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PROJECT MANAGEMENT OF OIL AND GAS COMPANIES IN THE PRODUCTION ENHANCEMENT CONTRACTS (PEC) FORMAT: STATUS AND PROSPECTS

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Abstract. *The article analyzes the strategic tasks of the development of oil and gas enterprises in accordance with the New Energy Strategy of Ukraine at the stage of "Ensuring sustainable development until 2035" and the corporate strategy of the Naftogaz Group. The specifics of the projects of JSC "Ukrgezvydobuvannya" in the format of Production Enhancement Contracts (PEC) (by clusters of fields) were studied. The need to rethink the way they carry out capital projects is substantiated, taking into account the world's leading and own positive experience of cooperation in the PEC format.*

Key words: *project management, strategy, cluster, oil and gas fields, Production Enhancement Contracts (PEC).*

Introduction. The new energy strategy of Ukraine [1] at the stage "Ensuring sustainable development (until 2035)" is aimed at the innovative development of the oil and gas sector and provides for the implementation of a number of important tasks, in particular:

- investments in the exploration and development of new gas and gas condensate fields;
- Ukraine's participation in international projects on the development of the resource base, the transfer of the latest technologies, etc.

However, the full-scale war of the Russian Federation against Ukraine had a critical impact on the development opportunities of domestic oil and gas enterprises. Since the beginning of the war, operations on the basic fund of wells, drilling of new wells have been almost completely stopped (part of the fund of wells and ground infrastructure found themselves in temporarily occupied territories), the supply of critically needed services and materials for production activities has been significantly complicated [2]. The companies were also forced to suspend the implementation of a number of strategically important projects in the east of Ukraine. At the same time, according to the analytical brief "Sustainability of Ukraine: Lessons of 2022" [3], taking into account the potential of explored fields and subject to the implementation of a number of measures, natural gas production can be increased to 25-26 billion cubic meters per year within 2-3 years after the end of the war (practically equal to the total volume of gas consumption at the end of 2021). If it is possible to develop the deposits of the Yuziv gas-bearing cluster and the shelf zone, we can expect a further increase in own production, which will create conditions for the export of natural gas to European countries.



Main text.

The new corporate strategy of the Naftogaz Group [4] envisages the development of the company on the basis of three business platforms, in particular "Gas Business". In accordance with the strategy, Naftogaz plans to achieve 100% replacement of gas reserves (more than 250 billion cubic meters) within five years, and about 500 billion cubic meters in the next 10 years (Figure 1). Implementation of Naftogaz’s E&P strategy will require \$ 20-25 bln investment in the coming 10 years [5]. On January 25, 2022, JSC "Ukrgezvydobuvannya" presented opportunities for cooperation in new projects in the format of Production Enhancement Contracts (PEC) to Ukrainian and international companies. The company "Ukrgezvydobuvannya" on competitive terms planned to attract partners for the development of 35 depleted fields in Eastern and Central Ukraine, located in the Poltava, Kharkiv, Dnipropetrovsk, Donetsk, and Luhansk regions [6]. For the second stage, the deposits were grouped into the following four clusters (table 1):

- Karlivsky cluster (3 fields);
- Yuliivsky cluster (8 fields);
- Izyumsky cluster (11 fields);
- Pereschepynsky cluster (13 fields).

