

Energy Transportation and Energy Security in Europe

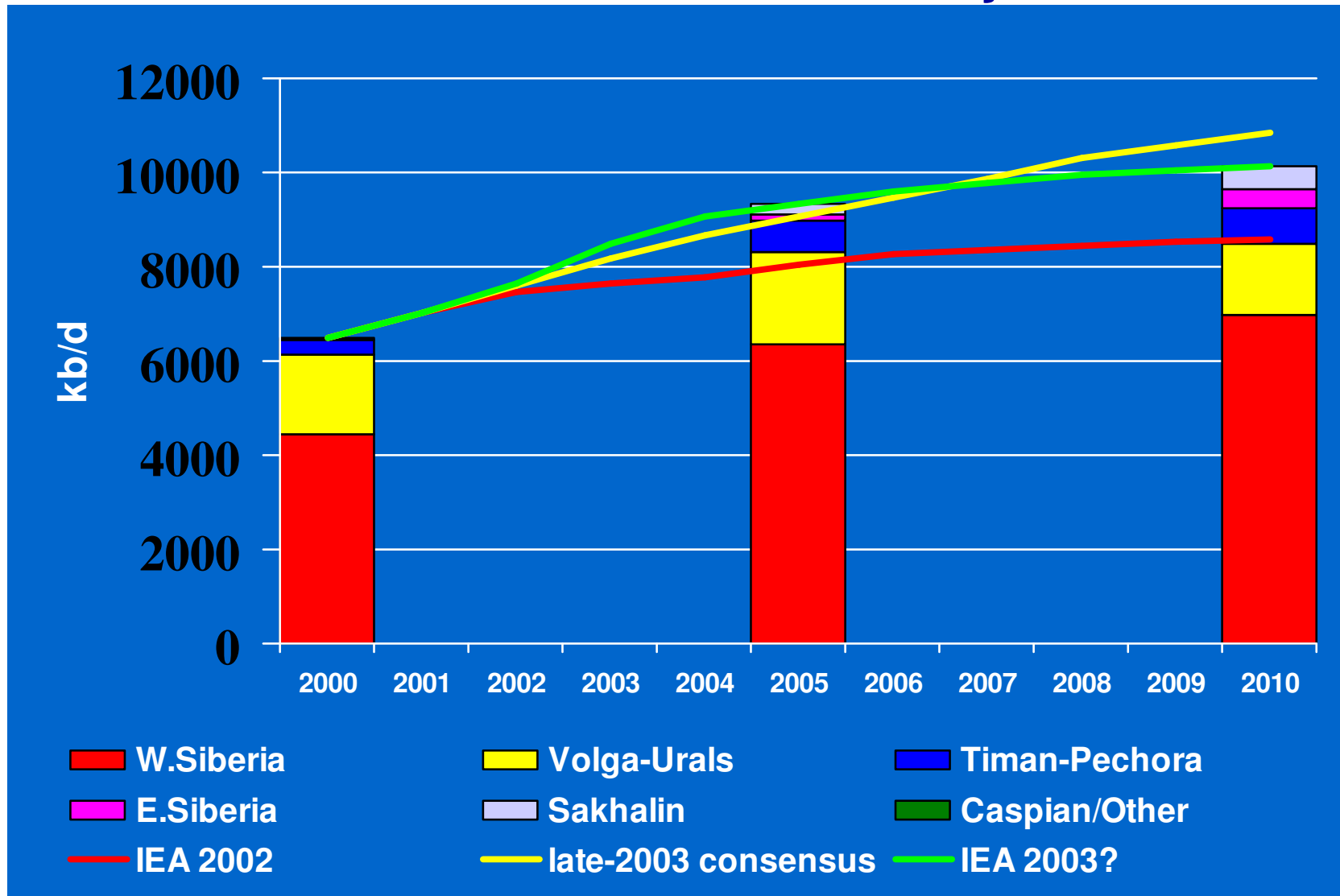
Elena A. Telegina

**Member of the Board of Russian Union of Oil Exporters
Director of the Institute of Energy and Geopolitics of Russia
Doctor of Economics, Professor**

