THE ENERGY RESEARCH INSTITUTE
OF THE RUSSIAN
ACADEMY OF SCIENCES

АНАЛИТИЧЕСКИЙ ЦЕНТР
ПРИ ПРАВИТЕЛЬСТВЕ
РОССИЙСКОЙ ФЕДЕРАЦИИ

THE ANALYTICAL CENTER
FOR THE GOVERNMENT
OF THE RUSSIAN FEDERATION

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GLOBAL AND RUSSIAN ENERGY OUTLOOK 2016

Edited by A.A. Makarov, L.M. Grigoryev, T.A. Mitrova

Tokyo, 2017

Scenario Assumptions

Three scenarios cover wide range of uncertainties

- **Favorable**(high economy, low risks, technology and capital transfer)
- **Probable** (BAU)
- **Critical** (economic slowdown, many local conflicts, increasing economic and technological gap between the countries)

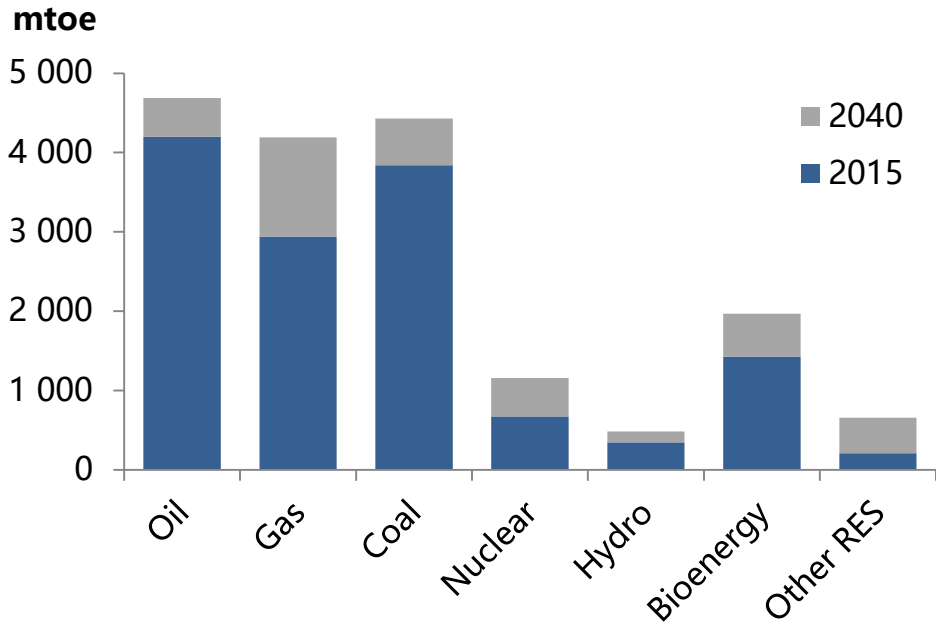
Scenario Matrix

	Favorable	Probable	Critical
Global population	9, 2 bln. by 2004		
Global GDP AAGR	3,4%	2,8%	2,1%
Geopolitical risks	No conflicts	Few local conflicts	Many local conflicts
State energy policies	New plans and methods.	Partial implementation of the existing plans.	Current plans are not implemented.
Global CO2 quotas trade	Global trade is emerging	No global market, but regional trade is developing successfully.	No development
New technologies	No technological revolutions. Several technological breakthroughs, but only for the technologies that are being tested currently.		
Technological transfer	Unlimited	Limited	No transfer, new technologies develop only in OECD and in China

