Proceedings of the 9th International Conference on Energy Harvesting, Storage, and Transfer (EHST 2026)
June, 2026 | Barcelona, Spain
DOI: 10.11159/ehst26.001

Driving Sustainability: Converting Municipal Solid Waste into Clean Fuels

Dr. Md Jahirul Islam
Central Queensland University, Australia

Abstract **-** The problems of solid waste management and energy security are worldwide challenges, and conventional treatment techniques, such as landfill and incineration, are becoming less and less appropriate. This This keynote will present the results of an innovative project that proved the viability of converting blended post-consumer plastic material at a municipal level to renewable diesel using an integrated pyrolysis, distillation and hydrotreating process. The project demonstrated that it is technically feasible to produce a clean, high-quality, low-carbon fuel that can be used in modern automobile engines and complies with international diesel specifications. Crucially, this study also identified environmental benefits such as decreasing greenhouse gas emissions by order of magnitude, as well as moving significant volumes of plastic waste from landfill. In addition to validating the technology, the study presented a detailed blueprint for commercializing waste-to-fuel technology. It proved that employing large-scale, this is economically feasible and environmentally sensitive, providing a realistic opportunity to reduce dependence on polluting landfills and to shore up energy resilience. This research tests the nexus of science, policy, and industry in converting waste into a resource. The project is creating a blueprint to introduce a recyclable economy from environmentally challenging waste materials to the front line of sustainability and demonstrates the feasibility of deploying this recycle economy in various similar sites around the world.