



LEED

Lakshmi Energy and Environment Designs Limited

— Group of **LRT** —

TOTAL ENVIRONMENT MANAGEMENT SOLUTIONS

Total Environment Management Solutions: From the people who understand water treatment, waste to energy *and* Solid Waste Management.

Lakshmi Energy and Environment Designs Limited (LEED) a LRT group company is the part of well known Lakshmi Machine Works Limited (LMW Group) Coimbatore. LRT was incorporated in 1974 and its operations are organised into independent business clusters comprising of Ring Traveller Division, Engineering Division, Foundry Division, CNC Profile Cutting Division, Water Treatment Division and Waste to Energy Division.

LEED is formed to serve industries in total water management and waste management areas. LEED provides state of the art treatment plant from its overseas technical collaboration and technical tie-up with leading professional consultants. Our customized treatment solutions are mainly focused in equipment quality, long life, technologically advanced, energy efficient, competitive pricing and minimum operating cost.

Fully equipped fabrication and assembly unit ensures quality fabrication and well trained installation team makes sure the equipment installed as per specification and site requirement.

We are committed and assure you our best service for complete water, waste water treatment, waste to energy and solid waste management solutions.

Water and Waste water Treatment

End to End solutions offered in,

- Sewage Treatment Plant (STP)
- Effluent Treatment Plant (ETP)
- Reverse Osmosis Plant (R.O)
- Zero Liquid Discharge Plant (ZLD)
- Salt Recovery Solutions
- Mechanical Evaporator
- Bio Remediation
- Chemicals & Operation and Maintenance

Waste to Energy and Solid waste Management

Concept to Commissioning for

- Organic Waste Converter (OWC)
Converts Organic Waste to Green Compost Manure
- Fuel Pellets
Converts Garden Waste to Fuel Pellets
- Bio gas/ Bio CNG plant
Converts Food Waste to Bio Gas and Clean Green Gas
- Plastic Waste to Oil
Converts Plastic Waste to Oil for Furnace use
- Solid Waste Management
Converts Waste to Solid Fuel, Oil and Compost

State of the art advanced Water Treatment Systems which focuses on

Long equipment life
Energy efficiency
Environment friendliness
Delighting you



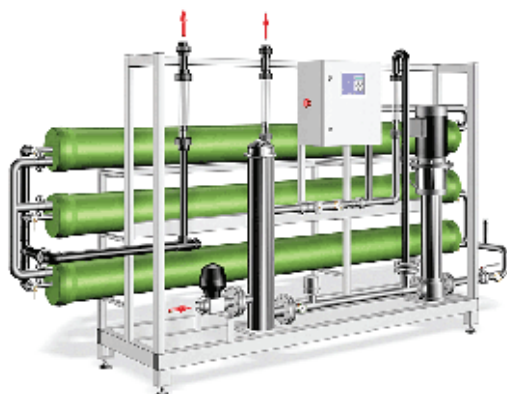
Sewage Treatment Plant

STPs based on ASP, MBR, MBBR and SBR type in skid mount or civil structure for Real Estate, Housing Colonies, Hospitals, College Hostels and Industries.



Waste Water Treatment Plant

Primary, Secondary and Tertiary Treatment, Contaminant Reduction and Removal, Chemical Feed, Control and Disinfection, Hazardous Waste Treatment, Spent Caustic Treatment, Oil/Water Separation



Waste Water Recycling

Rainwater Harvesting, Waste Water Reclaim and Reuse, Zero Liquid Discharge (ZLD) plants, Ultra Filtration, Reverse Osmosis plants, Nano Filtration plants, Municipal Water Reuse.



Sludge Management System

Aerobic and Anaerobic Digestion, Sludge Drying, Stabilization, Thickening and Dewatering by Belt Press, Filter Press and Centrifuge.



Water and Waste Water Treatment Equipments

Agitators, Auto - Bar screen, Clarifier, Dosing Systems, Evaporators, Filters, Flocculators, Reverse Osmosis, Softeners, Ultra Filtration, Aeration System, Anaerobic Digestion System. Electrocoagulation Systems, Cooling Towers, all type of Pumps & Membranes



Consultancy and Maintenance

Water resource management is a great task and companies are now looking at completely offloading their water management to concentrate more on their core product. Our AMC team takes care in this regard.



Bioremediation

LEED provide Solutions & Activated bio organisms to remove or neutralize pollutants from a contaminated site.

We offer Solution for Phytoremediation, Bioventing, Bioleaching, Landfarming, Bioreactor, Composting, Bioaugmentation, Rhizofiltration, and Biostimulation.



Water and Waste Water Treatment Chemicals

Chemicals for Cooling Tower, Boiler, Coagulants, Flocculants, Polymers, Antiscalent, Biocide, Disinfectant, and Bio culture for Aerobic & Anaerobic Treatment.