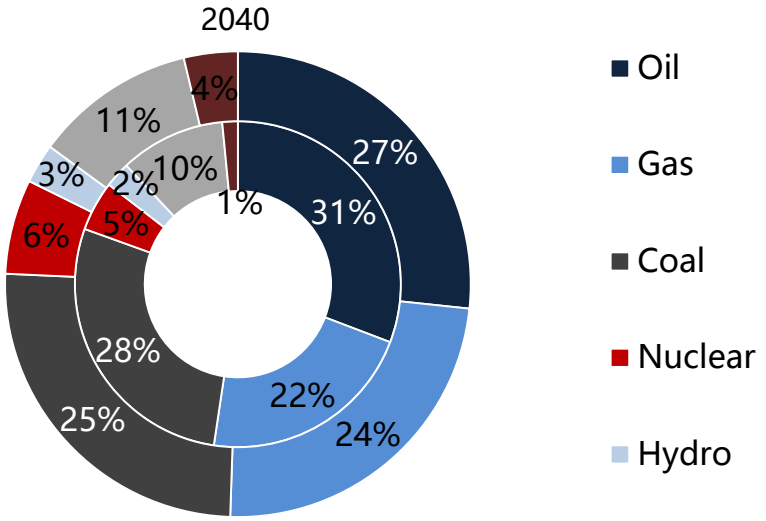
Global Energy Outlook

Global fuel mix is becoming more diversified, gas and RES are demonstrating the highest growth

Primary energy demand by fuel (in 2015 and increase by 2040), Probable Scenario



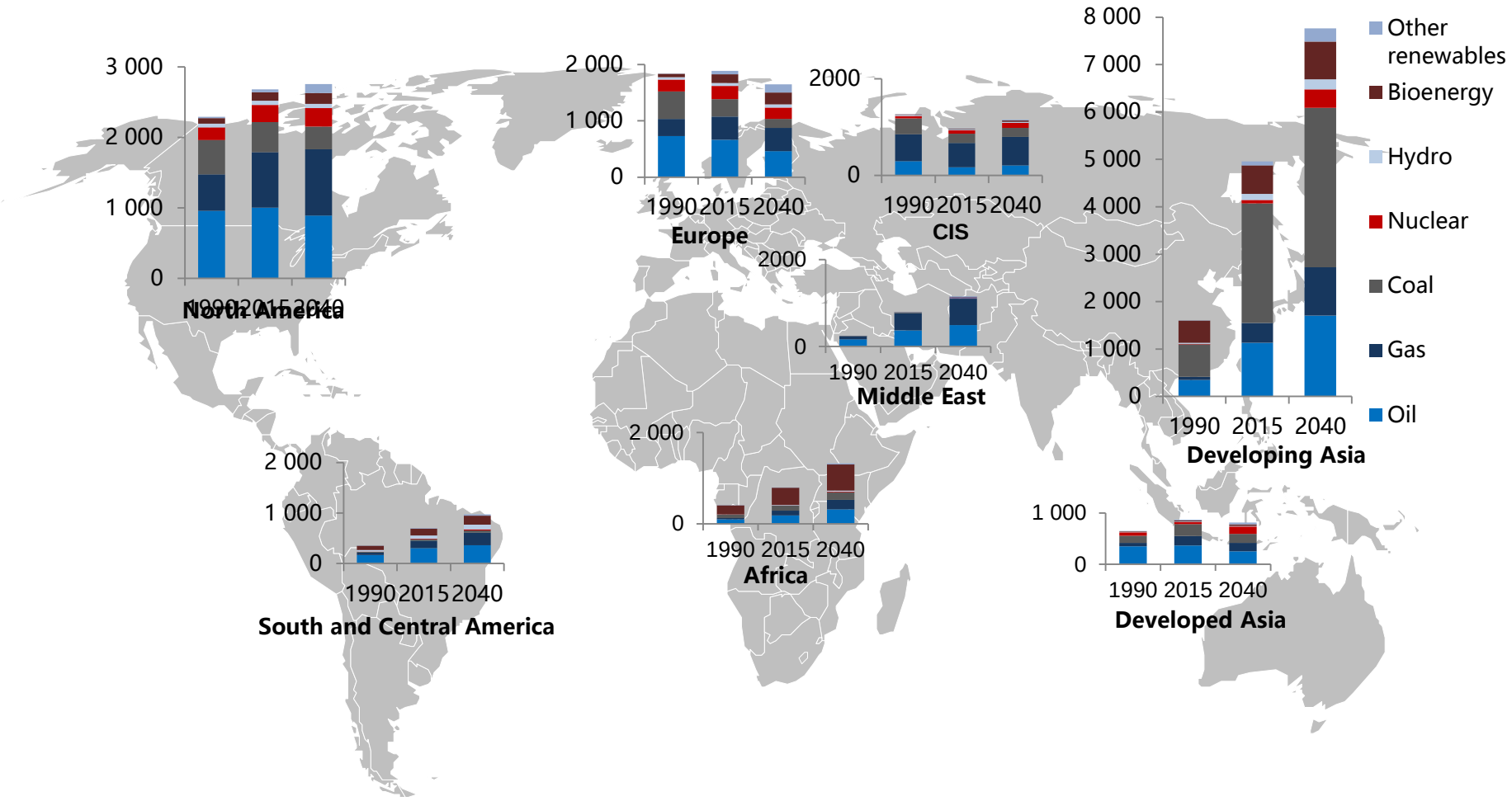
Structure of primary energy demand by fuel in 2015 and in 2040, Probable Scenario



