Income & Expenditure	75,000,000.00	74,000,000.00
Excess of Expenditure out of Previous Year Advance	-	-
EMD,Performenc Guarnatee,Security Deposit Returned	-	-
Sub Total (i)	110,000,000.00	114,000,000.00

(Amount in Rs.)

SCHEDULE 3.1 - UNUTILISED GRANT - CFA	As on 31.03.2025	As on 31.03.2024
Less: Payables		
Expenses Payable	-	-
Security Deposits & Performance Guarantee	-	-
Sundry Creditors	-	-
Other Current Liabilities	-	-
Advances received	-	-
Salary Payable / EPF Payable	-	-
Sub Total (ii)	-	-
Less: Advances & Deposits		
Less: Advances paid	-	-
Less: Deposits	-	-
Less: Prepaid Expenses	-	-
Sub Total (iii)	-	-
Total (D) [i+ii+iii]	110,000,000.00	114,000,000.00
UNUTILIZED GRANT (Refundable to Ministry)	-	-
UNUTILIZED GRANTS (Receivable from Ministry)	-	-
UNUTILIZED GRANTS / Funds (Others)	-	-

COMPILED FROM THE BOOKS OF ACCOUNTS PRODUCED TO US

For Sardar Swaran Singh National Institute Of Bio Energy

Date:11-08-2025
Place:Jalandhar
Udin:25573176BMIIDY9091



FOR ANAND TARUN & CO.
CHARTERED ACCOUNTANTS

Gagan Arora
GAGAN ARORA
M.NO 573176
PARTNER

Anand T. Singh
Anand T. Singh

Finance & Accounts Officer Director General
ਸਰਦਾਰ ਸੁਵਰਨ ਸਿੰਘ ਰਾਸ਼ਟਰੀ ਜੀਵ ਊਰਜਾ ਸੰਸਥਾਨ
12 ਕਿ.ਮੀ ਪੱਥਰ, ਜਾਲੰਧਰ-ਕਪੂਰਥਲਾ ਰੋਡ,
ਬਡਾਲਾ ਕਲਾਂ, ਕਪੂਰਥਲਾ (ਪੰਜਾਬ) 144601
Sardar Swaran Singh National Inst. of Bio-Energy
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SARDAR SWARAN SINGH NATIONAL INSTITUTE OF BIO-ENERGY

(An Autonomous Institution of Ministry of New & Renewable Energy)

Kapurthala (Punjab) - 144601

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR'2025

(Amount in Rs.)

SCHEDULE 5 - CURRENT ASSETS, LOANS & ADVANCES	31st March, 2025	31st March, 2024
A. CURRENT ASSETS:		
Sundry Debtors	2,016,122.00	33,940.00
Inventories	-	
Stock of Stationery	-	
Closing Stock	-	
Bank Balances:		
With Scheduled Banks:		
In Current Account	646,266.52	1,003,372.33
In Savings Bank Account	49,386,405.20	38,034,136.41
In Cash	1,048.00	17,922.00
In Deposit Account	68,239,243.00	76,816,843.00
Branch Division Receivables	-	-
TOTAL (A)	120,289,084.72	115,906,213.74
B. LOANS, ADVANCES AND OTHER ASSETS		
Advances and other amounts recoverable in cash or in kind or for value to be received:		
a) On Capital Account	-	-
a) Prepayments	300,000.00	350,858.00
b) Interest accrued on term deposits	2,019,203.38	1,380,918.38
c) 4,114,584.49	Advances	2,294,551.69
d) Interest accrued on security deposit	527,145.00	429,016.00
e) Balance with Govt. Authority - TDS	10,385,768.11	9,681,505.70
TOTAL (B)	15,526,668.18	15,956,882.57
GRAND TOTAL { (A)+(B) }	135,815,752.90	131,863,096.31

COMPILED FROM THE BOOKS OF ACCOUNTS PRODUCED TO US

For Sardar Swaran Singh National Institute Of Bio Energy

Date:11-08-2025
Place:Jalandhar
Udin:25573176BMIIDY9091

FOR ANAND TARUN & CO.
CHARTERED ACCOUNTANTS

Gagan Arora
GAGAN ARORA
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Anand Singh
Anand Singh
Finance & Accounts Officer

Director General
ਸਰਦਾਰ ਸਵਰਨ ਸਿੰਘ ਰਾਸ਼ਟਰੀ ਜੀਵ ਊਰਜਾ ਸੰਸਥਾਨ
12 ਕਿ.ਮੀ ਪੱਥਰ, ਜਾਲੰਧਰ-ਕਪੂਰਥਲਾ ਰੋਡ,
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SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR'2025

(Amount in Rs.)

SCHEDULE 6 - INCOME FROM SALES / SERVICES	31st March, 2025	31st March, 2024
Income from Services		
Testing Fee	958,177.00	419,160.00
NIT Course Fee	792,325.00	1,308,062.00
Registration FeeSemester Fee	941,881.23	1,073,591.19
	68,000.00	
TOTAL	2,760,383.23	2,800,813.19
	-	-
SCHEDULE 7 - INCOME FROM PUBLICATION	31st March, 2025	31st March, 2024
Sale of Books & Reports	-	-
TOTAL		

	-	-
SCHEDULE 8 - INTEREST EARNED	31st March, 2025	31st March, 2024
On Term Deposits with Scheduled Banks (Corpus)	0.00	746,714.00
On Savings Bank account/MOD with Scheduled Banks	4,936,000.00	2,623,139.00
Interest from PSPCL		109,330.00
TOTAL	4,936,000.00	3,479,183.00

	-	-
SCHEDULE 9 - OTHER INCOME	31st March, 2025	31st March, 2024
Rent Received	5,084.76	5,084.76
Sponsorship fee	155,000.00	3,202,969.53
Overhead Income	300,000.00	284,000.00
Hostel fee	179,638.50	65,452.00
Discount/Rebate	0.44	
Other Misc Income	2,309.00	388,798.92
Licence fee	187,110.00	139,200.00
Evaluation Fee	415,000.00	
Profit on Sale of Tractor		38,684.00
Tender Fees		7,720.00
Grant Amortised/ Deferred income Related to Fixed Asset	8,973,159.00	5,293,696.00
Deduction for late installation	121,200.00	
Insepection Charges	800,000.00	
Maintenance And Utility Charges	61,257.00	
TOTAL	11,199,758.70	9,425,605.21

SARDAR SWARAN SINGH NATIONAL INSTITUTE OF BIO-ENERGY

(An Autonomous Institution of Ministry of New & Renewable Energy)

Kapurthala (Punjab) - 144601

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR'2025

(Amount in Rs.)