WASTE-TO-ENERGY & SOLID WASTE MANAGEMENT SOLUTIONS

The enormous increase in the quantum and diversity of waste materials generated by human activity and their potentially harmful effects on the general environment and public health, have led to an increasing awareness about an urgent need to adopt scientific methods for safe disposal of wastes. While there is an obvious need to minimize the generation of wastes and to reuse and recycle them, the technologies for recovery of energy from wastes can play a vital role in mitigating the problems.

Besides recovery of substantial energy, these technologies can lead to a substantial reduction in the overall waste quantities requiring final disposal, which can be better managed for safe disposal in a controlled manner while meeting the pollution control standards.



Waste To Energy Schematic

LEED provide Waste-to-energy facilities which are technologically advanced, generating clean renewable energy, reducing greenhouse gas emissions, supporting recycling through the recovery of metals and safer systems.

Organic Waste Converter (OWC)

Converts Waste to Green Compost

Composting is the process of controlled aerobic decomposition of biodegradable organic matter. During composting, microorganisms break down organic matter into carbon dioxide, water, heat, and compost. OWC converts the organic waste into odourless, precompost manure in 15-20 minutes. The shredder reduces the organic waste into the optimum particle size for composting. Then it is mixed and blended for a homogeneous mixture and is converted into pre compost manure in 20 minutes.

The pre compost manure is then fed into aerated compost blocks and left for 20 days. The compost blocks are specially designed for the pre compost manure to have proper aeration and suitable environment to mature. At the end, we get manure rich in nutrient derived out of Wasted Organics.



Nutrients rich compost for garden landscaping, horticulture and agriculture use.

Fuel Pellets

From Garden and Agri Waste



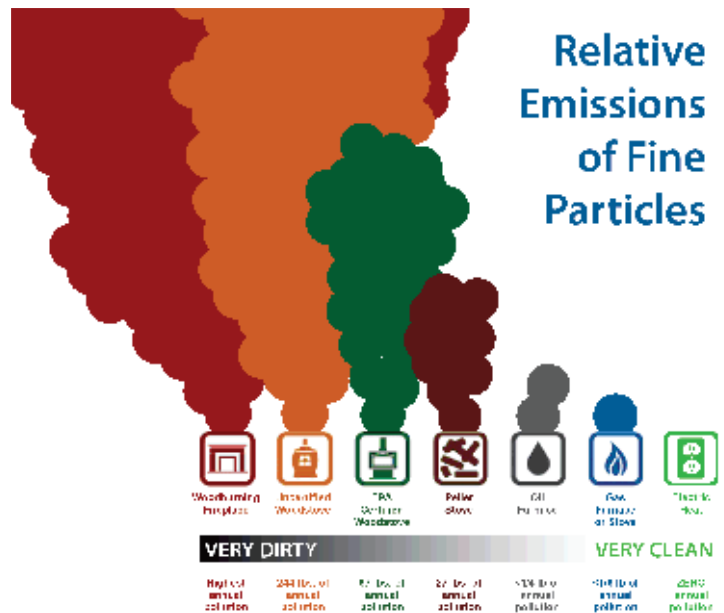
Fuel pellets are technically feasible, economically viable and environmentally sustainable and provides productive solution to Garden Waste Management. The concept is to manufacture Fuel Pellets from tree cuttings, grass cutting, leaf litter i.e. all kinds of Garden Waste.

The fuel pellets produced can be used as a cooking fuel. Which can be burned in Biomass Cooking Stoves. These stoves are smokeless, and can cook even faster than conventional LPG. These fuel pellets can substitute commercial LPG at almost half the cost.

Pay Back:

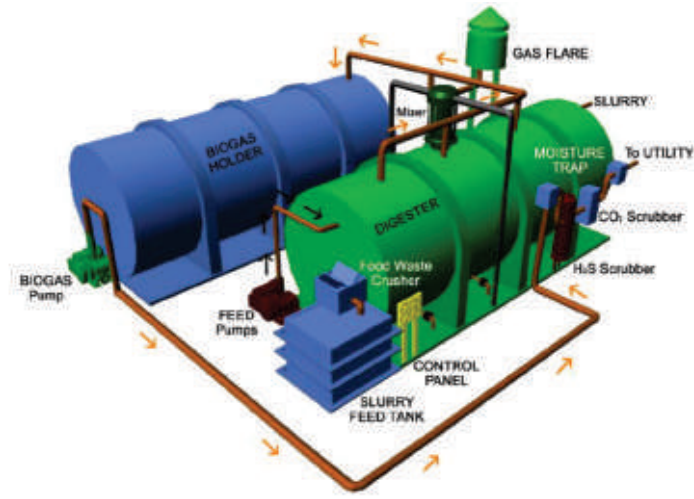
Plants are designed to pay back in 2 years.