Source: Global and Russian Energy Outlook-2016, ERI RAS-AC

Regional primary energy demand is also becoming more diversified

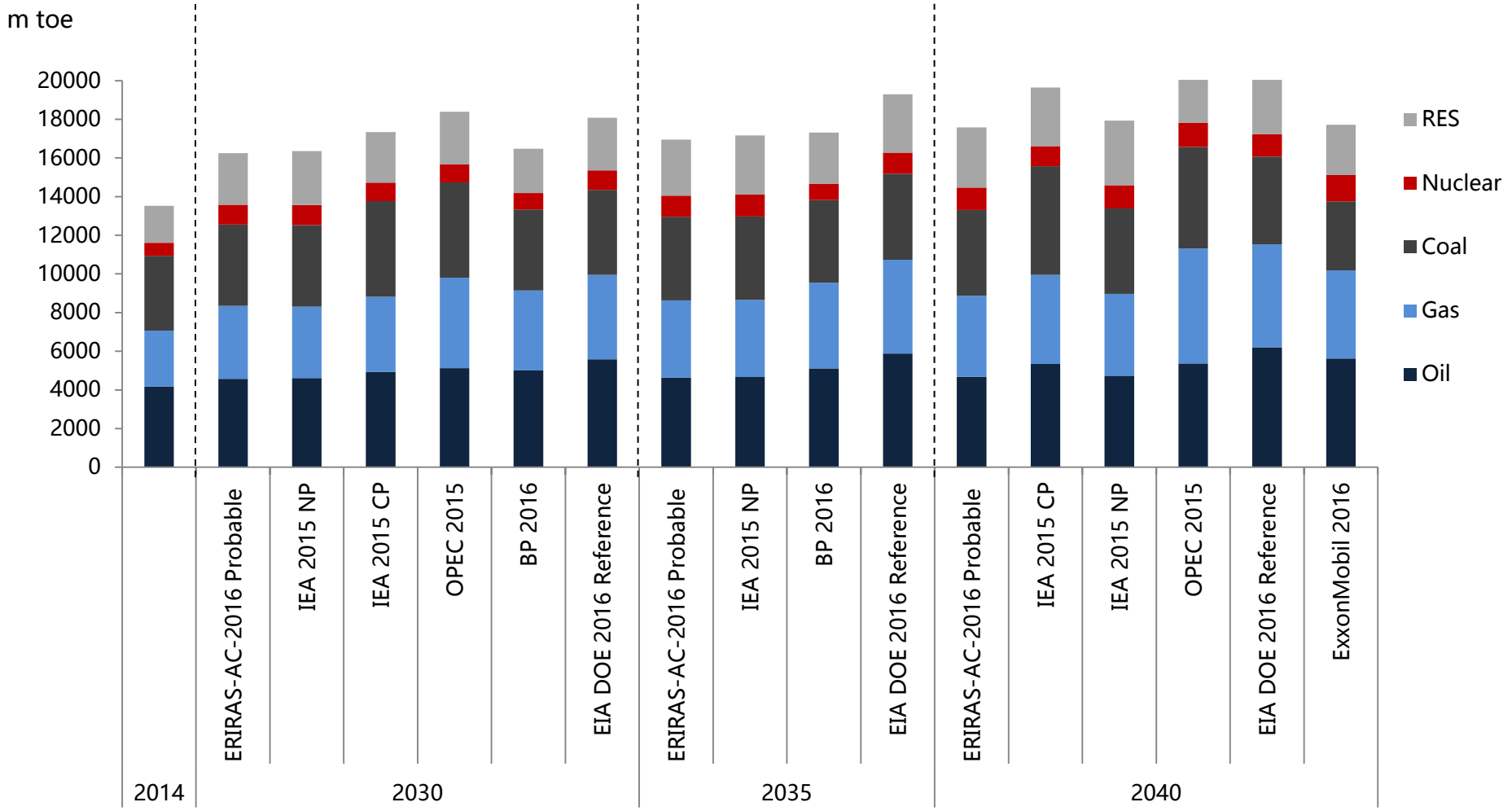
Primary energy demand by fuel and by region, Probable Scenario