SCHEDULE 10 - ESTABLISHMENT EXPENSES	31st March, 2025	31st March, 2024
ADMINISTRATION AND R&D STAFF		
Salaries and Allowances	28,873,626.00	23,709,353.00
Bonus & Ex-gratia		-
Contribution to Provident Fund (EPF)	2,893,314.00	2,639,575.00
Contribution to Pension	188,750.00	195,000.00
Leave travel concession	580,162.00	567,681.00
Children Education Allowance	430,305.00	355,780.00
Medical reimbursement	143,449.00	
LTC Leave Encashment	126,106.00	155,358.00
Transportation Allowance	1,137,162.00	
Honorarium to staff	20,000.00	20,000.00
TOTAL	34,392,874.00	27,642,747.00

COMPILED FROM THE BOOKS OF ACCOUNTS PRODUCED TO US

For Sardar Swaran Singh National Institute Of Bio Energy

Date:11-08-2025
Place:Jalandhar
Udin:25573176BMIDY9091



FOR ANAND TARUN & CO.
CHARTERED ACCOUNTANTS

Gagan Arora
GAGAN ARORA
M.NO 573176
PARTNER

Anand Singh
Anand Singh
Finance & Accounts Officer

Director General
सर्दार स्वर्ण सिंह राष्ट्रीय जैव ऊर्जा संस्थान
12 कि.मी पथर, जालंधर-कपूरथला रोड,
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SARDAR SWARAN SINGH NATIONAL INSTITUTE OF BIO-ENERGY

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Kapurthala (Punjab) - 144601

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR'2025

(Amount in Rs.)

SCHEDULE 11 - OTHER ADMINISTRATIVE EXPENSES	31st March, 2025	31st March, 2024
Advertisement and Publicity	846,032.00	247,958.70
Audit & Legal fee	330,919.00	442,880.98
Board and committee meetings	445,884.00	
Consumable laboratory workshop exp	809,086.09	630,617.60
Electricity and Power	4,361,451.00	4,446,328.00
Stipend	11,452,501.00	7,389,305.00
Expenses on Seminar, Meetings, workshop & conference	3,310,937.80	4,408,023.70
Hospitality Expenses(other)	619,662.14	422,163.48
Computer software exp	83,190.00	116,046.00
Insurance Exp		3,757.00
Other Expenses	7,612.00	56,742.00
Computer hardware exp	245,163.00	291,623.00
Late Fee (CGST/SGST/TDS)	330.00	400.00
Printing and Stationery		86,294.00
Repair & maintenance	664,768.50	1,715,833.00
Newsletter/Newspaper exp	15,063.00	23,613.00
Refreshment	269,020.00	353,009.00
Machinery & Equipment Exp	1,456,312.52	1,684,994.54
Research & Development Exp	349,695.58	169,371.00
Contingency exp	7,837.00	139,799.40
Telephone and Communication Charges	1,982,742.00	2,097,582.00
Manpower & hiring of professional services	18,580,514.00	18,062,290.00
Reports exp	160,174.00	88,500.00
Travel & Conveyance and Taxi hire	1,648,790.18	1,426,684.93
Vehicles Running and Up Keeping		193,569.00
Overhead expenses	379.59	
Horticulture exp	278,589.00	240,113.00
TOTAL (A)	47,926,653.40	44,737,498.33
CONSULTANCY PROJECT EXPENSES		
Expenses on In Consultancy Projects (B)	-	-
GRAND TOTAL { (A) + (B) }	47,926,653.40	44,737,498.33

COMPILED FROM THE BOOKS OF ACCOUNTS PRODUCED TO US

For Sardar Swaran Singh National Institute Of Bio Energy

Date:11-08-2025
Place:Jalandhar
Udin:25573176BMIIDY9091



[Signature]
Finance & Accounts Officer
Sardar Swaran Singh National Inst. of Bio-Energy
12 कि.मी पत्थर, जालंधर-कपूरथला रोड,
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SARDAR SWARAN SINGH NATIONAL INSTITUTE OF BIO-ENERGY
(An Autonomous Institution of Ministry of New & Renewable Energy)
Kapurthala (Punjab)- 144601

VI. INVESTMENTS (Corpus Fund)

	PARTICULARS	31st MARCH, 2025	31st MARCH, 2024
A	Fixed Deposits with Banks	289,422,211.00	289,422,211.00
B	IREDA- NIBE Award Sweep Account	-	14,422,400.00
	Interest under MOD of NIBE Award		960,000.00
	<i>(Transferred from Deposit A/c)</i>		
	TOTAL	289,422,211.00	304,804,611.00

COMPILED FROM THE BOOKS OF ACCOUNTS PRODUCED TO US

For Sardar Swaran Singh National Institute Of Bio Energy

Date:11-08-2025
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FOR ANAND TARUN & CO.
CHARTERED ACCOUNTANTS

Gagan Arora
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सर्दार स्वर्ण सिंह राष्ट्रीय नई ऊर्जा संस्थान
12 कि.मी पत्थर, जालंधर-कपूरथला रोड,
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SARDAR SWARAN SINGH NATIONAL INSTITUTE OF BIO-ENERGY

(A Society Registered Under the Registration of the Societies Act, 1860)

