Investor Day 2023

LONG-TERM DEVELOPMENT OF UPSTREAM BLOCK

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VIII OF



The Main Directions of Development

PRODUCTION OF HYDROCARBONS

- Maintaining HC from 2024 in order to preserve the volume of business, engagement in refining and the reduction of the share of imports.
- Filling the reserves.

NEW BUSINESS DIRECTIONS AND EXIT TO FOREIGN MARKETS

- Diversification of the business portfolio in conditions of high market instability and the creation of reserves (EBITDA from non-profile business projects).
- Development of renewable energy source and integration of the green agenda (30% of SO₂ emissions by 2030)
- Monetisation of acquired competences on the external market.

Operation with potential and increasing operational efficiency

TECHNOLOGY

- Increasing drilling technology ((horizontal wells, horizontal wells with multitrack, re-entry drilling, lateral drilling) to increase efficiency
- Development of chemical methods for production to increase the coefficient of recovery.
- Development of gas with a high content of CO₂ - development of e/e (projects B. Miloševo, S. Crnja) for the introduction of gas reserves in development

DEVELOPMENT OF CONCESSIONS

- Angola: Extending the sharing agreement until 2040 with the improvement of fiscal conditions
- B&H: further development in E. Herzegovina
- Romania: Focus on the central asset Teremija Sever, (North) completion of permitting and transition to infrastructure construction.



Upstream Projects



Up to **30 %** Reduction of CO₂ emissions by 2030.



The Project of Chemical Methods for Production Increase



Кључне информације о пројекту



EOR (*enhanced oil recovery*) technologies are used by leading oil companies in order to extend the life of mature fields; they are based on the injection of surfactant and polymer solutions into oil reservoirs with the aim of starting trapped oil and thus increasing the oil production



program of EOR project is one of the key ones for maintaining production. The technology is implemented at NIS with the scientific support of NIS Scientific Technical Centre, as well as the participation of Russian and European partners

Potential effect



Up to 5-10% increasing the coefficient of bearing utilization

Work in progress and completed

- The desk work on assessing the applicability of technology and design for application in priority fields has been completed.
- Currently, field tests of the effectiveness of pressing surfactant polymer mixture on individual wells are underway.
- It is planned to start pilot permanent injection at the end of 2024 on 3 wells, and the complete implementation of injection is planned from 2028.



New Technologies Aimed at Efficient Use of Domestic Oil and Gas Resources



CONE OF VALUE CREATION FROM NEW TECHNOLOGIES 2023 Technological limit of new technologies of Upstream **Covered with Technological solutions Replication potential (EMV** Block hypotheses and portfolio (technology across the horizon) business challenges projects and pilot projects) in Upstream Block 21 40 10 11 technological challenges technology, ready for hypotheses draft decisions replication

KEY RESULTS OF STM IN 2023.

- 1. Standards on the formation of Technology Asset Plans and work with New Technologies elaborated and implemented
- 2. Portfolio formed and the potential of New technology replication on Upstream Block assets.

PORTFOLIO OF PILOT PROJECTS 2024

Pipeline relining



Relining involves the use of a structure, which is a flexible hose that is used to insert into an existing steel pipeline. Multi-layer polyethylene and Kevlar structure creates a resistant, flexible and strong hose, which is resistant to chemical influences and mechanical loads.



Intelectual diagnostic of pipelines

Intelligent diagnostics implies the use of a small-diameter in-pipe diagnostic tool, which ensures the implementation of preventive diagnostics of risky sections of the pipeline. The method includes the preparation of launch and acceptance ramps for the launch and reception of the intra-pipeline diagnostic tool, as well as the interpretation of the obtained data for the purpose of creating plans for reconstruction and / or determining the deadlines for the safe exploitation of the pipeline.



Mechanical cleaning of pipelines

Use of flexible inner-tube hoses and jet nozzles to clean pipelines. It is necessary to make transition pieces and adapt the entrances to the pipe so that the flexible connections can be drawn into the pipeline and perform the removal of deposits by applying fluids under high pressure.



Working fluids for reservoirs with abnormaly low formation pressure

The technology involves the application of a block composition, which represents a fluid of high density and viscosity, which is pumped into the well by means of aggregates. Upon contact with the perforation, a filtration cake is created, which ensures the complete hermeticity of the well.

CONCLUSIONS:

Within the last cycle, technological plan of assets (TPA) was formed and defended for the first time on the Technical Committee the portfolio of 4 OPI (trial test) implementation projects. The next step is to present a package of documents to the Investment Committee, conduct field tests with monitoring of the achievement of the planned effects and further circulation on Upstream Block assets.



Increasing the Efficiency of Domestic Reservoirs



Latteral drilling using Mini Coil Tubing

- Lateral drilling is an alternative to hydraulic fracturing
- The technology involves opening lateral holes with a diameter of up to 50 mm in the casing and drilling up to 6 lateral channels through the production formations in the length of 30 to 100 m.
- In this way, it is possible to obtain residual oil reserves between wells.
- After drilling the lateral, stimulation with near wellbore zone acid solution is possible through the same equipment used for drilling the lateral.
- The application of this technology before conventional fracturing significantly increases the chances of controlling fracture formation in the desired direction.



Drilling optimization

Formation Pressure Maintenance

can be compensated.

- The optimization of drilling costs by over 20% through modification of the well structure and increase in technological efficiency.
- The reduction of deadlines for the construction of new wells by over 10%.
- Implementation of the process of complete well construction cycle, in order to improve and effectiveness
- The production of the outwash mud base and the optimization of the total amount of use and depositing of the working fluid for drilling.





sand drift problem. **Assignments:**

"SandWedge"

- Preventing production reduction over a long period of time.
- Increasing the efficiency of the Gravel Pack system in terms of fine sand removal.
- A water-based chemical technology that chemically modifies the surface of the formation's sand grains in the well, resulting in increased permeability and stabilization of the near-wellbore zone



The drop in reservoir pressure can be the cause of loss of oil production from the reservoir by injecting water under pressure into the reservoir, this loss







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THANK YOU FOR THE ATTENTION!