Source: Global and Russian Energy Outlook-2016, ERI RAS-AC

ERI RAS-AC Outlook is among the lowest demand projections

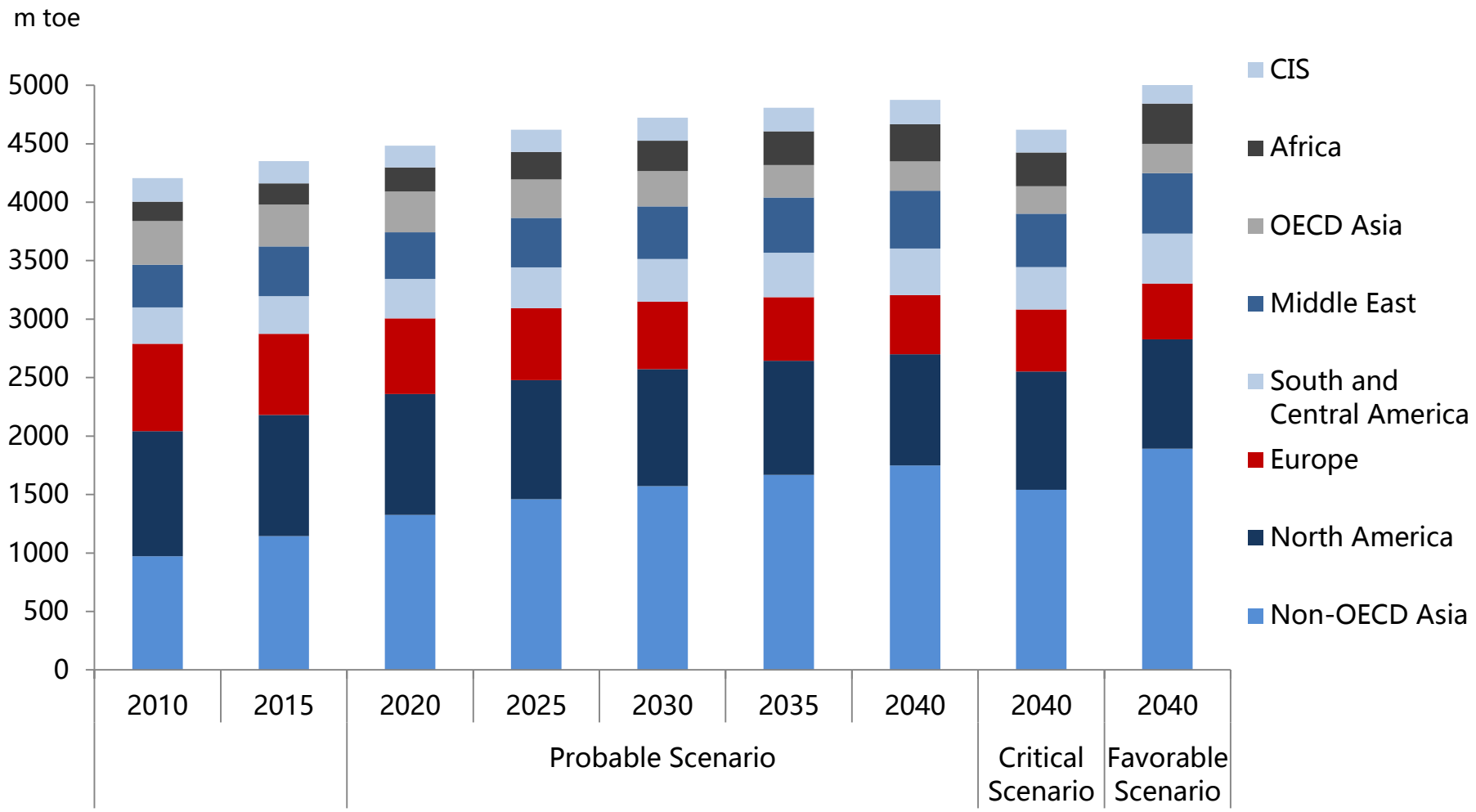
Primary energy demand scenarios comparison