IV: Fixed Assets and Depreciation Schedule as on 31.03.2025

RATE OF DEP	PARTICULARS	WDV AS ON 3/31/2024	ADDITIONS MORE THAN 180 DAYS	LESS THAN 180 DAYS	DEDUCTIONS/ ADJUSTMENT	WDV AS ON 31.03.2025	Depreciation	W.D.V. AS ON 31.03.2025
-	Land	7,500,000.00	-	-	-	7,500,000.00	-	7,500,000.00
-	Land & Site Related Dev Works	1,285,066.00	-	-	-	1,285,066.00	-	1,285,066.00
0.15	Plant Mach & Equip Office-I	24,931.00	-	-	-	24,931.00	3,740.00	21,191.00
FURNITURE, FIXTURE, OFFICE & HOSTEL EQUIPEMENTS								
0.40	Computer & Printer	1,593,348.12	219,990.00			1,813,338.12	725,335.00	1,088,003.12
0.10	Furniture & Fixtures	6,068,238.13	199,500.00	297,782.00	-	6,565,520.13	641,663.00	5,923,857.13
0.15	Office Equipments	546,308.00				546,308.00	81,946.00	464,362.00
0.15	Refrigerator	19,231.00				19,231.00	2,885.00	16,346.00
0.15	Security Cabin			298,996.00		298,996.00	22,425.00	276,571.00
0.15	Smart TV LED			38,000.00		38,000.00	2,850.00	35,150.00
0.15	Water Cooler		31,873.90			31,873.90	4,781.00	27,092.90
0.10	Gym Equipments			698,799.00		698,799.00	34,940.00	663,859.00
Project Bio Crude Assets								
0.15	TBP Bio-Crude project	357,058.00			-	357,058.00	53,559.00	303,499.00
0.15	Gas Regulator	4,670.00			-	4,670.00	701.00	3,969.00
0.15	Hydrogen Gas Cylinder	3,679.00		-	-	3,679.00	552.00	3,127.00
Project Bio Diesel Assets								
0.15	Diesel Engine Test Rig	231,879.00			-	231,879.00	34,782.00	197,097.00
0.15	Foundation Stone	13,216.00			-	13,216.00	1,982.00	11,234.00
0.15	Oxygen Gas Cylinder	1,238.00			-	1,238.00	186.00	1,052.00
0.15	Flash Point Apparatus	70,089.00			-	70,089.00	10,513.00	59,576.00
0.15	Kinematic Viscometer	52,437.00			-	52,437.00	7,866.00	44,571.00
0.15	Mechanical Stirrer	7,644.00			-	7,644.00	1,147.00	6,497.00
0.15	Petroleum Density Meter	140,808.00			-	140,808.00	21,121.00	119,687.00
0.15	Rotary Vacuum Evaporator	66,325.00			-	66,325.00	9,949.00	56,376.00
0.15	Soxhlet	10,996.00			-	10,996.00	1,649.00	9,347.00
Project Bio Ethanol Assets								
0.15	Bio reactor	514,243.00			-	514,243.00	77,136.00	437,107.00
0.15	Gel Electrophoresis	39,172.00			-	39,172.00	5,876.00	33,296.00
0.15	Real Time PCR	222,901.00			-	222,901.00	33,435.00	189,466.00
0.15	SDS Page Electrophoresis	49,672.00			-	49,672.00	7,451.00	42,221.00
0.15	Gas Cylinder	2,294.00			-	2,294.00	344.00	1,950.00
0.15	Water Jacket Vessel	21,472.00				21,472.00	3,221.00	18,251.00
Project Bio Gas Assets								
0.15	Infrared Thermometer	1,852.00	-		-	1,852.00	278.00	1,574.00
0.15	Equipments	12,410.00				12,410.00	1,862.00	10,548.00
Project Bio Mass Cookstove Assets								
0.15	Gas Cylinder	18,090.00	-		-	18,090.00	2,714.00	15,376.00
0.40	Computer & Printer	41.00				41.00	16.00	25.00
0.15	Office Equipments	18,330.00				18,330.00	2,750.00	15,580.00
Project Indo Brazil Assets								
0.15	Equipments	580,095.00				580,095.00	87,014.00	493,081.00
Scientific & Laboratory Equipments (12-13)								
0.15	Cook Stove	75.00			-	75.00	11.00	64.00
0.15	Fume Hood	13,754.00			-	13,754.00	2,063.00	11,691.00
0.15	Photo Bioreactor	2,166.00			-	2,166.00	325.00	1,841.00
0.15	Weight Scale 100 kg	1,132.00			-	1,132.00	170.00	962.00
0.15	Weight Scale 30 kg	808.00			-	808.00	121.00	687.00
Plant & Machinery Equipments								
0.15	Air Compressor Machine	3,587.00			-	3,587.00	538.00	3,049.00
0.15	Fixed Drill Machine R/f 20mm	4,617.00			-	4,617.00	693.00	3,924.00
0.15	Gas cutting Set	5,121.00			-	5,121.00	768.00	4,353.00
0.15	Grinder Angle 100mm (Hand Grinder)	612.00			-	612.00	92.00	520.00
0.15	Hydraulic Power Hacksaw Machine	7,066.00			-	7,066.00	1,060.00	6,006.00

0.15	Lath Machine	48,489.00			-	48,489.00	7,273.00	41,216.00
0.15	Pana Machine(Arc Welding Set)	11,212.00			-	11,212.00	1,682.00	9,530.00
0.15	Pedestal Grinder 300mm	4,400.00			-	4,400.00	660.00	3,740.00
0.15	Tractor,Trolly & Equipments	720,630.00	-			720,630.00	112,329.00	608,301.00
0.15	Borewell with 2HP Submersible Pump	149,743.00				149,743.00	22,461.00	127,282.00
0.15	Drill Machine (GBM 10 MM Heavy)	535.00			-	535.00	80.00	455.00
0.15	Fire Extinguishar	18,123.00			-	18,123.00	2,718.00	15,405.00
0.15	Grass Moving Machine	229.00			-	229.00	34.00	195.00
0.15	Hmpv Fitting Lamp	8,582.00			-	8,582.00	1,287.00	7,295.00
0.15	Leveller	1,276.00			-	1,276.00	191.00	1,085.00
0.15	Projector	44,365.00			-	44,365.00	6,655.00	37,710.00
0.15	Tiller	1,776.00			-	1,776.00	266.00	1,510.00
0.15	Vehicle Car Ambessador (New)	69,619.00			-	69,619.00	10,443.00	59,176.00
0.15	Workshop Tools	64,050.00			-	64,050.00	9,608.00	54,442.00
0.15	Drill Hammer Rotary 26(hand Grinder)	2,122.00			-	2,122.00	318.00	1,804.00
0.15	Gas & Four Cylinders	1,491.00			-	1,491.00	224.00	1,267.00
0.15	Electrical Equipments	53,941.00			-	53,941.00	8,091.00	45,850.00
0.10	Guest Houes Assest/ Office Equipment.	43,935.00			-	43,935.00	4,394.00	39,541.00
0.10	Leddger	8,617.00			-	8,617.00	862.00	7,755.00
0.10	Plant Mach & Equip Office-II	2,069.00			-	2,069.00	207.00	1,862.00
0.10	Fins Room Heater	148,838.40	-	-		148,838.40	14,883.84	133,954.56
0.15	Lab Scale Anaerobic Digester	991,261.33	-	-	-	991,261.33	148,689.20	842,572.13
0.15	Vehicle Staff Car	815,977.77	-	-	-	815,977.77	122,396.67	693,581.11
Scientific & Laboratory Equipments								
0.15	Air Oven (250 degree)	5,713.00			-	5,713.00	857.00	4,856.00
0.15	Bomb Calorimeter	71,906.00			-	71,906.00	10,786.00	61,120.00
0.15	Circ,Refrig,6Lt,STD(Auto Clave)	15,625.00			-	15,625.00	2,344.00	13,281.00
0.15	Data Acquisition System	50,408.00			-	50,408.00	7,561.00	42,847.00
0.15	Digital Ph.Meter	7,039.00			-	7,039.00	1,056.00	5,983.00
0.15	Incubator Bacteriological	5,944.00			-	5,944.00	892.00	5,052.00
0.15	Kern Analytical Balance (220gm)	6,952.00			-	6,952.00	1,043.00	5,909.00
0.15	Laboratory Refrigerator	85,059.00			-	85,059.00	12,759.00	72,300.00
0.15	Laminar Airflow Horizontal	7,393.00			-	7,393.00	1,109.00	6,284.00
0.15	Megnetic Stirrer	4,611.00			-	4,611.00	692.00	3,919.00
0.15	Platorm Scale(Platform Balance)	2,176.00			-	2,176.00	326.00	1,850.00
0.15	Precision Laboratory Balance(610gm)	3,969.00			-	3,969.00	595.00	3,374.00
0.15	Water Bath	17,212.00			-	17,212.00	2,582.00	14,630.00
0.15	Automatic Sieve	42,478.00			-	42,478.00	6,372.00	36,106.00
0.15	Bio-Diesel Preparation Unit(England)	98,537.00			-	98,537.00	14,781.00	83,756.00
0.15	Biomass Gassifier	129,768.00			-	129,768.00	19,465.00	110,303.00
0.15	CHN Analyzer (Germany)	267,682.00			-	267,682.00	40,152.00	227,530.00
0.15	Fibretech Apparatur	30,890.00			-	30,890.00	4,634.00	26,256.00
0.15	Incubator Shaker(USA)	103,604.00			-	103,604.00	15,541.00	88,063.00
0.15	Micropipette	7,811.00			-	7,811.00	1,172.00	6,639.00
0.15	Portable Biogas plant	11,826.00				11,826.00	1,774.00	10,052.00
0.15	2 Gel Electrophoresis	147,351.00				147,351.00	22,103.00	125,248.00
0.15	Automatic Colony Counter	208,015.00				208,015.00	31,202.00	176,813.00
0.15	Bio Photometer	76,611.00				76,611.00	11,492.00	65,119.00
0.15	Co2 Incubator Shaker	181,047.00				181,047.00	27,157.00	153,890.00
0.15	Gas Flow Meter	155,649.00				155,649.00	23,347.00	132,302.00
0.15	Dry Bath	12,234.00				12,234.00	1,835.00	10,399.00
0.15	Electroporation Unit	36,602.00				36,602.00	5,490.00	31,112.00
0.15	Filter Paper Type SMP Sysytem	42,302.00				42,302.00	6,345.00	35,957.00
0.15	Flue Gas Analyser	354,141.00				354,141.00	53,121.00	301,020.00
0.15	FTIR Spectrometer (FTIR 660)	334,801.00				334,801.00	50,220.00	284,581.00
0.15	Gradient PCR (Mastercycler Nexus GX2)	96,410.00				96,410.00	14,462.00	81,948.00
0.15	Hot Plate Cum Magnetic Stirrer	10,021.00				10,021.00	1,503.00	8,518.00
0.15	Precision Microbalance	29,958.00				29,958.00	4,494.00	25,464.00
0.15	Ultrasonic Cleaner	6,916.00				6,916.00	1,037.00	5,879.00
0.15	Refrigerated Centrifuge (Germany)	65,296.00		-		65,296.00	9,794.00	55,502.00
0.15	TG DTA (STA6000)Singapore	148,441.00				148,441.00	22,266.00	126,175.00
0.15	Ultra Low Freezer(Deep Freezer)(USA)	56,454.00				56,454.00	8,468.00	47,986.00
0.15	U V Vis Spectrophotometer(Singapore)	86,728.00				86,728.00	13,009.00	73,719.00
0.15	Autoclave	23,437.00				23,437.00	3,516.00	19,921.00