Nice, November 2005

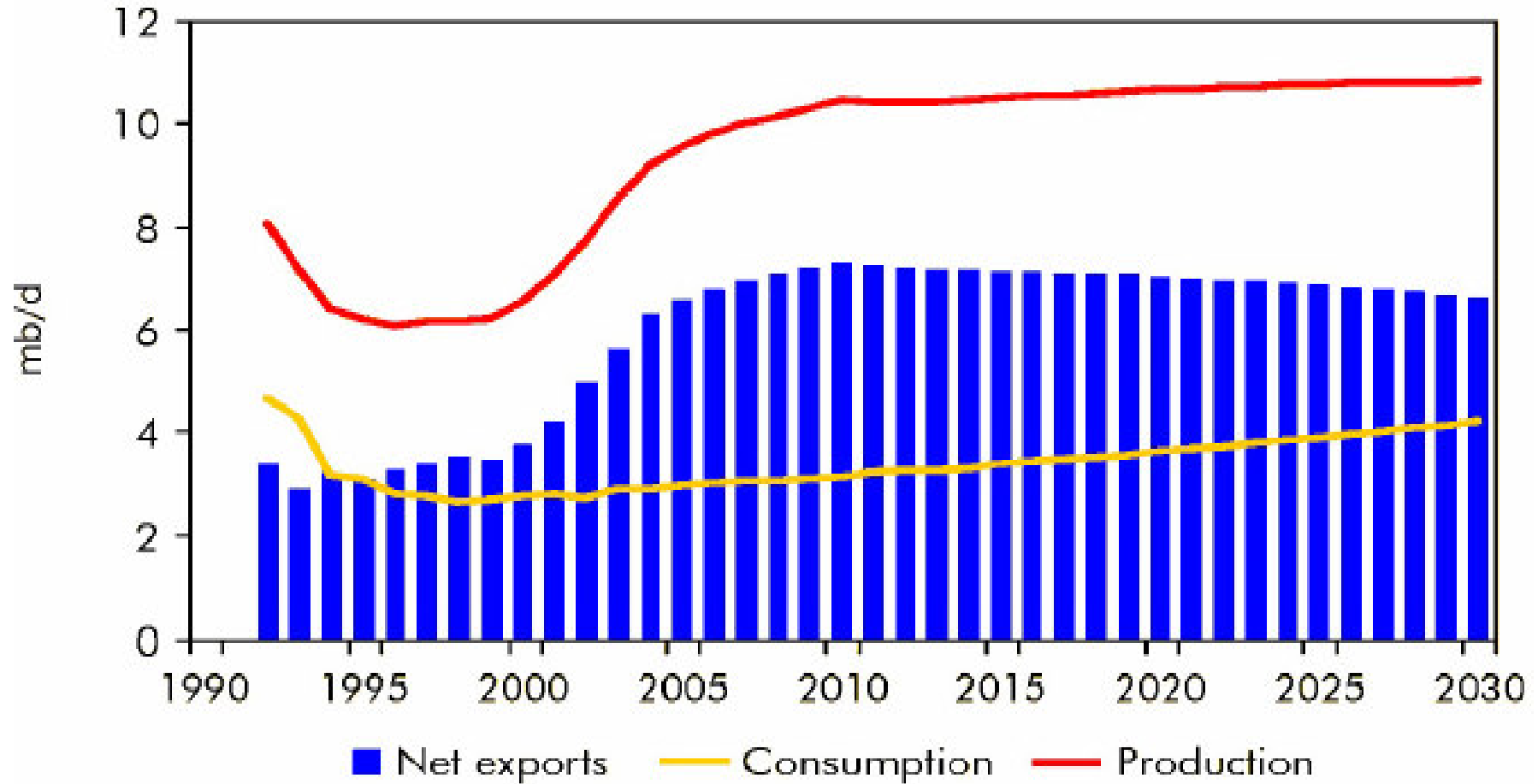
Russian Production through 2010

Western Siberia Still the Key

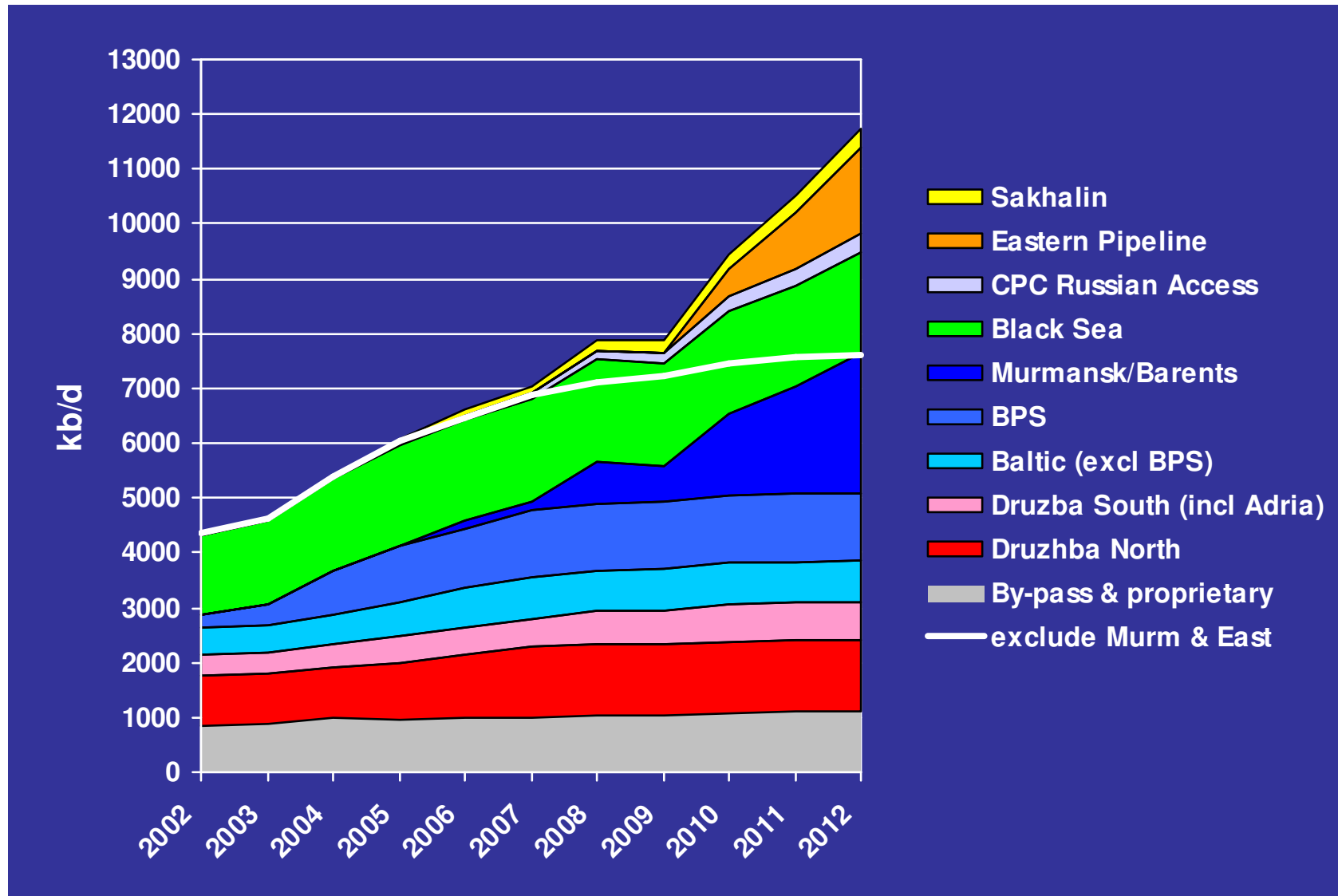


IEA, 2004

Russian Oil Balance



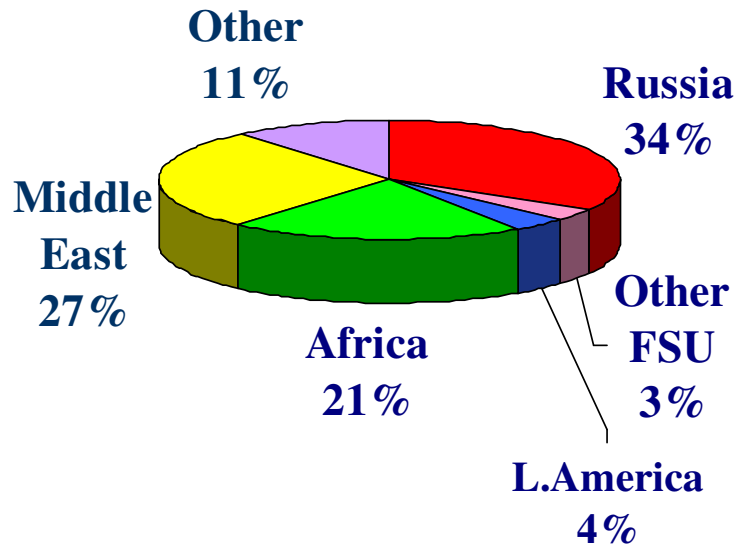
Development of Russian Crude Export Capacity



IEA, 2004

Russian Exports – Europe Predominant

OECD Europe Oil Imports



Diversification into other increasingly import-dependent markets is a key Russian objective