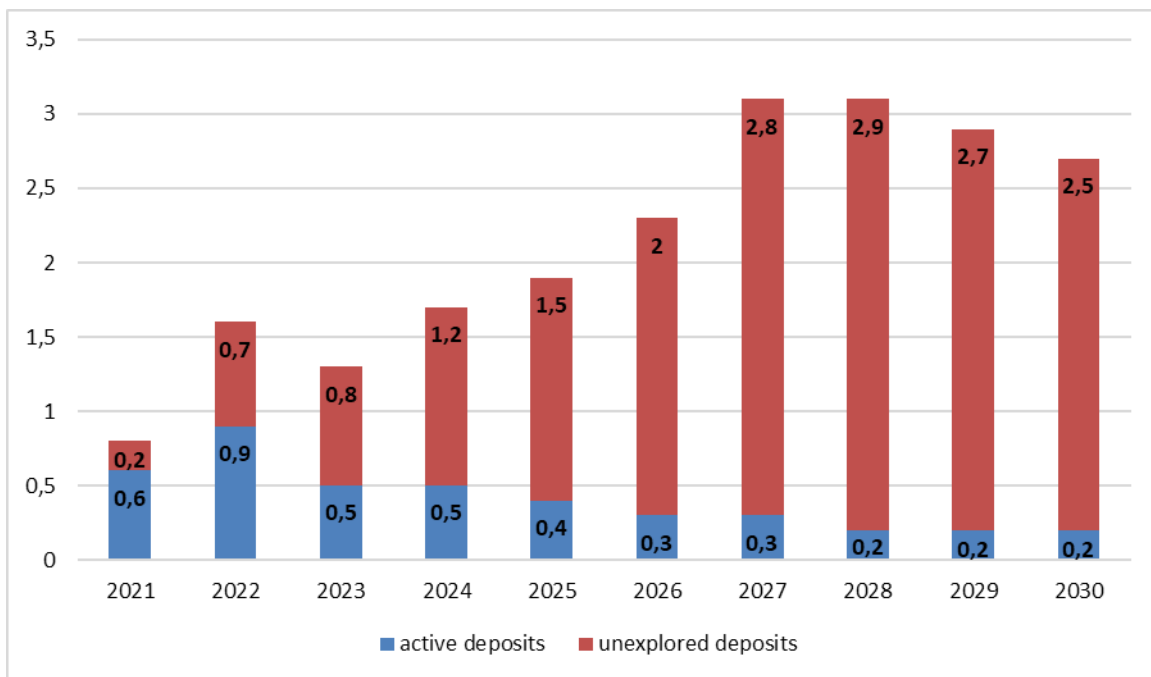


Figure 1 – Naftogaz's need for investments to implement the development strategy

A source: [5]

Deposits for the new project were selected and distributed by clusters based on the following criteria [7]:

- self-sufficient and ring-fenced surface infrastructure and other assets and resources of the clusters (ability to operate on standalone basis);
- upside potential: economics can be improved or production can be enhanced with application of new technologies and knowledge;



- no significant potential for near-field exploration;
- cluster size and potential is material for potential partners.

In particular, Yuliivsky cluster (Figure 2) is the largest of 4 clusters (~500 mcm / year) with very high depletion rate (88%). However, all fields of the clusters (Klenove, Kuzmychivsko - Nedilne, Skvortsivske, Yuliivske, Narizhnyanske, Bezliudivske, Akstiutivske) are compactly packed in close proximity to each other, which makes them easy to operate from a logistics standpoint.

The agreements provided that the partners would attract investments and carry out operational management of production activities at the transferred deposits.

Table 1 - Projects of JSC "Ukrgezvydobuvannya" in the format of Production Enhancement Contracts (PEC) (by deposit clusters)

Cluster	Number of producing wells	2Pgas reserves, mcm	Liquids prod '20, tons	Average well depth (m)	Gas depletion rate, %
Yuliivsky cluster	75	2665	31825	3478	88
Pereschepynsky	136	2089	18107	2582	93
Karlivsky cluster	66	4079	4834	4030	93
Izyumsky cluster	101	2890	8912	2449	82
Total	378	11723	63678	2977	91

A source: [7]

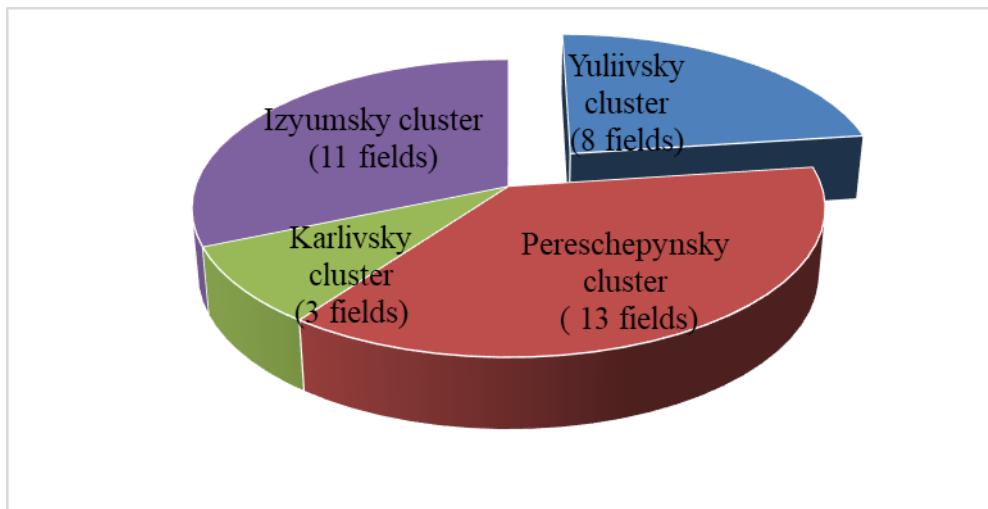


Figure 2 - Number of fields of the clusters of Production Enhancement Contracts (PEC) Project of JSC "Ukrgezvydobuvannya"

