



JSC GAZPROM
Urengoigazprom LLC
XXIII World Gas Congress

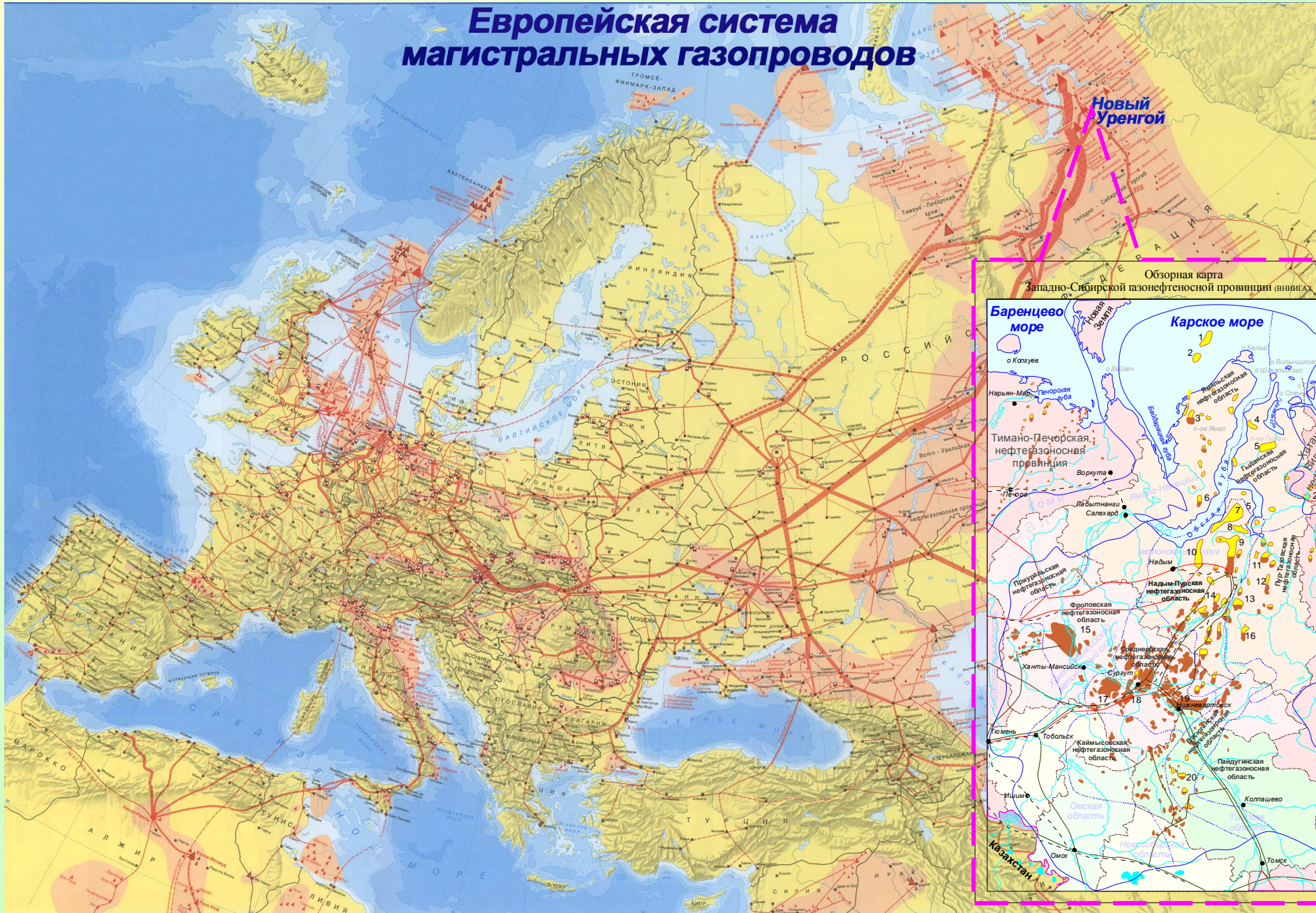
PROSPECT OF RESOURCE INCREASE OF URENGOI COMPLEX

