Vostok project
A game changer for Russia, or a Potemkine village?

Par X. Chavanne

Univ. Paris Cité & Institut de Physique du Globe de Paris

What is?

Rosneft 2019

A new petroleum province, in Arctic, of world class

6 Gt (45 Gb) of oil resource, 2 T.m^3 of gas (1.8 Gtoe)

30 Mt/y in 2024 > 115 Mt/y (2,3 Mb/d) by 2033

Tax breaks worth 2.6 trillion rubles ($41 billion) over the next 30 years

Indian and Chinese investors (and buyers)

Oil shipped in 120 kt ice tankers by the northern sea Route, opened by nuclear powered icebreakers from Rosatom

A new oil pipeline, 770 km long 100 Mt/y capacity, along the Yenisei river

A new oil terminal, Bukhta Sever (North Bay) port at the mouth.

Why?

Energy Minister 2019:

We will reach a peak of 570 million tonnes in 2021

Levels expected to drop to 310 million tonnes by 2035

Loss of taxes worth 3.6 trillion rubles each year

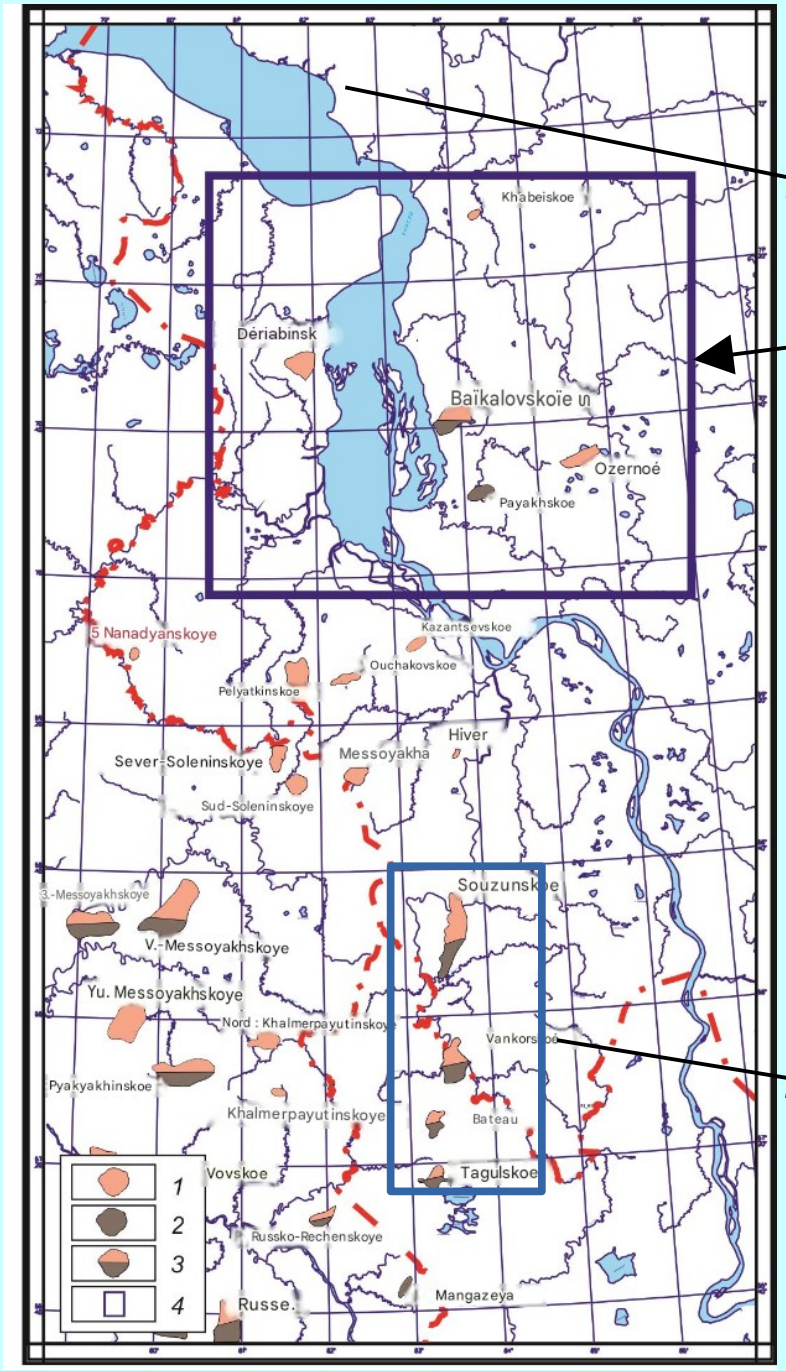
During 2000s and 10s resilience and growth of Russian oil industry.