Sources: Global and Russian Energy Outlook-2016, ERI RAS-AC, WEO-2015, IEO-2016, BP, ExxonMobil, OPEC

In all scenarios global demand for liquids is increasing, driven by non-OECD countries

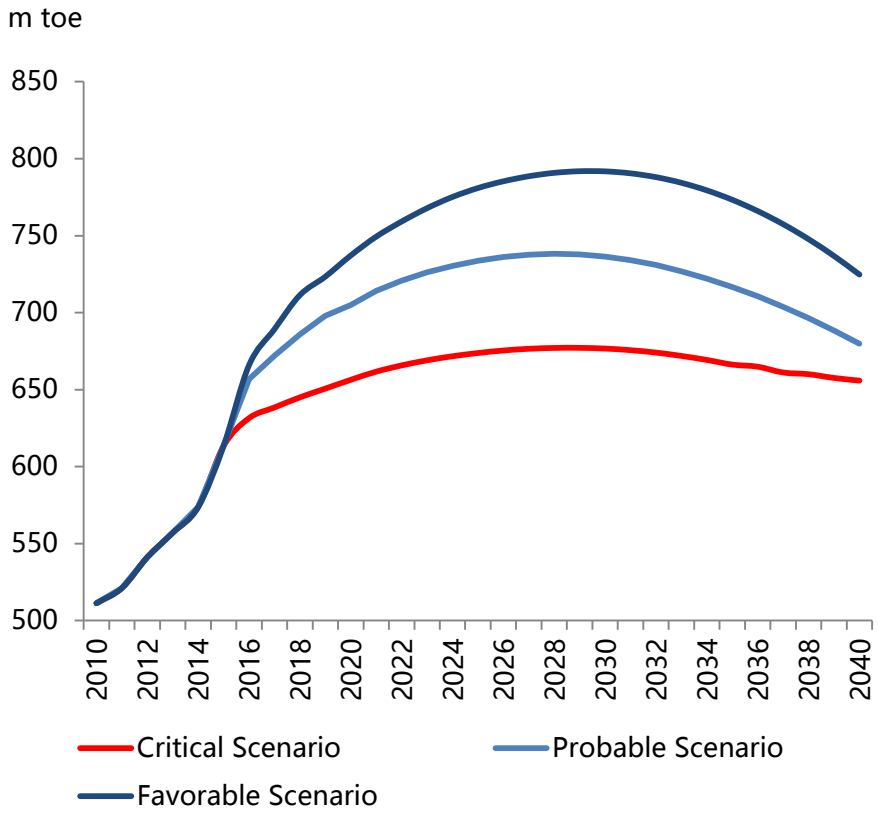
Liquid fuel demand by region for three scenarios