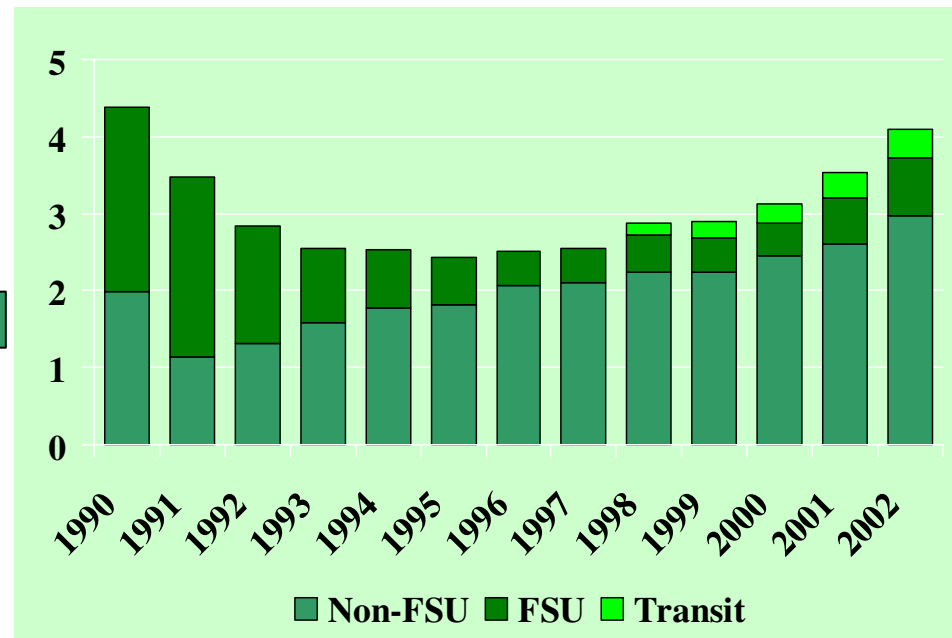
US & Asia 2%

Europe 98%

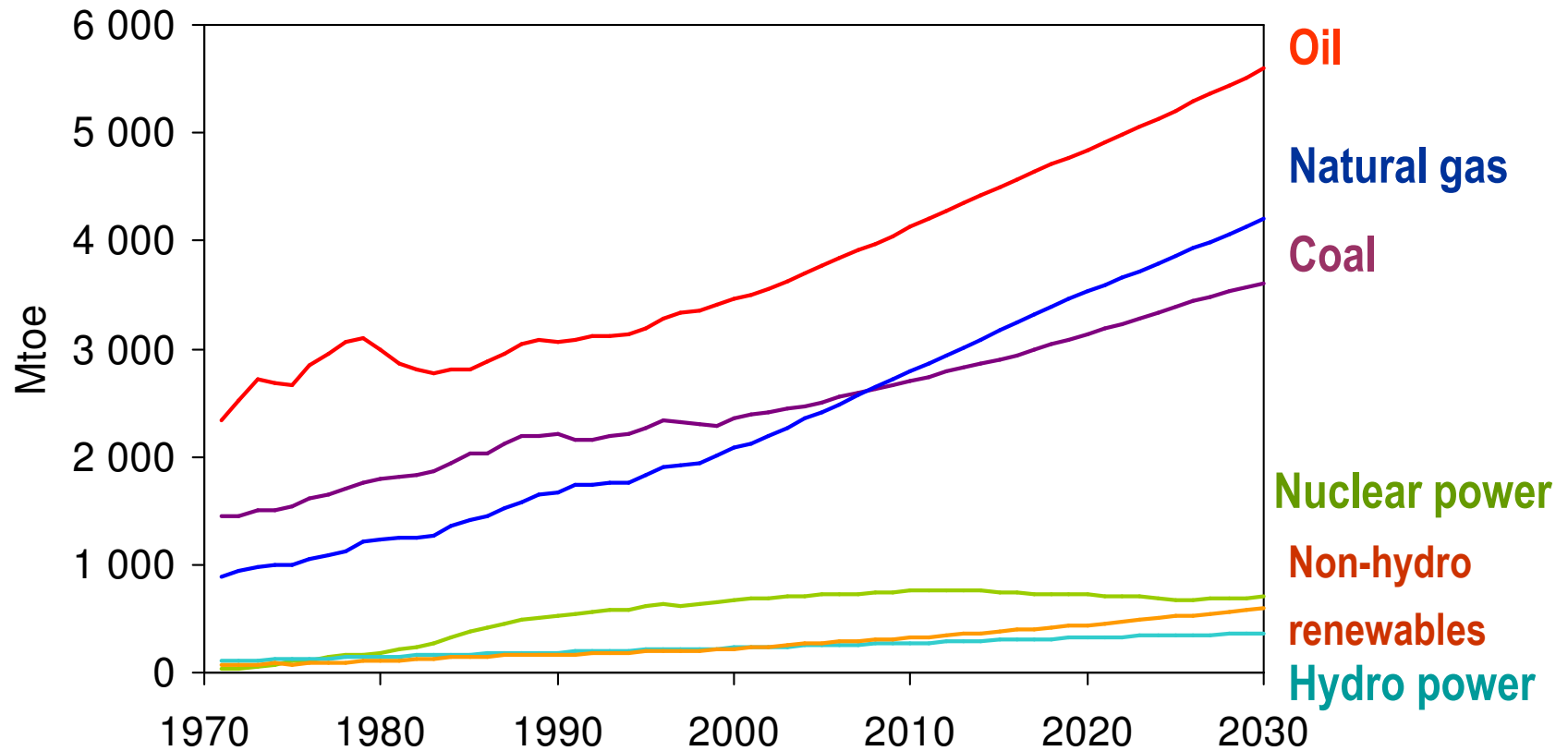


IEA, 2004

Russian Crude Oil Exports, mb/d



World Primary Energy Demand

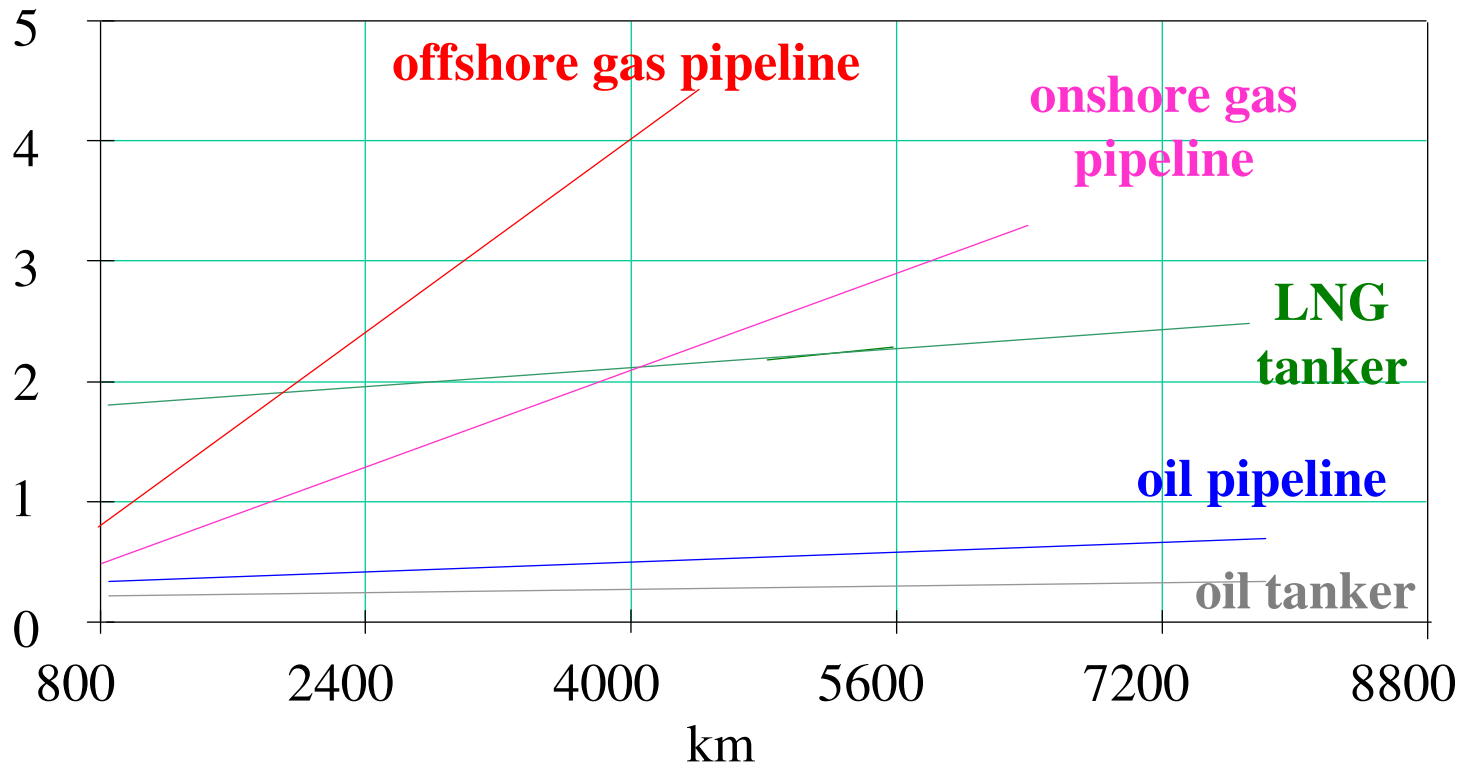


Gas grows fastest in absolute terms & non-hydro renewables fastest in % terms, but oil remains the dominant fuel in 2030

