Chemical Recycling of End-of-Life Plastic

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Introduction

• Introduce ReNew ELP (End-Of-Life Plastic)
  • A business that has invested in the patented Catalytic Hydrothermal Reactor (Cat-HTR) technology that utilises hydrothermal upgrading to recycle waste plastic into valuable feedstocks.

• Summarise our Chemical Recycling Technology
  • Cat-HTR is an advanced conversion technology that has been developed by Australian-based hydrothermal upgrading specialists, Licella.

• Present ReNew ELP’s plans
  • To chemically recycle end-of-life plastics into refined hydrocarbon products that have a variety of uses.
  • To commence the global roll-out of Cat-HTR, a sustainable solution to the ever increasing problem of waste plastic production.
First Commercial Plant

• ReNew ELP has chosen the Wilton International Site in Teesside for its first commercial plant.

• Teesside is an ideal location
  • Centre of UK’s chemicals industry
  • Skilled workforce
  • Suitable infrastructure
  • High volume of local feedstock

• The first plant will process 20,000 tonnes of end-of-life plastics per annum however we have planning consent for 3 more plants enabling 80,000 tonnes of process capacity.
Technology and Process

Technology

• Cat-HTR uses water at high pressure and high temperatures (Supercritical).
• Been through multiple phases of scale-up over the past 10 years.
• Unique as it uses water as the 'agent of change’ and operates at lower temperatures than alternative plastic conversion technologies.
• Far less susceptible to corrosion and coking than other process that operate at higher temperatures.
• High conversion rates from plastic to valuable products.
• High operational flexibility enabling production to be tailored to meet product market demand.

Process

• Feedstocks, including LDPE film, PP Pots tubs and trays, HDPE piping all with varying material properties and levels of contamination and moisture content is compacted and heated.
• Feedstock is mixed with the supercritical water and further heated.
• In the supercritical phase the plastic depolymerises, water molecules are split and the available hydrogen is used to produce new stable hydrocarbon molecules.
• Distillation allows the production of different fractionated products.
• The process is efficient as it recovers product gas and uses this for steam generation.
Feedstocks and Products

• Cat-HTR can accept:
  • High density polyethylene
  • Low density polyethylene
  • Polypropylene
  • Polystyrene, and
  • PET

• Potential Feedstock sources:
  Numerous plastic waste streams that cannot be recycled due to levels of contamination or poor mechanical properties from:
  • Material recycling facilities
  • Commercial waste
  • Anaerobic digestion
  • Hospital waste processing
  Invariably the only option for these streams is SRF or RDF production or landfill
Feedstocks and Products

• The Cat-HTR reactor has the ability to tailor production towards either hydrocarbon liquids or waxes, providing a high degree of operational flexibility.

• The process can achieve higher conversion rates than other plastics to fuel technologies.
• ReNew ELP has an ambitious programme of development in the UK.
• Our site at Wilton International has planning consent for a further three units, with a potential total processing capacity of 80,000 tonnes per annum.
• Currently appointing EPCm contractor and look commence operation Q4 2019.
• Completed a Front-End Engineering Design of Plant 1 but have included aspects covering all 4 plants.
• We have set a challenging project schedule that leads to production by the end of 2019.

• Continue to trial real waste feedstock at our pilot facility in Australia to tighten process control understanding and de-risk operation.

• Feedstock supply agreements currently in negotiation.

• Production supply agreements underpinned by intensive product testing by offtakers.
Summary

• The Cat-HTR process uses water at high pressure and high temperatures to convert end-of-life plastic into stable hydrocarbon distillates, valuable chemicals and waxes.

• ReNew has chosen the Wilton Industrial Site in Teesside for its first commercial plant with planning approved for 3 more plants.

• The Cat-HTR process has no need for additional hydrogen and achieves high rates of conversion with high degree of operational flexibility.

• Capability to process a wide range of plastic feedstocks; HDPE, LDPE, Polypropylene, Polystyrene and PET.

• From a variety of supply routes; AD plastic, contaminated MRF plastic, medical plastics.

• Aim to achieve production from the first plant by the end of 2019 and commence global roll-out of Cat-HTR technology.