

Working paper

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Stiftung Wissenschaft und Politik
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Russian Energy and Europe

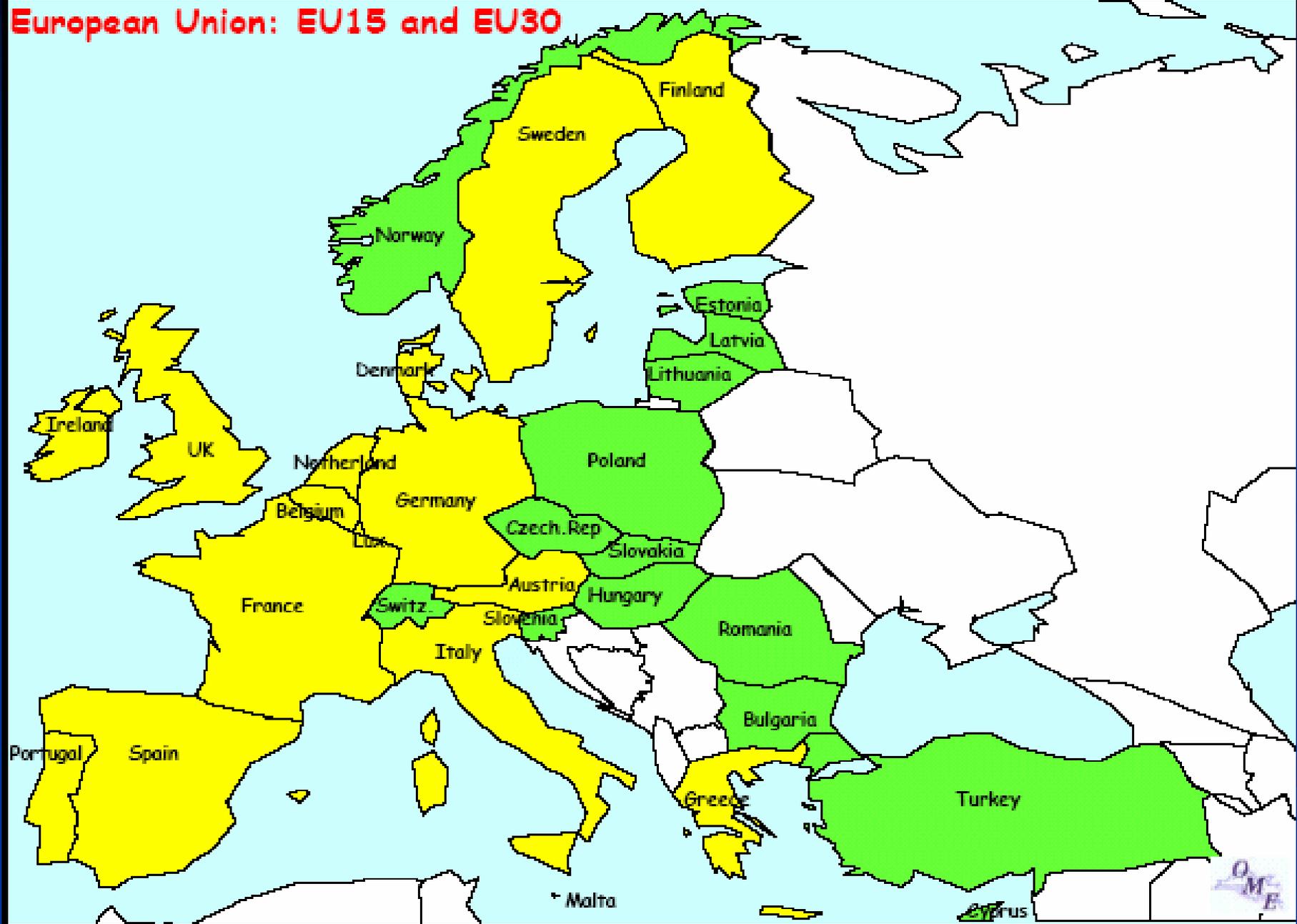
FG 5 2005/10, December 2005

Working papers are papers in the subject area of a Research Unit which are not officially published by SWP. These papers are either preliminary studies that later become papers published by SWP or papers that are published elsewhere. Your comments are always welcome.

Europe

Europe in this presentation means
western and eastern Europe, without
CIS countries

European Union: EU15 and EU30



Gt SKE

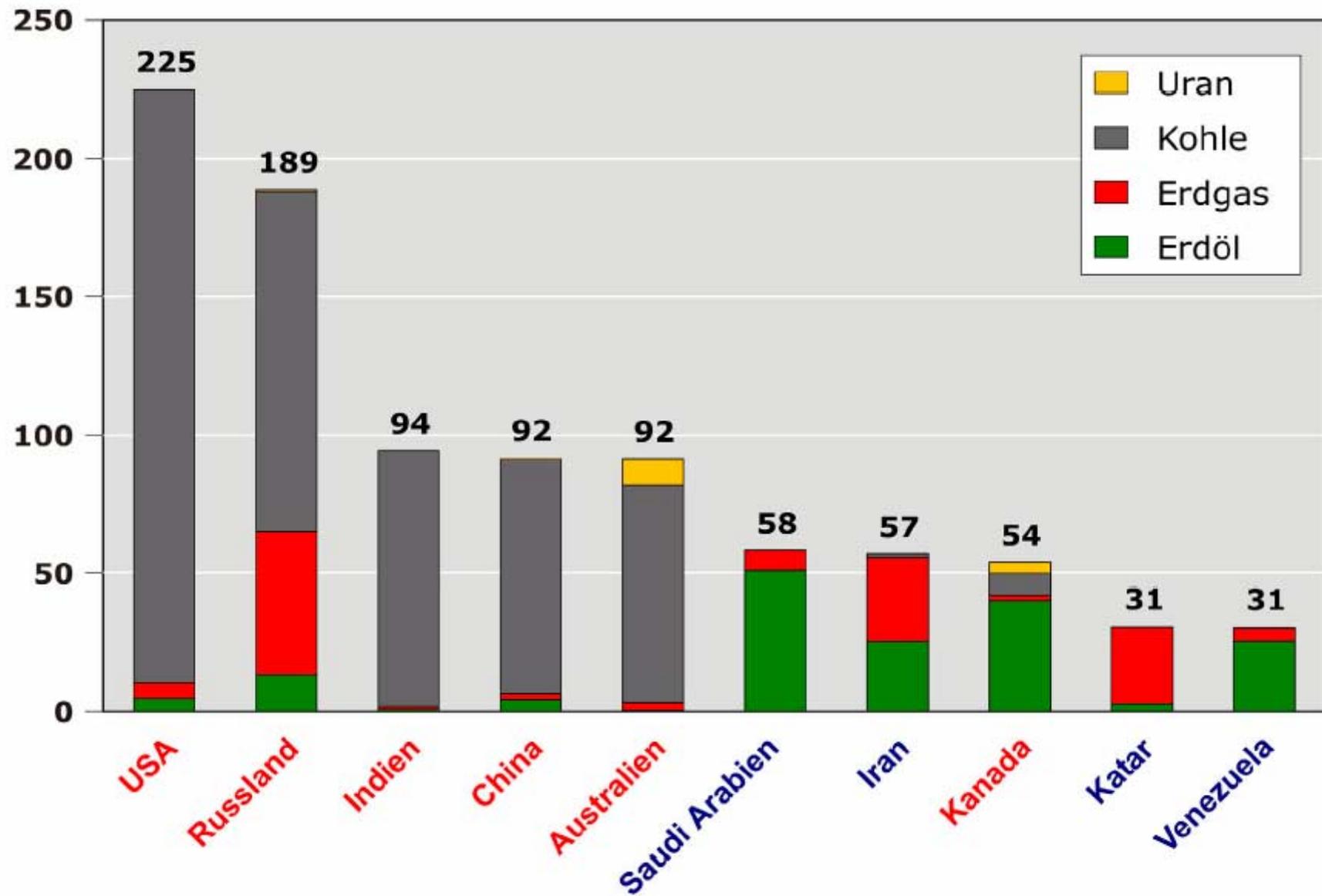
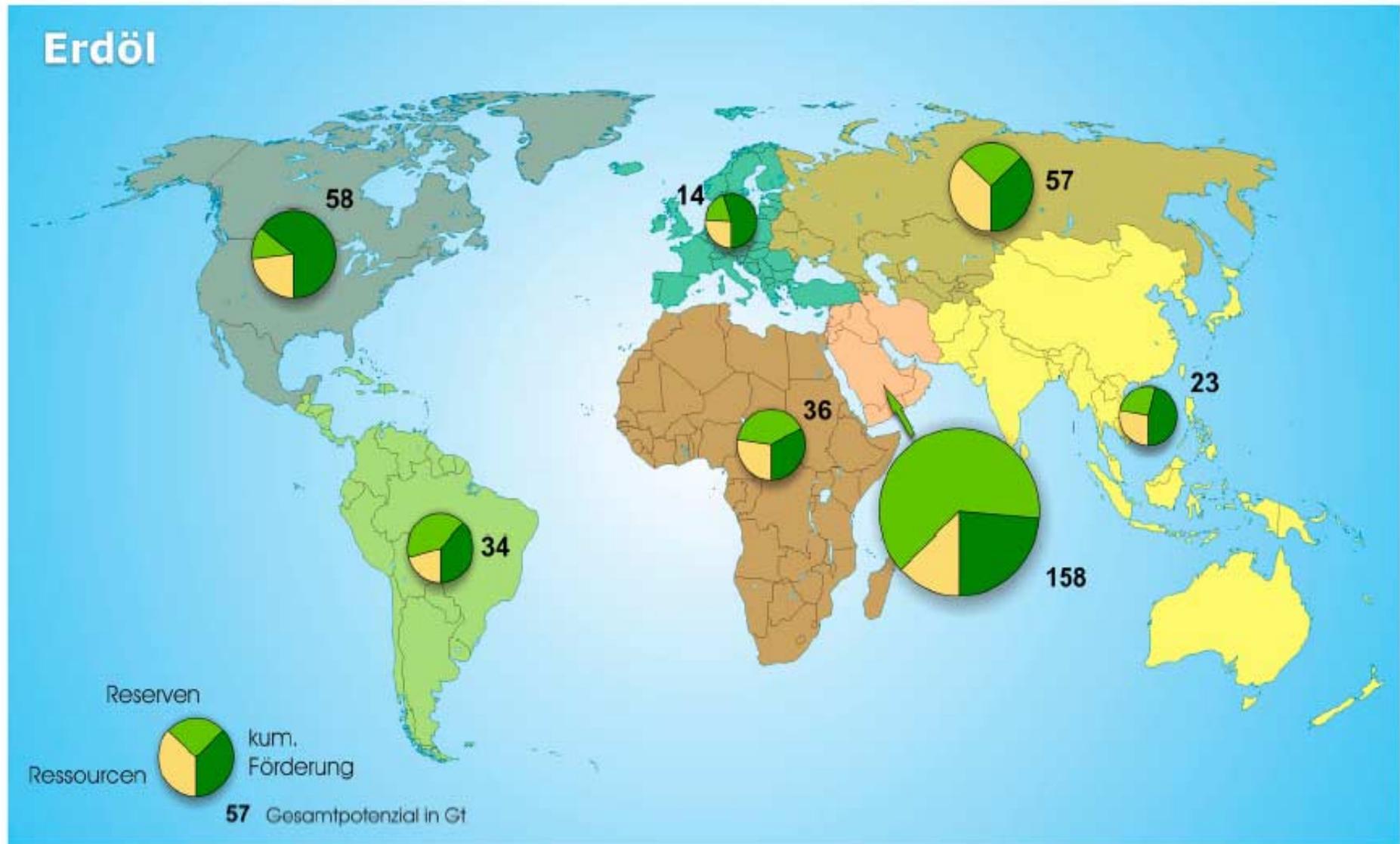