0.15	Auto Emission Analyzer	56,916.00			56,916.00	8,537.00	48,379.00
0.15	BOD Incubator	77,706.00			77,706.00	11,656.00	66,050.00
0.15	Carbon Monoxide Indicator	2,315.00			2,315.00	347.00	1,968.00
0.15	Circulatory Water Bath	28,223.00			28,223.00	4,233.00	23,990.00
0.15	Gas Chromatography	487,851.00			487,851.00	73,178.00	414,673.00
0.15	Microscope	26,195.00			26,195.00	3,929.00	22,266.00
0.15	Muffle Furnace 1200 (1400)	6,665.00			6,665.00	1,000.00	5,665.00
0.15	Muffle Furnace 1100 (1400)Degree	4,950.00			4,950.00	743.00	4,207.00
0.15	Vaccum Oven	25,104.00			25,104.00	3,766.00	21,338.00
0.15	Gas Regulator	1,278.00			1,278.00	192.00	1,086.00
0.15	Water PurificatiOn System	143,836.00			143,836.00	21,575.00	122,261.00
0.15	Equipments (Scientific and laboratory)	10,514.00			10,514.00	1,577.00	8,937.00
0.15	Automatic cell counter	99,823.00		-	99,823.00	14,973.00	84,850.00
0.15	Fluorescence Microscope	329,713.00			329,713.00	49,457.00	280,256.00
0.15	Hot air oven	122,560.00			122,560.00	18,384.00	104,176.00
0.15	incubator 104	24,033.00			24,033.00	3,605.00	20,428.00
0.15	irox diesel	533,327.00			533,327.00	79,999.00	453,328.00
0.15	Micro balance	429,172.00			429,172.00	64,376.00	364,796.00
0.15	Moisture analyzer	135,665.00			135,665.00	20,350.00	115,315.00
0.15	Muffle Furnace 1400	96,936.00			96,936.00	14,540.00	82,396.00
0.15	phase contrastmicroscope	222,035.00			222,035.00	33,305.00	188,730.00
0.15	Shaking Water Bath	88,777.00			88,777.00	13,317.00	75,460.00
0.15	Staked Enviroment Shaker	580,865.00			580,865.00	87,130.00	493,735.00
Scientific & Lab. Equipments (For Bio-Dieseal Project)							
0.15	Circular Saw Ma chine	3,870.00			3,870.00	581.00	3,289.00
0.15	Differntail Scanning Calormiter	515,977.00			515,977.00	77,397.00	438,580.00
0.15	Gel Documents	169,311.00			169,311.00	25,397.00	143,914.00
0.15	High Mast Light	684,956.00			684,956.00	102,743.00	582,213.00
0.15	Homogenizer	77,524.00			77,524.00	11,629.00	65,895.00
0.15	HPLC	300,456.00			300,456.00	45,068.00	255,388.00
0.15	Lyophilizer	136,935.00			136,935.00	20,540.00	116,395.00
0.15	Oxidation Stabily Apparatus	173,680.00			173,680.00	26,052.00	147,628.00
0.15	Ramsbotton Carbon Residue Apparatus	151,167.00			151,167.00	22,675.00	128,492.00
0.15	Street Light	756,625.00			756,625.00	113,494.00	643,131.00
0.10	Furniture & Fixture	8,352,989.00			8,352,989.00	835,299.00	7,517,690.00
0.40	Computer/Peripherals	4,513.06			4,513.06	1,805.00	2,708.06
0.15	Library Books	631,847.00	246,681.00		878,528.00	113,278.00	765,250.00
0.15	Cycle	40.00			40.00	6.00	34.00
	Misc Equipments (Cellphone)				-		
0.15	Hand Held XRF Analyser		1,911,600.00		1,911,600.00	143,370.00	1,768,230.00
0.10	Misc Fixed Assets	28,513.00			28,513.00	2,851.00	25,662.00
0.10	Guest House Misc Assets	13,684.00			13,684.00	1,368.00	12,316.00
0.15	Guest House Equip Mach-I	1,988.00			1,988.00	298.00	1,690.00
0.10	Guest House Equip Mach-II	40.00			40.00	4.00	36.00
0.15	Land Site Related Dev Tubewell	129,344.00			129,344.00	19,402.00	109,942.00
0.10	Civil Works Building & Built Up Space	101,935,240.00	4,048,024.00		105,983,264.00	10,395,925.00	95,587,339.00
0.15	Mobile	651.00			651.00	98.00	553.00
0.10	Inaugration of Gate	4,707.00			4,707.00	471.00	4,236.00
0.15	Air Conditions	2,816,924.98			2,816,924.98	422,539.00	2,394,385.98
0.15	Hair refrigerator 601 Ltr	10,877.00			10,877.00	1,632.00	9,245.00
0.15	Digital Electronic Balance ML 204	16,709.00			16,709.00	2,506.00	14,203.00
0.15	Helium Gas Cylinder with Regulator	5,080.00			5,080.00	762.00	4,318.00
0.15	Online UPS 15KVA	38,593.00			38,593.00	5,789.00	32,804.00
0.10	Development of Gate	820,187.00			820,187.00	82,019.00	738,168.00
0.15	Panasonic Fax	1,402.00			1,402.00	210.00	1,192.00
0.15	Washing Machine	4,480.00	30,800.00		35,280.00	5,292.00	29,988.00
0.15	Gas Purification	12,835.00			12,835.00	1,925.00	10,910.00
0.15	Liquid Nitrozen	13,458.00			13,458.00	2,019.00	11,439.00
0.15	Bike Passion	9,902.00			9,902.00	1,485.00	8,417.00
0.15	Machinery (Assets)	23,304,462.08	11,868,105.00	13,863,535.00	49,036,102.08	6,315,650.00	42,720,452.08
0.15	Process Equipment	59,508.00			59,508.00	8,926.00	50,582.00
0.15	LG refrigerator	13,472.00			13,472.00	2,021.00	11,451.00
0.10	Sign Board	345,668.43			345,668.43	34,567.00	311,101.43

