

From waste to oil

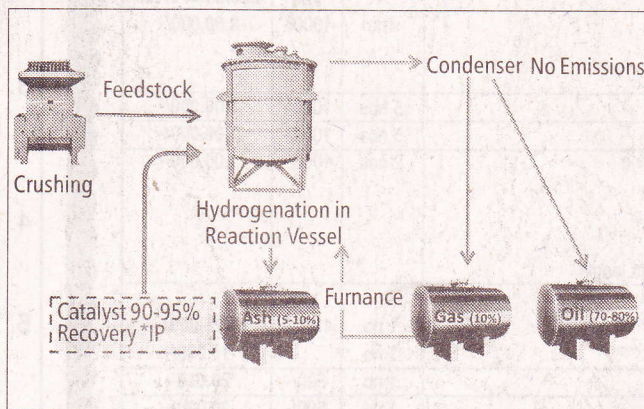
PK Clean Technologies has won several awards for its method of converting plastic waste into oil and gas

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AMONG the six winners of this year's Business Plan Competition conducted by Rice University, Texas, was PK Clean Technologies, which bagged the third position for an environment-friendly technology it uses to recover energy from waste products. PK Clean also won MIT's Clean Energy Prize under the non-renewable category. The company has combined and tweaked the technology which was originally invented by the late Australian Percy Kean with unique inputs that aim to optimise the mass energy balance.

The concept was originally tested in various laboratories across Australia. Further development was conducted at a laboratory in Pune, where the firm has established a 10,000 sq ft pilot plant. "The plant has the potential to convert 20 tonne of plastic waste into 80 barrels of fuel each day," said Priyanka Bakaya, founder PK Clean Technologies, that was set up in the year 2009 in the US. The project is currently in the pilot testing phase in Pune and is expected to reach the commercialisation stage by 2013. The company's method of converting plastic waste into oil and gas is called catalytic depolymerisation. It takes two-to-four hours for the entire process and requires 8-10 people including engineers and operators.

This is how it works: Plastic waste is first crushed, then



Conversion of plastic waste into oil and gas (above); Priyanka Bakaya, founder PK Clean Technologies

mixed with catalysts in a reaction vessel. After applying heat to the reaction vessel, the product goes through a vapour column and condenser to get converted into oil (70-80 per cent) and gas (10-15 per cent). This hydrocarbon gas is reused to heat the system. The catalyst (90-95 per cent) is recycled, and a small amount of ash (5-10 per cent) is left which can be sold for industrial purposes. The key is the catalysts, which allow the reaction to happen at a lower temperature. "It costs us \$25-\$30/bbl to produce oil from waste, which is better than our closest competitor at \$52/bbl," Bakaya said.

PK Clean is essentially targeting two markets. "The customers we take the plastic waste from and customers we sell the oil product to. In the US, we are eying the metal recy-



cling industries who are large producers of non-recyclable plastic waste and small refineries who would be interested in buying our renewable fuel. We hope to build a plant that will have the capacity to convert 100 tonne of waste per day. It would cost \$1 million," said Bakaya, an MIT Sloan and Stanford University graduate.