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Zaychikov G.M.,

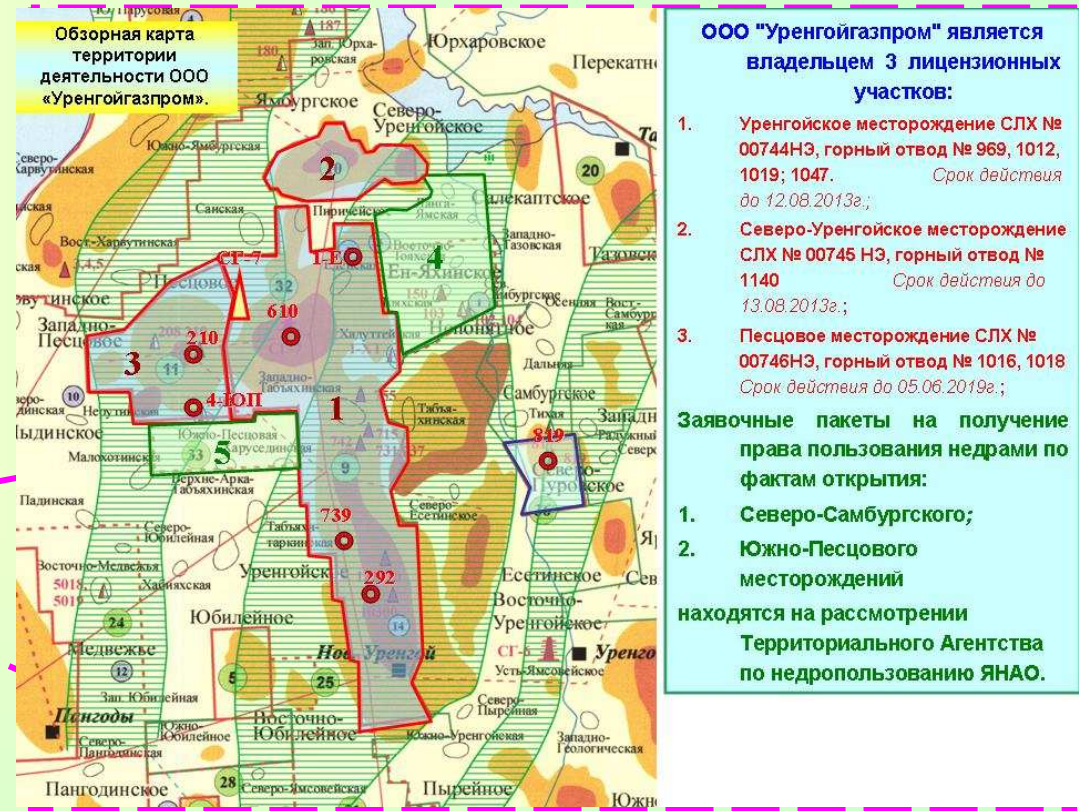
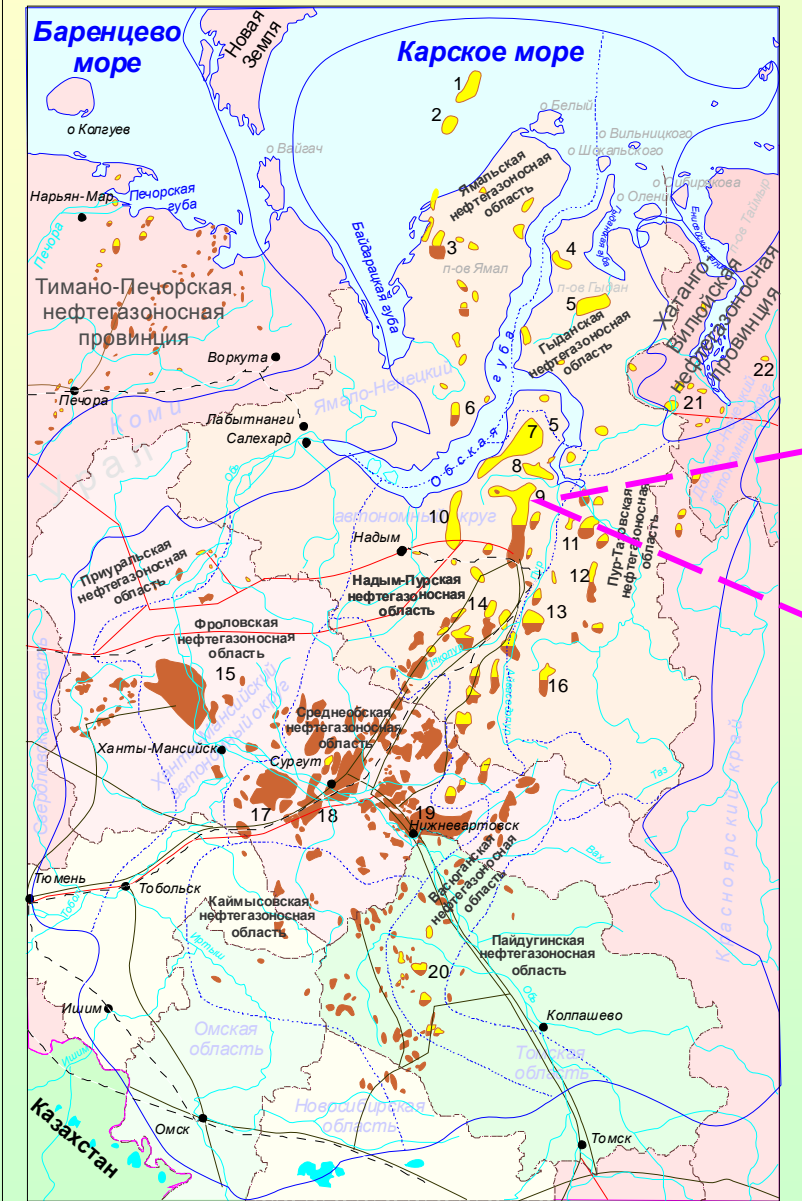
Lecturer: **Marinin V.I.**

AMSTERDAM
2006

Европейская система магистральных газопроводов



Обзорная карта
Западно-Сибирской газонефтеносной провинции (внигаз, 2004г.)



ООО "Уренгойгазпром" является владельцем 3 лицензионных участков:

- 1. Уренгойское месторождение СЛХ № 00744НЗ, горный отвод № 969, 1012, 1019; 1047.** Срок действия до 12.08.2013г.;
- 2. Северо-Уренгойское месторождение СЛХ № 00745 НЗ, горный отвод № 1140** Срок действия до 13.08.2013г.;
- 3. Песцовое месторождение СЛХ № 00746НЗ, горный отвод № 1016, 1018** Срок действия до 05.06.2019г.;

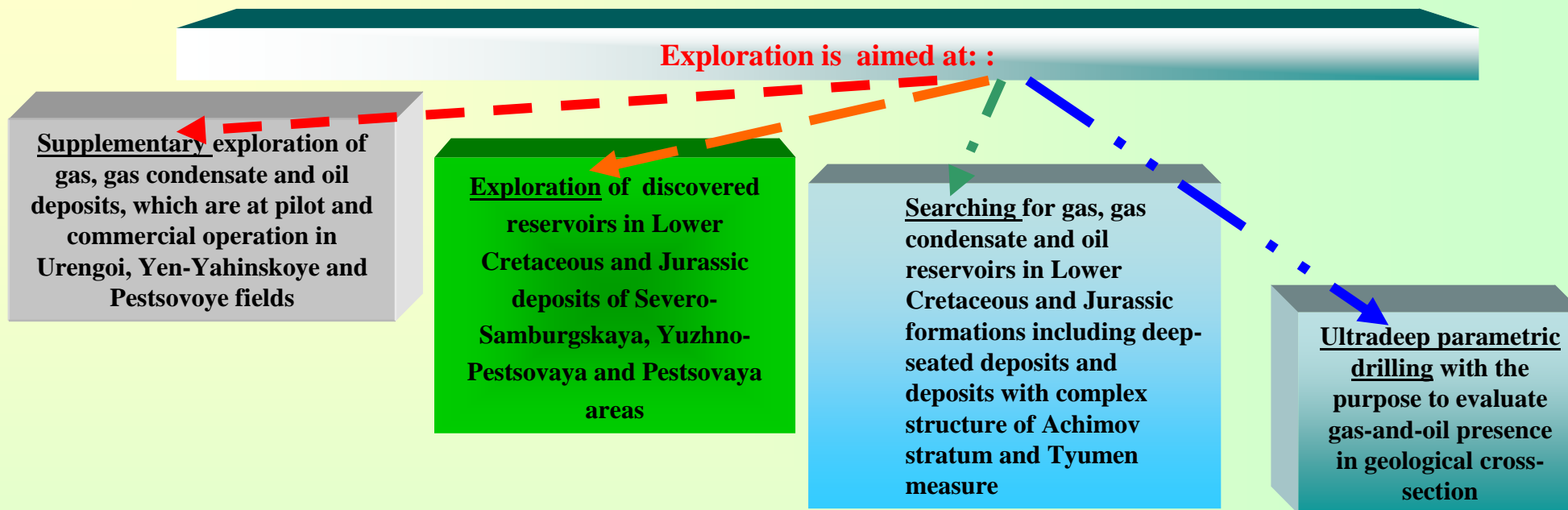
Заявочные пакеты на получение права пользования недрами по фактам открытия:

- 1. Северо-Самбургского;**
- 2. Южно-Песцового месторождений**

находятся на рассмотрении Территориального Агентства по недропользованию ЯНАО.

- Major and medium size gas fields, prospective resources are concentrated in the central part of Nadym-Pur-Tazovskaya oil, gas bearing area.
- More than 67% of initial summary gas reserves of Western Siberia are located in Nadym-Pur-Tazovskaya area .
- Exploration of central part of the area, Achimov, Jura and Trias deposits of Urengoi and Pesto-voe banks will be continued.
- Log information of ultra deep well SG-7, located in Yen-Yahinskaya area, shows gas presence in Achimov, Jura and Trias deposits.