0.15	Water Purifiers	53,603.00				53,603.00	8,040.00	45,563.00
0.10	Stainless steel Doors	97,266.00				97,266.00	9,727.00	87,539.00
0.15	Rear Disk Rod	1,436.00				1,436.00	215.00	1,221.00
0.15	Sheet Cutting Machine	8,132.00				8,132.00	1,220.00	6,912.00
0.10	Water tank	80,962.00				80,962.00	8,096.00	72,866.00
0.15	Sheet Rolling Machine	12,192.00				12,192.00	1,829.00	10,363.00
0.10	Construction	545,215.00				545,215.00	54,522.00	490,693.00
0.15	Audio Video Conferencing Sys	734,782.00				734,782.00	110,217.00	624,565.00
0.40	Scanner	43.00				43.00	17.00	26.00
0.10	Office Buildings (W	1,650,758.00				1,650,758.00	165,076.00	1,485,682.00
0.15	Plant Assets	5,586.00				5,586.00	838.00	4,748.00
0.15	CCTV Camera	859032.31	69,285.79	14,632.00		942,950.10	140,345.12	802,604.99
0.40	Software	1786811.41				1,786,811.41	714,724.56	1,072,086.85
0.40	Software MS Office			129,600.00		129,600.00	25,920.00	103,680.00
0.40	Computers/printers	563140.09				563,140.09	225,256.04	337,884.06
0.25	Patent	30187.50				30,187.50	7,546.88	22,640.63
0.15	Telephone	5039.86		11,739.94		16,779.80	1,636.47	15,143.33
0.15	UPS 20KVA			1,124,760.00		1,124,760.00	84,357.00	1,040,403.00
0.15	Forbes Vaccum Cleaner Wet & Dry	12159.13				12,159.13	1,823.87	10,335.26
0.15	Water Geyser	71382.25	57,000.00	7,574.00		135,956.25	19,825.39	116,130.86
0.15	Exhaust Fan	88522.50				88,522.50	13,278.38	75,244.13
0.15	Microwave Oven	11530.13				11,530.13	1,729.52	9,800.61
0.15	Crompton water heater geyser	6375.00				6,375.00	956.25	5,418.75
0.15	Projector Screen	13597.50				13,597.50	2,039.63	11,557.88
0.15	Video Conferencing Camera	23117.60		330,000.00		353,117.60	28,217.64	324,899.96
	Sub-Total	177,519,914.58	12,476,554.69	23,021,722.94	-	213,018,192.21	23,830,332.44	189,187,859.78

COMPILED FROM THE BOOKS OF ACCOUNTS PRODUCED TO US

For Sardar Swaran Singh National Institute Of Bio Energy

Date:11-08-2025
Place:Jalandhar
Udin:25573176BMIIIDY9091



FOR ANAND TARUN & CO.
CHARTERED ACCOUNTANTS

Gagan Arora
GAGAN ARORA
M.NO 573176
PARTNER

Anand Singh
Anand Singh

Finance & Accounts Officer Director General
ਸਰਦਾਰ ਸਵਰਨ ਸਿੰਘ ਰਾਸ਼ਟਰੀ ਜੀਵ ਊਰਜਾ ਸੰਸਥਾਨ
12 ਕਿ.ਮੀ ਪੱਥਰ, ਜਾਲੰਧਰ-ਕਪੂਰਥਲਾ ਰੋਡ,
ਬਡਾਲਾ ਕਲਾਂ, ਕਪੂਰਥਲਾ (ਪੰਜਾਬ) 144601
Sardar Swaran Singh National Inst. of Bio-Energy
12 Km. Stone, Jalandhar-Kapurthala Road
Wadala Kalan, Kapurthala (Punjab) 144601

SARDAR SWARAN SINGH NATIONAL INSTITUTE OF BIO-ENERGY

(An Autonomous Institution of Ministry of New & Renewable Energy)

Kapurthala (Punjab) - 144601

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR'2025

(Amount in Rs.)

Schedule 3 Security Deposit, EMD, PG

Sr No	Particulars	Amount
1	Avon Corporation Ltd (EMD)	4,000.00
2	Eppendorf India Ltd	50,000.00
3	ISS Hicare Pvt Ltd	5,000.00
4	Labmate Asia Pvt Ltd	20,000.00
5	M/s Bharat Instruments	6,000.00
6	M/s Hysel India Pvt Ltd	20,000.00
7	M/s Metrohm india Pvt Ltd	59,000.00
8	M/s Namco National Medicine Co	4,000.00
9	M/s Punjab Ex Servicemen Corporation	125,000.00
10	M/s Radical Scientific Equipment	30,000.00
11	M/s Saggu Tubewell Co	7,500.00
12	M/s Sandeep Builders	17,000.00
13	M/s Scientific Imporium	20,000.00
14	M/s TCI Chemicals Pvt Ltd	20,000.00
15	M/s Vinny Scientific Store	20,000.00
16	M/s Wipro GE Healthcare	40,000.00
17	Shankar Book Agency Pvt Ltd	7,500.00
18	EMD	82,000.00
19	M/s K Bhagat & Co.	1,545.00
20	Security Deposit Payable	69,350.00
	Total	607,895.00

COMPILED FROM THE BOOKS OF ACCOUNTS PRODUCED TO US

For Sardar Swaran Singh National Institute Of Bio Energy

Date:11-08-2025
Place:Jalandhar
Udin:25573176BMIIDY9091



[Signature]
Finance & Accounts Officer & Director General
12 कि.मी पत्थर, जालंधर-कपूरथला रोड,
बडाला कला, कपूरथला (पंजाब) 144601
Sardar Swaran Singh National Inst. of Bio-Energy
12 Km. Stone, Jalandhar-Kapurthala Road
Wadala Kalan, Kapurthala (Punjab) 144601

SARDAR SWARAN SINGH NATIONAL INSTITUTE OF BIO-ENERGY

(An Autonomous Institution of Ministry of New & Renewable Energy)

