

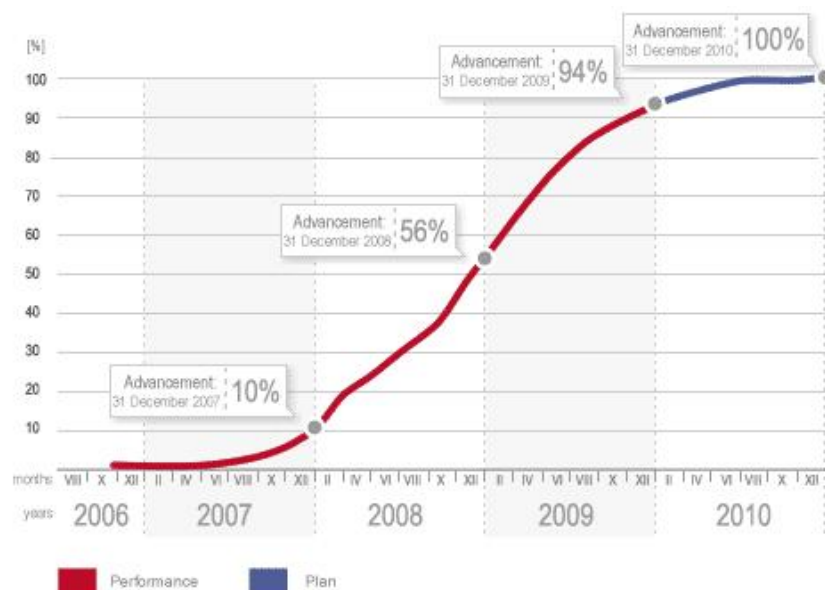
The greatest achievements of the LOTOS Group in the operating segment were within the implementation of the 10+ Programme and the Spring 2009 Overhaul Down-Time. The actions taken in 2009 belonged to the strategy for the operating segment and covered all the strategic objectives adopted for this part of business activities. Most other programmes and projects, due to the introduced Anti-Crisis Package, were postponed. As the Anti-Crisis Package was introduced at the beginning of the year for the projects planned in the budget for 2009, it resulted in the discontinuation of their preparation before the implementation stage. Grupa LOTOS stopped the preparation and limited the implementation of 27 projects, and the LOTOS Group of 38 projects.

The operation of the refinery of Grupa LOTOS was stable in 2009, except for the planned overhaul shut-down. No quality problems were experienced with regard to finished products.

10+ Programme

The 10+ Programme is the largest investment programme in the LOTOS Group. Its aim is to increase the production capacities of the refinery in Gdańsk and thus to improve the competitive position of Grupa LOTOS. In 2009, the construction of several key production systems within the 10+ Programme was completed and they were commissioned successively.

As at the end of December 2009, the advancement of work within the 10+ Programme stood at 94.47%.



The project is being implemented according to the timetable. The last system of the 10+ Programme is to be completed in November 2010 with the start-up of the heavy vacuum remnants processing ([ROSE](#)). The last system of the Programme will commence production at the earliest in 2011. In spite of the global economic slump, the work within the 10+ Programme was carried out in 2009 without any interruptions.

Status of work within the systems of the 10+ Programme in 2009

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Nitrogen system (1 st stage)				MC		RFSU						
Fan coolers				MC	RFSU							
Hydrocracking Diesel Desulphurization (HDS)					MC	RFSU						
Amine-Sulphur Complex (KAS) – ARU/SWS system					MC	RFSU						
Modernization of the condensate stations No. 1 and					MC	RFSU						

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Air system

System of new and modernised trestle bridges

Sewage treatment plant

Steam systems

Hydrogen Generation Unit ([HGU](#))

'Wild [naphtha](#)' System

Amine-Sulphur Complex ([KAS](#)) – sulphur systems (SRU)

Power facilities GBDM, GPZ 2, GPZ 3 and redevelopment of the 110 kV line

Demi water tank

Boiler water system

Fuel gas system and HIPPS system

Pipelines to the R7 port

HV, MV and LV cable networks

Discharge system

Warm cooling water system

Pyrolysis gasoline tanks (V=2x20,000m³)

Heavy fraction tanks VR/VGO (V=4x20,000m³)

Amine-Sulphur Complex ([KAS](#)) – [LPG](#) amine washing system

Modernization of water systems

[LPG](#) tank (V=1,700m³)

Atmospheric and vacuum oil distillation system ([CDU/VDU](#))

ICconnections between facilities – 2nd phase of the IC pipelines

	RFSU				
	RFSU				
	MC	RFSU			
	RFSU				
		MC	RFSU		
				PDU	
		MC		RFSU	
				RFSU	
		MC			
		MC			
		PDU			
			MC		RFSU
					PDU
					PDU
				MC	RFSU
				MC	
				MC	RFSU
					MC
					MC
					RFSU
					RFSU
					RFSU

Nitrogen system (2nd stage)

MC

Diesel oil tanks (V=3x32,000m³)

RFSU

MC – [Mechanical Completion](#)

RFSU – [Ready For Start Up](#)

PDU – [Transfer For Use](#)

A critical moment in the implementation of the 10+ Programme was the end of Q1 2009. At the end of March on average 3,450 persons from 67 contracted companies were working on the 10+ Programme every day. This was the highest number of workers involved in the construction during the whole project.