Abb. 7: Die 10 Länder mit den größten Reserven nicht-erneuerbarer Energierohstoffe 2004. (OPEC-Länder in blauer Schrift)

Erdöl-Gesamtpotential 2004 (BGR)



Russian oil and gas fields

- Russian/Soviet oil and gas production in the 20th century moved from the Caspian area to the Wolga/Ural area and only after World War II to western Siberia
- Western Siberia remains the main production area
- In the 21th century important production areas will become offshore fields in the Barents sea, Eastern Siberia and Sachalin



50° N 60° N 70° N 80° N 40° E 60° E 80° E 100° E 120° E 140° E 160° E 80° N 180° E 70° N 60° N

50° N 20° E

40° N 40° E

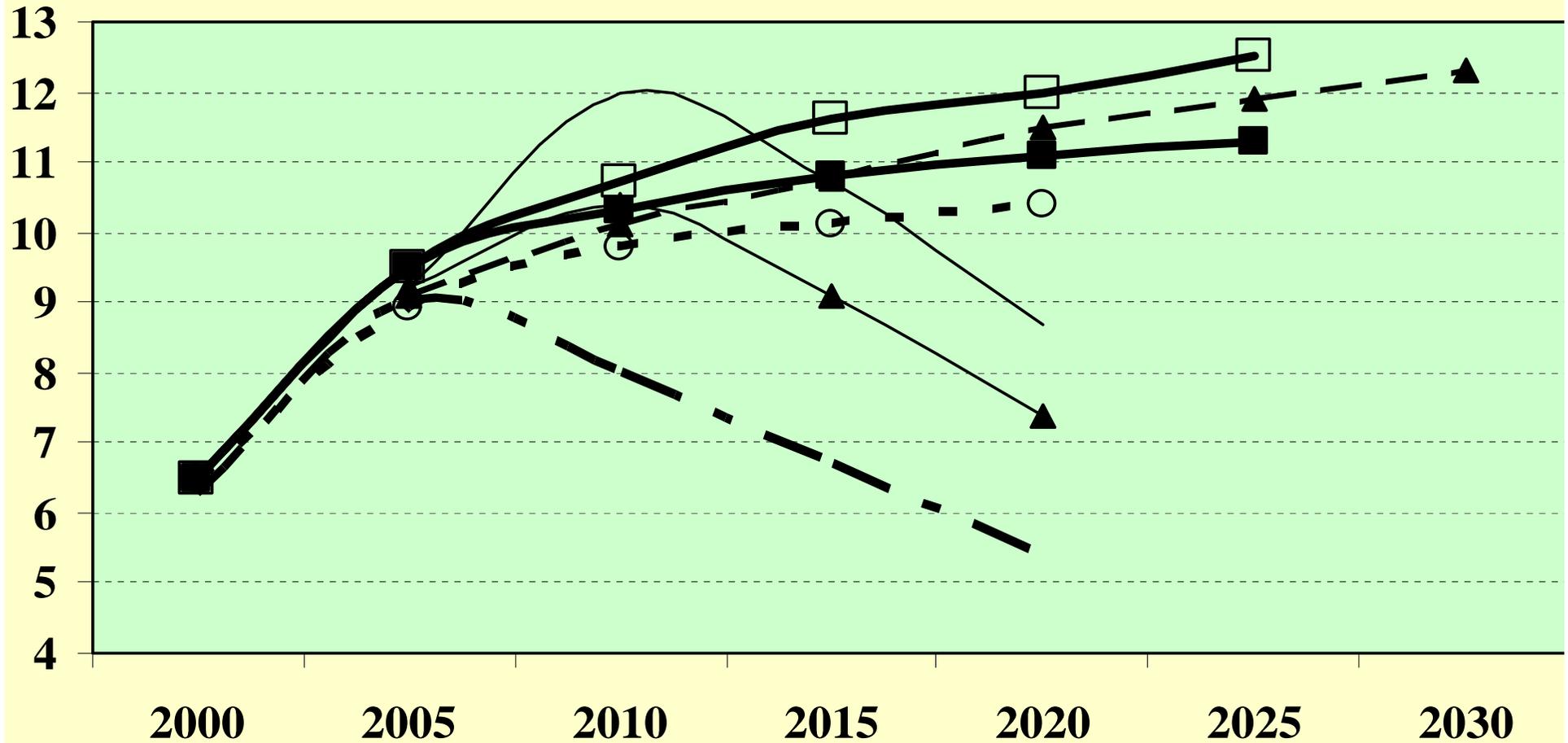
30° N 60° E 80° E 20° E 40° N 100° E 40° N 120° E 140° E 160° E 80° N 180° E 70° N 60° N