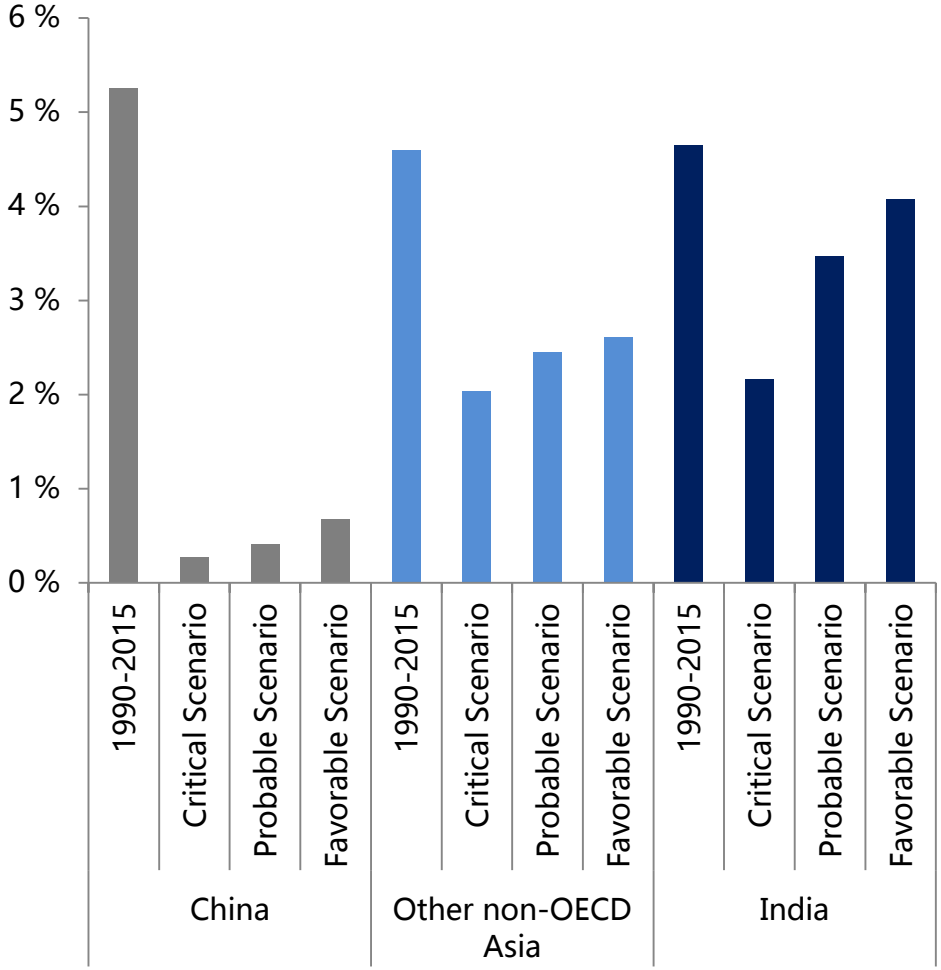
Source: Global and Russian Energy Outlook-2016, ERI RAS-AC

Main liquids demand growth in non-OECD will be located not in China, but in India and in the other non-OECD Asia

