THE PROSPECT OF GAS PRODUCTION
AND SPECIFIC FEATURES OF DEVELOPMENT
OF THE YAMAL PENINSULA

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(GAZPROM, VNIIGAZ)
Yamal climate.

Average year temperature
- 10 – 11°C.

Average winter temperature
-22 – 26°C.
Winter duration 240 days.

Average summer temperature
+6 – +9°C. Summer duration 67 days.

Permafrost thickness 120-300 m,
Temperature -6°C.
Weight ice content: from 20 to 80%.
Yamal region

Structure of initial gas resources, Bcm
The groups of Yamal gas fields

Bovanenkovo (1)
(Bovanenkovo, Kharasavei, Kruzenshtern)

Northern (Tambei) (2)

Southern (3)

Offshore (4)
**Strategy of Yamal**

**gas fields development**

was founded in “Complex commercial development program for Yamal Peninsula and the adjacent offshore areas”.

This Program was developed by VNIIGAZ on the instructions of Gazprom in 1996 – 2002 under leading of prof. G.E.Odisharia and prof. R.M.Ter-Sarkisov.

Program include parts on:

- Geology
- Development
- Transportation
- Economy
- Ecology
- Work program on short-term and long-term perspective.
Relative stable:
Activating of cryogenic processes is improbable
The surface is not deformed
The geologic environment is stable

Unstable:
Activating of cryogenic processes is probable
The surface may be deformed
Irreversible variations of the geologic environment are probable

Surface stability

![Surface Stability Map](image)

- Relative stable: light yellow
- Unstable: pink

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*Image: Surface Stability Map with color-coded areas indicating stability.*
**Probable production of Yamal gas fields groups**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Gas resources, Tcm</th>
<th>Probable production, Bcm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bovanenkovo</td>
<td>8,2</td>
<td>211</td>
</tr>
<tr>
<td>2 Northen (Tambei)</td>
<td>3,6</td>
<td>65</td>
</tr>
<tr>
<td>3 Southern</td>
<td>1,4</td>
<td>30</td>
</tr>
</tbody>
</table>
Probable gas production forecast from Yamal gas fields

Probable gas production forecast from Yamal gas fields

production, Bcm per year

Structural elements:
- **Bovanenkovo (senoman+apt)**
- **Kharasavei (jurassic)**
- **Bovanenkovo (jurassic)**
- **Kharasavei (senoman+apt)**
- **Kruzenshtern**
- Tambei group

Key values:
- 250 Bcm
**Bovanenkovo gas field**

Well construction and well clusters location

<table>
<thead>
<tr>
<th>Ice content</th>
<th>Well type</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20% or from 20 to 40% and thickness &lt; 10-15 meters.</td>
<td>Well without insulated tubing.</td>
</tr>
<tr>
<td>&gt; 20% and thickness &lt; 25 meters.</td>
<td>Well with insulated tubing.</td>
</tr>
</tbody>
</table>
| > 40% and thickness > 25 meters. | **a)** Well with insulated tubing and special refrigerants.  
**b)** Move the well clusters |

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Bovanenkovo gas field
Special programs and models were used for evaluation of reservoir development impact on the environment.

Yamal environment

After 18 years

After 27 years
Approaches to the unique reserves of Yamal gas fields are formed with GAZPROM and VNIIGAZ experts experience on the field development in similar conditions. However here we do not talk about simple duplication of already done. Our experience allowed to define in the right way:

- Approaches to exploration of the new gas bearing region – commencing development from major fields which can reliably provide the loading of new system of gas mains;
- Strategy of gas production development – use of the newly constructed infrastructure for further additional exploration and development of new fields;
- Ways to reduce environmental impact upon Yamal – location of wells cluster, equipped by thermal-insulation pipes, and construction of the site structures on the preliminarily selected land plots with minimal ice;
- Directions of increasing reliability of gas production and transmission – preliminarily testing of all the new technologies and equipment in real climatic and site conditions.
Yamal gas fields

The main problems of the Yamal resource commercial development are related to environmental protection. To tackle this problem JSC Gazprom has worked out an Advanced research program unprecedented by scale and volume of financing. The program is intended for developing environmentally sound technologies, minimizing environmental impacts and preserving and developing unique culture, ethnos and traditional forms of activity of local nations.

The results obtained made it possible to conclude that the commercial development of Yamal gas fields, including the construction of gas mains and railway, will not lead to irreversible ecological consequences on the peninsula.
THANK YOU
FOR ATTENTION