West Siberia, the biggest province by far, in particular:

New technology used, new reserves added and developed.

But now it is mature and most deposits in production

Where?



Yenisei mouth



North Siberia

North east of West Siberian Basin

At the boundary. Outside?

Vankor cluster. Developed since 2009. Included in the project (?!).

Licenses and fields

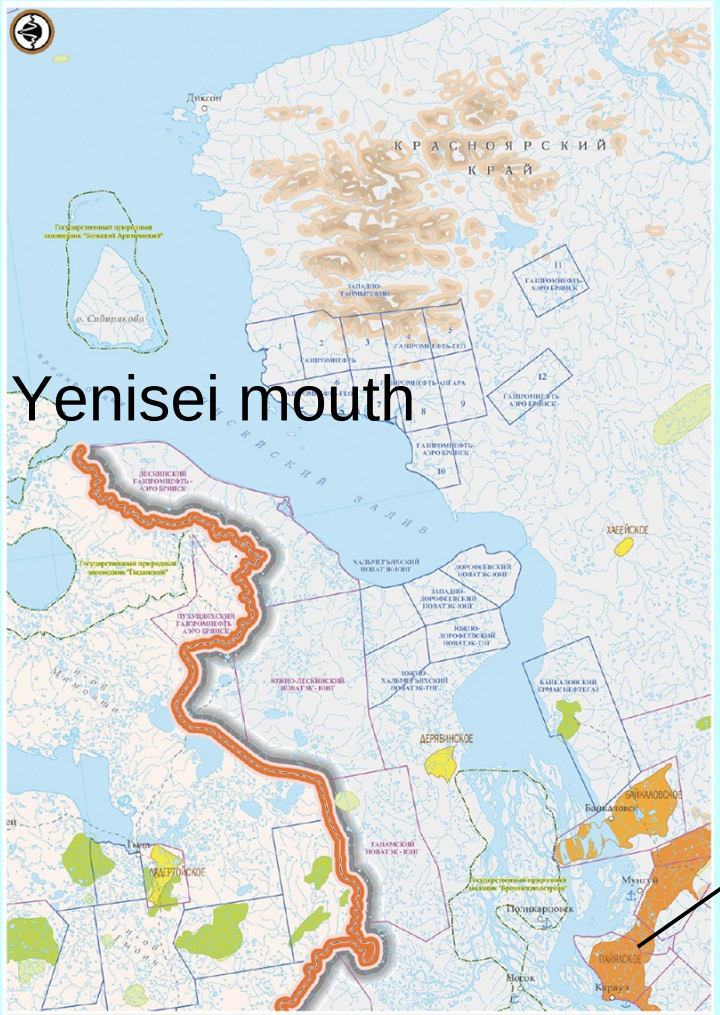
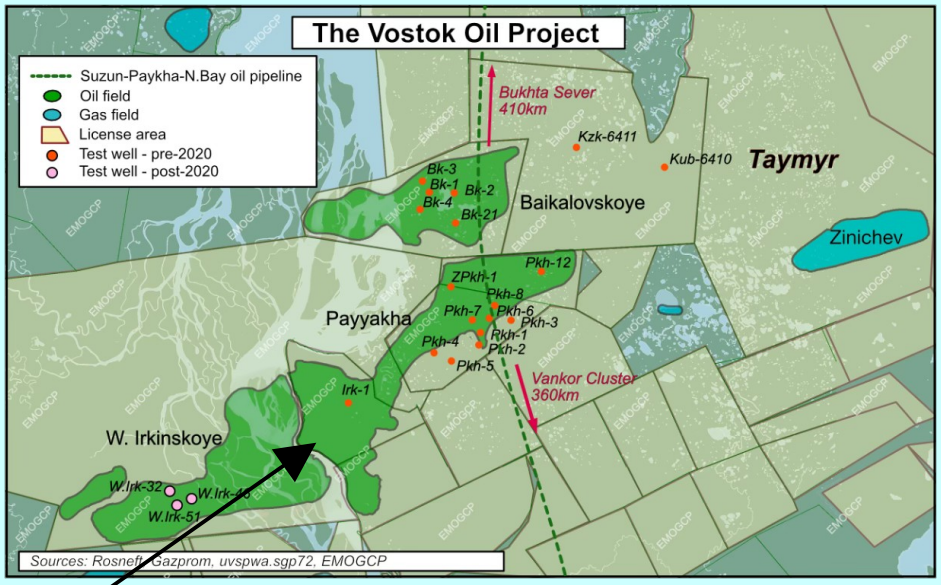