According to Gazprom's plans to raise hydrocarbon production Urengoigazprom LLC faces the task to expand its resources base .



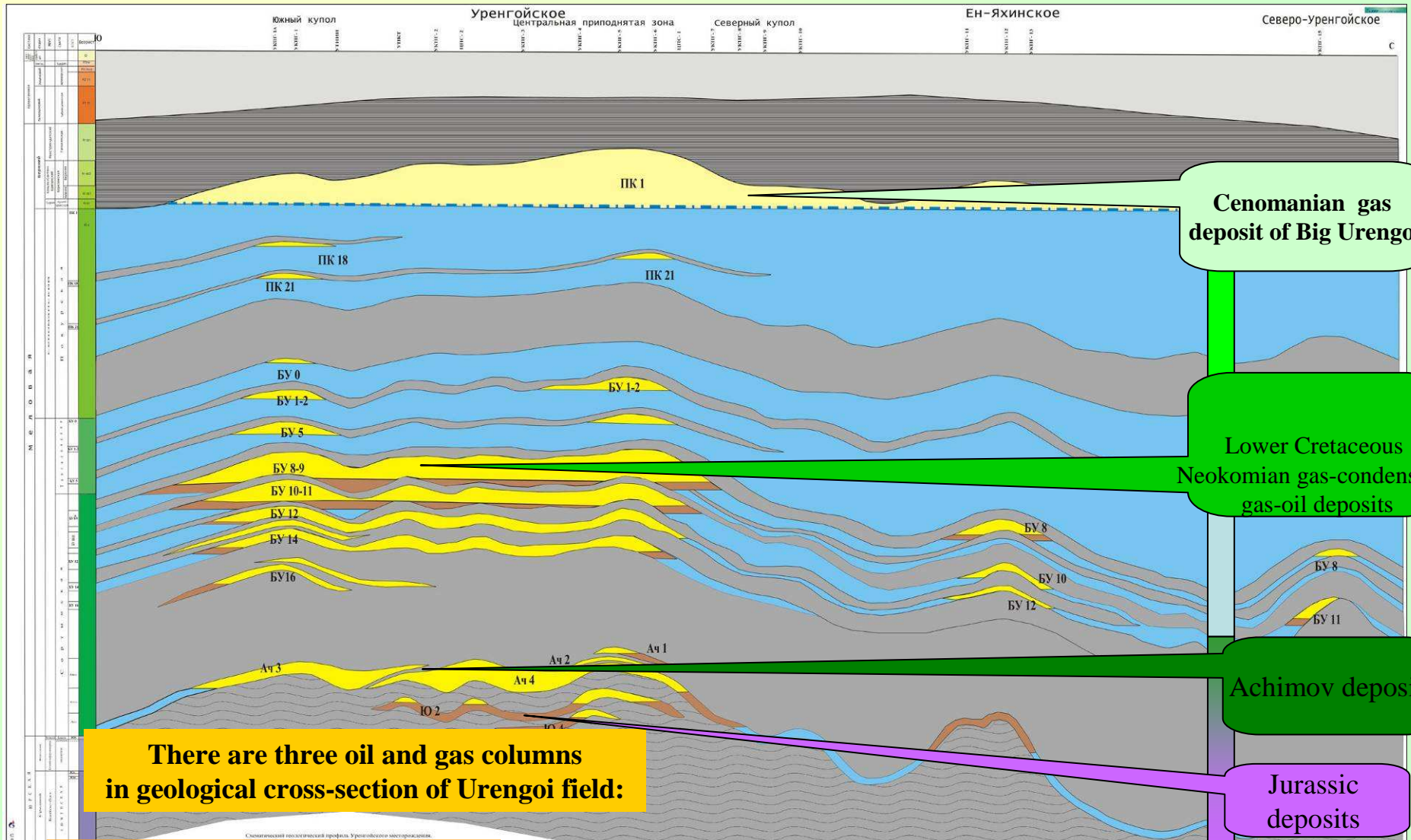
To fulfil these tasks Urengoigazprom LLC carries out the following:

Seismic survey 2-D method,
allows to obtain more precise information about geological structure of licensed areas including structures of the main pay horizons of Big Urengoi

Seismic survey 3-D method,
gives information about reservoir structure of prospective and pay horizons of Urengoi oil, gas, condensate field, their filtration, volume and saturation characteristics

Exploration, prospecting and parametric drilling ,
gives information about production characteristics of pay horizons and discovers new gas, gas condensate and oil reservoirs

Geological cross-section of Urengoi field



Cenomanian gas deposit of Big Urengoi

Lower Cretaceous Neokomian gas-condensate, gas-oil deposits

Achimov deposits

Jurassic deposits

There are three oil and gas columns in geological cross-section of Urengoi field:

1 column -deep-seated Jura and Achimov gas- condensate and oil deposits;

2 column- Neokomian gas-condensate and oil deposits;

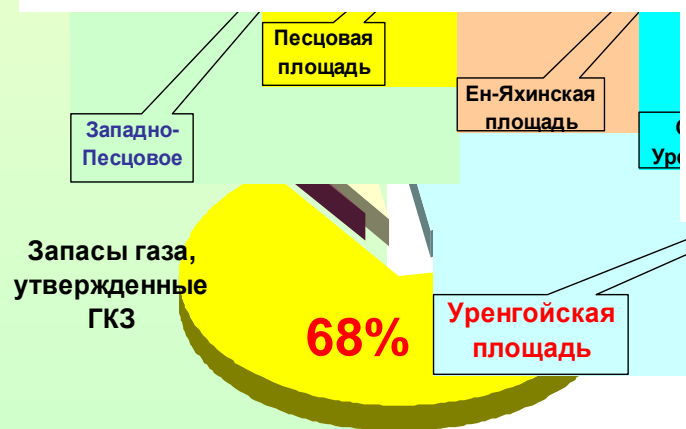
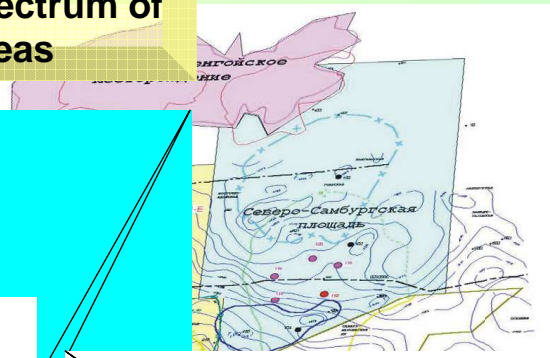
3 column- Cenomanian – Alb gas deposits.