Oil production

- After dissolution of the Soviet Union Russian oil production fell sharply because of privatisation problems and lacking internal and CIS demand
- Oil export to western countries soon began to increase
- Long-term production depends heavily on world market conditions and investment climate in Russia

mb/d

Oil production prognoses for Russia



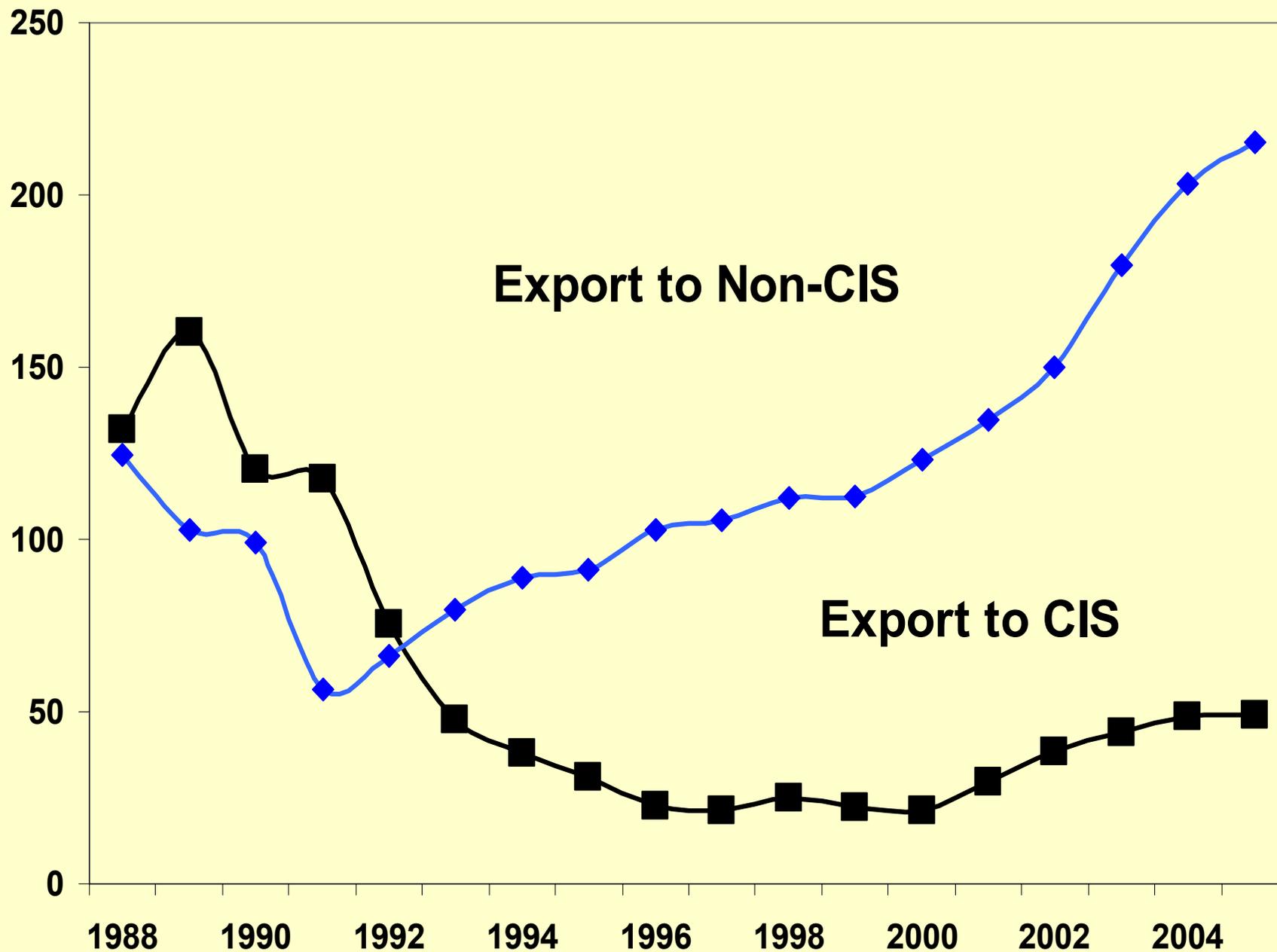
- Rußland Referenzfall
- Rußland Hoher Ölpreis
- RF Energiestrategie (2003) - Günstiges Szenario
- ▲- Russ. Akadem. D. Wiss. (2004)
- ▲- Wood Mackenzie (2004) Base case
- Wood Mackenzie (2004) Unconstrained case
- - ASPO (2005) - Nur regular oil

Russia and Caspian oil export

- Russian oil production has almost reached its peak production level
- Russian oil export will increase slightly
- Caspian oil production is expected to grow considerably
- Caspian oil export will increase more than Russian oil export

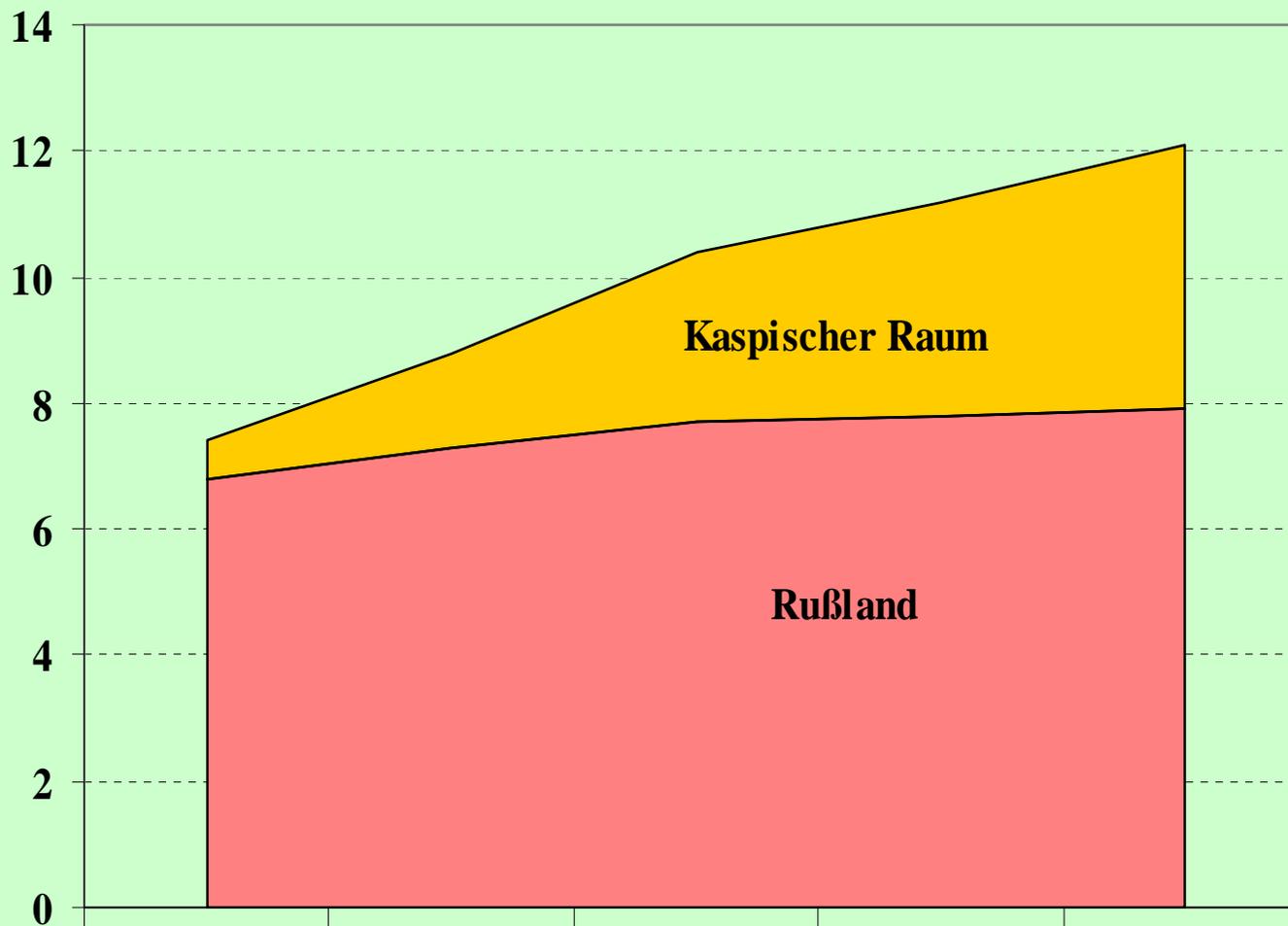
Russian oil export 1988 - 2005

mmt



Erdölexport aus Russland und dem Kaspischen Raum

mbd



■ Kaspischer Raum	0,6	1,5	2,7	3,4	4,2
■ Russland	6,8	7,3	7,7	7,8	7,9

Import need of USA, China, Europe

- Strong increase of oil import need of USA and China
- Small increase of oil import need of Europe

