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Hydrocarbon Bomb With 26-Year Delay

The energy sector of the Russian economy is facing a strategic challenge: its proven oil reserves (31 billion tons) will only last for 26 years at the current production level. The situation is made more complicated by the two conditions: first, only 13 billion tons make up for economic production, second, the lion's share of this figure is hard-to-recover reserves. This message was sent to the state by Alexander Kozlov, head of the Ministry of Natural Resources and Environment of the Russian Federation, in his speech to the State Duma. The implications are obvious: Russian oil industry and primarily geological exploration are underfinanced.

The minister added, that the total estimated hydrocarbon resources in the country reach up to 95 billion tons. But these "have yet to be prepared via geological exploration — both by the state and corporations, and only then these could be registered reserves", — specified Kozlov.

Russia's oil reserves are the fifth largest in the world – after Venezuela, Saudi Arabia, Canada and Iran, and it comes third in oil production (in 2024 its oil production amounted to 514,1 million tons): only the USA and Saudi Arabia produce more oil today. At the same time new oilfields are discovered every year. Just last year alone there were 39 oilfields discovered, with the most significant located in Irkutsk region, the Yamal-Nenets Autonomous District, Krasnoyarsk Krai and Yakutia. But discovering does not mean putting it online, starting production.

What does "proven reserves" mean? These are the reserves that have been identified as a result of comprehensive geological

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exploration activities, second, these reserves have been estimated to a degree, sufficient for their processing, design and economic feasibility assessment for mining facility construction. By the degree of exploration maturity, reserves fall into three categories: “A” — proven reserves; «B» — prospected reserves; “C1” — complex geology reserves and explored reserves. There is also “C2” category - prospective, estimated reserves.

Speaking of hard-to-recover reserves (HTR), traditional production technologies cannot be applied to these reserves. HTRs include fields in remote areas (the Arctic or shelf seas, lacking production and transportation infrastructure); remaining reserves of worked-out deposits; high-viscosity oil, very hard to extract. A great example is the Bazhenov formation in the Western Siberia, a shale formation, occurring at depths of 2–3 kilometers. This unique and the largest oil deposit in the country requires use of the so-called horizontal drilling, and only Gazpromneft can utilize this technology, says Nikita Maslennikov, lead expert of the Center for Political Technologies.

Old, Soviet-era deposits have been almost completely depleted by now, – says the economist. – The key issue is that geological exploration is largely underfinanced in Russia, we are lagging behind many states in geological exploration technologies.

And what could be a possible way out?

Most reserves are categorized as hard-to-recover. This means more effort is required, primarily in the area of geological exploration, there is a lot to get on with. Second, Russia needs its own national technology for HTR extraction, and this is a very massive challenge. The Bazhenov formation is actually in a very limited status: oil is extracted in tiny volumes there, predominantly for research purposes. And according to tentative estimates, the formation may have 10-12 billion tons of oil. Moreover, the country has several thousand off-balance wells – abandoned and unused. I think a special subindustry should be set up in the oil production sector, which would operate low-margin oilfields, abandoned by the majors. But this would require logistics, technology and financial solutions.

The situation is exacerbated by issues with the industry tax regime, which looks like a patchwork quilt. At least a half of all oilfields in Russia enjoy various preferences, and the amount of these preferences is growing with every year. And at the same time there is no tax incentive for production at off-balance wells. Many wells are totally unused: they are mothballed, though they still have 30-40% reserves.

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What is the current breakeven point for Russian oilfields?

It is average in terms of global values. If markets undergo a stress case, demand will dive and oil price will drop down.This breakeven point in any case would be lower than for shale oil wells in the United States: oil producers there start making sustainable profits when oil is at $50-55 per barrel. Let me note in this regard that after the financial crisis of 2008–2009 lower investments into oil production became a global trend. And if things stand as they are today, prices may soar at about 2035-2040. It is obvious that today it is totally unprofitable to extract oil in the Arctic, to make any profit there, a barrel of oil should cost $100-115. Even if this happens, it would be no earlier than by the end of this decade.

How costly is it to develop a field?

It is not only very expensive, but also extremely complex in terms of technology. This is a whole set of activities: you should drill to hit oil, solve the perennial issue of water flooding, study oil reservoir structure, run 3D scanning. And depending on the formation density, you need to have a relevant set of drill bits, which should be replaced regularly. There is yet another reason for rising costs in Russia, because sanctions and import restrictions force us to use lower quality equipment, supplied from friendly countries. This equipment wears down quicker, drilling ultimately costs more.

In September 2024 Kozlov, head of the Ministry of Natural Resources and Environment of the Russian Federation, reported at a meeting of President Putin with government members on “insufficient geological exploration” for many types of minerals. In particular, he mentioned uranium, chrome, manganese, titanium, fluorspar, tungsten and aluminum, proven reserves of which would only last for 5 to 15 years. It seems that the geological exploration issue applies not only to the oil sector?

Regretfully, it is so. There are reserves for extraction and production of rare earth metals: there are lots of these in the ground, but we haven’t even started mining them. And all cutting-edge technologies are tied to use of these metals one way or another. It is also obvious that we should develop processing industries simultaneously with geological exploration and production of primary resources. This applies to the oil industry and to natural gas conversion and coal chemistry as well. A comprehensive approach is required. For example, it is not enough to produce natural gas, liquefy it, this is solvable. Let’s say, there is an issue with helium – a strategic resource for improving conductivity and response of computer equipment, for development of nuclear and airspace industries. Helium needs to be extracted from methane, it is a lengthy and multi-stage process.

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According to Alexander Kozlov, currently only 35% of the Far East and 45% of Siberian territories are geologically explored. Where could we get the money to explore these vast spaces?

It is hard to say. One of the options would be joint financing of geological exploration by state-run companies and private business. But they will have to extract resources in the very same places, build processing facilities, engage labor and specialists. A whole system of incentives needs to be created. Tomorrow of the global economy cannot be separated from the issue of new materials, from the very same rare earth metals.

Georgy Stepanov.

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