The reserve structure of gas, condensate and oil of commercial categories approved by the State Reserves Committee shows the wide spectrum of hydrocarbon deposits found in the licensed areas



Ен-Яхинская площадь

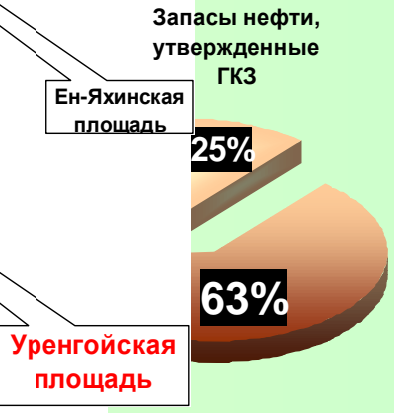
Песцовая площадь



Западно-Песцовое

Песцовая площадь

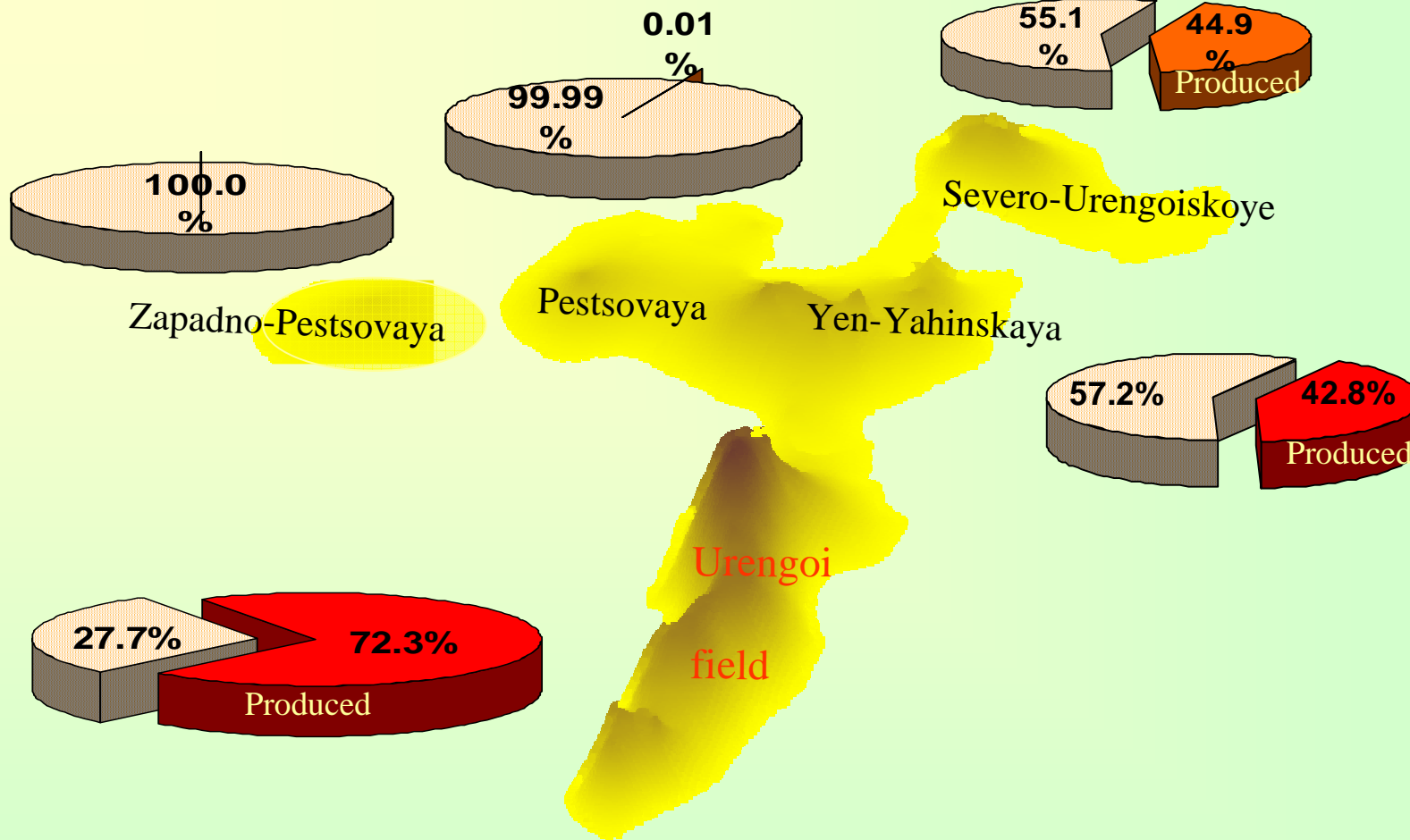
Ен-Яхинская площадь



Ен-Яхинская площадь

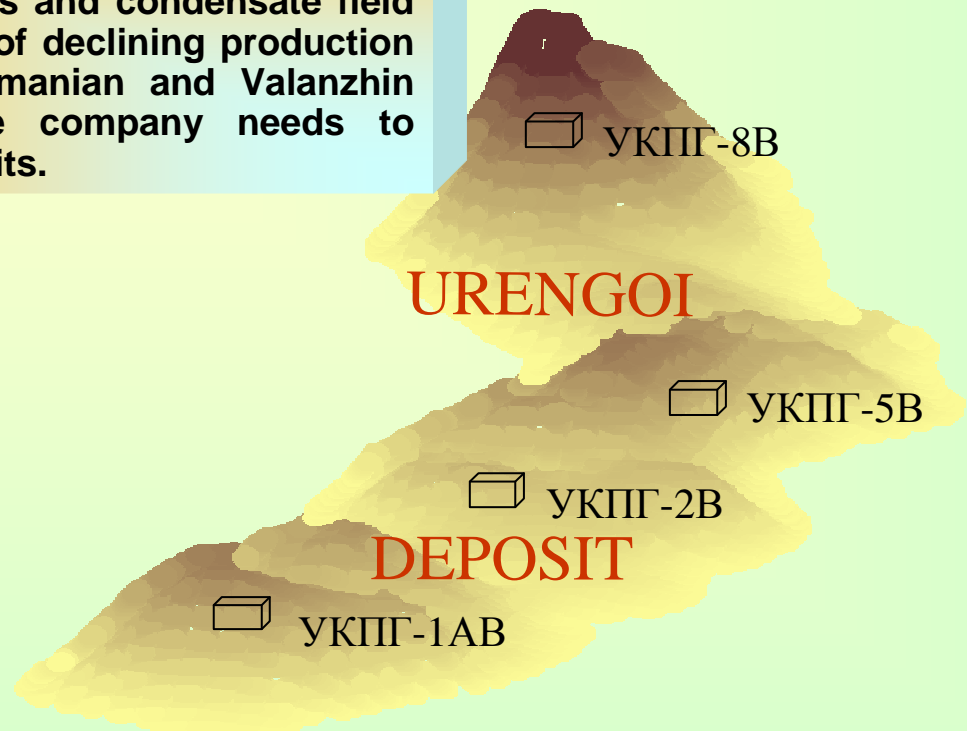
Уренгойская площадь

Hydrocarbon reserves, which belong to Urengoigazprom, are characterized by spacious territories, the biggest production thickness, and the highest degree of investigation with drilling.