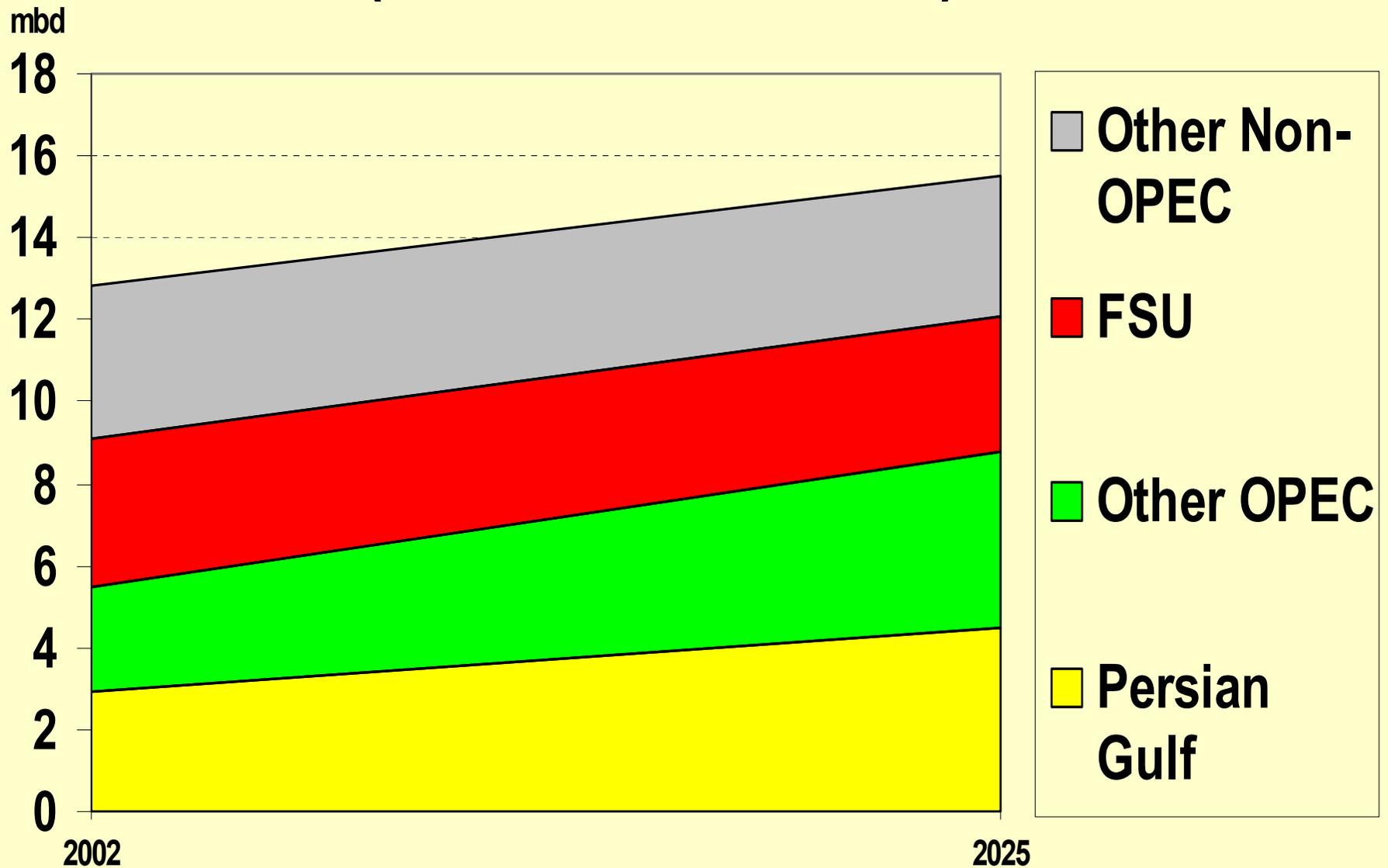
European oil import in the reference case

Reference case: low oil price, small Non-OPEC oil production

European oil import mainly from Gulf-OPEC and Other OPEC

Russian and Caspian (FSU) oil export to Europe is assumed to be constant

West European oil import (EIA reference case)



Oil pipelines

- Oil pipelines from western Russia to Europe mainly built in Soviet times
- Capacity increase of the Baltic Pipeline System (BPS)
- Planned export pipelines to Murmansk / Barents sea for export to USA and Europe
- Bottlenecks Baltic sea, Black sea ports, Bosphorus



Oil pipelines to Europe

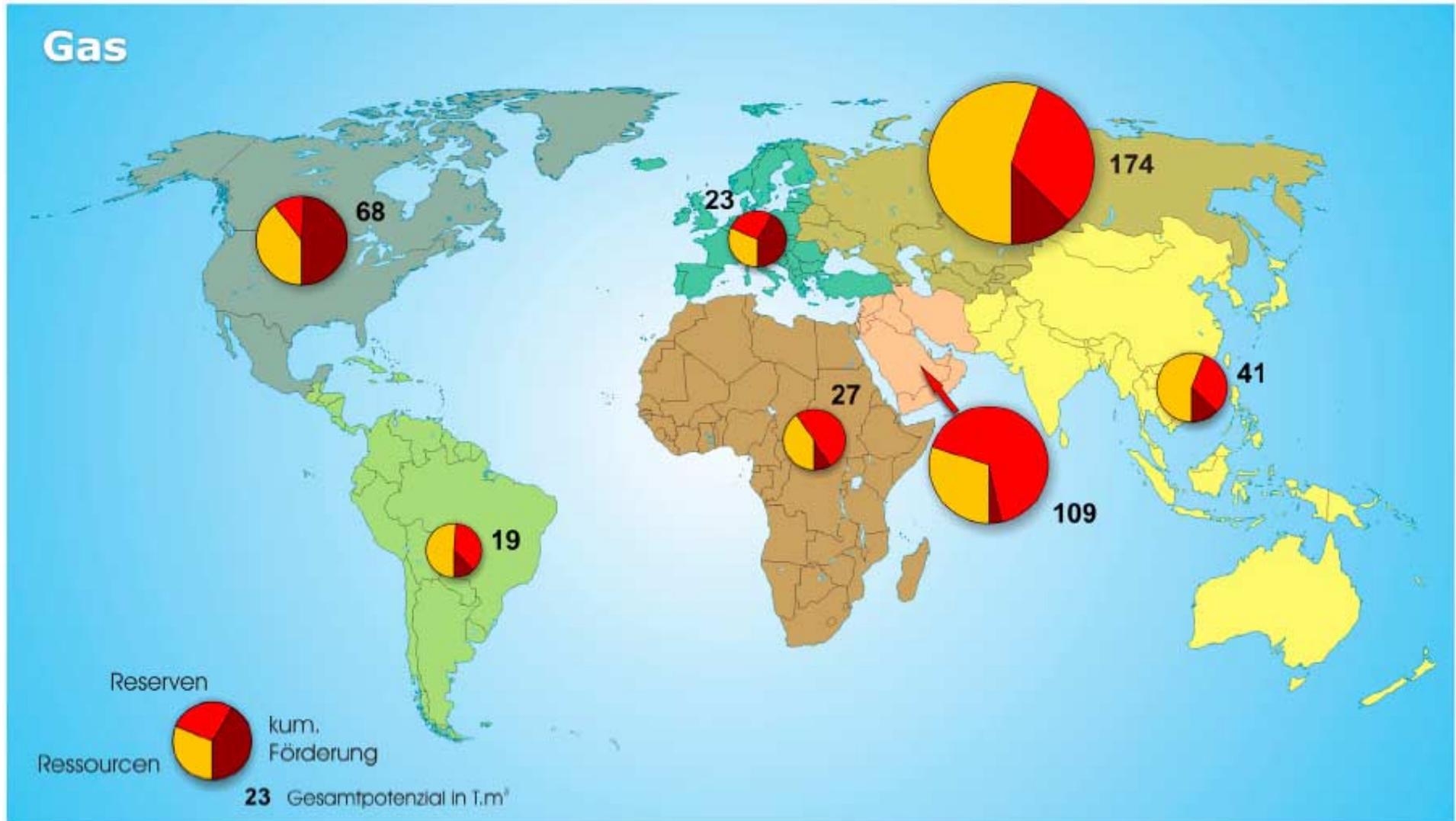


Oil pipelines East Siberia



Gas

Gas potential 2004 (BGR)