IEA, 2005

Indicative Costs of Oil and Gas Transportation

US\$/MBTU



Transneft's pipeline network



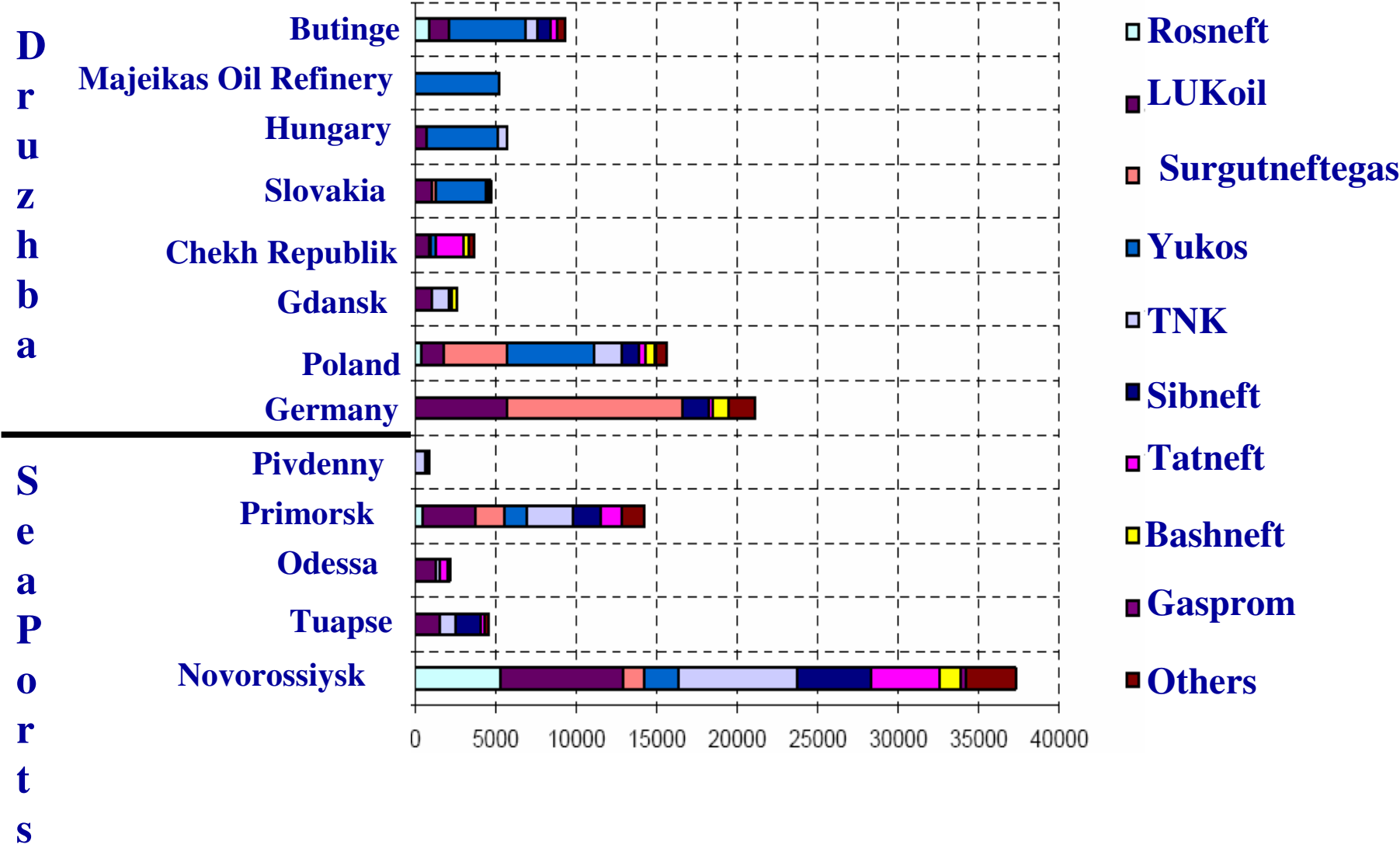
Oil



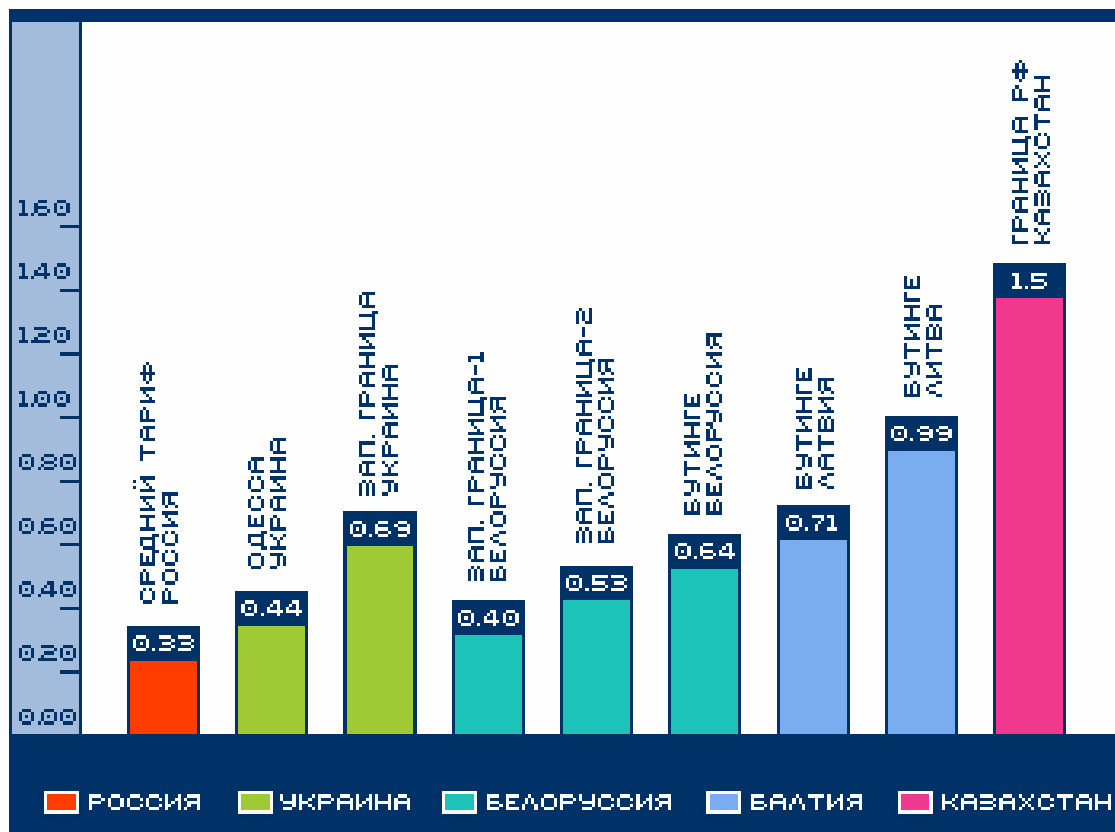
Capacity of the Main Russian Oil Pipelines and Sea Terminals for Export and Transit, bln t/year

Oil Pipeline Direction	2003	2005	2010	2015	2020
BTS - Primorsk	30	60	60	60	60
Other ports of Northern-Western direction	6	15	15	15	15
Druzhba Pipeline	63	66	66	66	66
Transneft's pipelines to Black Sea ports direction	63	63	63	63	63
CPC	20	28	67	67	67
East Siberia – Pacific Ocean	-	-	30	50	80
West Siberia - Timan-Pechora – Barents Sea	-	-	-	50	80
Total	182	232	301	371	431