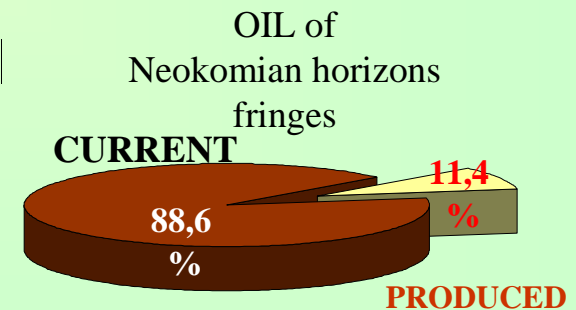
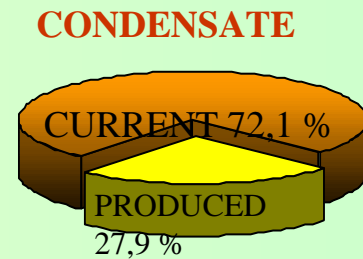
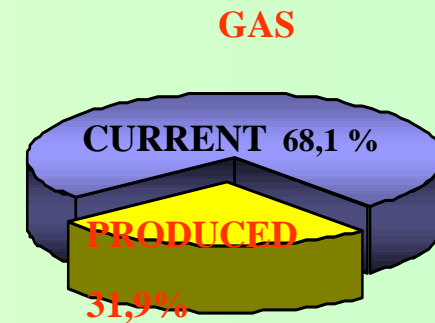


The main reserves to maintain gas production in the future are Cenomanian pays of Pestsovaya and Zapadno-Pestsovaya areas

Decrease of formation pressure leads to progressive water encroachment of pay horizons which influences hydrocarbon production and affects economic results. As Urengoi oil, gas and condensate field entered the phase of declining production in the main Cenomanian and Valanzhin pay horizons, the company needs to develop new deposits.



Depletion degree of hydrocarbon reserves of Cenomanian and Valanzhinian pay horizons **indicates the necessity to increase reserves on Urengoi, Yen-Yahinskaya, Severo-Urengoiskaya areas and on the adjacent territories**



To maintain the achieved production capacity

Urengoigazprom LLC developed

Cenomanian deposits on

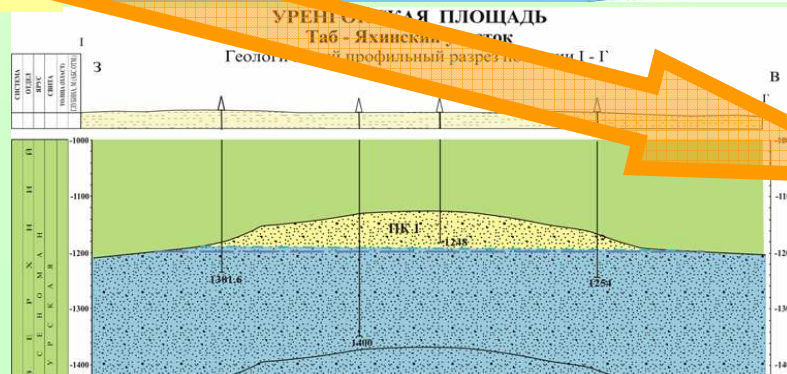
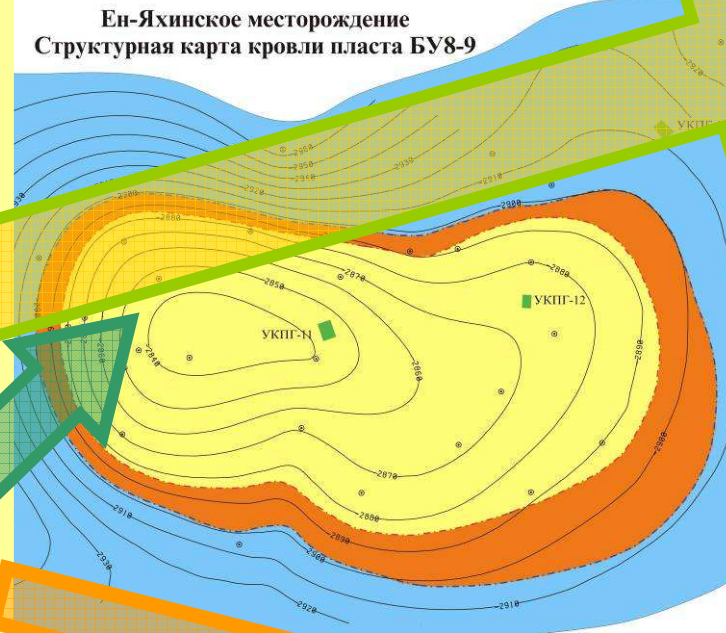
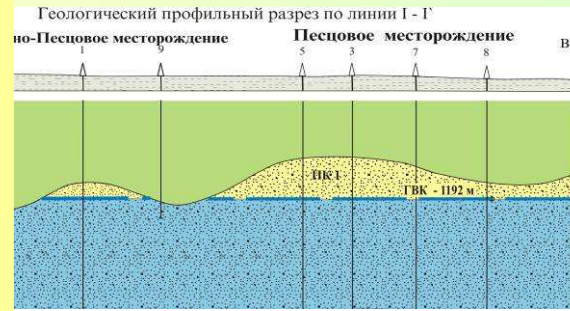
Pestsovaya, Yen-Yahinskaya