Рис. 9: Карта лицензирования восточной части Енисей-Хатангской НГО

Fig. 9: The eastern Yenisei-Khatanga petroleum area licensing map

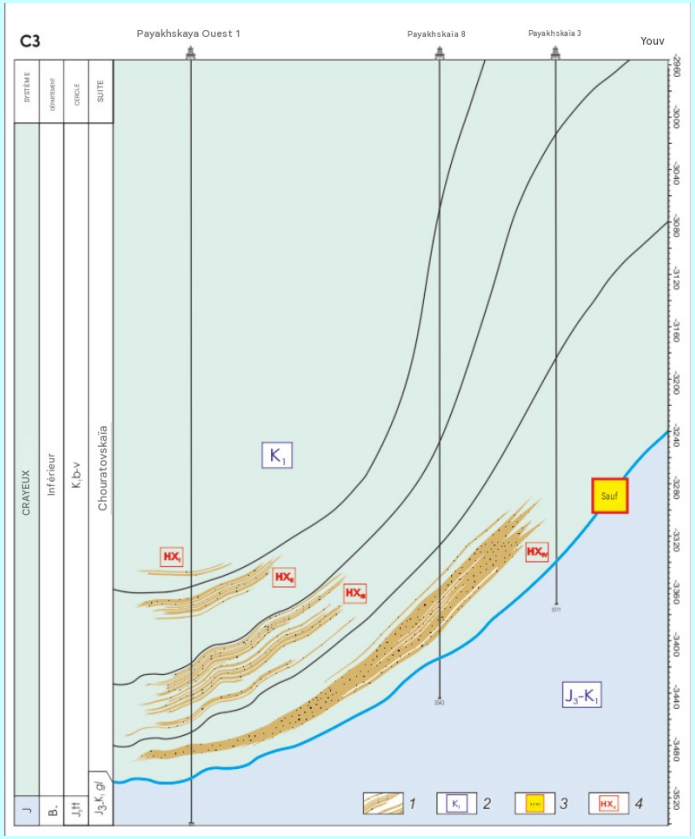


Few tenth of test wells.

Recent discoveries: Payakha, Baikalovskoye, Irkinskoye, West-Irkinskoye

Early K clinoforms





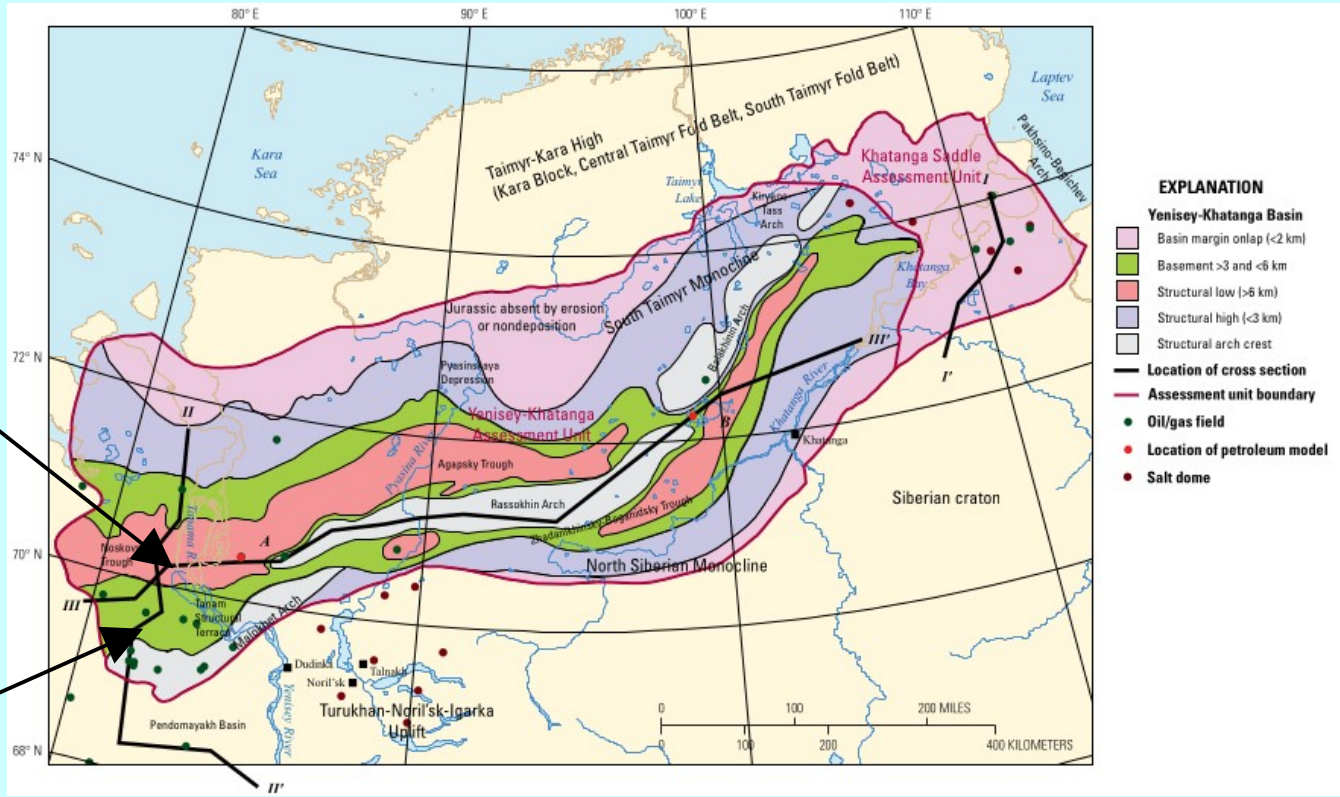
Turbidites at the base of a slope in a deep sea fed from Siberian craton.
Lateral heterogeneity, sands interbedded with clay…
In contact with source rocks