Kapurthala (Punjab) - 144601

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR'2025**(Amount in Rs.)****Schedule 3 Salary Payable**

Sr No	Particulars	Amount
1	Salary & Allowances Payable	1,617,634.00
2	EPF Payable	510,003.00
	Total	2,127,637.00

Schedule 4 Prepayments

Sr No	Particulars	Amount
1	Accrued Overhead Income	300,000.00
	Total	300,000.00

Schedule 5 Sundry Debtors

Sr No	Particulars	Amount
1	Adv B.Raghavendra Babu,RA	13,500.00
2	Arc Bio Fuel Pvt Ltd	2,360.00
3	Asbri Energy & Enviro Technologies Pvt Ltd	1,180.00
4	Dr Anand Pandey	3,540.00
5	Dr Richa Arora	3,540.00
6	Dr Savita Vyas	900.00
7	Dr Ujwal P C/o NMAM Institute of Technology, NITTE	3,540.00
8	Executive Engineer CHD-II DTPS,HTPS,ALIGARH	33,040.00
9	Executive Engineer PWD	694,565.00
10	Head Dept of Renewable Energy Engineering PAU	2,360.00
11	Hod Dept of Microbiology	2,360.00
12	Kaps Green Energy Llp	53,690.00
13	Kritika Jain C/o PAU	1,180.00
14	Mr Atharv Jagtap	2,172.00
15	Mr Sumit Garg	23,600.00
16	M/s. B.N. Construction	500,000.00
17	M/s Ecosense Sustainable Solutions (P) Ltd	29,500.00
18	M/s GPS Renewables	11,600.00
19	M/s Green Power International Pvt Ltd	75,000.00
20	M/s Khilari Infrastructure Pvt Ltd	3,540.00
21	M/s Oil and Natural Gas Corp Ltd Noida	8,850.00
22	M/s Organic Recycling Sys Ltd	334,550.00
23	National Informatics Centre Services Inc.	189,445.00
24	National Institute of Solar Energy(NISE)	5,000.00
25	Punjab Technical University	10,030.00
26	The Principal,NMAM Institute of Technology	7,080.00
	Total	2,016,122.00

SARDAR SWARAN SINGH NATIONAL INSTITUTE OF BIO-ENERGY

(An Autonomous Institution of Ministry of New & Renewable Energy)

Kapurthala (Punjab) - 144601

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MAR'2025**(Amount in Rs.)****Schedule 5 Advances**

Sr No	Particulars	Amount
1	Gas Security	7,100.00
2	BHAGWAN SHREE ASSOCIATES	0.20
3	CSIR NATIONAL PHYSICAL LABORATORY	177,000.00
4	M/S ANIL MESS SERVICE	1,390.00
5	M/S PRECISION BIOMETRIC INDIA PVT LTD	21,240.00
6	PARI TRAINING INSTITUTE LLP	43,660.00
7	ANAND KUMAR	6,000.00
8	ADV. SHIKHA BOKADIA, TECHNICAL ASSISTANT	3,000.00
9	Adv.Amarjit Singh, Tractor Driver	800.00
10	Advance Dr.Tapas Patra	41,278.00
11	Casa New Delhi	300,000.00
12	Deposit with CPWD	68,685.00
13	IRCTC AMBALA RO ACCOUNT	500,000.00
14	Jain University	337,040.00
15	M/s. DeeJay Corporation	63,279.00
16	National Institute of Technology Hamirpur	630,404.00
17	Punjab State Council for Science & Technology	5,900.00

COMPILED FROM THE BOOKS OF ACCOUNTS PRODUCED TO US

For Sardar Swaran Singh National Institute Of Bio Energy

Date:11-08-2025
Place:Jalandhar
Udin:25573176BMIIDY9091



[Signature]
Finance & Accounts Officer
Sardar Swaran Singh National Inst. of Bio-Energy
12 कि.मी पत्थर, जालंधर-कपूरथला रोड,
बडाला कला, कपूरथला (पंजाब) 144601
Sardar Swaran Singh National Inst. of Bio-Energy
12 Km. Stone, Jalandhar-Kapurthala Road
Wadala Kalan, Kapurthala (Punjab) 144601

INDEPENDENT AUDITOR'S REPORT

To
The Directors
Sardar Swaran Singh Institute of Bio-Energy
Kapurthala

Report on the Audit of the Standalone Financial Statements

Opinion

We have audited the attached Balance Sheet of Sardar Swaran Singh Institute of Bio-Energy, Kapurthala as at March 31, 2025 and also the Income and Expenditure Account for the year ended on that date annexed thereto. These financial statements are the responsibility of the management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with auditing standards generally accepted in India. Those Standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

Basis for Opinion

We conducted our audit in accordance with the Standards on Auditing (SAs) as prescribed by the Institute Of Chartered Accountant Of India (ICAI). Our responsibilities under those Standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the institute in accordance with the Code of Ethics issued by the Institute of Chartered Accountants of India and we have fulfilled our other ethical responsibilities in accordance with these requirements and the Code of Ethics. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibility of Management for Standalone Financial Statements

The management of Institute is responsible to the preparation of these standalone financial statements that give a true and fair view of the financial position, financial performance, and cash flows of the institute in accordance with the accounting principles generally accepted in India. This responsibility also includes maintenance of adequate accounting records for safeguarding of the assets of the institute and for preventing and detecting frauds and other irregularities; selection and application of appropriate accounting policies; making judgments and estimates that are reasonable and prudent; and design, implementation and maintenance of adequate internal financial controls, that were operating effectively for ensuring the accuracy and completeness of the accounting records, relevant to the preparation and presentation of the financial statement that give a true and fair view and are free from material misstatement, whether due to fraud or error.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with SAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

Other Matter Paragraphs

Following are our observations during the course of the audit and the corresponding resolutions:

1. An amount of Rs 3,50,00,000/- received as grant for purchase of capital asset during the year & Rs 3,54,98,277.63/- was spent on acquisition of capital asset. Grant received during the year had been credited to Grant Received for the capital asset under the major head of Reserves & Surplus. Amount which was spent for purchase of fixed assets of Rs 3,54,98,277.63/- had been credited to capital fund account by debiting to Grant Received for capital asset account. An Amount of Rs 89,73,159/- is charged as Depreciation on Capital Asset acquired out of the funds received for the purchase of fixed assets. Hence This amount is transferred from capital asset fund to Profit & Loss account being treated as income during the year.
2. Balance with the Government Authorities includes Advance Income Tax amounting to Rs. 4,28,395/- which belongs to some previous year. As explained to us, this amount had been claimed as refund in the Income Tax Return filled . However, Refund of this amount is yet not issued by Income tax authorities. Management is unable to provide the exact details as to which year this refund relates and why it is not being released by the Income Tax Department. In our opinion this amount is not recoverable at all and hence it should be written off in the books of accounts.
3. The Employees of the institute is entitled to certain benefits like Leave Encashment & Leave Travel Concession. They are also entitled to Gratuity to be received at the time of retirement of Employee. No provision is made by institute w.r.t Gratuity, Leave Encashment & Leave travel Concession. Institute claim expenditure of gratuity, leave Encashment , etc in its books of accounts when it is actually paid. Institute had not followed the provisions of AS 15 regarding the valuation of employees benefits and also had not made the provision for it. Therefore the profits are overstated by this amount.
4. Some of the purchases made in cash does not reflect in Inventory records . Hence the management should install proper system of inventory control so that each & every purchase should be properly recorded in stock register.
5. Expenditure from Imprest account should be minimized & it should be paid through PFMS mode. Institute is following the practice of incurring expenses through the imprest account of employee .Adequate Stock should be maintained by the concerned department to avoid excess usage of imprest.

