

The ReOil® process

The innovative process of ReOil® converts used plastics under moderate pressure and normal refinery operating temperatures into so-called synthetic crude oil. This synthetic crude oil can then be used as-is as refinery feedstock to produce fuels or as base materials for the plastics industry.

One particular advantage of this synthetic crude oil is its low content of heavy components. Another advantage is the short transfer distance of this refinery feedstock compared to conventional refinery feeds.

There are already well established recycling systems in place for typical beverage bottles PET (PET2PET). Other plastics – for example packaging foils or containers made from thick-walled polyethylene, polypropylene or polystyrene – can also be used for this process.



A February 2016 study by the Austrian Federal Environmental Agency about the process of used plastics recycling concluded that substituting synthetic crude oil for fossil crude oil within the Schwechat Refinery process could result in a 45% reduction in greenhouse gas emissions together with a 20% lower requirement for energy input.

Used plastics as valuable resource

Although used plastics contribute significantly to reducing CO₂ emissions in both the mobility and the packaging sector, the term plastic is often used synonymously with waste. A McKinsey study commissioned by the Ellen McArthur Foundation presented at the opening ceremony of the 2016 World Economic Forum in Davos, Switzerland, summed it up as follows: *“By 2050 oceans are expected to contain more plastics than fish. Every year at least 8 mn tonnes of plastics leak into the ocean – which is equivalent to dumping the contents of one garbage truck into the ocean every minute.”* However, **used plastics are not just ordinary waste – they are also an extremely valuable raw material.**

Proof of Concept – Installation of a lab-scale unit for recycling of used plastics process

Since 2011 OMV Downstream has been researching ways to harness the highly interesting resource potential of used plastics. After an intensive but unfortunately disappointing screening of available process technologies, the ReOil® process has been developed.

The ReOil® process is based on thermal cracking, a proven refining technology, whereby long-chain hydrocarbons are cracked into shorter-chain light hydrocarbons. This unique process utilizes a solvent to decrease the viscosity of the plastics feed and to improve the heat transfer and is currently patented by OMV in Europe, USA, Russia, Australia, Japan, India and China and many other countries.

After a year-long planning phase, the first lab-scale production plant with around 5 kg/h went into operation at the technical center of the Schwechat Refinery.



From proof of concept to pilot plant

As a next step in developing the process OMV invested around EUR 10 mn in the construction of a pilot plant at the Schwechat Refinery, supported by the Austrian Research Promotion Agency (FFG) within the framework of the Competence Headquarter Program. This pilot plant, which will process 100 kg/h of waste plastics, will perform all of the experiments required to enable the implementation of a commercial-size installation.

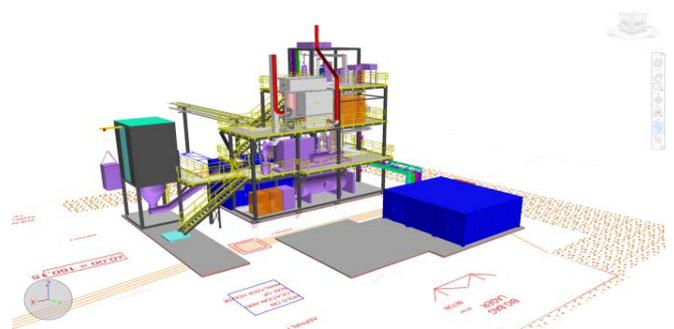


Fig. : 3D image of the pilot plant in the Schwechat Refinery

This pilot plant went into operation at the beginning of 2018 and is already fully integrated into the refinery.