Ref: Kondaneft 2018

Yenisei Khatanga basin USGS 2008

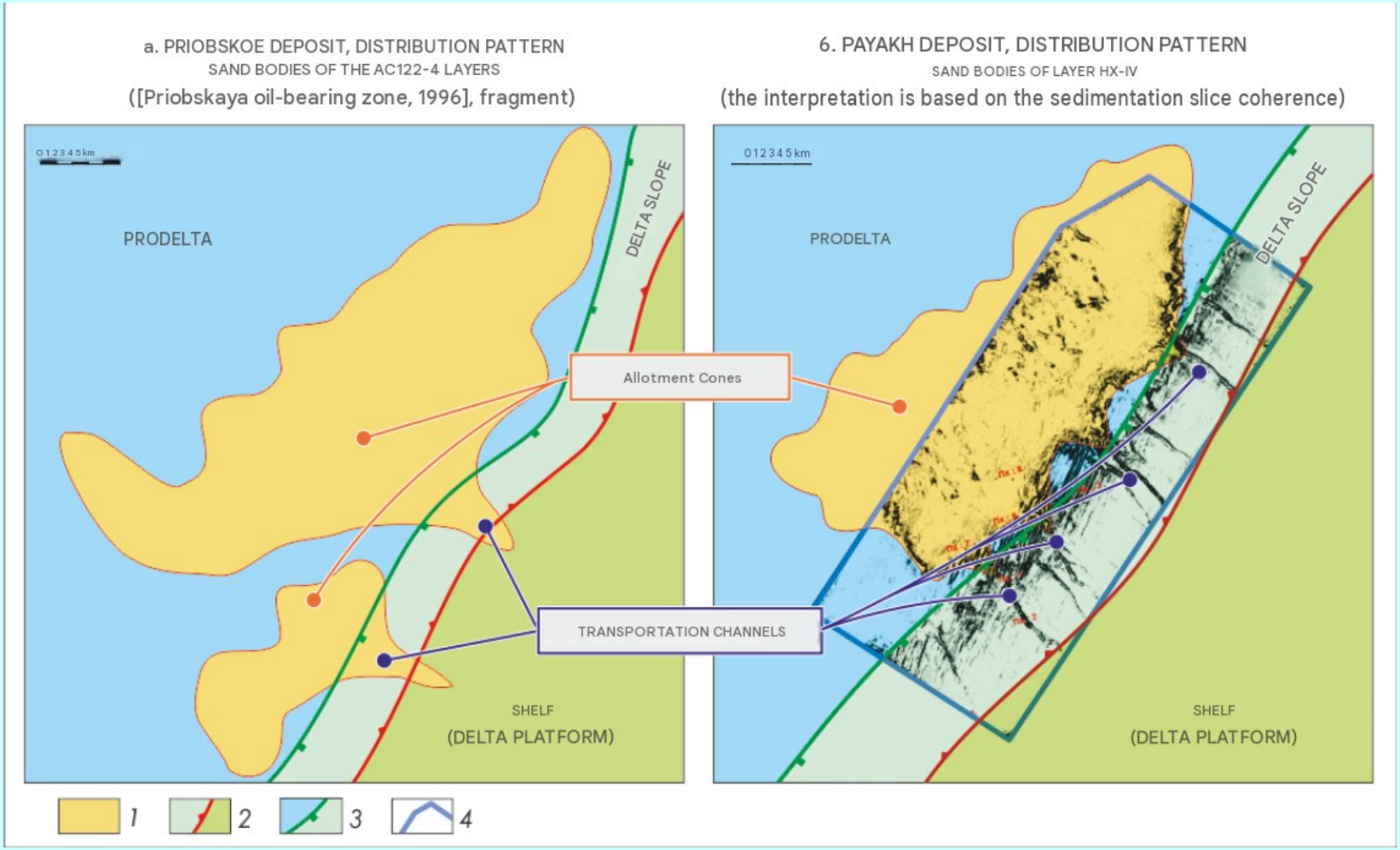
Basin trough:
6 km of sediments
No field reported
Clinoforms mentioned but with poor perspective