Russian Oil Exports through Transneft, 2003



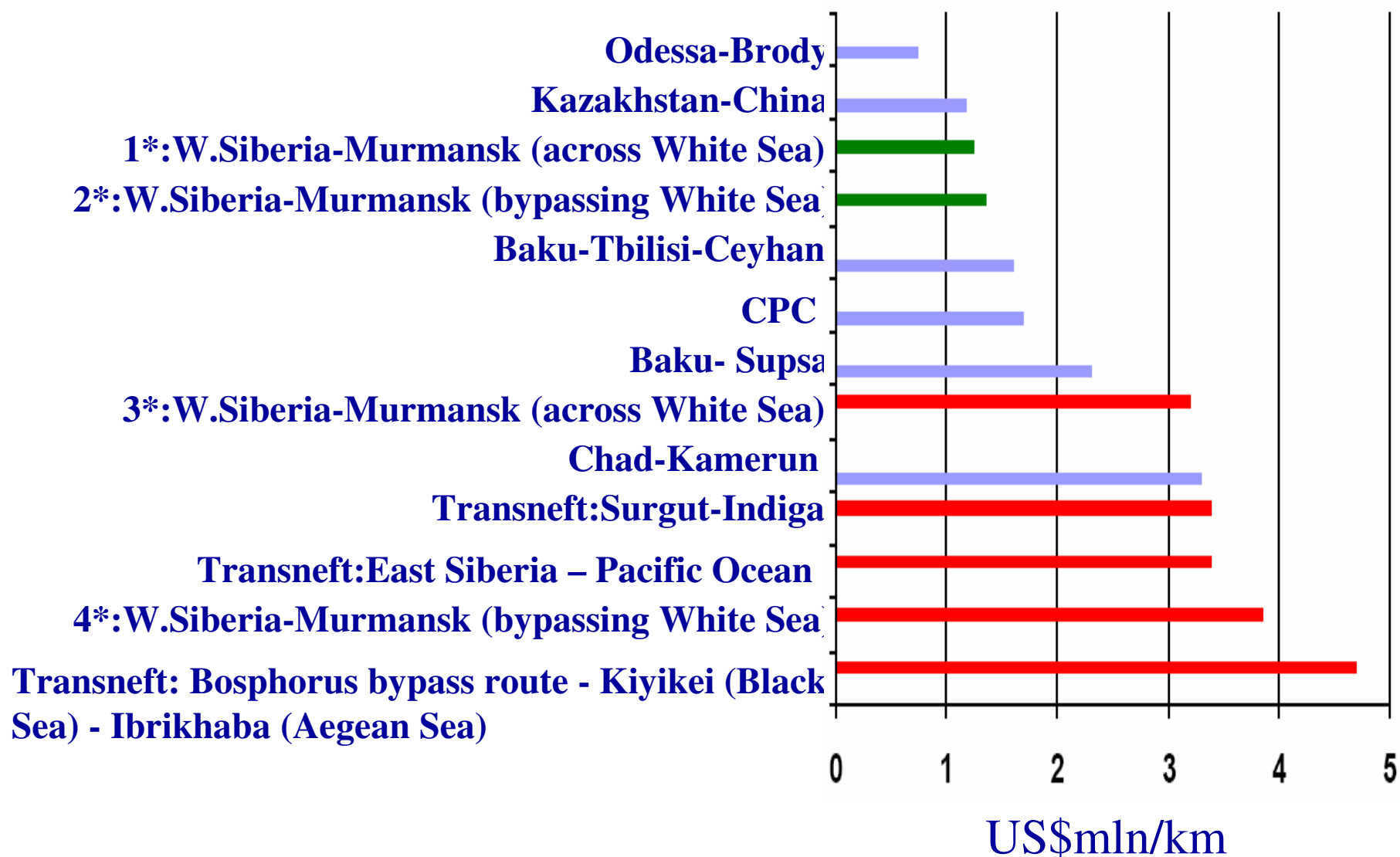
Comparison of Oil transportation tariffs



Oil export routes and options

	Lengh	Capacity	Cost/Investment	Status
West Siberia – Varandeya Terminal (Murmansk)	3000	54,75 mln b (7,5 mln t) a year	\$2,5 –4 bln	Feasibility Study has been worked out, now postponed
Varandeya Terminal at Barentz Sea		300 tbd (15,0 mln t/year) after reconstruction		For oil from Timan-Pechore fields. Now –under modernization
Taishet – Skovorodino - Perevoznaya	4188 km	Up to 80 mln t	\$11,5 bln	For oil exports to APR or the USA
Baltic Pipeline System	850 km	Up to 60 mln t/year by the end of 2005	1 stage -\$460 mln 2 stage - \$350 - 400 mln	1 stage completed in 2001, 2 stage – 2003, 3 stage - 2005
Druzhba - Adria	180 km	1 stage – 5 mln t/year 2 stage – up to 15 mln t/year	\$300-320 mln	Integration of two systems
Atryay - Samara	700 km	15 mln t /year	\$33,6 mln	Upgrading of the existing pipeline

Comparative oil pipeline construction costs



1,2* - Oil Companies

3,4* - Transneft

Comparative oil pipeline construction costs

US\$ mln/km

CPC	1,5
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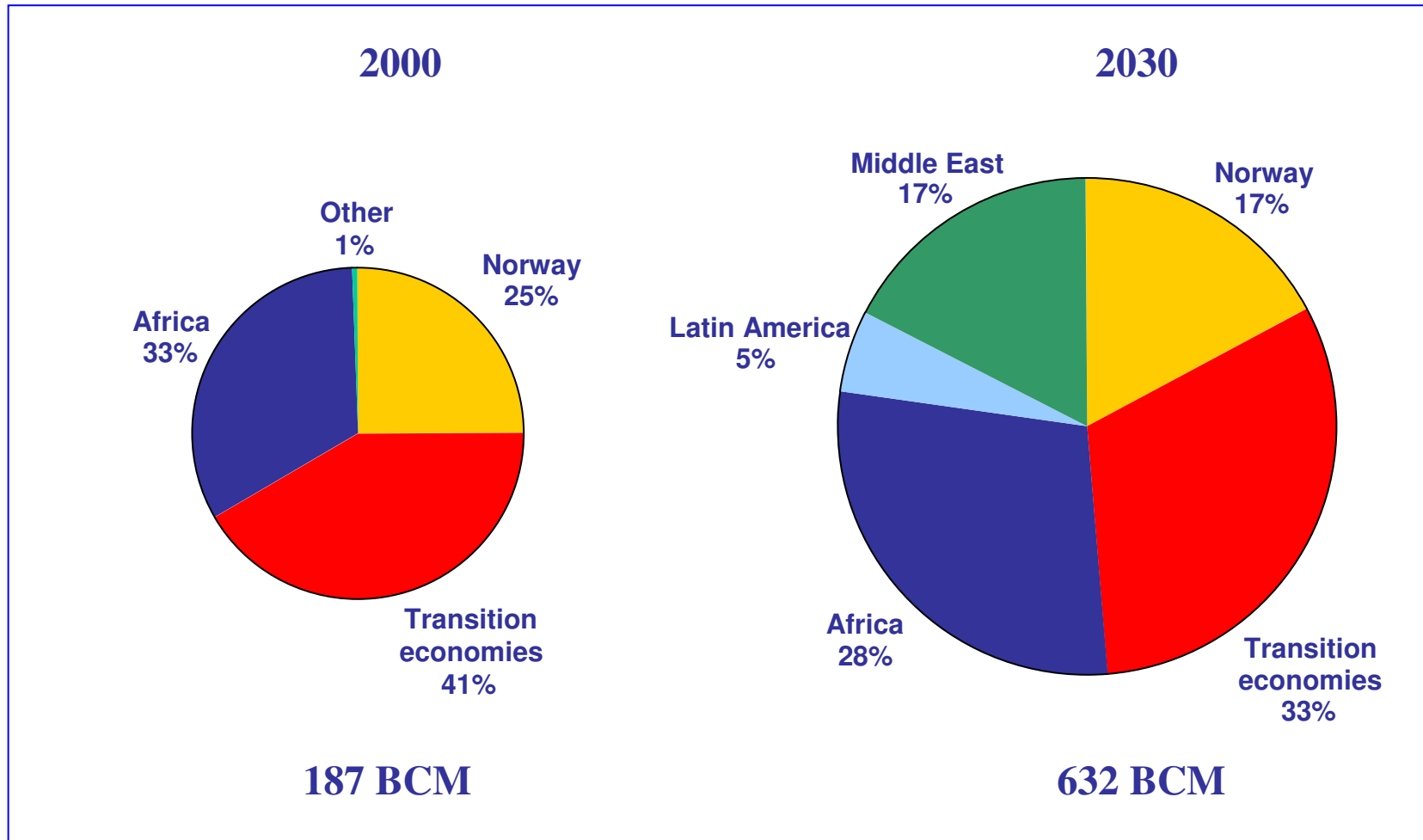
Baku – Ceyhan	1,6
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Transneft (average)	3,4
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BTS-Primorsk (Transneft data)	0,7
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World average	1-2
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EU Gas Market Outlook



