Cooperative Research Project for Improved Operability of Rice Husk Gasification Power Generation in Myanmar –Achieving Reductions in Tar and Rice Husk Volumes–

The New Energy and Industrial Technology Development Organization of Japan (“NEDO”), Ministry of Industry (“MOI”), Ministry of Commerce (“MOC”) and Myanmar Agricultural Produce Trading (“MAPT”) will launch a cooperative research project to improve the operability of a rice husk gasification power generation system at a rice mill plant in Myanmar.

Myanmar’s rice husk gasification power generation systems frequently stop due to tar contaminants in generated gas. With the aim of minimizing tar accumulation, reducing rice husk volume and purifying effluent, a system, which includes equipment to briquette semi-carbonized rice husk fuels, filters to remove tar and effluent purification technology, will be introduced and demonstrated at a rice mill plant in Myanmar.

Bio Fuel Co., Inc. of Japan will implement the project with the support of NEDO. MOI and MOC of the Republic of the Union of Myanmar aim to promote the dissemination of the system to approximately 30,000 rice mill plants throughout Myanmar as well as increase the electrification rate in unelectrified areas by supplying surplus power to surrounding areas (see image below).

This project will be implemented based on a letter of intent (“LOI”) concluded in January last year between NEDO and the Rural Energy Development Committee of the Republic of the Union of Myanmar, as well as a policy dialogue held last September between the MOC of Myanmar and the Ministry of Economy, Trade and Industry of Japan. NEDO will continue to explore the implementation of future projects in
accordance with the LOI.

1. Background and Overview

NEDO has selected Bio Fuel Co., Inc. as an implementing company for the cooperative research project for improved operability of rice husk gasification power generation in Myanmar.

Myanmar’s primary industry is agriculture, which accounts for one-third of the country’s GDP. As rice is the country’s main agricultural product, large amounts of rice husks are generated during the rice production process as agricultural residue. Rice husks can be utilized as a source of biomass for power generation. In Myanmar with an electrification rate of 26%, rice husk gasification power generation systems are expected to help provide stand-alone power sources to unelectrified villages where it is difficult to install power grids.

In Myanmar’s rice husk gasification power generation systems, generated gas that contains tar is fed directly in power generators. Due to tar accumulation, power generator operations are frequently stopped for necessary cleaning and maintenance, thereby making it difficult to ensure a continuous electricity supply for long periods of time. Two-thirds of rice husks that can potentially be recycled as biomass are discarded, particularly in rural regions of Myanmar, because there is insufficient storage space for rice husks. Moreover, as water used in gasification generators, which contains tar and other harmful substances, undergoes only a simplified treatment process and is discharged into nearby rivers, there are concerns about adverse environmental effects.
With the aim of removing tar, reducing rice husk volume, and purifying power generation effluent, in this project, a system that combines a semi-carbonized briquette machine, filters using carbonized rice husks and effluent purification technology will be introduced and demonstrated at a rice mill plant in Myanmar. Seminars on technology transfer and dissemination will be held to provide capacity-building assistance to research institutions.

The dissemination of the system throughout Myanmar is therefore expected to improve power generation capacities by reducing necessary maintenance and ensure stable operation of energy-intensive high-performance rice mills, thereby increasing the amount of milled rice and contributing to revenue growth for rice mill plants. In addition to the effective utilization of unused rice husks as biomass fuel, securing sufficient rice husk storage space as well as the reduction of environmental burdens in neighboring areas, the project is also expected to increase the electrification rate in unelectrified areas through the sale of surplus power generated at rice mill plants to surrounding areas.

2. Project Summary
   1) Implementing company: Bio Fuel Co., Inc. and MAPT
   2) Project period: November 2012–February 2013
   3) Project budget: Approximately 90 million yen
   4) Project activities:
      1. Introduction of semi-carbonized briquette machine and test gasification power generation furnace*, demonstration of tar and rice husk volume reductions
         *Diesel engines and power generators manufactured by a state-owned company under the jurisdiction of MOI will be used.
      2. Development and demonstration of tar removal filters using carbonized rice husks
      3. Development and demonstration of effluent purification technology using rice husk combustion ash
      4. Analysis of system dissemination plans in Myanmar

3. Future Outlook
   Following the completion of the project, the system will be manufactured locally and dissemination of the system to approximately 30,000 rice mill plants throughout Myanmar will be promoted in cooperation with MOI and MOC of Myanmar. These activities are expected to contribute to the improvement of rice husk gasification power generator capacities and protection of the environment, as well as increase the electrification rate in rural areas through the sale of generated surplus power to surrounding areas. The project is also expected to help develop local industries and promote the export of Japanese technologies.
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NEDO Projects in Myanmar

In cooperation with the government of Myanmar, NEDO has carried out 11 projects in the energy and environmental fields, including the three projects below since 1999.

   - Hybrid technology utilizing both PV and wind power generation was demonstrated, and the project results were used for the development of a design support tool.
   - The project site was utilized for on-site training during capacity building programs.

   - Annual CO₂ emissions reduction of 46,000 tons was achieved by recovering exhaust heat.
   - NEDO proposed the introduction of this technology at fertilizer plants in Salay and refineries in Thanlyin.
3. The Model Project on High-efficiency Gas Turbine Technology

● Due to improved power generation efficiency, the project facilities achieved annual CO₂ emissions reduction of 108,000 tons and supplied approximately 10% of electricity used in Yangon city.

● NEDO proposed to introduce this technology at five other power plants