Other plays known
Mostly gas



Estimated mean volumes of undiscovered oil less than 5 Gb

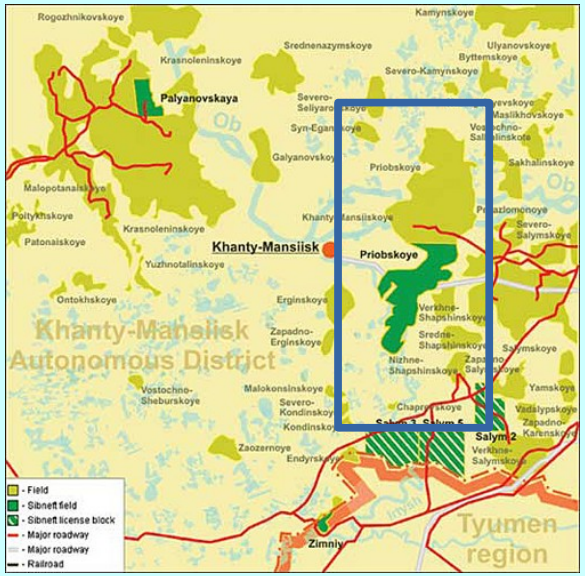
Field analogy



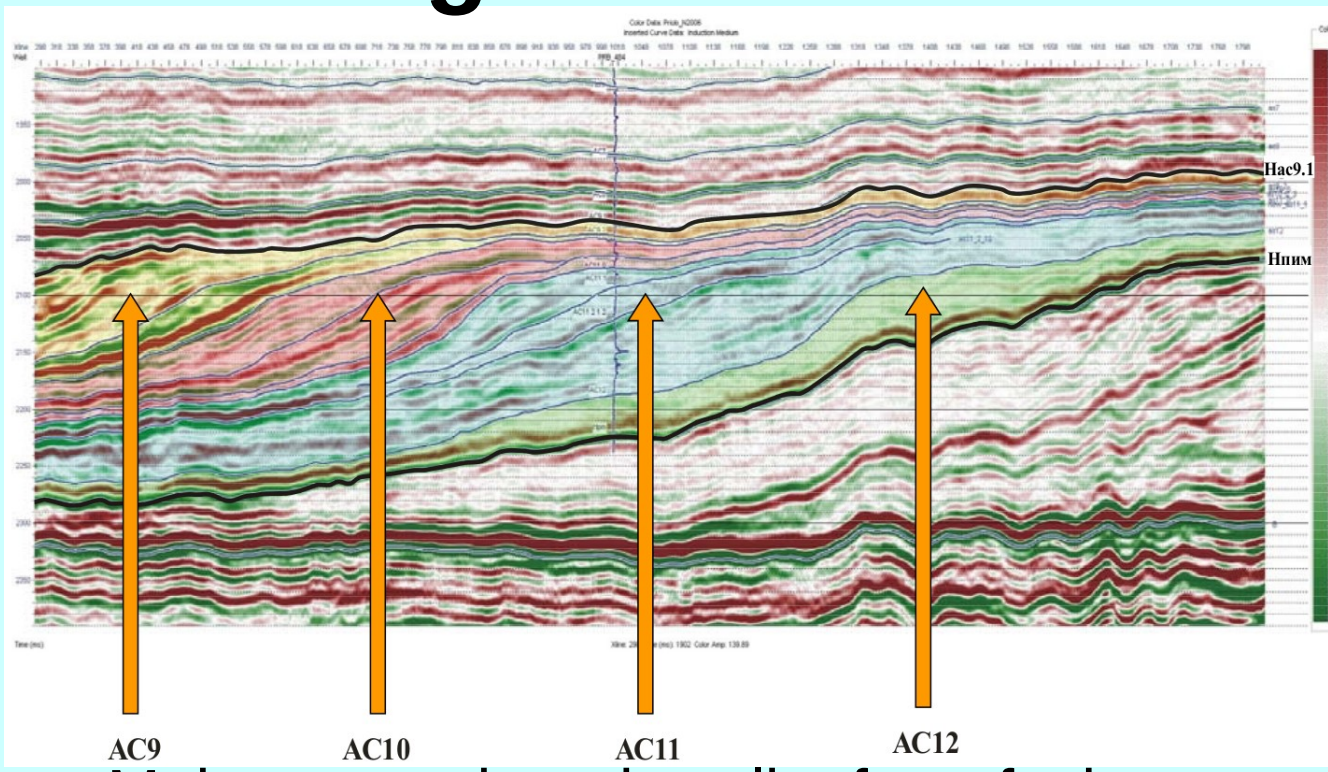
Similar to a field in the south east of west Siberia basin: Priobskoye