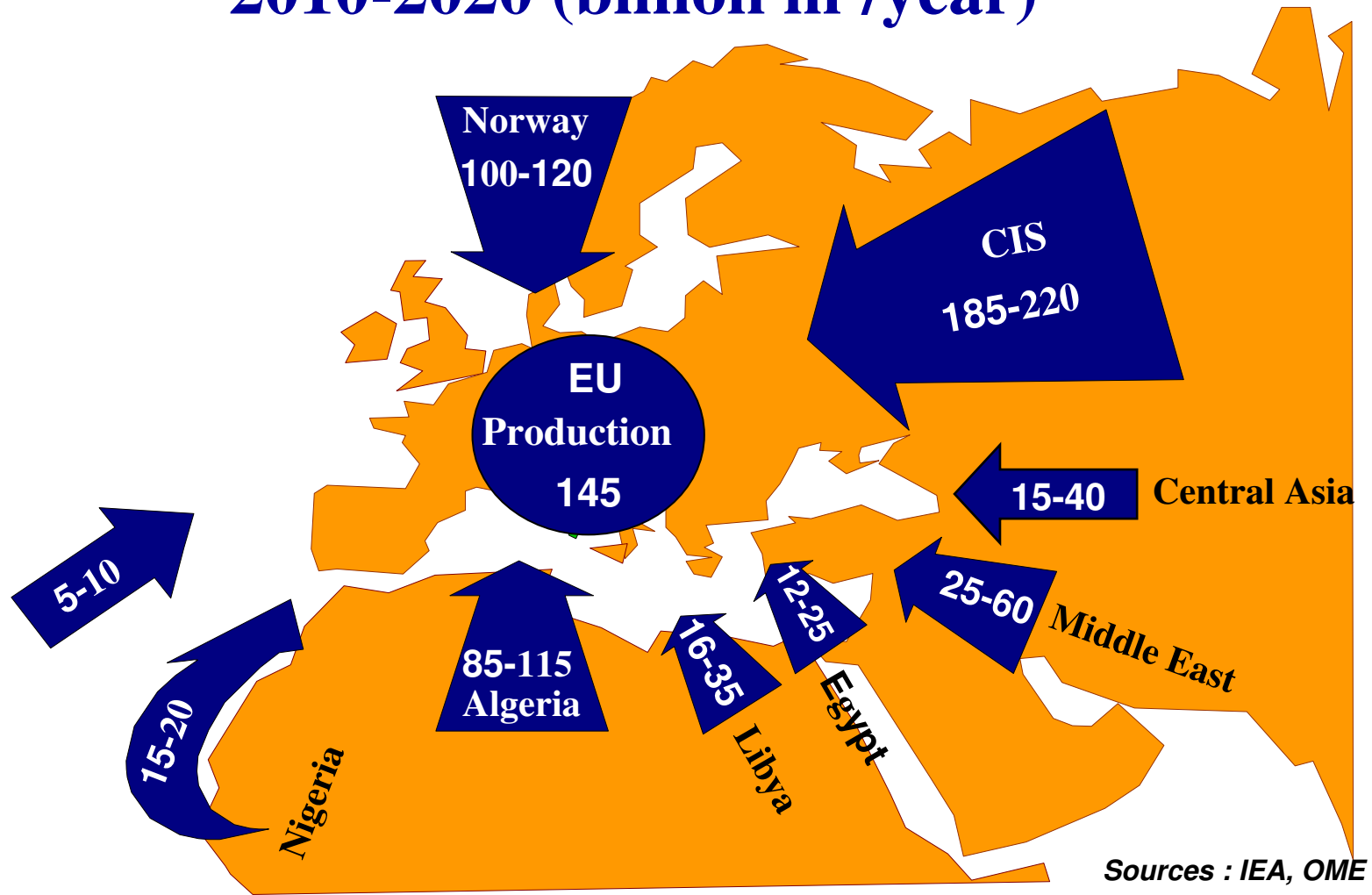
European Union Domestic production:

2000 - 241 BCM

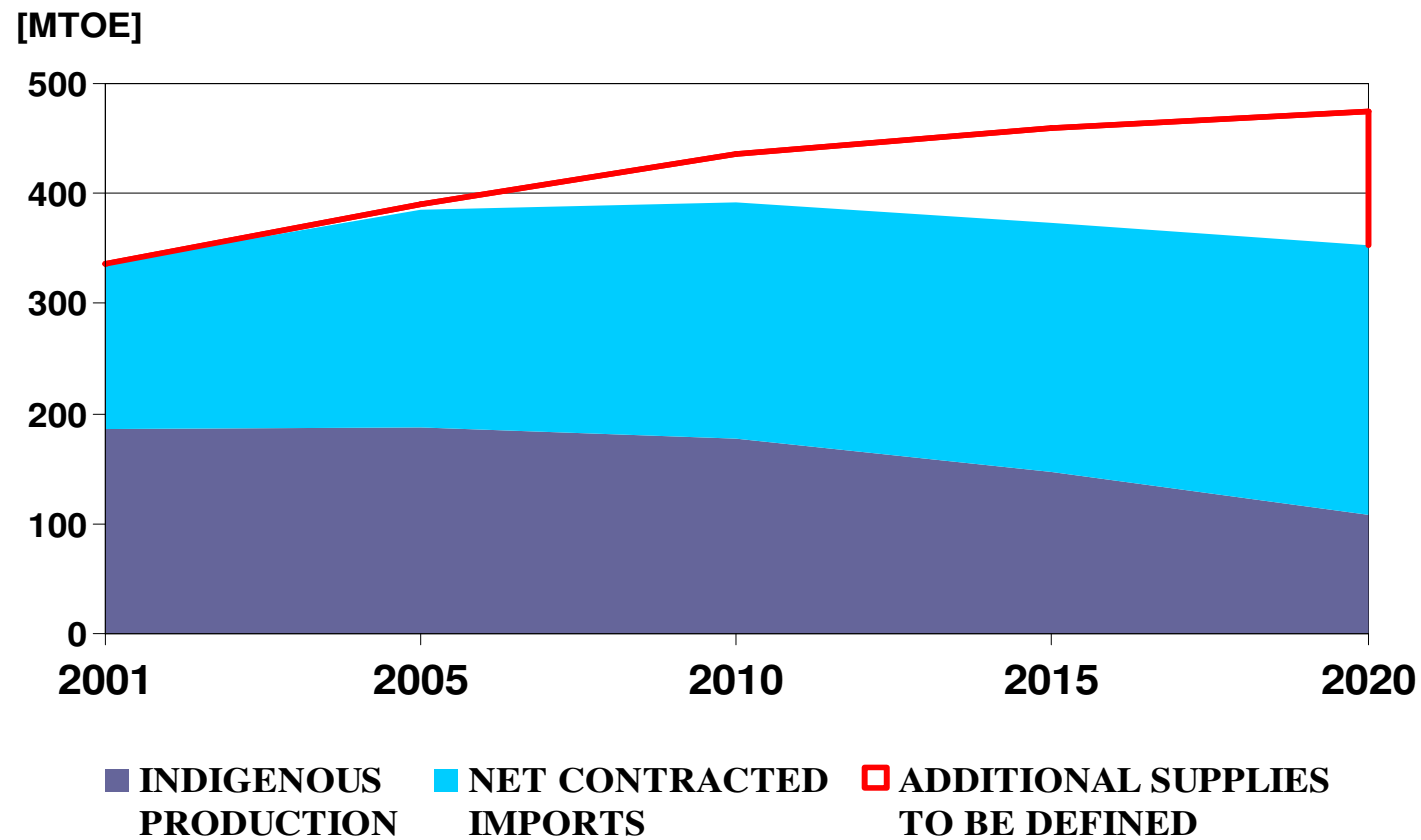
2030 - 150 BCM

IEA, 2004

Supply capacities for Western Europe 2010-2020 (billion m³/year)

