

Unipetrol wants to recycle plastic – will build a new pyrolytic unit

Unipetrol will build a pyrolytic unit for waste-plastic processing at its plant in Litvínov. In it, it will be looking into chemical plastic recycling and the possibility of implementing it in standard production in the next three years. *“Our ambition is to chemically recycle waste plastic not only from our nearest surroundings, but probably from the entire Czech Republic and potentially from other parts of Central and Eastern Europe within several years,”* said Tomáš Herink, board member of the Unipetrol Group. The costs of the PYREKOL research project, which is run by Unipetrol, the Institute of Chemical Technology in Prague, and the Unipetrol Centre for Research and Education, amount to CZK 71.7 million. The Technology Agency of the Czech Republic contributed CZK 50.2 million within the framework of the TREND subsidy programme. The actual pyrolytic technology investment in the amount of CZK 18 million is being arranged outside the framework of Unipetrol’s PYREKOL project, with support from the Ministry of Industry and Trade within the framework of the Enterprise and Innovations for Competitiveness programme.

According to the Ministry of Industry and Trade¹, more than 400,000 tonnes of plastic waste are produced annually in the Czech Republic. Of this amount, roughly 37% of waste plastic is used for recycling and 18% is used as energy for heat and/or electricity generation. The remaining waste plastic, approximately 45%, is neither used as energy nor recycled. Unipetrol, one of the largest manufacturers of plastic primary products in the Czech Republic, is now beginning to look into how to reuse this plastic waste.

The concept of a circular economy, in which there is minimal or no waste, applies to many industrial sectors, including the chemical industry. A circular economy can contribute to protecting the environment by introducing new methods of waste-plastic processing which will lead to lowering the volume of plastic waste and lowering the emissions caused by burning it. *“We are actively looking for ways to use circular economic principles in manufacturing, and chemical recycling utilising thermal decomposition is one of them. The project’s objective is to successfully develop a functional technology for reusing waste plastic and rubber from waste tyres in the petrochemical industry, which will result in more effective utilisation of existing plastic waste and in lowering the carbon footprint,”* said **Tomáš Herink, board member of the Unipetrol Group.**

Pyrolysis, or thermal decomposition of materials at elevated temperatures, represents the most interesting waste-plastic processing technology, as it provides a high utilisation ratio of liquid products that can subsequently be additionally processed using petrochemical or, alternatively, refinery technologies. **At the same time, the transition of waste plastic into a usable raw material can go hand in hand with subsequent refining that will contribute to its greater value.** *“The research also includes other questions that need to be resolved. These include, for instance, improving the quality of liquid and gaseous pyrolytic by-products, how to store the liquid to avoid repeat polymerisation, and how to effectively transport it over longer distances. However, we will primarily be testing various types of input materials, single-type waste plastic, and mixed types of plastic. We want to find out what impact the*

¹ Source: THE CZECH REPUBLIC’S UPDATED POLICY FOR SECONDARY RAW MATERIALS FOR THE 2019–2022 PERIOD, Ministry of Industry and Trade, November 2018.



basic parameters of these materials have on the utilisation ratio and on the quality of the final product. We will also be looking for a safe mixing ratio of the material garnered through pyrolysis, the quality of which can be variable, in the existing production process, so that the continuity of plastic production is not compromised,” explained Jiří Hájek, director of the Unipetrol Centre for Research and Education.

The project’s output will be a comprehensive proposal of a technology on an industrial scale on the basis of pyrolysis for the processing of waste plastic and rubber from tyres whose products will be usable in the petrochemical industry for the manufacturing of basic chemicals such as ethylene, propylene, butadiene and benzene. By means of subsequent processes, they will then be used to manufacture final petrochemical products – polyethylene, polypropylene, polystyrene, etc. In the refinery industry, pyrolytic products will be added to existing processed raw materials in order to increase the production of motor fuels, i.e. petrol and diesel fuel.

The use of output products from the pyrolysis of waste plastic will help meet the expected objectives committing plastic-product manufacturers to the mandatory use of waste materials within the EU. Restricting the production of waste plastic belongs among the main ambitions of the European Union. *“In terms of planned legislative changes, the surplus of waste plastic, and insufficient recycling possibilities, our research project is fully in accordance with the EU’s policy on waste management. The legislation clearly defines that it is desirable to recycle waste plastic and to process it in the petrochemical segment, if possible. The objective is to change this material into the most valuable raw material, and in business terms, petrochemical products are more valuable than refinery ones,”* said Jiří Hájek in conclusion.

The investment project for the construction of the pilot pyrolytic unit for waste-plastic processing is being publicly funded under the title “Expansion of Unipetrol’s Research and Development Infrastructure by Adding a Unit for Pyrolytic Testing”, ref. no. CZ.01.1.02/0.0/0.0/17_165/0016037, carried out within the framework of the Operational Programme Enterprise and Innovations for Competitiveness. The supplier of the pyrolytic unit for **testing** waste-plastic and polymer processing is the Norwegian company Vow ASA via its French subsidiary ETIA, **who delivers its patented Biogreen process, protected by intellectual property and proven in the industrial applications since 2003.**

The Unipetrol Group is the largest refinery and petrochemical company in the Czech Republic. It focuses on crude-oil processing and on the production, distribution and sale of vehicle fuels and petrochemical products – particularly plastics and fertilisers. In all these areas, it belongs among the important players on the Czech and Central European market. The Unipetrol Group encompasses refineries and production plants in Litvínov and Kralupy nad Vltavou, Paramo with its Mogul brand in Pardubice and Kolín, Spolana Neratovice, and two research centres in Litvínov and Brno. Unipetrol also includes a network of Benzina filling stations in the Czech Republic and Slovakia. With 416 filling stations, Benzina is the largest chain in the Czech Republic. Unipetrol is one of the largest companies in terms of turnover in the Czech Republic. It earned CZK 129 billion last year and employs more than 4,800 persons. In addition to its business development, Unipetrol is proud to be a socially responsible corporation. Therefore, it pays an equal amount of attention to initiatives which focus on the cultivation and support of sustainable development, education, local communities, and the environment. In 2005, Unipetrol became a member of the ORLEN Group, the largest crude-oil processor in Central Europe.

For more information, please visit the “Responsible Company” section at www.unipetrol.cz.

Contact information: Pavel Kaidl, spokesman, telephone: +420 225 001 407, +420 736 502 520, e-mail: pavel.kaidl@unipetrol.cz