Ref: Kondaneft 2018

Priobskoye: **Reserve "growth"**



2nd largest field of West Siberian Basin (after Samotlor)



Main reservoir rocks: clinoform facies

1997	**2006**	**2025**
50 Mt (USEIA 4 Gb!)	1300 Mt	766 produced, 1060 (A), 575 (B) Mt
500 wells		+5000 wells (in general Hz multifrac)

Ref: T.V. Kruchkova 2008, GeoRes 2025

Priobskoye ↔ Payakha

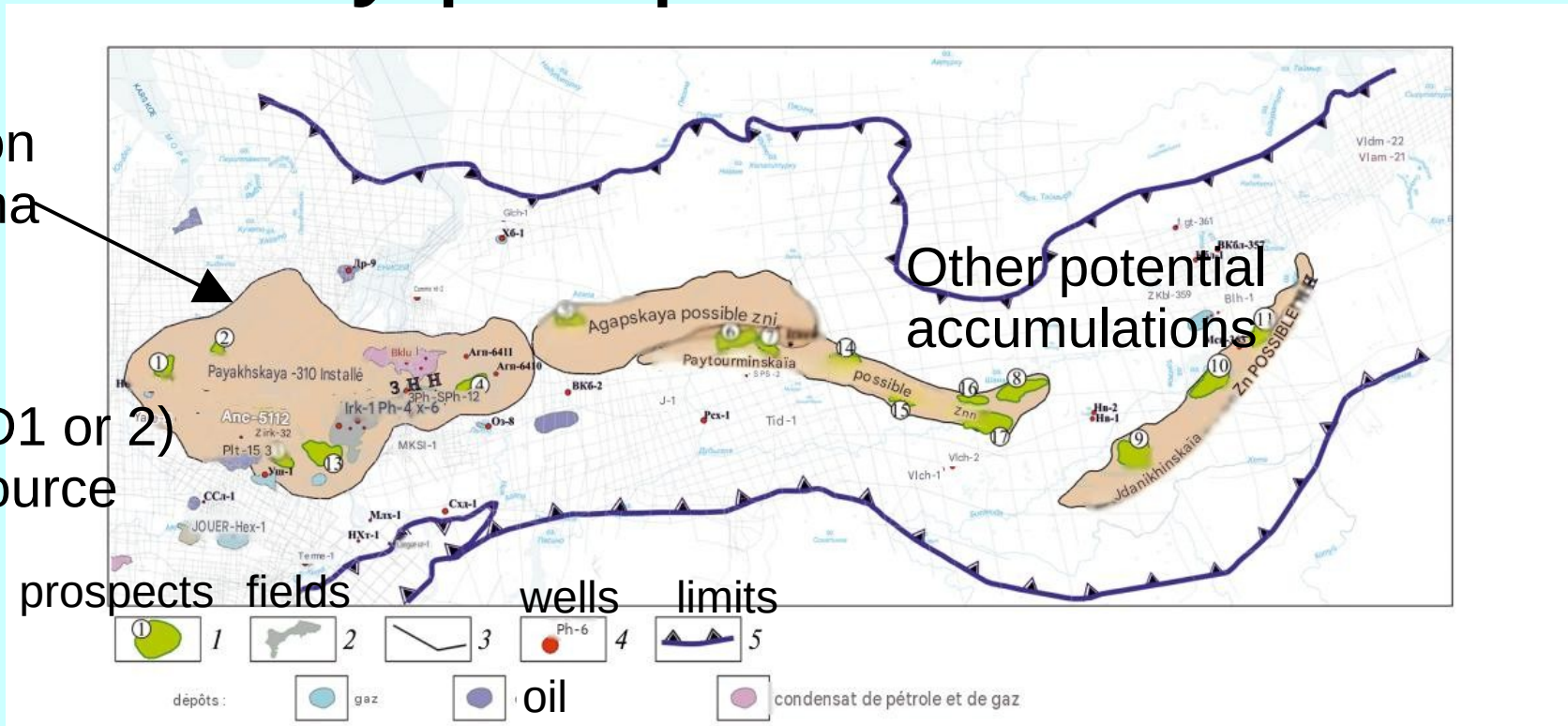
"hard to recover reserve"

