



UI GreenMetric Questionnaire

University : West Sumatera Maritime Polytechnic
Country : Indonesia
Web Address : <https://poltekpelsumbar.ac.id/>

[3] Waste (WS)

[3.12] Inorganic Waste Treatment (WS.4)



Example of Inorganic Waste Treatment (West Sumatera Maritime Polytechnic)

Description:

The campus implements an integrated inorganic waste management program to reduce waste generation and promote environmental sustainability. Inorganic waste is separated at the source using categorized waste bins placed in strategic locations across the campus. The bins are designated for plastic and paper waste, hazardous waste, food waste, and general waste, encouraging students and staff to dispose of waste properly.

After collection, recyclable inorganic waste such as plastics and paper is transported to the campus waste processing facility. The campus utilizes a plastic chopper machine to process plastic waste into smaller pieces, making it easier to store, transport, and recycle. The shredded plastic is then sent to recycling partners or further processed into reusable materials.

In addition to waste processing, the campus regularly conducts environmental awareness campaigns, waste segregation education, and clean-campus activities to encourage responsible waste management behavior among students, lecturers, and staff. These initiatives help reduce the volume of waste sent to landfills while supporting the campus's commitment to sustainability and the principles of a green campus. The implementation of waste segregation facilities and plastic recycling equipment demonstrates the institution's effort to create a circular waste management system and improve resource efficiency on campus.

As part of its commitment to environmental sustainability and technological innovation, the Politeknik Pelayaran Sumatera Barat has developed an innovative plastic shredding machine to support the campus plastic waste recycling program. This machine was designed and engineered by the institution to provide an efficient, cost-effective, and environmentally friendly solution for managing plastic waste generated both on campus and in surrounding communities. The innovation reflects the institution's dedication to integrating engineering knowledge with sustainable environmental practices while fostering practical learning opportunities for cadets and lecturers.



The plastic shredding machine serves as the first stage in the plastic recycling process. It is specifically designed to reduce the size of various plastic materials, including plastic bottles, containers, packaging, plastic bags, and other recyclable plastic waste, into small and uniform flakes. The machine is equipped with durable cutting blades, a powerful motor, and a safe operating system, enabling it to process large volumes of plastic waste efficiently. By reducing the size of plastic waste, the machine significantly simplifies subsequent recycling processes, such as washing, drying, melting, pelletizing, or manufacturing recycled products.

The shredded plastic produced by the machine is utilized in two different recycling pathways. Soft plastic waste is processed further into plastic paving blocks, which are durable and suitable for use in pedestrian walkways, parking areas, and other campus infrastructure. Meanwhile, hard plastic waste is processed into plastic pellets (plastic granules), which serve as secondary raw materials for manufacturing new plastic products. This integrated recycling system ensures that different types of plastic waste are recovered and reused efficiently, minimizing waste disposal while maximizing resource utilization.

Beyond its technical function, the plastic shredding machine also serves as an educational and research facility. Cadets and lecturers actively participate in operating, maintaining, and improving the machine as part of applied research and engineering innovation projects. This hands-on experience enhances students' technical competencies in mechanical systems, waste management technologies, and sustainable engineering practices while encouraging innovation in environmental problem-solving.

The development of this machine demonstrates the commitment of Politeknik Pelayaran Sumatera Barat to supporting the principles of the circular economy, where waste is transformed into valuable resources instead of being discarded. By converting plastic waste into reusable raw materials and useful products, the institution reduces the amount of waste sent to landfills, decreases environmental pollution, and promotes the efficient use of natural resources. In addition, the innovation contributes to reducing greenhouse gas emissions associated with the production of virgin plastic materials.

Overall, the plastic shredding machine represents a significant technological innovation that strengthens the campus's sustainable waste management system. It not only improves the efficiency of plastic recycling operations but also supports environmental education, applied research, and community engagement. Through this innovation, Politeknik Pelayaran Sumatera Barat demonstrates its commitment to creating a cleaner campus, promoting environmental responsibility, and contributing to the achievement of national and global sustainable development goals.

Additional link:

https://drive.google.com/file/d/1G8nHFLUkFR-rMfqcVTaZwB3qXs0p4WaD/view?usp=drive_link