areas and on Tab-Yahinskaya

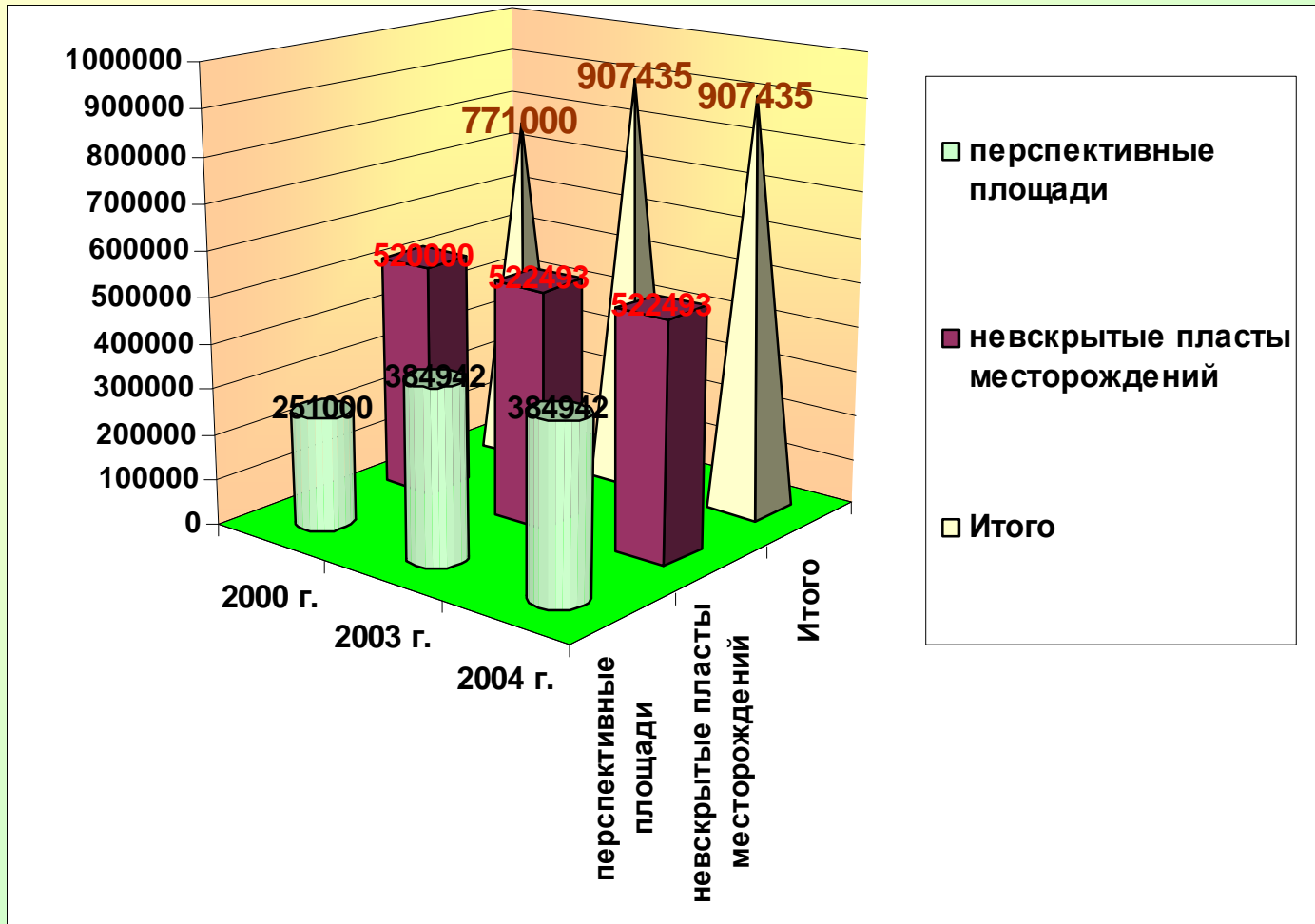
block of Urengoi area, and

Valanzhin deposits on Yen-

Yahinskoye field.



DYNAMICS OF PERSPECTIVE HYDROCARBON RESERVES OF CATEGORY C₃



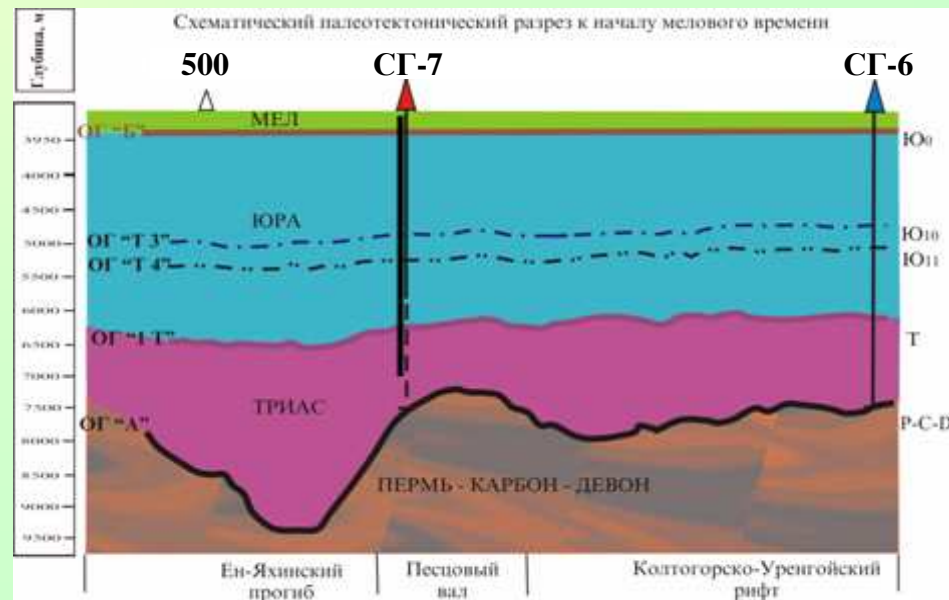
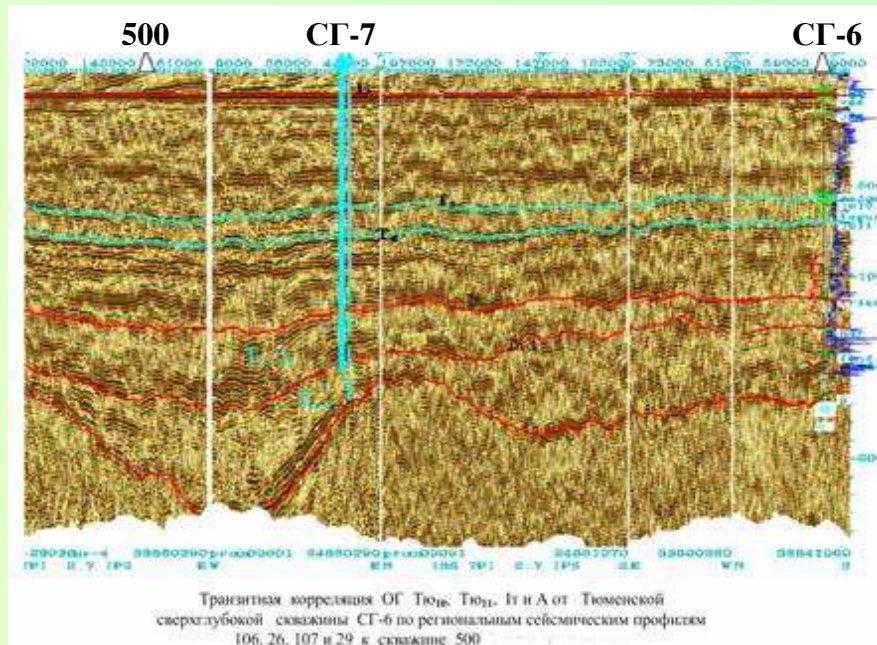
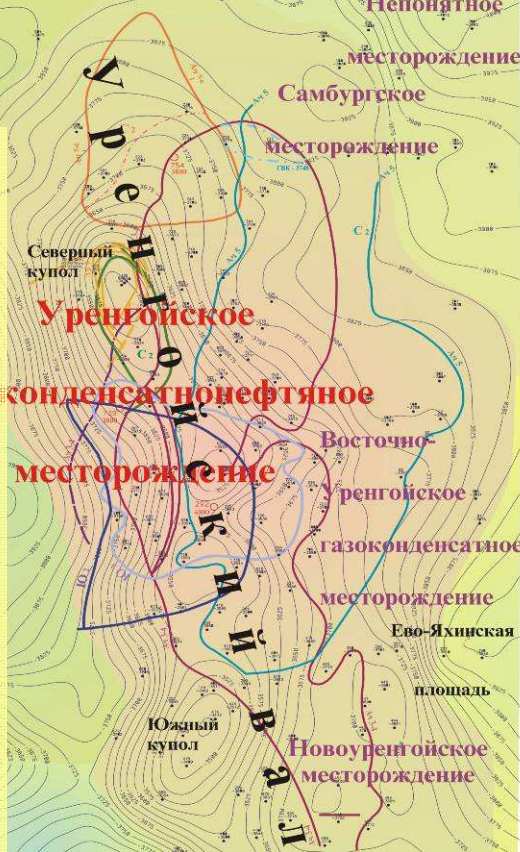
To provide near-term outlook the company proceeds with additional exploration on the developed areas with the purpose to transfer C₂ reserves into industrial categories, that can increase the commercial gas reserves by 12,2%, gas condensate – by 26,2% and oil – by 128%.