Reservoirs	Neocomian	Berriasian–Hauterivian clinoform sandstones
Depth m:	2400-2600 m	3300-3600 m
Initial pressure MPa:	25 (hydro)	60 !
Net thicknesses m:	10–25	1–41
Porosity:	19 % (So~68%)	15 % (So~67%)
Permeability mD:	1–5	0.1–5
In situ viscosity cSt:	1.4 – 1.5	1 to 2
oil density kg/l	0.866 (30 API), 2%-sulfur	0.826 (40 API), low-sulfur, paraffinic
GOR (m3/m3)	51	200
Hz multifrac wells		

Very prospective

Oil accumulation zone of Payakha

7 Gt (potential–D1 or 2) recoverable resource over 30 000 km²



Delimitations and prospects based on seismic (3D and 2D) and few wells

Fields: West-Irkinskoye: 510 Mt (C2), Payakha 220 Mt (C2)… > 1200 Mt

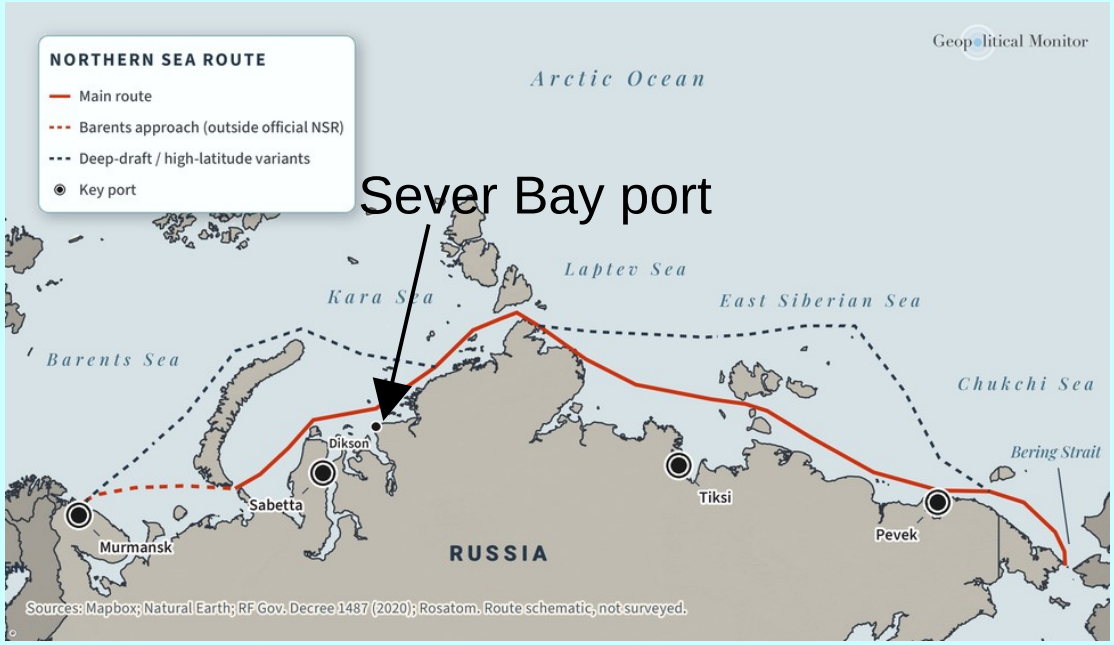
Ref: A. V. Isaev 2024

Logistics: an essential factor

Materials in: summer river barge; winter ice road

Oil out: pipelines to Sever Bay port > tankers bound to Asia through Suez or Bering