*Clean And Green Energy
From Garden & Agri Waste*



Waste to Biogas

Waste To Wealth



Biogas is produced in a "no oxygen is present" environment or in an anaerobic environment, when certain bacteria decompose organic material. The whole process is referred to as anaerobic digestion (AD). AD effectively treats the organic fraction of waste which has many benefits. The process not only leads to a healthy and clean environment, but also produces a renewable energy source like methane.

In a biogas plant, biomass like vegetable wastes, animal excreta, and weeds undergo decomposition in the absence of oxygen and form a mixture of gases. This mixture is the biogas which is used as a fuel for cooking and lighting.

APPLICATION AREAS:

- Cooking
- Lighting
- Power generation

Pay back period:

Plants are designed to
pay back in 2-3 year

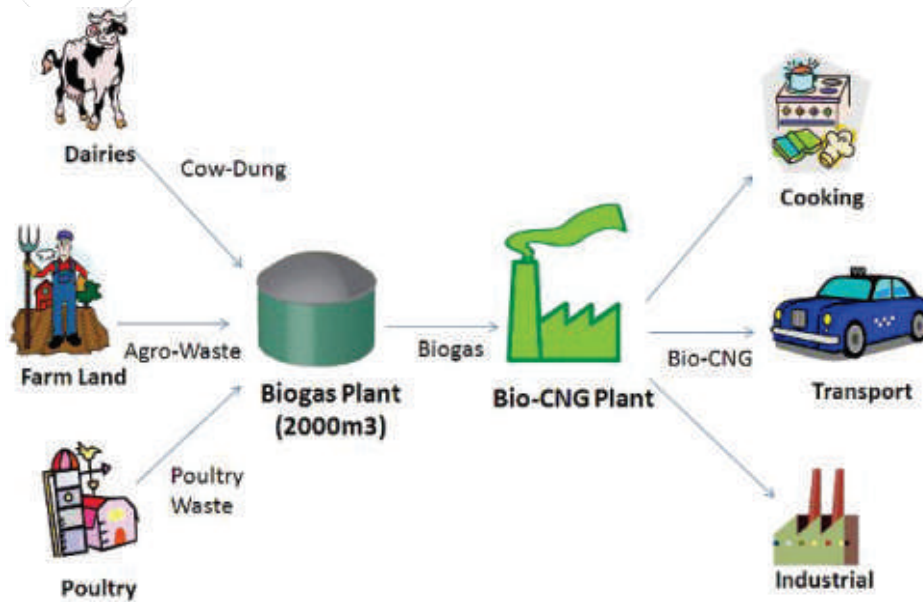


Bio CNG for Clean Energy

Clean Energy Green Environment

Bio CNG is the purified form of Biogas where all the unwanted gases are removed to produce >95% pure methane gas.

Bio CNG is exactly similar to the commercially available natural gas (CV: ~52000 KJ/Kg) in its composition and energy potential. As it is generated from biomass, it is considered a renewable source of energy and thus, attracts all the commercial benefits applicable to other renewable sources of energy.



BENEFITS OF BIO CNG PLANTS:

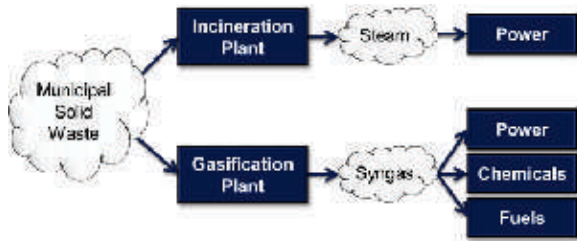
- ▮ A non-polluting and renewable source of energy is created in biogas plant.
- ▮ It is an excellent way of energy conversion.
- ▮ Biogas plants produce enriched organic manure. This can be used as fertilizers.
- ▮ Biogas as a gas provides improvement in the environment, and sanitation and hygiene.
- ▮ The biogas plants provide a source for decentralized power generation.

Pay Back:

Plants are designed to pay back in 1-2 years.

Municipal Solid Waste Management

Recover wealth save Earth



Municipal Solid Waste (MSW) is looming into a major problem world-over. With the increased appetite for consumerism, increase in purchase capability and wide availability of consumable items, change in life styles and quality of life, the solid waste rejects from households is increasing exponentially. This ever increasing mountain of waste is proving to be a challenge as the pressure on vacant land is increasing incessantly.

The existing land fills are overflowing and new landfills are not available. Transportation costs of the garbage being hauled long distances are making a hole in civic budgets. The limited availability of man power and equipment is leading to filthy roads, foul air and overflowing sewerages spreading diseases through out the civilized societies.

LEED offers renerzyme treatment to convert MSW into Biogas, Fertilizer, Refuse derived fuel and oil. Our solutions are focussed and designed to treat for any type of MSW and all are self energy sustained i.e. do not require outside energy to run the plant.