Authoring based [7]

First results of PEC Phase 1.0 should include:

- Investment program was over delivered comparing to the agreement requirements due to higher number of operations performed; results were achieved mostly from HF, WO and pressure optimization operations;
- average WO operation (from spud to release) completed within PEC project executed twice faster than in-house done by Naftogaz previously, and cost significantly less; installation of a new BCS was completed in just 4 months (similar projects take Naftogaz more than a year);



- average actual initial production rate of completed WO operations substantively higher than planned and that retrospective by application of new reservoir management best-practices and techniques.

However, the tender is currently suspended and may be continued after the end of hostilities on the territory of Ukraine.

It should be noted that JSC "Ukrgezvydobuvannya" already has a positive experience of cooperation in the PEC format at 13 fields in Western Ukraine (during the year, Expert Petroleum ensured an increase in basic production due to intensification operations and reconstruction of ground infrastructure [8]). According to the results of an open competition, Naftogaz engaged the international company Expert Petroleum to increase hydrocarbon production at the deposits of JSC "Ukrgezvydobuvannya" in Western Ukraine in April 2020. Within the scope of the production enhancement service contract (PEC) (the first full-fledged one in the history of the oil and gas industry of Ukraine), the Western partner in the first 5 years of cooperation committed to invest about \$30 million in intensification, well drilling and infrastructure development, and, potentially, to make additional investments in further. According to the company's calculations, the intensification of works, the increase of taxes and other budget deductions of the partnership will allow to accumulate more than UAH 4 billion to the GDP of Ukraine and the Lviv region.

Projects in the format of Production Enhancement Contracts (PEC) are an internationally recognized form of partnership. In particular, Rueda Carlos Fernando & Saldano Roberto [9] describe the successful achievements in a mature field through an innovative gain-share business model implemented in the Casabe Field, between Ecopetrol and Schlumberger: Ecopetrol having the asset knowledge and experience, remaining as field operator and owner of reserves, and Schlumberger possessing new technologies and practices to allow identification and exploitation of production enhancement opportunities.

There are many factors affecting the profitability of overseas PEC projects. On the one hand, according to Hu, Y., Dai, C., Zhang, H. [10] it can promote the optimization of programme investment deployment and production operation; on the other hand, it can guide the geological reservoir technology research, and the single well production allocation can be continuously adjusted according to the international price changes during the project execution to achieve project profitability.

So, according to experts [11], the time is right for O&G companies to rethink the way they carry out capital projects. Opportunities to improve productivity exist all along the development cycle. As a critical first step, managers need to articulate a vision of what these new practices mean for the organization as it builds the Project of the Future. That vision then needs to be translated into a set of actions that will allow the project to deploy new solutions.

To realize the benefits that these new practices afford, O&G companies will need to rewrite their rule books regarding policies, project management, engineering practices, etc. They will need to instill collaborative practices not only among product owners but also between internal engineering, procurement, and construction teams and external suppliers. Although deep collaborations based on trust are currently rare in the O&G industry, they will be critical in the future.



Summary and conclusions.

Therefore, management practices and digital technologies used by world companies can help Ukrainian oil and gas companies boost capital-project productivity. As the ultimate integrators of most projects, Naftogaz Group are in a position to mandate standards, technologies, and working practices. Hence, it is expedient in the future to scale the experience gained as an opportunity for the company to free up resources and focus efforts on priority projects.

Naftogaz Group's strategic development projects presented by oil and gas companies must meet modern challenges. The development of new domestic oil and gas production projects, the involvement of the latest technologies will undoubtedly ensure the development of the oil and gas industry in the post-war period, and will become a prerequisite for increasing natural gas production in Ukraine and strengthening its energy security.

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Анотація. У статті проаналізовано стратегічні завдання розвитку підприємств нафтогазової галузі у відповідності до Нової енергетичної стратегії України на етапі «Забезпечення сталого розвитку до 2035 року» та корпоративної стратегії Групи Нафтогаз. Досліджено специфіку проектів АТ «Укргазвидобування» у форматі *Production Enhancement Contracts (PEC)* (за кластерами родовищ). Обґрунтовано необхідність реформатування способів реалізації капітальних проектів з урахуванням провідного світового та власного позитивного досвіду співпраці у форматі *PEC*.

Ключові слова: управління проектами, стратегія, кластер, нафтогазові родовища, контракти підвищення видобутку (КПВ).

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