At the same time the volume of prospect C₃ reserves is not big and prospecting works can not be provided sufficiently, as taking into account the planned degree of reserves increase, they can last for 10-11 years.

Geological and exploration prospects are provided with reserves of categories C₃ only for 20-25%, but their volumes are constantly increasing mainly owing to seismic prospecting



Developing of deep seated gas-bearing horizons can be profitable when using their energy for increasing gas, oil and condensate recovery ratio from Senomanian and Valanzhin payout beds. Taking into account this circumstance, it is recommended to carry out pilot works on controllable intrawell bypass effectiveness with purpose to keep back the selective water encroachment, to introduce cycling process and to maintain formation pressure, that is especially urgent in connection with methanoic - nitric composition of deep seated gas and formation pressure reaching 1200 atmosphere.

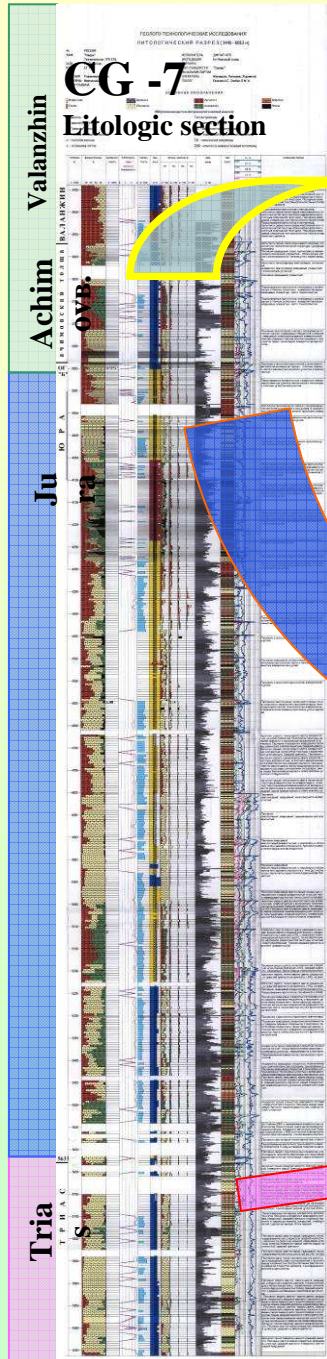
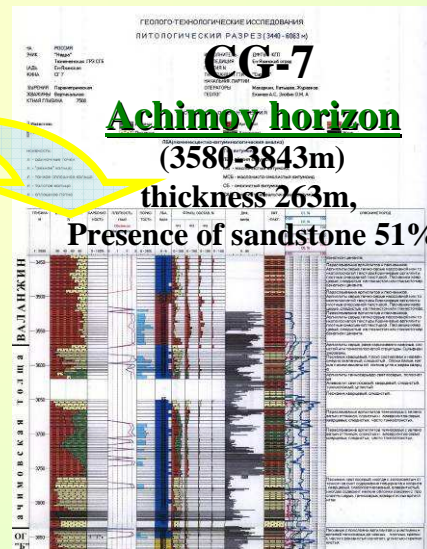
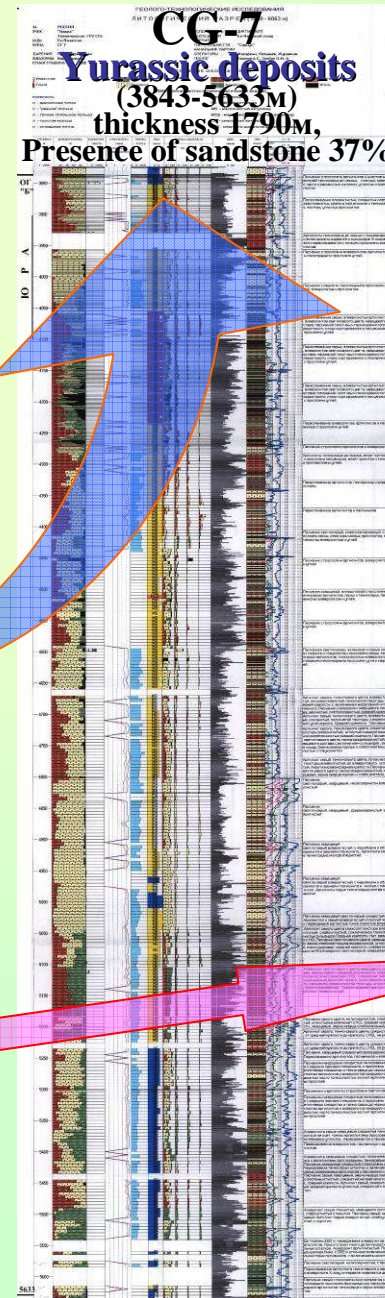
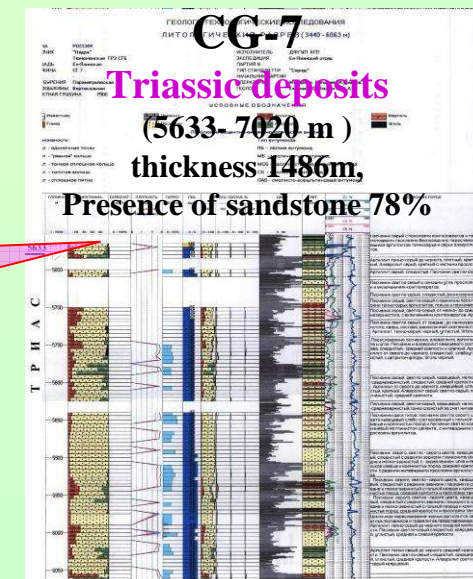


The most important new data proving gas occurrence in **Jurassic** and **Triassic** deposits are the follows:

Occurance of sandstones is higher than it was assumed earlier both in Yurassic and Triassic deposits;

- Numerous penetrations of sandstones and conglomerate deposits into the underlying argillite making hydrodynamic "windows" and combining separate reservoir-beds into big volume reservoirs were detected in the core of Yurassic and Triassic deposits;

Sandstones with porosity up to 20 % were detected in the core of Yurassic deposits, and cavities partly filled with quartz were found in the core of Triassic deposits.