6. Advance paid to M/s Pushpa Gujral Science City of Rs. 12,320/- on 07/10/2023 for room booking but till date the invoices for these expenditure are not being received by the institute and hence had not been booked as expenditure.
7. Following is the List of Debtors/ Loans & Advances / Securities where in advances have been given for more than a year and have not been given the proper adjustment in the books of accounts.

(in Rs)

Particulars	Date of Advance	Balance as on 31.03.2025
CASA, New Delhi	17/07/2003	3,00,000 /-
Sundry Advances	31/03/2015	41,055.49 /-
M/s DeeJay Corporation	2012	63,279 /-
M/s B.N Construction	21/10/2014	5,00,000 /-
Dr Savita Vyas	9/01/2022	900 /-
M/s Ecosense Sustainable Solutions	16/03/2022	29,500 /-
Security Deposit Recievable	02/09/2022	800 /-
Deposit with CPWD	25/03/2021	68,685 /-
Gas Security	-	7,100 /-
Punjab Technical University	23/08/2022	3,540 /-
Comptroller, Punjab Agriculture University	29/08/2022	59,000 /-
Dr. Anand Pandey	25/08/2022	35,400/-

The above advances are long outstanding. As explained to us no legal proceedings had been initiated to recover these outstanding amounts and also no Utilisation Certificate or Invoice had been received. We recommend that proper action should be taken up for recovery from above parties and there should be regular review of all the advances to ensure that vendors are fulfilling their commitments as per the terms of work orders. If at all these advances are not recoverable then it should be written off in the books of accounts.

8. Following is the list of creditors which are not paid for more than a year

(In Rs)

Particulars	Detail	Balance as on 31.03.2025
Arora Vikram & Associates	16/12/2019	18,880 /-
CA Manmohan Puri	23/10/2021	3,780 /-
M/s Chemicot Scientific gases	31/03/2016	3,810 /-
M/s Puri & Gupta	31/03/2022	59,000 /-

The above liabilities are outstanding for more than a year, we recommend proper action should be taken to settle the liabilities. In case these amounts are not payable at all then these should be marked as income in the Books of Accounts.

9. Statutory liabilities:-

In view of there being no taxable income under Income Tax Act, 1961, provision for Income Tax has not been considered necessary. However, it is found from Income Tax Portal that the organization has pending outstanding liability of Income Tax is as under:

(in Rs)

Sr No.	Assessment Year	Amount
1	2015-16	3,09,88,260/-
2	2016-17	5,47,460 /-
3	2022-23	2,12,54,320 /-
4	2023-24	20,000/-

As explained to us Appeal for the AY 2015-16 has been filed before Commissioner of Income Tax (Appeals) Decision of Honorable CIT (A) is still pending. In connection to AY 2016-17 assessment has been made under Section 143(3) vide order 27.11.2018 with Nil demand but demand of Rs 5,47,460/- has been still reflected in Income Tax Portal.

10. Physical verification of library books by the librarian should be done. Any books that are found to be damaged /missing, issued to students which is not possible to get back should be identified and if necessary should be written off from the stock as well as from the books of accounts.
11. It has been observed that certain amounts are standing in Reserve and Surplus as grant received in respect of projects that have already been completed. However, the balance/unutilized portion of such grants has neither been returned to the grantor nor recognized as income. The organization should take appropriate action in this regard. If the terms of the grant require the return of unutilized funds, the amount should be refunded to the grantor without delay. In the absence of any such stipulation, and where the grantor has not demanded the return, the unutilized amount should be transferred to income and appropriately recognized in the Profit & Loss account.

**FOR ANAND TARUN & CO
CHARTERED ACCOUNTANT**

**CA GAGAN ARORA
PARTNER
M. No. 573176**

SOCIAL MEDIA / ONLINE PRESENCE



SSS National Institute of Bio Energy
@SssNibe

A MoU was signed between @SssNibe and @Organic recycling System (ORS) on 8th April, 2024 to collaborate on sustainable technology development.



3:24 pm · 08 Apr 24 · 349 Views



SSS National Institute of Bio Energy
@SssNibe

@SssNibe celebrated National Technology Day on 9th May. During the programme, a keynote lecture was delivered by our Chief Guest Prof. Adarsh Pal Vig, Chairman, Punjab Pollution Control Board.



10:44 am · 10 May 24 · 148 Views



SSS National Institute of Bio Energy
@SssNibe

Sardar Swaran Singh National Institute of Bio-Energy, Kapurthala, & Punjab State Council for Science & Technology @PSCST_GoP signed an MoU today to advance bio-energy research, capacity building, and clean energy adoption.
#RenewableEnergy
#Sustainability



6:07 pm · 23 Jan 25 · 109 Views



SSS National Institute of Bio Energy
@SssNibe

@SssNibe conducted one day workshop on 30th April on the theme Idea, Research, Innovation, Intellectual Property Rights and Technology Transfer jointly supported by @PSCST_GoP. The workshop was inaugurated by Chief Guest DG NIBE and Ms Divya Kaushik, PSCST, Chandigarh.



SSS National Institute of Bio Energy
@SssNibe

Congregation at MNRE New Delhi for the 39th Governing Council (GC) meeting of SSS NIBE on 29th May 2024. Grateful to the Secretary, @mnreindia who is also the Chairman GC and all the GC members for their participation.



8:35 am · 30 May 24 · 185 Views



SSS National Institute of Bio Energy
@SssNibe

🔄 Translate post
संसदीय राजभाषा समिति की दूसरी उप-समिति द्वारा संस्थान का राजभाषायी निरीक्षण दिनांक 27.02.2025 को चंडीगढ़ में सफलतापूर्वक संपन्न हुआ। इस दौरान माननीय सदस्यों ने मंत्रालय एवं संस्थान के वरिष्ठ अधिकारियों की उपस्थिति में #राजभाषा प्रदर्शनी का अवलोकन किया।



11:28 am · 28 Feb 25 · 162 Views



SSS National Institute of Bio Energy
@SssNibe

SSS-NIBE and Punjab Agricultural University Ludhiana have signed a MOU on collaborate on bio-energy research, academic programs & capacity building. This partnership aims to promote sustainable utilisation of agricultural residue for energy production and soil nutrient amendment.



6:16 pm · 17 Mar 25 · 148 Views



SSS National Institute of Bio Energy
@SssNibe

On the occasion of Rashtriya Ekta Diwas, the Director General of the institute led the oath-taking ceremony, reinforcing our commitment to national unity and integrity. Together, we uphold the values that strengthen our nation.