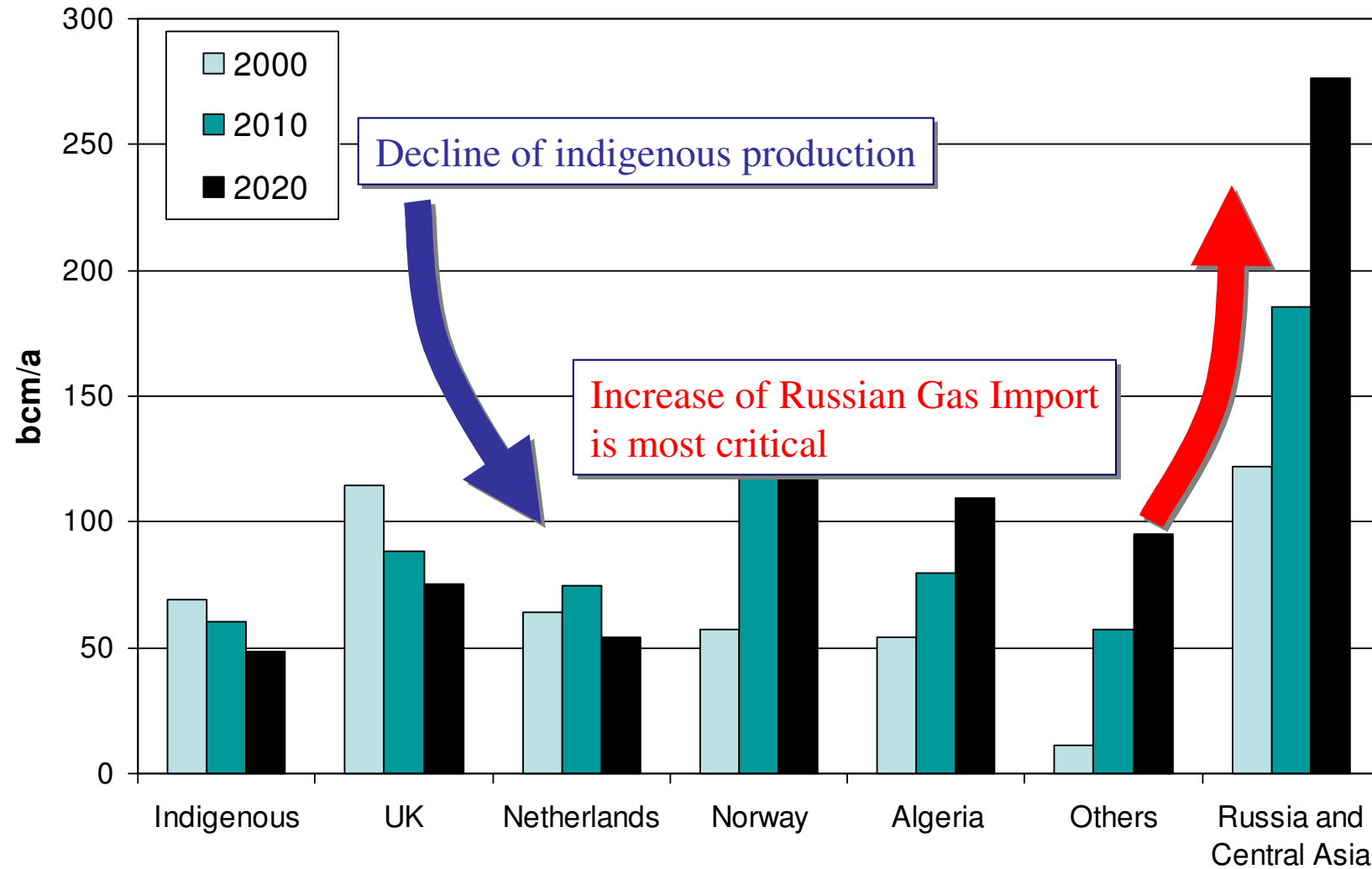


Natural Gas demand & supply outlook 2001-2020 (European Union)