Russian gas production prospects

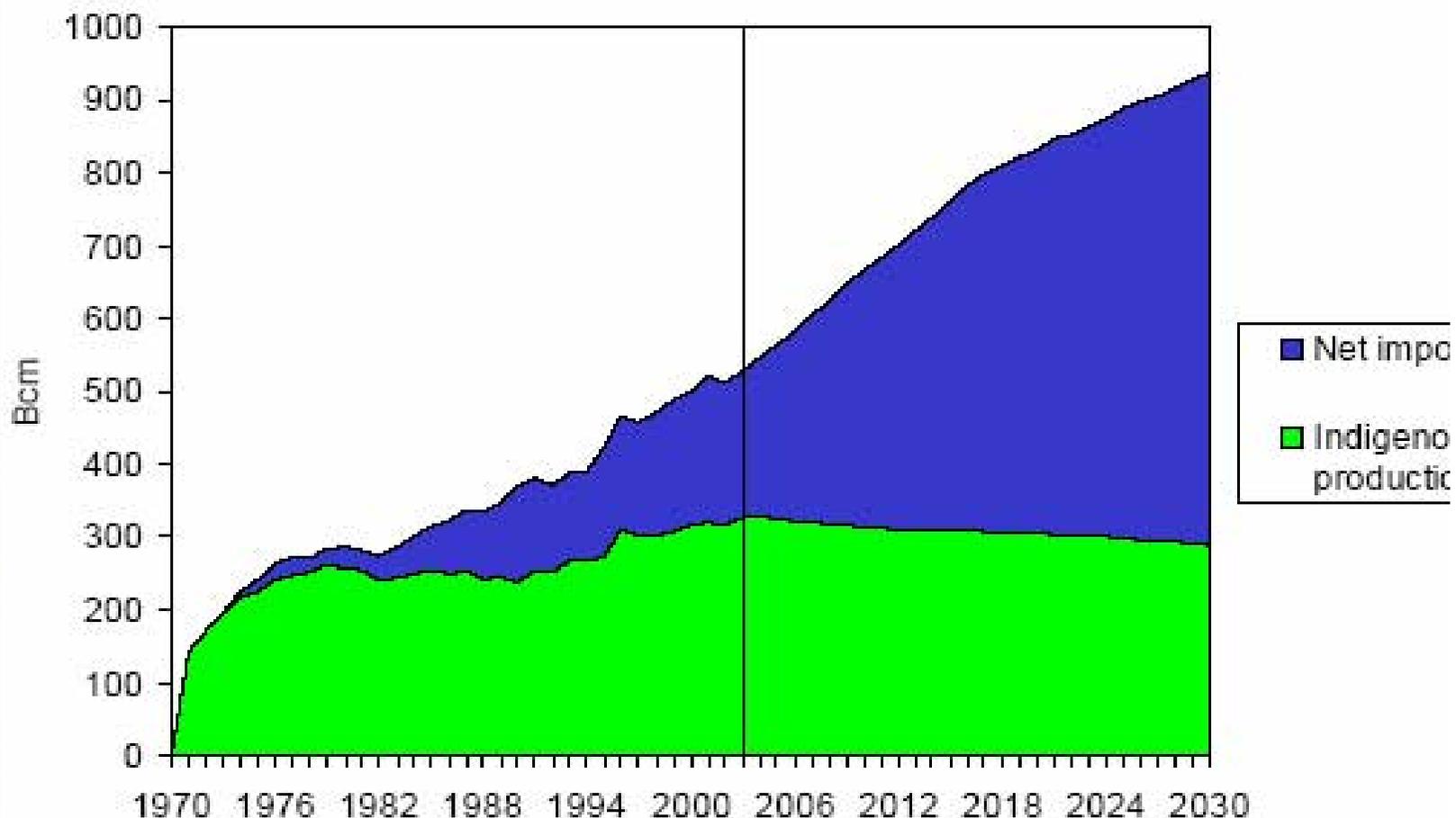
- Old West Siberian giant fields in decline
- Many new and relatively small fields can be developed
- Giant fields in remote areas (Barents sea/Shtokman, Yamal) will need big investment
- Shtokman field will produce LNG for US and China markets

European gas import forecast

- European import need 2000-20 is growing by 200-250 bcm
- Russian gas export to Europe will grow by about 70 bcm
- Russian import share will fall from 70 percent to 50 percent
- Gas import from Africa, Near East and the Caspian Region will increase

