



The Sepco Opportunity

FEATURING THE POLYPETRON™ WASTE PLASTIC TO FUEL PRODUCTION SYSTEM

By Sepco Industries Co., Ltd.

The founders of Sepco Industries Co., Ltd., in collaboration with prominent researchers from Thailand's prestigious Chulalongkorn University, have developed and optimized an innovative and eco-friendly industrial process for converting waste plastic into high quality synthetic fuel using a machine called the Polypetron™. The first generation model began operations in 2003 and is still functional today.

Our flagship Polypetron™ Gen. 5 model has the capacity to produce 15,000 liters of crude oil equivalent per day, per module, while disposing of 20,000 kilograms of waste plastic.

The Polypetron™ Gen. 5: Turning Waste into Wealth

The Polypetron™ Gen. 5 applies pyrolysis technology for converting virtually all types of waste plastic into low carbon, low sulfur, synthetic fuel, using an innovative continuous process which produces no pollution whatsoever. The pyrolysis crude oil produced in this proprietary process is equivalent to sweet or light crude, but of superior quality due to low bitumen content. Our pyrolysis crude oil can be used as is in low-speed diesel engines, or further refined to produce 60% European Standard EN590 grade high-speed diesel, and 20-30% gasoline.

Viability of our business and production model has been proven with genuine use cases, both through the sale of pyrolysis fuel oil for industrial machinery and agricultural equipment, and sales of our diesel to the BMTA – one of the largest bus companies in Thailand. In all cases our fuel has been confirmed to be of excellent quality, drawing a positive response from consumers. The greatest demand for our product is from refineries due to the high diesel yield achieved.

Sepco: Meet the Founders

Sepco Industries Co., Ltd. is headed up by a veritable who's who in the Petroleum and Energy sector of Thailand and supported by esteemed and distinguished engineers and academics of the highest caliber, along with leaders in the banking and finance sector and numerous other industries.



SEPCO INDUSTRIES CO., LTD.

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CHAIRMAN

Dr. Chitrapongse Kwangsukstith

Dr. Chitrapongse has held many executive management positions at PTT Public Company Limited and partner companies, including Chairman of the Board of PTT International Company Limited, Chairman of PTT Energy Resources, Chairman of Sakari Resources Co., Chairman of PTT FLNG, and President of PTT Exploration and Production Public Company Limited.

FOUNDER AND CEO

Dr Metta Visessombat

Metta Visessombat, DSc. has had an illustrious career working in many countries all over the world for such global powerhouses as PepsiCo International. He managed a number of national level green energy projects in Africa before returning to Thailand to initiate eco-friendly waste management operations.

He is Co-Founder and CEO of Sepco Industries Co., Ltd., the Joint Venture company newly set up to fully commercialize our industrial waste to energy technology. Furthermore, Dr. Metta oversees all aspects of production, ongoing R&D, and quality control of the Polypetron™ Waste Plastic to Fuel Production System.

CHIEF ENGINEERING OFFICER

Mr. Tawat Kulabusaya

Mr. Tawat is one of the chief architects developing our waste plastic to fuel production process from its inception. As a lecturer, engineer and researcher at the prestigious Chulalongkorn University, Mr. Tawat has tirelessly worked for decades to perfect and optimize our pyrolysis process, consistently updating and modifying it through countless revisions towards its current maximum efficiency and environmentally friendly design.

The Polypetron™ Gen. 5: Eco-Friendly. Efficient. Economical.

The Polypetron™ System features a continuously operating reactor which is fully enclosed. The system is operational 24 hours per day, 330 days a year (30-35 days per year are required for system maintenance).

- **Product:** Projected production from 20 tons of plastic per day is:
 - Pyrolysis Crude Oil - 16,940 liters
 - Solid (Char) – 2.83 tons
 - Gas – 1.89 tons



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- **Refined Product** (with optional Refinery System add-on):
 - Diesel – 11,858 liters
 - Gasoline – 1,711.43 liters
 - Solid (Char) – 0.99 tons
 - Gas – 1.41 tons
- **Feedstock:** Preferred waste plastic feedstock is Polyethylene (PE), Polypropylene (PP) and Polystyrene (PS) with a projected fuel yield of up to 75%. PVC and plastics containing mixed silicates should not be used. For example, PPCO (Polypropylene Copolymer), fiberglass and nylon. PET plastic can be used but is not recommended due to lower fuel yield and better profit gained through other forms of recycling. Tire, rubber, oil sludge, and medical waste are also usable. Fuel yield is contingent upon the purity of the feedstock.
- **Heating the Reactor:** The PPT20 model requires 1.75MW of thermal energy per hour. Heating of the reactor is structured using 50% gas and char residue from the process, and 50% external fuel such as firewood (depending on availability and how economical this is locally), compressed municipal waste, or other standard fuels based upon regional availability and/or cost. For a total closed-cycle self-sustained solution, 1,000 liters of the crude oil product can be allocated towards heating the reactor. Other acceptable fuels include gas, fossil fuels, or coal.
- **Electrical Power Consumption:** 55kW per hour, or less than one kWh of electricity per liter of fuel produced.
- **Manpower:** 24-hour operation takes a workforce of 10-12 persons – 3-4 staffs per eight-hour shift.
- **Area:** The production plant property should have a minimum land area of 3,000 square meters, although 4,000-4,500 square meters is recommended to allow for expansion.
- **Facility Buildings:**
 - Factory building: Floor area – 30x25m. Roof area – 20x15x10m. Load – 3,000kg./sq. m.
 - Warehouse: Floor area – 20x40m. Ceiling clearance – 6-8 m. Load – 1,500kg./sq. m.
- **Scalability:** Through the Polypetron™ Integrated Modular System, production is easily expanded according to local demand and requirements by adding production modules.
- **International Standards:** The Polypetron™ is compliant with numerous international regulatory standards, including BS, EN, DIN, ASMT, etc.
- **Lead Time:** Manufacture, transportation, assembly, testing and assembly has a maximum lead time of 9-12 months, providing all import/export processes are expedited and plant site is prepared in time.
- **Warranty and Service:** Training and after service plus complete conditional warranty of system for one year from time of commissioning.
- **Service Life:** Minimum 10 years. Life Expectancy: more than 15-20 years.



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A Polypetron™ on Wheels

In addition, Sepco manufactures a Mobile Polypetron™ Unit (the PPT3K Model) which can be placed on a flatbed trailer truck and transported in a standard 40-foot shipping container. This unit can manage 3 metric tons of waste plastic per day while producing 1,500-2,000 liters of fuel daily.

An additional benefit is that a refinery unit can be added to the same mobile unit, meaning that the complete process of converting plastic to diesel is mobile and can be transported freely and conveniently by truck.

The PPT3K reactor is heated using fuel from the process. With extended use, solid (char) and RDF gas byproducts can also be used to heat the reactor. This mobile unit is operated by a single semi-skilled machinist at a time. Feedstock and product are the same as the PPT20.

A Sustainable and Profitable Business Venture

In a benchmark scenario based upon operations in Thailand, with the Polypetron™ Gen. 5 producing 15,000 liters per day per module, through 24-hour operation, 330 days per year, and a unit sales price of 15.37 Thai Baht per liter, revenue sits at more than 76 million Baht per annum (over 2 million Euros). This yields a profit (EBITDA) of about 37 million Baht per module, per year, or around 1 million Euros.

Leveraging upon the cash-positive and profitable business, along with property and industrial assets, financing is easily secured, making expansion options highly plausible. The revenue generated can be even greater in most countries as waste management companies and authorities are often willing to pay gate fees for recycling services.

Sepco Industries Company Limited

Future Energy Now

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