Maintenance and the Spring 2009 Overhaul Down-Time

The Spring 2009 Overhaul Down-Time, i.e. a comprehensive overhaul of refining systems, was implemented for the first time in four years (in opposition to standard three years) of non-stop operation of the refinery in Gdańsk. During the overhaul all the necessary production connections were built to integrate the newly constructed production systems with the existing refining infrastructure.

During the overhaul, a large volume of work was performed to restore the complete production capacities of the systems, which would not have been possible during the normal operation of the refinery. Such work included the cleaning of systems and elements of the production facilities (heat exchangers, production furnaces, columns, reactors, tanks and pipelines), exchange of the catalysts in reactors, repairs and exchange of worn-out accessories of the systems and reviews of the control and security systems.

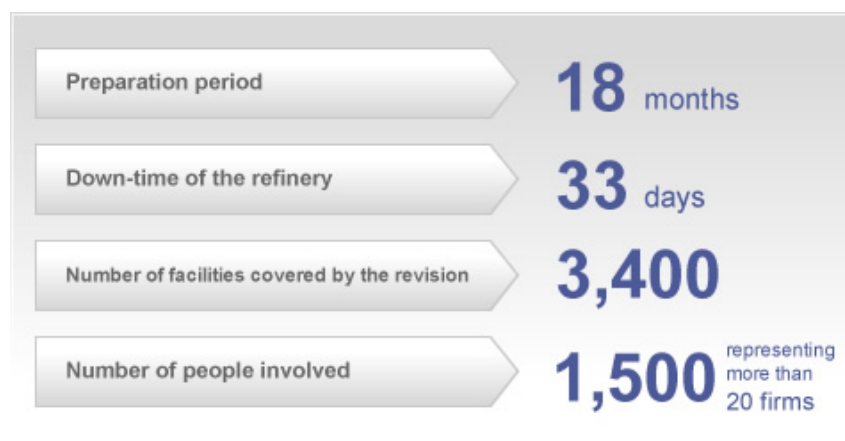
It is noteworthy that during the overhaul down-time, the refinery kept delivering finished products, produced based on the stored and imported components, and no quality issues occurred during this period. As regards maintenance and overhaul management, the greatest achievement was to provide the operation of the basic production and auxiliary systems at the availability of more than 99.3%. According to the SOLOMON report, which is an assessment of 350 world refineries, by the American consulting company, in terms of system utilization and availability, this result ranked Grupa LOTOS among the best refineries operating in Europe.

The overhaul progressed smoothly and without any interruptions, owing to the high level of technical and technological operation of the systems, the focus on the systematic improvement of qualifications among the staff, implementing state-of-the-art methods of work organisation and information flow, the development of prophylactics and preventing failures as well as implementing the rules of project

management in the performance of modernization and overhaul tasks. Due to the difficult economic situation, related to the implemented Anti-Crisis Package, the overhaul was conducted in compliance with the rules of cost streamlining. The operation was maintained owing to the maximum use of the potential of the LOTOS Group companies.

The success of the overhaul down-time was achieved mostly owing to half a year of careful planning in the preparatory period, which involved also external contractors. It is noteworthy that because of the commitment and effective cooperation of all the participants of this project, the overhaul was completed two days before the planned deadline. It was the shortest period of overhaul in the history of the Gdańsk refinery, after the longest failure-free period of operation.

Spring 2009 Overhaul Down-Time in figures:



Other projects

Apart from the 10+ Programme and the Spring 2009 Overhaul Down-Time, Grupa LOTOS implemented other projects related to improving the efficiency, safety and technical productivity of assets as well as the reduction of the environmental impact of Grupa LOTOS. The major investments in this period included:

- the air-tight sealing of the sewage treatment plant tanks: the aim of the project was to reduce the aromatic inconvenience for the environment. The work involved roofing and installation of bio-filters on all main tanks of the treatment plant. In 2010, the outgas recycling systems will be started and tested. Based on the operation experiences and if required, the premises will be prepared for the air-tight sealing of other tanks in the sewage treatment plant in 2011.
- the replacement of burners with low-emission ones in the heat and power plant: in 2009 the burners were exchanged in the first boiler and in 2010 the burners will be replaced also in the second boiler. The project will enhance the availability of steam for the production facilities taking into account the emission limits provided in the Integrated Permit,
- a computer system of energy consumption visualization and optimization – the system is used to optimise the power system of Grupa LOTOS and as a result to save fuels and energy. It provides ongoing monitoring of the energy system and analysis of the proposed changes of production settings to reduce costs due to the consumption of energy media, and
- a process simulator for the [Hydrocracking](#) 150 system: a simulation tool for the [Hydrocracking](#) Plant to provide training for system operators. The simulator will enable operators to maintain high control skills within the control of production processes and within responses to failures. Moreover, it will allow for testing of new production settings, thus contributing to the better use of the system potential.