Natural Gas Supply

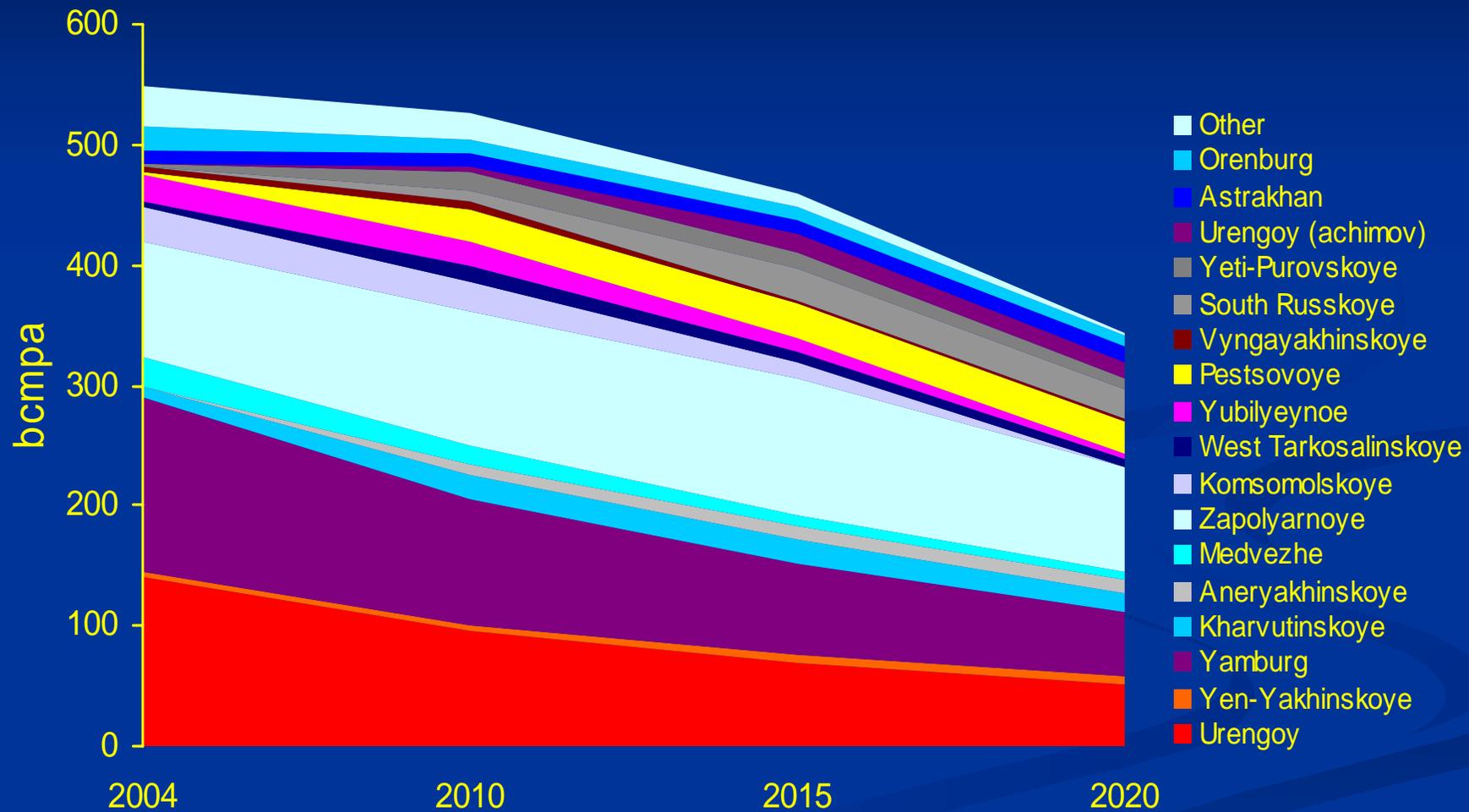
Reference Scenario : EU-30



Main gas fields

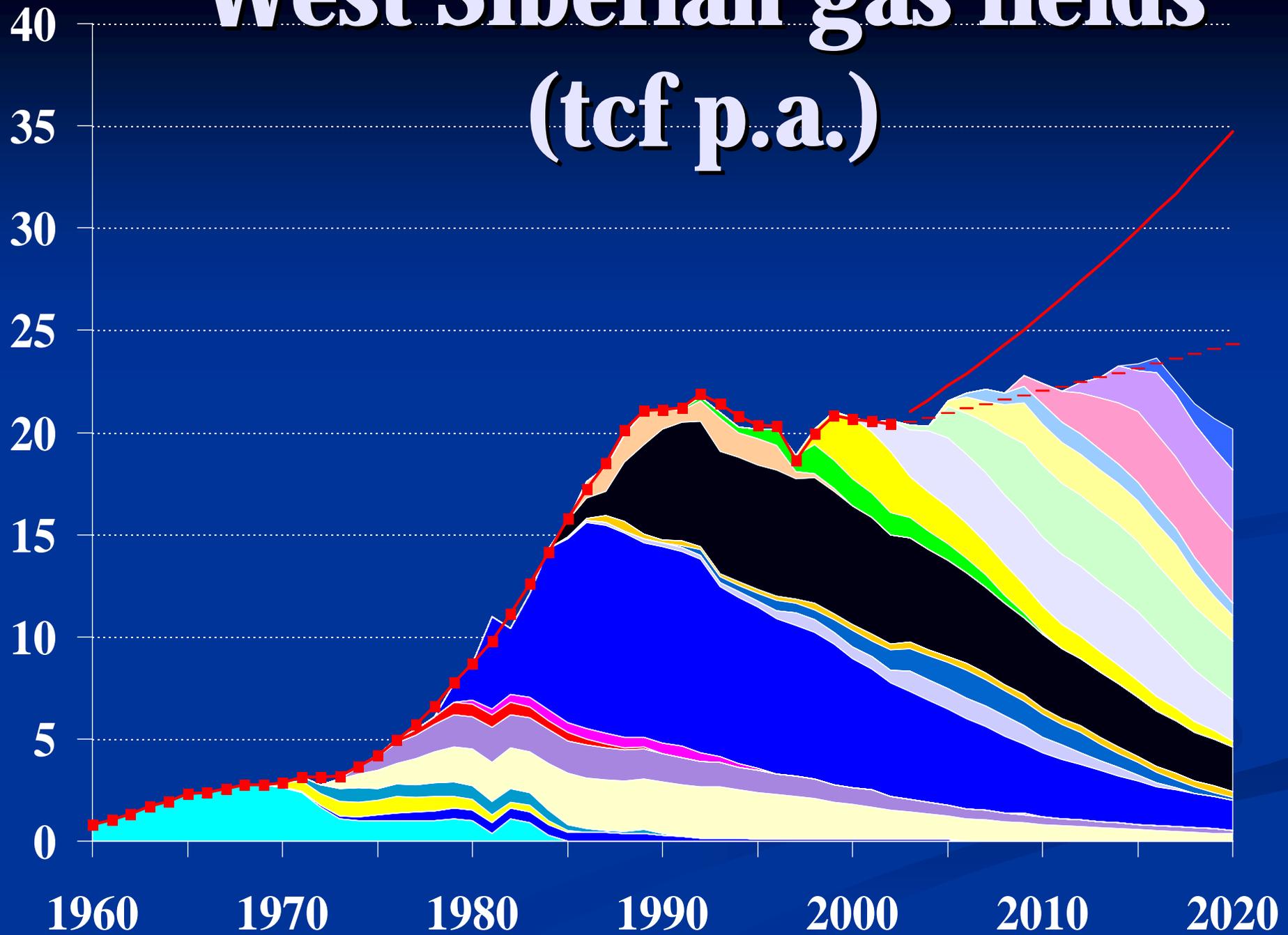
- Big west siberian gas fields in decline
- Addition of small new fields will not reverse decline

Gas production on Gazprom's mature gas fields is rapidly declining



Source: Jonathan Stern, Oxford Institute for Energy Studies, 'The future of Russian gas and Gazprom', 2005

West Siberian gas fields (tcf p.a.)