#RashtriyaEktaDiwas
#UnityInDiversity



6:21 pm · 30 Oct 24 · 151 Views



SSS National Institute of Bio Energy
@SssNibe

SSS-NIBE is observing #VigilanceAwarenessWeek2024 with the Integrity Pledge, today. All officials and staff pledged to ensure the highest level of integrity, transparency & accountability and work for a corruption-free India.

#VigilanceWeek2024
#mnreindia



5:16 pm · 28 Oct 24 · 137 Views



SSS National Institute of Bio Energy
@SssNibe

🇮🇳 Celebrated the 76th Republic Day at Sardar Swaran Singh National Institute of Bio-Energy!

A day to honor our Constitution and reaffirm our commitment to innovation in bioenergy for a sustainable future.

#RepublicDay2025
#RenewableEnergy
#Sustainability



7:08 pm · 26 Jan 25 · 78 Views



SSS National Institute of Bio Energy
@SssNibe

🌟 Inspiring Guest Lectures at SSS NIBE Today! 🌱

🎤 Prof. Arora (@iitroorkee) delivered an insightful lecture on Biomass Supply Chain Management.

🎤 Prof. Anuj K Chandel (USP, Brazil) discussed Lignin: An Untapped Reservoir of Renewable Carbon from Biorefineries.



12:21 pm · 22 Jan 25 · 82 Views



SSS National Institute of Bio Energy
@SssNibe

DG, NIBE participated in the panel discussion on biomass supply chain at the CII Bioenergy summit in Delhi.

@FollowCII
@mnreindia



2:33 pm · 14 Oct 24 · 265 Views



SSS National Institute of Bio Energy
@SssNibe

Dr. Arshbeer Kaur, Medical Officer at Civil Hospital Kapurthala, delivered an impactful CPR and basic First Aid Training session today at the institute.

Empowering skills that save lives! 🙌

#FirstAid

#CPRTraining

#HealthAwareness



5:19 pm · 15 Jan 25 · 113 Views



SSS National Institute of Bio Energy
@SssNibe

SSS NIBE has received NABL accreditation for Testing (in accordance with the standard ISO/IEC 17025:2017). Scope of accreditation – biogas/bioCNG and biomass testing (proximate and ultimate analysis).

#NABLAccreditation

#mnreindia

#Biogas

#bioCNG



SSS National Institute of Bio Energy
@SssNibe

Inauguration ceremony of National Training Program on Biogas technology at @SssNibe in presence of DG, NIBE, Prof. Adarsh Pal Vig, Chairman, PPCB and Sh. Gaurav Kedia, Chairman, Indian Biogas Association.

@biogasindia

@mnreindia

@BiomassMission



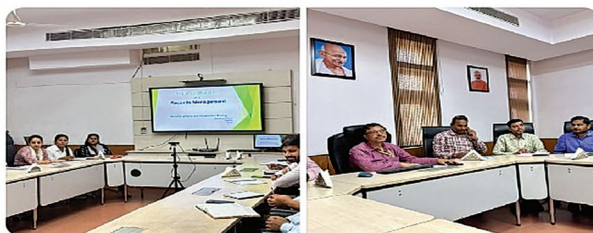
SSS National Institute of Bio Energy
@SssNibe

#SpecialCampaign4, a training session on Record Management provisions under Central Secretariat Manual of Office Procedure (CSMoP), GFR, Record Retention Schedule and timelines for responding to VIP References was organized at the institute today.

#MNRE

#DARPG

#DARPG_GoI



4:46 pm · 17 Oct 24 · 197 Views



SSS National Institute of Bio Energy
@SssNibe

MNRE booth at the Renewable Energy Expo inaugurated by Dr Sangita Kasture Scientist-G MNRE @SangitaKasture. SSS NIBE is also showcasing its work/activities. Do visit us during 3rd-5th October 2024.

@mnreindia



2:37 pm · 03 Oct 24 · 855 Views



SSS National Institute of Bio Energy
@SssNibe

The 40th Governing Council & 6th Annual General meeting was held at SSS-NIBE on 26.09.2024, chaired by Sh. Bhupinder S Bhalla, Secretary MNRE. There was tree sapling plantation in the afternoon, followed by a farewell function for the outgoing Secretary. We are grateful to him!



9:14 pm · 27 Sept 24 · 438 Views



SSS National Institute of Bio Energy
@SssNibe

Under the #EkPedMaaKeNaam campaign, the honorable Secretary MNRE Sh Bhupinder S Bhalla, Director General SSS NIBE Dr. G. Sridhar, Dr. Sangita M. Kasture, Scientist-G, MNRE and Dr. Sanjay Kumar Shahi, Scientist-F, MNRE planted saplings at SSS-NIBE, Kapurthala.

@mnreindia



9:21 pm · 27 Sept 24 · 1,196 Views



SSS National Institute of Bio Energy
@SssNibe

Prof. (Dr.) PV Aravind from the University of Groningen @UCGroningen delivered invited lecture on "Biohydrogen and Solid Oxide Fuel Cell" at the institute today.



12:44 pm · 22 Jul 24 · 254 Views



SSS National Institute of Bio Energy
@SssNibe

Translate post

आज 78वें स्वतंत्रता दिवस के पावन अवसर पर संस्थान के महानिदेशक जी ने ध्वजारोहण कर माँ भारती को नमन् किया।

सभी प्रदेश एवं देशवासियों को स्वतंत्रता दिवस की शुभकामनाएं।



11:53 am · 15 Aug 24 · 144 Views

Prepared and Edited by :

Dr. Ashish Bohre, Dr. Gurkamal Nain Singh, Sardar Gurpreet Singh and Shri Hitesh Sharma



SSS National Institute of Bio Energy
@SssNibe

Translate post

आज 78वें स्वतंत्रता दिवस के पावन अवसर पर संस्थान के महानिदेशक जी ने ध्वजारोहण कर माँ भारती को नमन् किया।

सभी प्रदेश एवं देशवासियों को स्वतंत्रता दिवस की शुभकामनाएं।



11:53 am · 15 Aug 24 · 144 Views



SSS National Institute of Bio Energy
@SssNibe

Happening now !!

National Seminar on Biomass Supply Chain Management
Inaugural Session with the DG, NIBE and Guest of Honour address by Mr. Pritpal Singh Executive Director @PSCST_GoP, Chief Guest, Mr. S. Upadhyay, SAMARTH Mission @Samarth mission, Mr. A. Tewari, DG @mgsipa



10:53 am · 05 Sept 24 · 166 Views



SSS National Institute of Bio Energy
@SssNibe

@SssNibe is organizing a two days National Workshop on " Specialized Hands-on-Training cum Workshop on Agro- Biomass Sampling and Characterization Techniques for Thermal Power Plant Applications" on 4-5 July, 2024 for @ntplimited officials.



5:09 pm · 04 Jul 24 · 229 Views



Sardar Swaran Singh National Institute of Bio-Energy, Kapurthala

(An Autonomous Institution of Ministry of New and Renewable Energy)

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 @NIBE

 SSS NIBE