Refining activity

Oil processing in 2009 amounted to almost 5.5 million tonnes and was lower than in 2008 by about 740 thousand tonnes. This decrease was mostly the result of the overhaul down-time, which stopped oil processing in the refinery for more than thirty days.

Oil processing and refining production (million tonnes)

The dominant blend of oil processed by Grupa LOTOS remained the Russian [REBCO](#) oil; however, diversification was continued by introducing Saharan Blend, a new blend of oil from Northern Africa, into production, as well as the already tested blends such as Troll, Volve

and Aasgard.

Structure of processed oil blends

Apart from oil, the production uses components and raw materials purchased for further processing, and improvers. As a result, the total production of the Grupa LOTOS refinery is higher than the volume of processed oil.

It is noteworthy that the share of diesel oil has increased in the total refining production in consecutive years. This situation follows the trend on the EU market, where the authorities promote diesel oils due to environmental considerations – such fuels provide lower emissions of carbon dioxide per energy unit obtained from combustion.

Structure of products

The use of the installed production capacities at the refinery of Grupa LOTOS in 2009 was lower than in the previous years due to the overhaul down-time. However, even during the period outside the overhaul down-time the use of the refining systems was not maximal. The conscious reduction in the use of the production capacities was caused by the low refining margins in 2009.

Use of production capacities

National Index Target implementation by Grupa LOTOS

The level of using components from renewable sources required under the rules of law meant that almost every litre of fuel leaving the Gdańsk refinery of Grupa LOTOS contained the biocomponent addition. Biocomponents were added both to gasoline and diesel oils. To limit the costs of fulfilling the [National Index Target](#), in the production of gasoline Grupa LOTOS applied both bioethanol and its equivalent, i.e. ethyl tertiary

butyl ether ([ETBE](#)). In the production of diesel oils, fatty acid methyl esters ([FAME](#)) were used. In total, the Gdańsk refinery of Grupa LOTOS consumed about 46 thousand tonnes of bioethanol, about 57 thousand tonnes of [ETBE](#) and about 150 thousand tonnes of [FAME](#) in 2009.

A large part of methyl esters came from the production plant owned by LOTOS Biopaliwa, a subsidiary of LOTOS Czechowice. In March 2009, a newly constructed system for biocomponent production ([FAME](#)) came into operation in Czechowice-Dziedzice. Its planned capacity is 100 thousand tonnes of [FAME](#) per annum. After one year of operation, it can be concluded that most of its parameters, such as productivity, use of raw materials and chemicals, energy consumption and the quality of products, are better than the design values. In 2010, LOTOS Biopaliwa will focus on improving production processes to provide the stability of [FAME](#) production at the highest possible level and to obtain the most favourable performance levels of the system.

Research and development

The research and development of Grupa LOTOS in 2009 focused on further development of fuel production with the addition of biocomponents and biofuels as well as on oil products made by LOTOS Oil. The greatest achievements within research and development in 2009 included:

- the launch of [B100](#) fuel, i.e. clean methyl esters of fat acids. The production technology of this fuel is based on raw materials from the LOTOS Biopaliwa system and packages of improvers, which provide the fulfilment of quality requirements and the stability of production in time,
- the production of the first industrial batch of an oil plasticizer of reduced toxicity for rubber and rubber products. The new class of [plasticizers](#) belongs to the TDAE group (Treated Distillate Aromatic Extract) and fulfils the requirements for [plasticizers](#) in the rubber industry that have been applicable in the European Union since 1 January 2010,
- the test production of low-oil [paraffin](#) as the main component for [paraffin](#) waxes,
- the introduction of 8 new engine oils (e.g. TURDUS POWERTEC SYNTHETIC PLUS 10W40, MarinoI RG CD 50, LOTOS DIESEL FLEET 10W40 and 5W40),
- obtaining Certificates of the Main Mining Institute for hydraulic oils, the gear oil and the emulsifying concentrate,
- obtaining 14 approvals for 7 oils for private cars (Mercedes Benz, BMW, Renault, Volkswagen and Opel),
- obtaining 9 approvals for 4 oils for trucks (VOLVO, Deutz, MAN, Mercedes Benz and TATRA), and
- obtaining 6 approvals for 2 oils for car transmission systems (ZF and MAN).