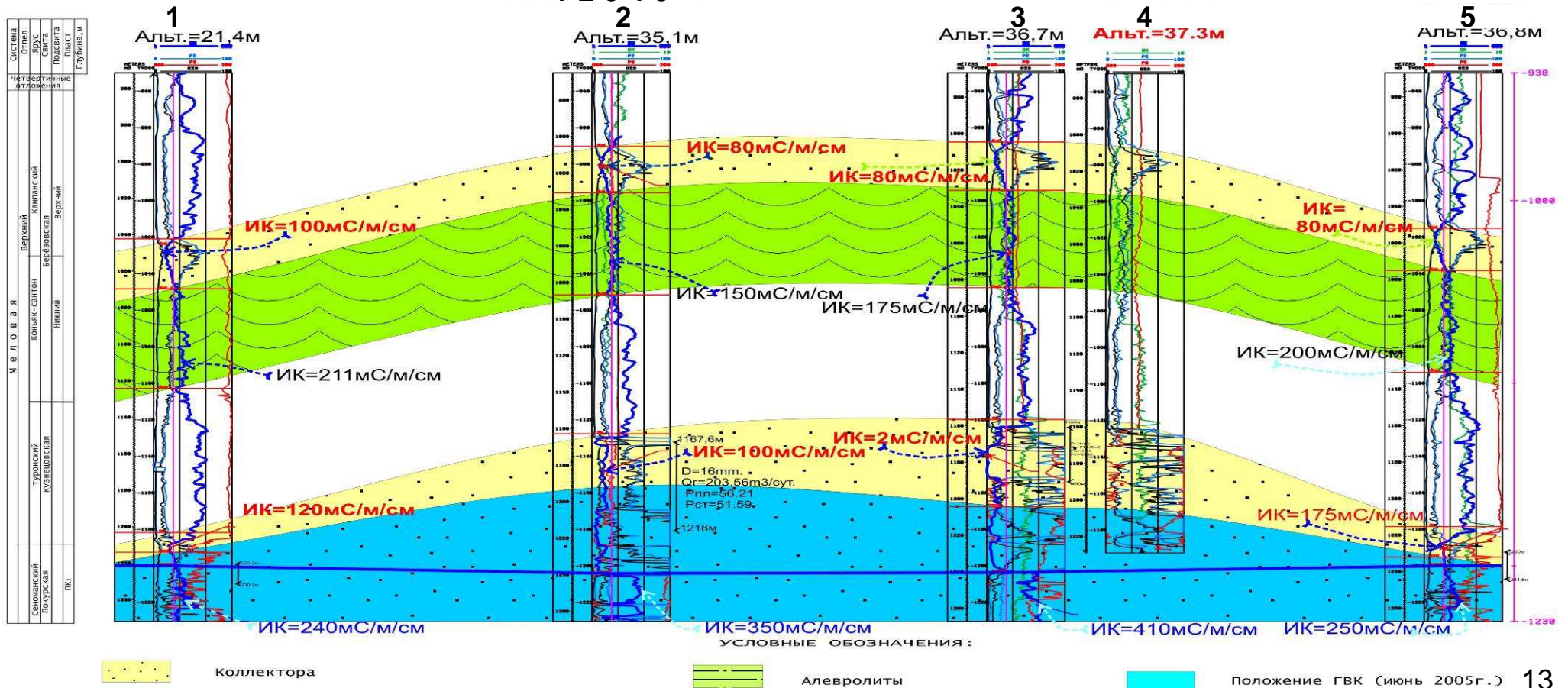
Togurskaya formation member, which consists of loam, changes into sandstone on the northern slope of Pestsovaya bank making lithologic screened natural gas reservoir;

Increased by up to 20% registration of mud logging at well bottom and formation of increased loam crust during Triassic deposits deepening.

Over-cenomanian sandstone-aleurolitic beds of Berezovskaya bed series are considered as a reserve for maintaining gas production capacity of Urengoi gas, oil and condensate field. Their gas bearing factor is proved by productivity of over-cenomanian deposit on Yuzhno-Russkoye, Zapolyarnoye and Nadymskoye fields. That's why it is recommended to include into well abandonment plan of Urengoi gasprom carrying out tests in sandstone-aleurolitic beds of Berezovskaya bed series due to the inequality of collecting properties within the area and difficulty to determine the filtration-capacitive quality and saturation.

The size of inductolog anomaly changing in Cenoman makes from 15 till 175 mC/m/cm for an effective pay, and for a water-bearing part of deposit it is much bigger : 246-252 mC/m/cm. Comparason of prospective reservoirs of Berezovskaya measure with these coefficients shows that their top part is characterized by anomalies in the range of 80-100 mC/m/cm, that is typical for Cenomanian deposits.

Северо-Уренгойское месторождение
Геолого-геофизическая разрез
по линии скважин 1-2-3-4-5

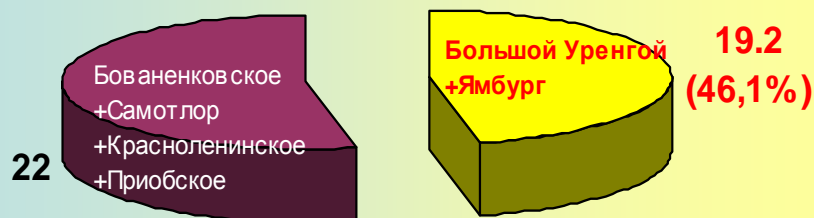


Общая площадь	около 3 млн.км ²
Объем осадочного чехла	10-11 млн.км³
Месторождений УВ	696
в т.ч. Г и ГК	94
Н	476
смешанных (ГН/НГ и др.)	126
Начальные геологические запасы УВ	150 млрд.т. (геол.)
Месторождения-лидеры (B+C ₁ +C ₂)	
Газ, трлн.м ³	Нефть (млрд.т., геол.)
Большой Уренгой - 12,2	Самотлор - 7,6
Ямбург - 7,0	Красноленинское - 5,5
Бованенковское - 4,9	Приобское - 4,0

(по данным
ВНИИГАЗа)

The maximum concentration of hydrocarbons is in the central part in the North of province. **Almost half of reserves is concentrated in two out of six big fields.**

Запасы углеводородов месторождений-гигантов категорий B+C₁+C₂, млрд.т.у.т.



Based on prospects of Western-Siberian oil, gas bearing province cited in the latest VNIIGAS' publications, at an average thickness of sedimentary cover of 3,67 km, the average density of initial geological reserves will make 13 636 t.o.e / km³

At such density on 1 km³ and sedimentary rock extension in Urengoi oil, gas region up to the depth of 3700 m. the initial geological reserves must not exceed 519,01 Mio t.o.e.

Practically only proved gas reserves of the categories B+C₁+C₂ to a depth of 3700 m make 12200 m t OE (based on publications of VNIIGAS). Then based on our calculations, the density of initial geological reserves in Big Urengoi makes more than 350529,67 m t OE / km³. In other words it is 25 times greater than on average in Western-Siberian oil-, gas-bearing region. By preliminary estimate and taking into account that the formation pressure grows with the depth (based on the results Ultradeep Well # 7), prospective gas reserves match prospected hydrocarbon reserves within the license areas of the Company.

UrengoiGazprom has every reason to increase its resource base, which will maintain hydrocarbon production at the achieved level and will ensure its growth in the presence of necessary investments.