Bio Oil

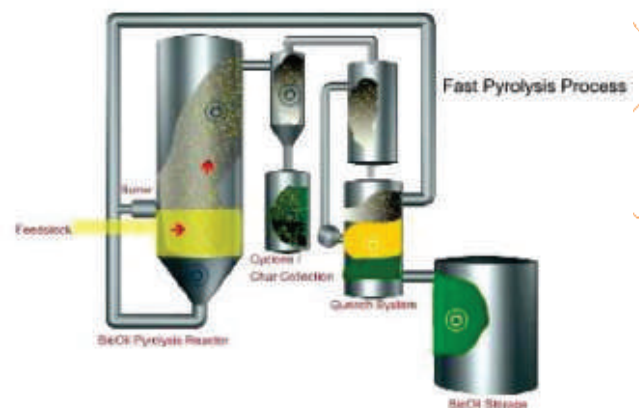
New Possibilities

Fast pyrolysis technology is used to convert plant residues to bio-oil which can be used as fuel in boilers & furnaces.

Bio-oil generated when bio mass heated in the absence of air at temperatures between 450 and 500 degree Celsius for a very short period of time (less than 2 seconds) and then condensing the resulting vapors within 2 seconds.

The plant residue which can be used are palm residues, dried sludge, pine, beech, oak, poplar, switch grass, olive pits, sorghum, and leather wastes.

LEED provide total solution for bio-oil plant design, installation and commissioning.



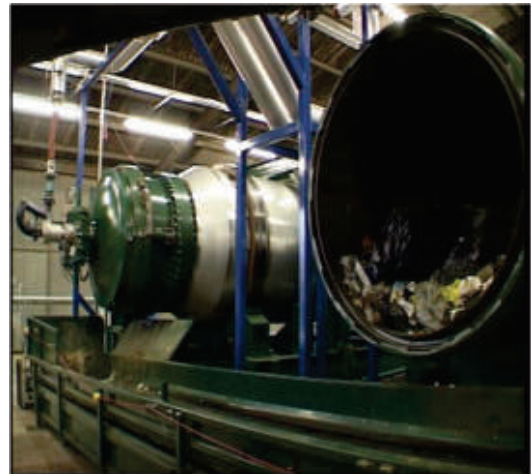
Plastic to Oil

Waste no more Waste

Plastic to oil is a depolymerization process using hydrous pyrolysis for the reduction of complex organic materials (usually waste products of various sorts, often biomass and plastic) into light crude oil. It mimics the natural geological processes thought to be involved in the production of fossil fuels. Under pressure and heat, long chain polymers of hydrogen, oxygen, and carbon decompose into short-chain petroleum hydrocarbons.

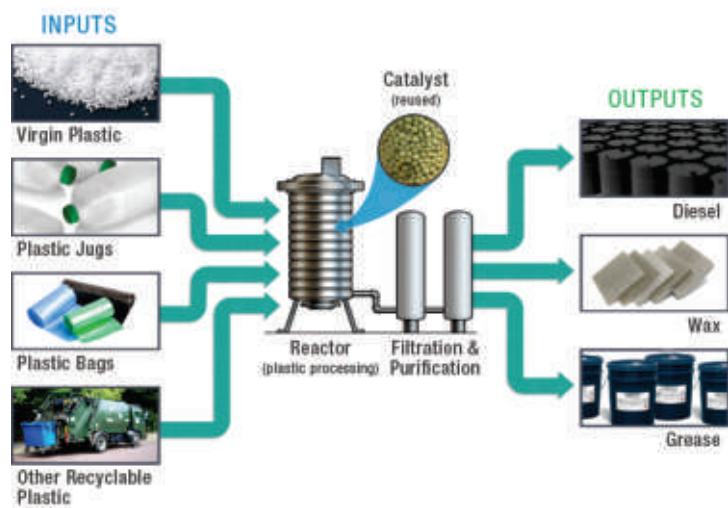
LEED provide end to end solution for plastic to oil plant, which converts difficult-to-recycle waste plastics into crude oil.

"If we burn the plastic, we generate toxins and a large amount of CO₂. If we convert it into oil, we save CO₂ and at the same time creating clean & green renewable energy".



The conversion process starts from shredding the plastic to small pieces. Pieces are then put in large cartridges and loaded into processing vessels. The solid plastic is first melted into a liquid, which is heated to a vapor state then condensed back into a liquid.

It's at that point the oil is separated from all the other chemicals and contaminants in the plastics.



Plastic to Oil Flow Schematic



Lakshmi Energy and Environment Designs Limited

Sulur Railway Feeder Road, Kurumbapalayam, Muthugoundenpudur, Coimbatore - 641 406, India.

Tel : +91 422 220 5000 | Fax : +91 422 220 5010

email : water@lrtltd.com Website : www.lrtindia.com/leed