Gas export potential to Europe

bcm

600

500

400

300

200

100

0

2002

2010

2020

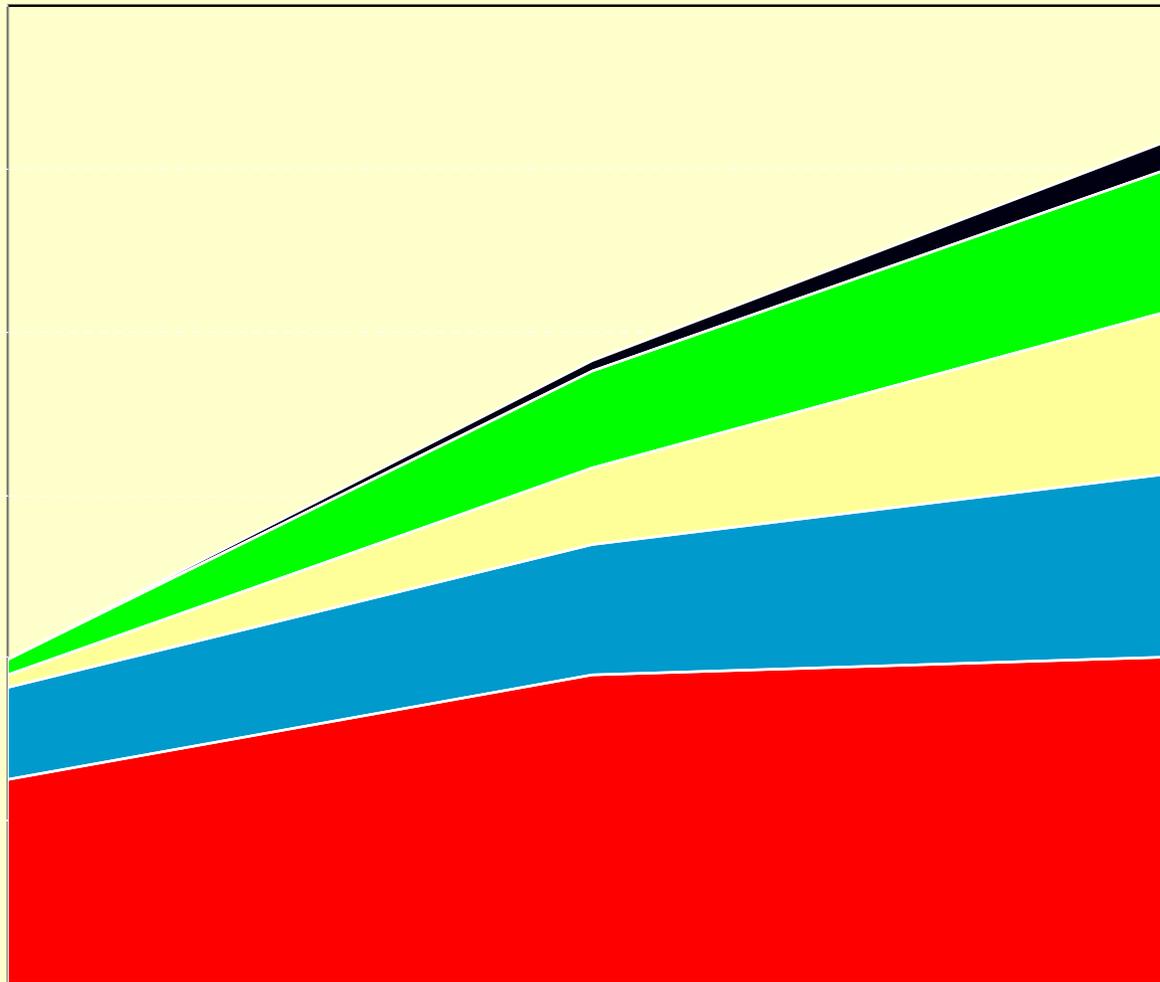
■ Caspian

■ Other
Africa

■ Near
East

■ Algeria

■ Russia



Gas pipelines

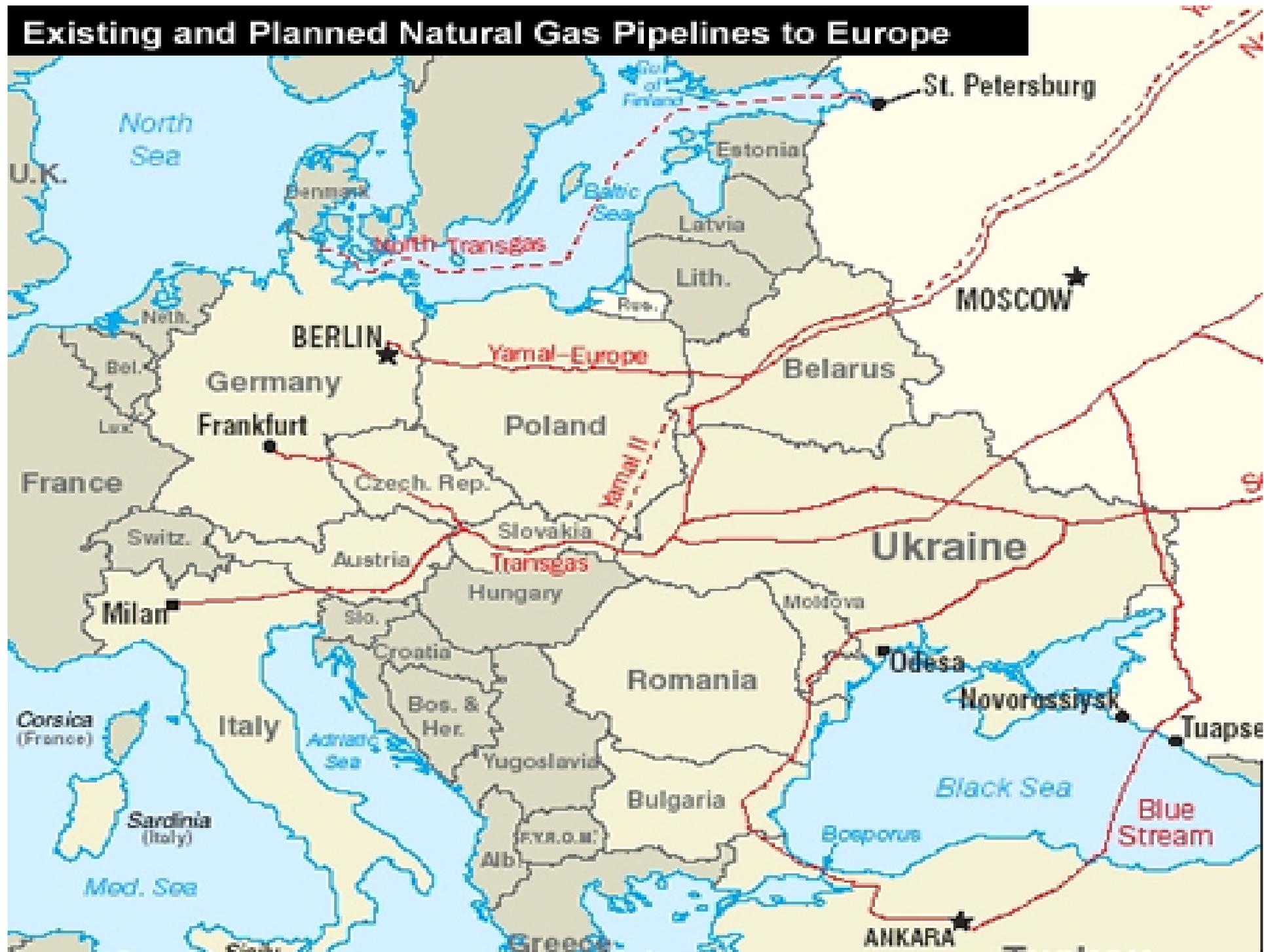
- Main gas export pipelines crossing Ukraine and Belarus (Yamal Europe pipeline)
- New gas export pipelines to the West: North European Gas Pipeline (NEGP)
- Ukraine-Russia-Germany Gas transport consortium should be revitalized

Turkey as gas transportation corridor

- Existing: Blue stream pipeline Russia-Turkey
- Planned: Nabucco pipeline Turkmenistan-Azerbaijan-Turkey-Europe
- Planned: Iran-Turkey pipeline
- Existing, but not operating: Iraq-Turkey pipeline



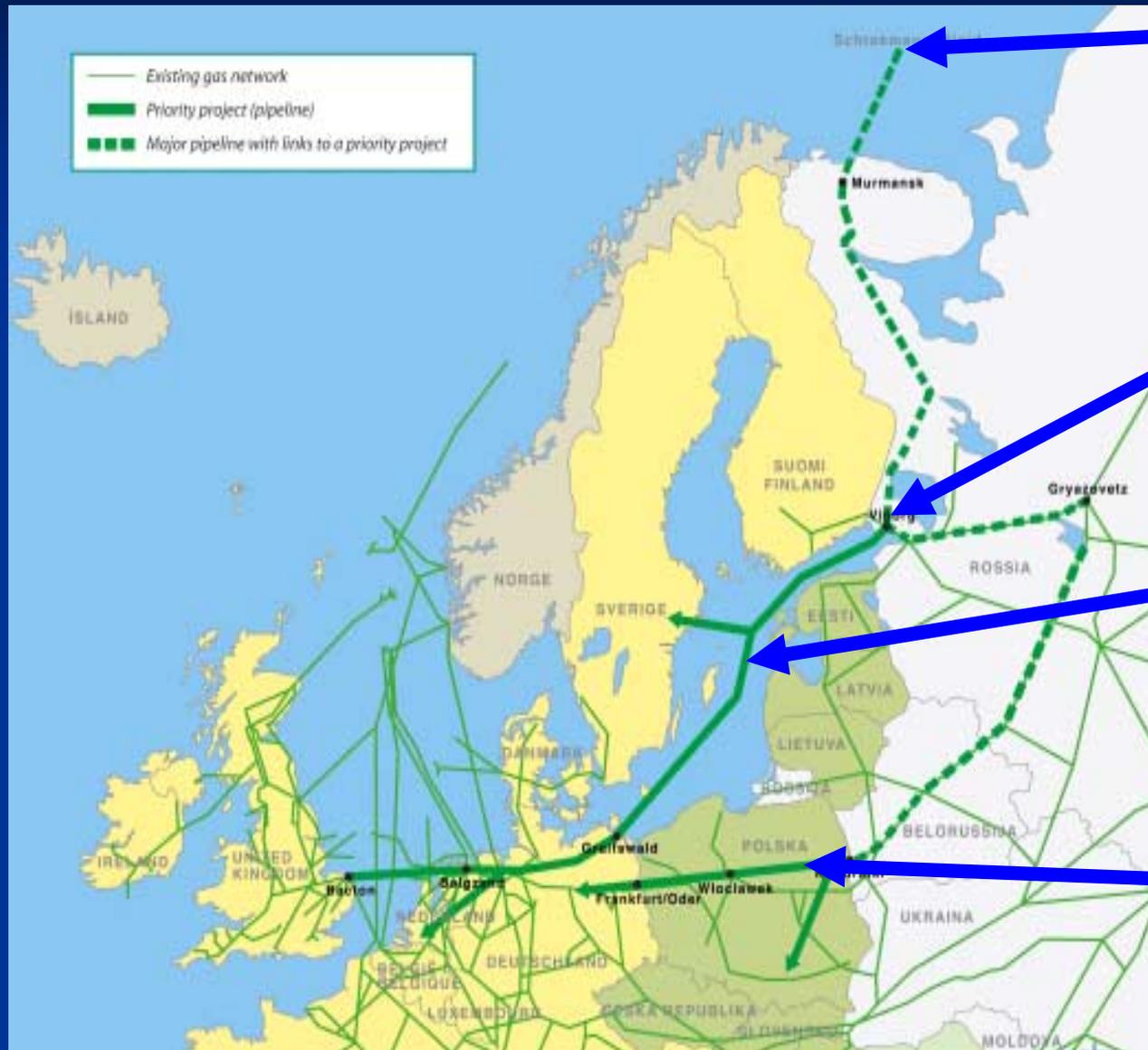
Existing and Planned Natural Gas Pipelines to Europe



North European gas pipeline

- Connecting Europe to west Siberian gas fields
- Shtokman gas field will produce liquid natural gas (LNG)
- NEGP will delay second branch of Yamal-Europe pipeline

