

## Refining activity

2008 was a time of major challenges in the refining activity for Grupa LOTOS. On 1 January, the Act on biocomponents and liquid biofuels came into effect together with a Regulation by the Cabinet on the National Index Targets for 2008-2013. They imposed the obligation to apply biocomponents on entities launching fuels on the market. On the other hand, the approaching finalization of the 10+ Programme required employees to be prepared to take over and effectively operate the new production systems.

## Production

In 2008, more than 6.2 million tonnes of petroleum were processed. Thus, it was another record-breaking year, with a growth of processing by 50 thousand tonnes compared to the previous year. This result, which was excellent from the technical point of view, was achieved in a year that was very difficult due to the global economic crisis and the slump in prices on the oil products market. The second half of 2008 was particularly hard; therefore, the processing of oil decreased in Q4.

The predominant raw material processed in 2008 was the Russian REBCO oil blend. However, the policy of diversifying the sources of raw material was continued by introducing new blends of oil from the North Sea – Volve and Aasgard. The Volve oil proved to be so interesting that in 2008 almost 300 thousand tonnes were received. Refinery of Grupa LOTOS became one of the key receivers of this new blend.

The production structure was being streamlined and adapted to the demand of the domestic market on an on-going basis, taking account of the observed price fluctuations. In 2008, the trend of shifting the demand from road fuels to diesel oils continued. Therefore, the production of gasoline decreased by 2% compared to 2007, while the production of diesel oil and aviation fuel increased by as much as 3.5% compared to the previous year.

2008 was a very important year for the policy of Grupa LOTOS in relation to the application of biocomponents. Due to the obligation of fulfilling the National Index Target, the refinery in Gdańsk almost exclusively produced fuels with the addition of biocomponents. Grupa LOTOS is the domestic pioneer and leader in the use of bioethanol, as it has produced the alcohol gasoline since 1999. Therefore, it has the relevant knowledge and experience, which has enabled it to commence the effective mass production of gasoline containing bioethanol. Also ethyl-t-butyl ester (ETBE) is applied in the production of gasoline, which is a partial equivalent to bioethanol.

As regards the production of diesel oil, the application of fatty acid methyl esters (FAME) posed a significant challenge. Grupa LOTOS started tests in this area already in 2006. They were continued in 2007, so as to provide the high quality of diesel oil produced with biocomponents in 2008. The preparations were successful and the transfer to the production of diesel oil with FAME commenced without any interruptions or problems in the fuel quality. In 2008, approximately 41 thousand tonnes of bioethanol, 54 thousand tonnes of ETBE and 136 thousand tonnes of FAME were produced and used at the refinery of Grupa LOTOS. Approximately 16% of methyl esters came from the plant in Czechowice-Dziedzice.

Finally, Grupa LOTOS achieved the index of biocomponent use of 4.02% in 2008, while the National Index Target amounted to 3.45%.

## Production systems

2008 was the fourth consecutive year of the continuous operation of the refinery, which was the best result in the history of the plant, as historically, maintenance shutdowns had to be carried out more frequently. The longer intervals between overhauls had no negative impact on the availability of key systems – the use of the throughput of the crude distillation system amounted to 103.7% and the hydrocracking system to 104.7%.

2008 was also a year of intense preparation for the 'Spring 2009' Overhaul Down-Time. The overhaul will provide the opportunity to make a number of production connections between operating and new systems constructed as part of the 10+ Programme.

## People are the refinery's strength

In 2009, the first systems constructed within the 10+ Programme will be commissioned. Such production facilities will have to be operated and controlled by qualified and efficient personnel. Therefore, Grupa LOTOS has been executing the 'Personnel 2009' programme to prepare its staff for the new systems. After the start-up of the systems, owing to the synergy effect and the construction of systems of the same type, it will be sufficient to increase the number of personnel only slightly to operate the refinery effectively with the throughput almost doubled compared to the present capacities.

## Operational Excellence Programme

In the new configuration, i.e. after commissioning the systems constructed in the 10+ Programme, the refinery will become more flexible in the selection of raw materials and its operating regimes. However, this poses additional challenges to the management due to the required optimisation of production process management.

Therefore, Grupa LOTOS has performed the Operational Excellence Programme since 2008. The objective of the Programme is to develop optimum relations between individual key areas in the production structures: planning, process back-up, advanced process control, operational training and the operational level.

The Operational Excellence Programme is implemented systematically with the knowledge shared by key consultants from the refining sector. The Programme envisages the implementation of top world production standards in the refinery. A specialist team has been appointed to optimise individual production areas. The Programme activities also include the application of new IT tools developed by global software leaders for the refining industry.

## Key achievements in research and development at Grupa LOTOS

In 2008, engine oils with 5% biocomponent additions were launched, the FAME additive was applied in diesel oils, while bioethanol and/or ETBE was applied in the production of gasoline.

The content of sulphur in the light diesel oil was reduced from 0.20% m/m down to max. 0.10% m/m. In 2008, the processes of certifying the oil plasticizers of reduced toxicity were continued with rubber and rubber product manufacturers.

With regard to lubricating products:

- recipes were developed for synthetic oils for industrial transmissions Transmil Synthetic, approved by Flender,
- a new group of LOTOS Quazar engine oils was launched after the approval by OEMs,
- new recipes were created for Hydromil Super L-HV hydraulic zinc-free oils, and
- the oil for car transmissions, Titanis Super GL-5 75W90, was launched.

In compliance with the REACH Regulation, Grupa LOTOS and its subsidiaries initially registered all the produced substances.