Sever Bay port: 16 storage tanks 25 kt each. Berth for loading 1 tanker.
By 2030 ten 125kt-arctic tankers available. About 100 at capacity.



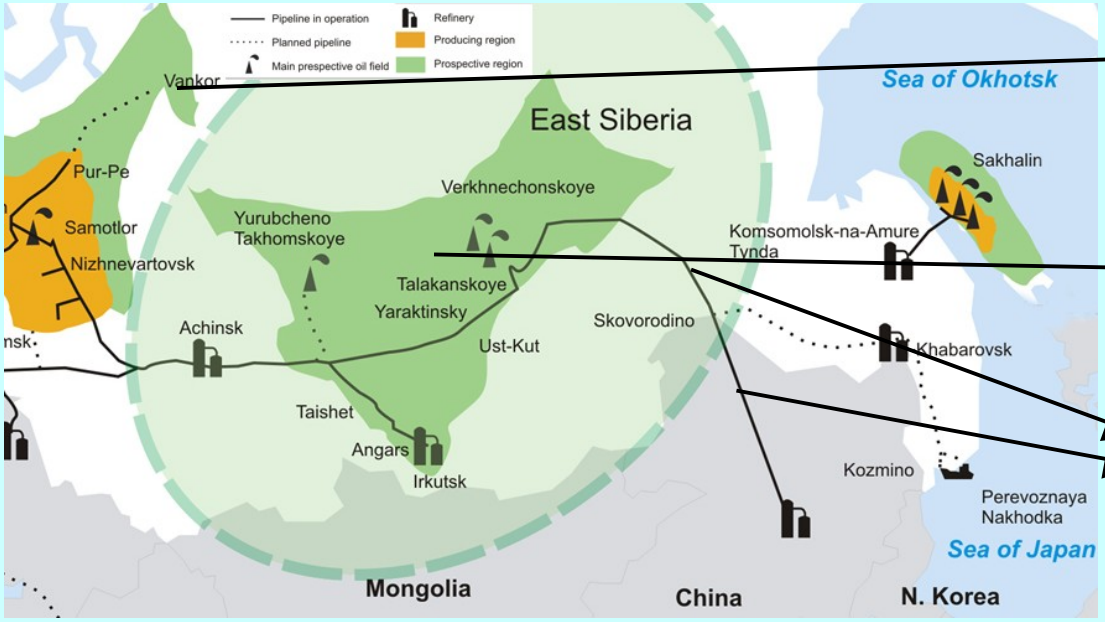
NSR in 2025:
38 Mt volume of which only 3,2 Mt in transit through Bering Strait (to East or to West)
From Russia to China and back about 30 days. Navigation period from end of June to mid November.
To Murmansk and back about 15 days. All the year

30 Mt/y > 82 kt/d > 10 tankers every 15 days > Murmansk

110 Mt/y > 300 kt/d > 100 tankers every 40 days > China + Murmansk

Ref: https://chnl.no/news/ . Sergey Vakulenko , 2025

Why not the Southern onshore route?



Vankor cluster. Close to and part of West Siberia

East Siberian group of fields Development after 2015 with ESPO

East Siberia Pacific Ocean pipeline 80 Mt/y capacity in 2025

H: ESPO close to saturation > booked for East Siberia group, the only basin able to grow (with Vostok)

Ref: Irkutsk Co., 2007

Conclusion

- The most important project currently in Russian petroleum industry: big investment, large political support (Putin himself). Essential to maintain country production. More than 100 Mt/y in early 30s.

- A new petroleum province still very prospective (reserves C2 and resource D1 or D2); a pilot production at one field.

- However, some prospects turned true (West-Irinskoye), and type of reservoirs well known with established technology (hydro frac).

- Working in Arctic conditions onshore is also manageable.

- However, a large difficulty: a route in Arctic to carry oil to Asian customers

- Already delays and more to come...