The gas: new European projects of Gazprom

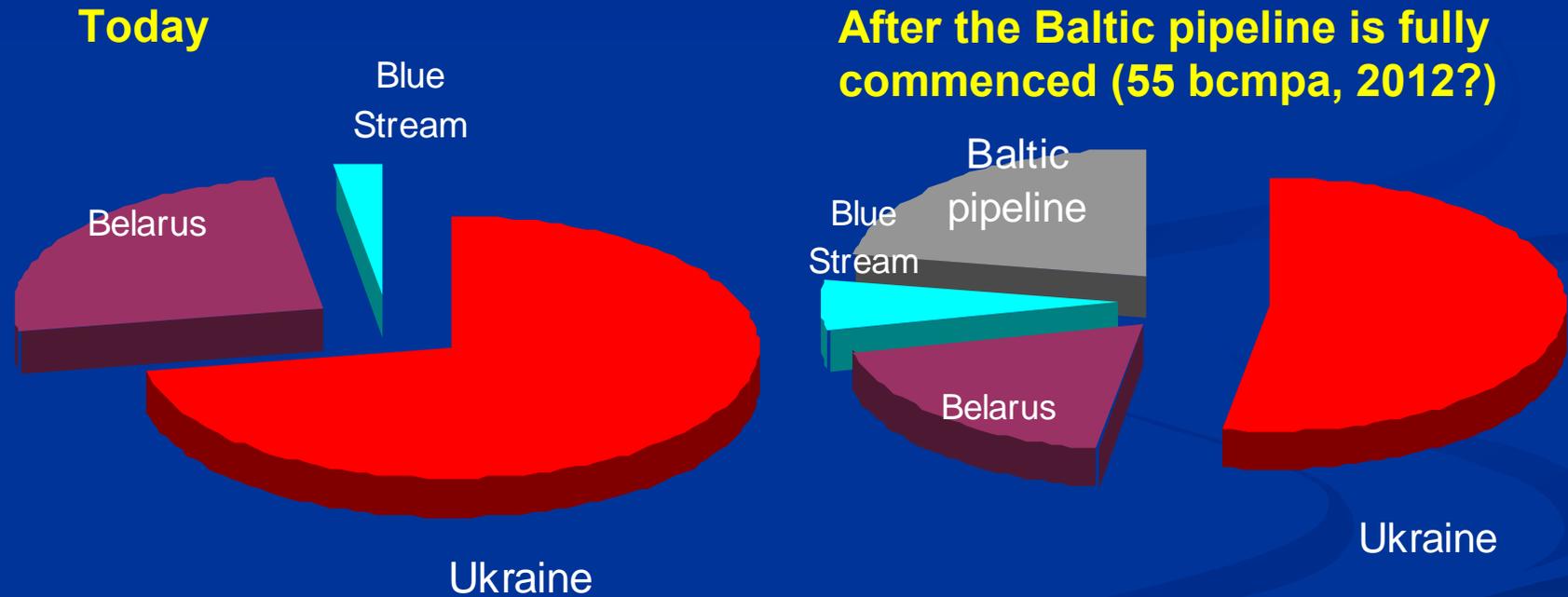


Shtokman gas field

- 3200 bcm gas reserves (all Russian ABC1 grade)
- On-stream introduction in 2012
- Peak production 21 bcm/year

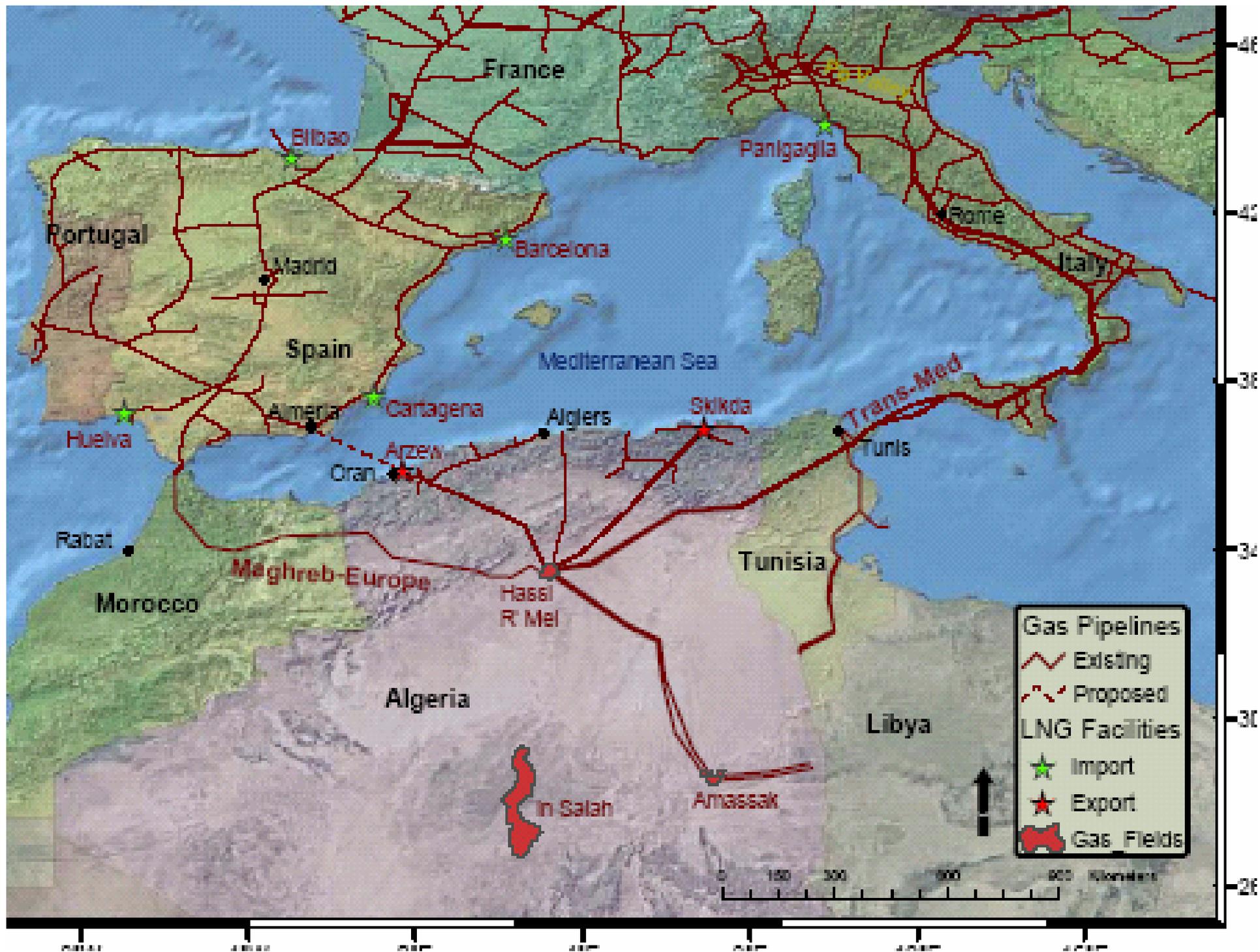
The Baltic gas pipeline: will Russia be able to bypass Ukraine?

The structure of Russian gas export corridors



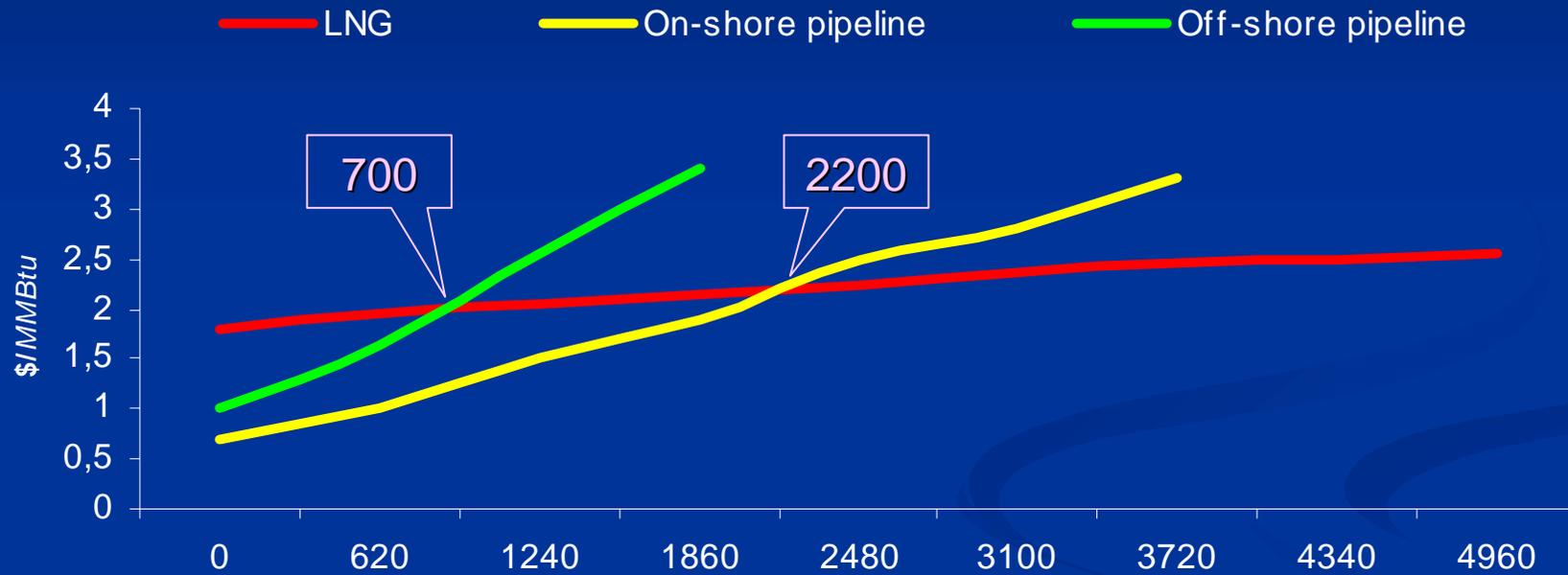
Mediterrean countries as gas suppliers

- Gas production in mediterrean countries will increase
- Third alternative to Russia and Caspian gas



Transportation Cost

(Institute of Gas Technology)



OAO SOVCOMFLOT



Delivering Russian Gas

<http://www.sovcomflot.ru>