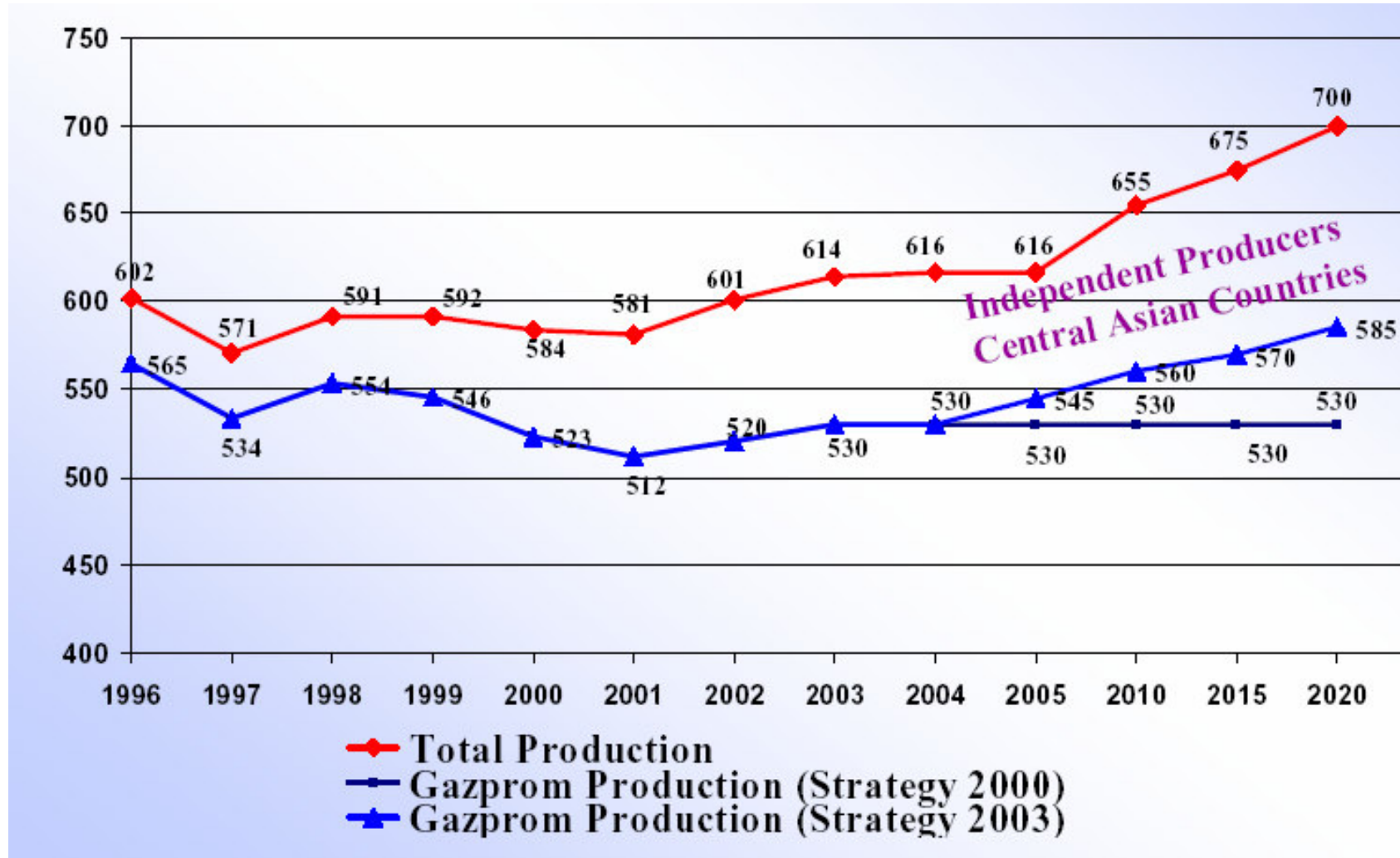


IEA, 2004

European Gas Supply by Source

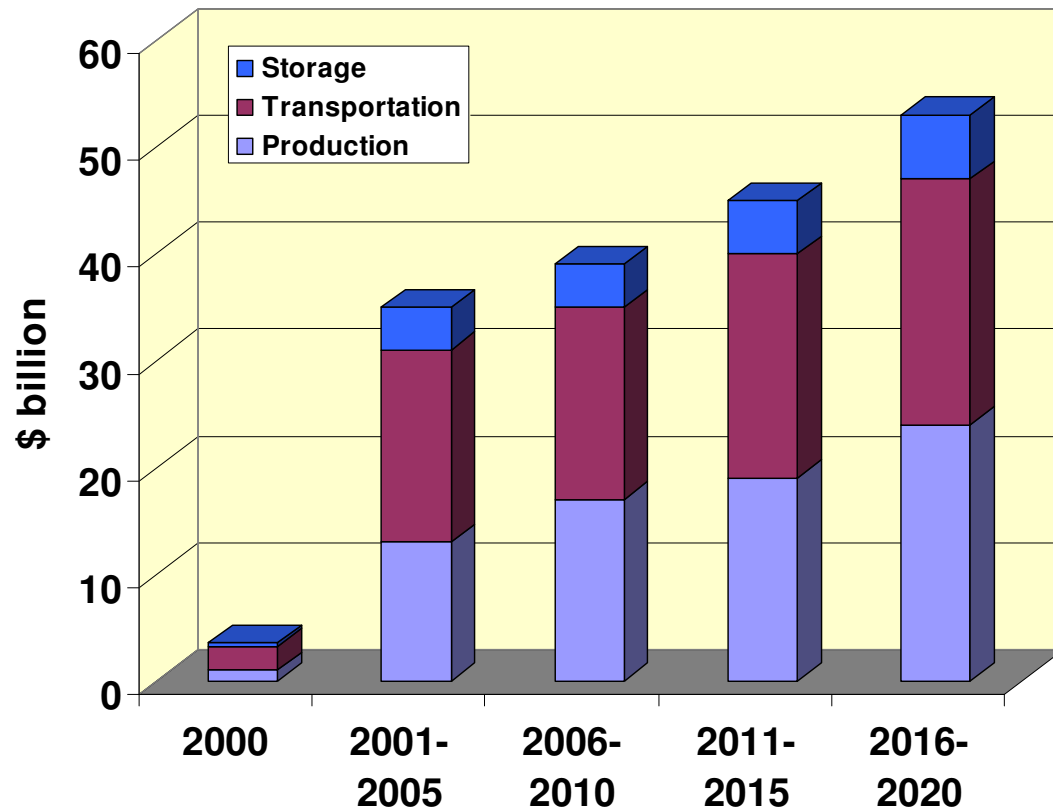


Russian Natural Gas Production to 2020, Bcm



IEA, 2004

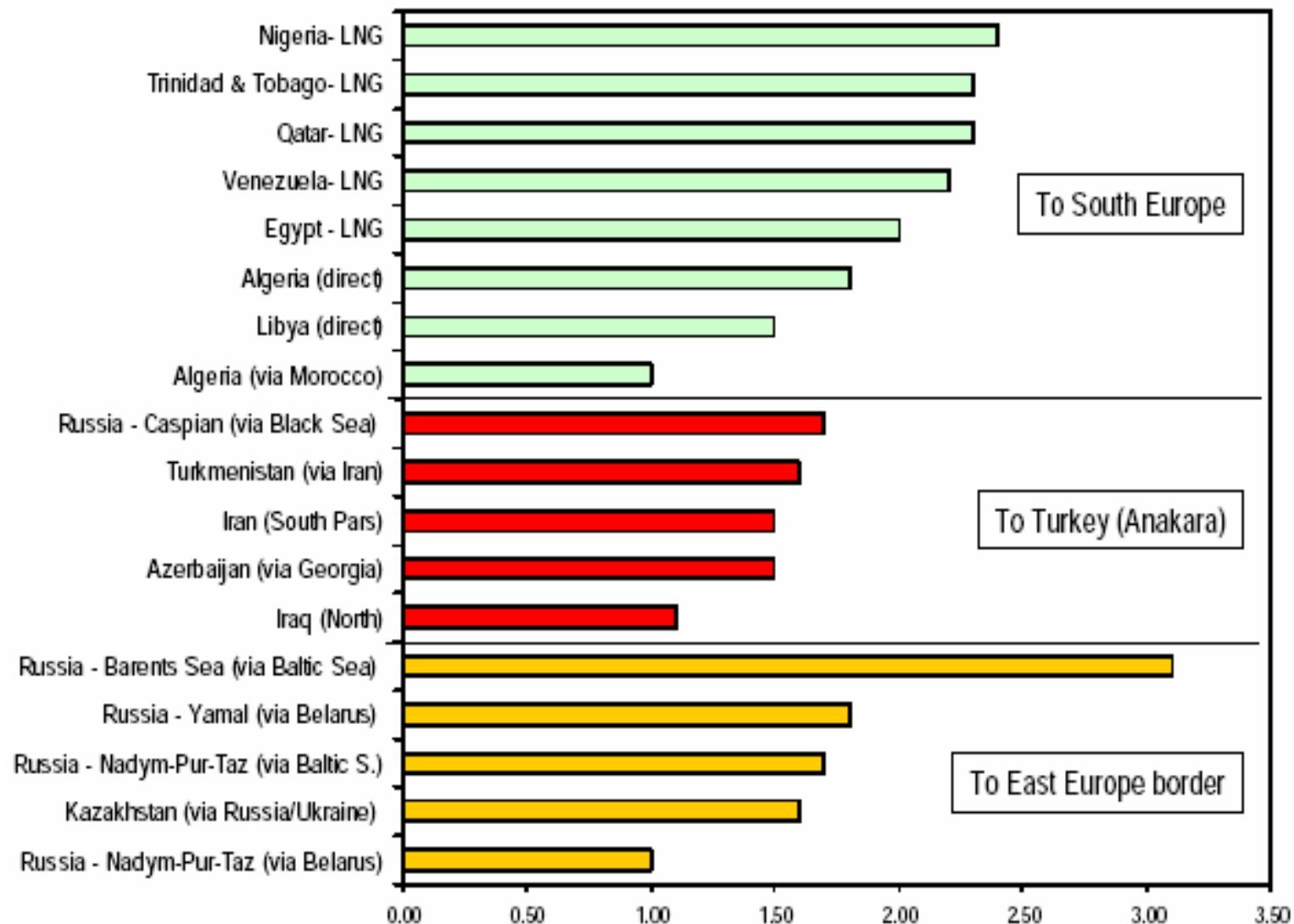
Russian Gas Outlook: Production & Investments



Source: Minpromenergo of the Russian Federation

- Highlights importance of gas sector restructuring to:
 - Attract necessary investments
 - Ensure production meets domestic and export needs
- Investment needs: \$7-10 Billion/year
- Role of Independent Gas Producers
- Third party access

Indicative Gas Supply Costs to Europe in 2010-2015 (\$/Mbtu)



SHTOKMAN: a major potential supply of gas to Europe and Russia

SHTOKMAN GAS FIELD AND GAS PIPELINE ROUTING



A Giant Gas field discovered in 1988, in Arctic offshore.

Location: 550 km NE Murmansk, in the Barents sea

Water depth: 330 m

One of the tenth largest fields in the world

Gas in place: 3200 BCM (twice the size of Troll)

Plateau : 60 to 90 Bcm/year

Total investment : over 20 GUSD (Full field development)

A first development phase of 20 BCM/year for European markets starting between 2010 and 2015.

A technical challenge : the platforms required for Shtokman will be the largest in the world (22.5 Bcm capacity each).

North European Gas Pipeline



Main Gas Pipeline Projects

Projects	Participants	Investment required
Yamal-Europe Pipeline	Gazprom, EuroPolGaz consortium, Germany	\$14 billion Estimated \$2 billion to construct Yamal II
Kovykta Gas Pipeline	Rusia Petroleum: BP-TNK (62,89%), Interros (25,82%), Irkutsk Oblast Property Fund (10,78%), other (0,51%)	More than \$ 12 billion
Shtokmanskoye Field (Barents Sea)	Gazprom (50%), Fortum (Finland), Conoco (U.S.), TotalFinaElf (France), and Norsk Hydro (Norway)	Investment estimated between \$15 and \$25 billion
North European Gas Pipeline	Gazprom (51%), BASF (24,5%), E.OH (24,5%)	Total cost – more than 4 billion euro
Sakhalin II Sakhalin Energy Investment Co. Ltd	Royal Dutch/Shell (62.5%, operator), Mitsui (25%), Mitsubishi (12.5%)	\$1.1 billion for Phase I; \$8.9 billion for Phase II

Conclusions

- **Russia has become the engine of Non-OPEC supply growth and will continue to play a central role in global energy supply and trade.**
- **Developing Russia's vast energy resources calls for huge investments.**
- **A substantial increase of pipeline capacity is required, though the costs of new construction should be observed carefully.**
- **Access to existing pipeline systems and ability to participate in new developments are essential for investment activities.**
- **A stable and predictable business regime and real progress in market reforms are critical to the prospects for financing this investment.**