Peak Chinese liquids demand



Liquids demand growth in non-OECD Asia



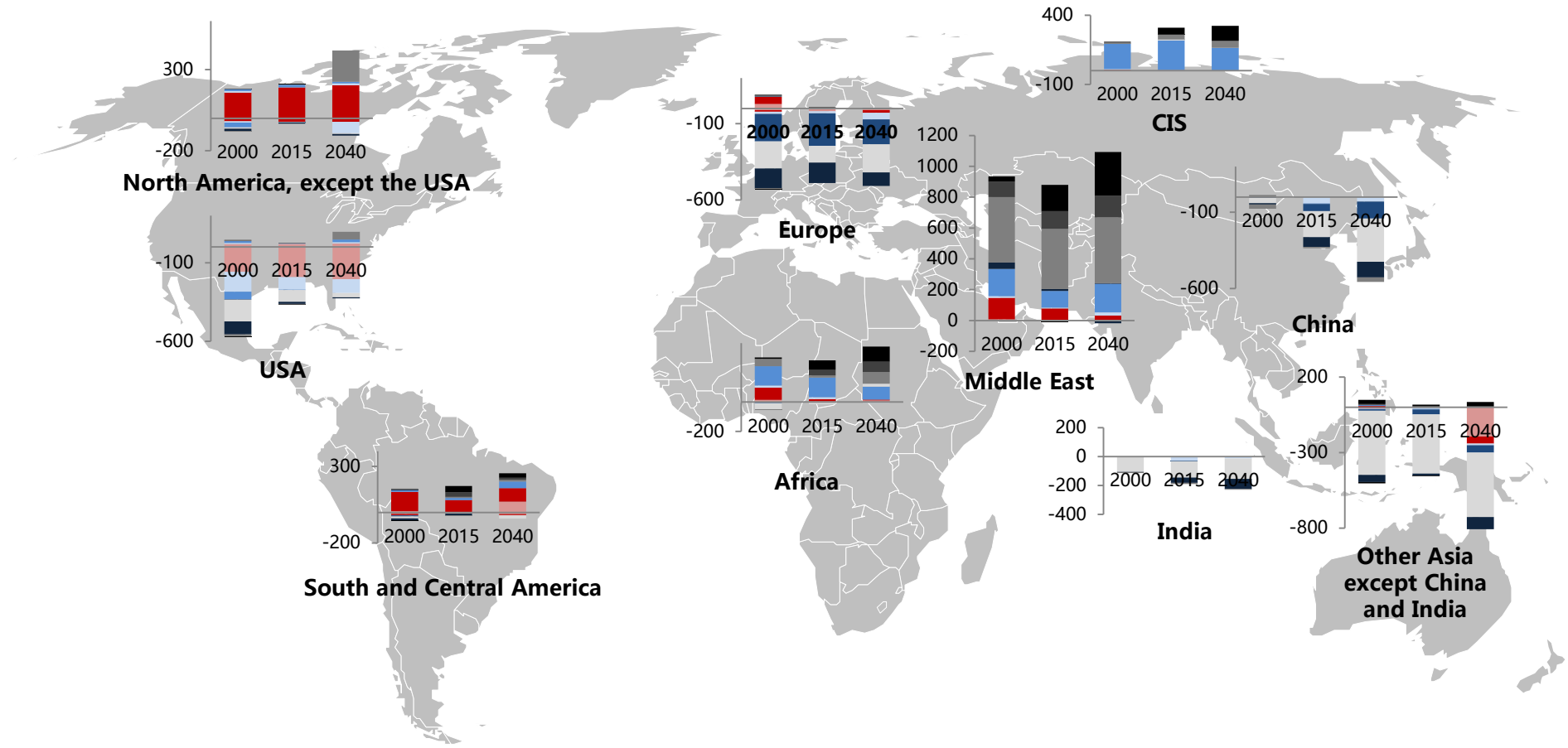
Source: Global and Russian Energy Outlook-2016, ERI RAS-AC

Oil price scenarios

USD2014/bbl	2020	2025	2030	2035	2040
IEA Current Policies	83	112	130	140	150
IEA New Policies	80	102	113	120	128
IEA 450 Scenario	77	85	97	96	95
IEA Low Oil Price	55	60	70	82	85
OPEC Reference	70	80	85	88	90
EIA Reference	79	91	106	122	141
EIA Low oil price	58	64	69	72	76
EIA High oil price	149	169	194	221	252
RF Ministry of Economic Development (+)	57	63	70	77	
RF Ministry of Economic Development (Baseline)	45	45	45	45	
Critical Scenario (ERI RAS -AC)	55	75	83	86	90
Probable Scenario (ERI RAS -AC)	60	81	88	94	99
Favorable scenario (ERI RAS -AC)	65	82	90	103	107

Global crude oil trade

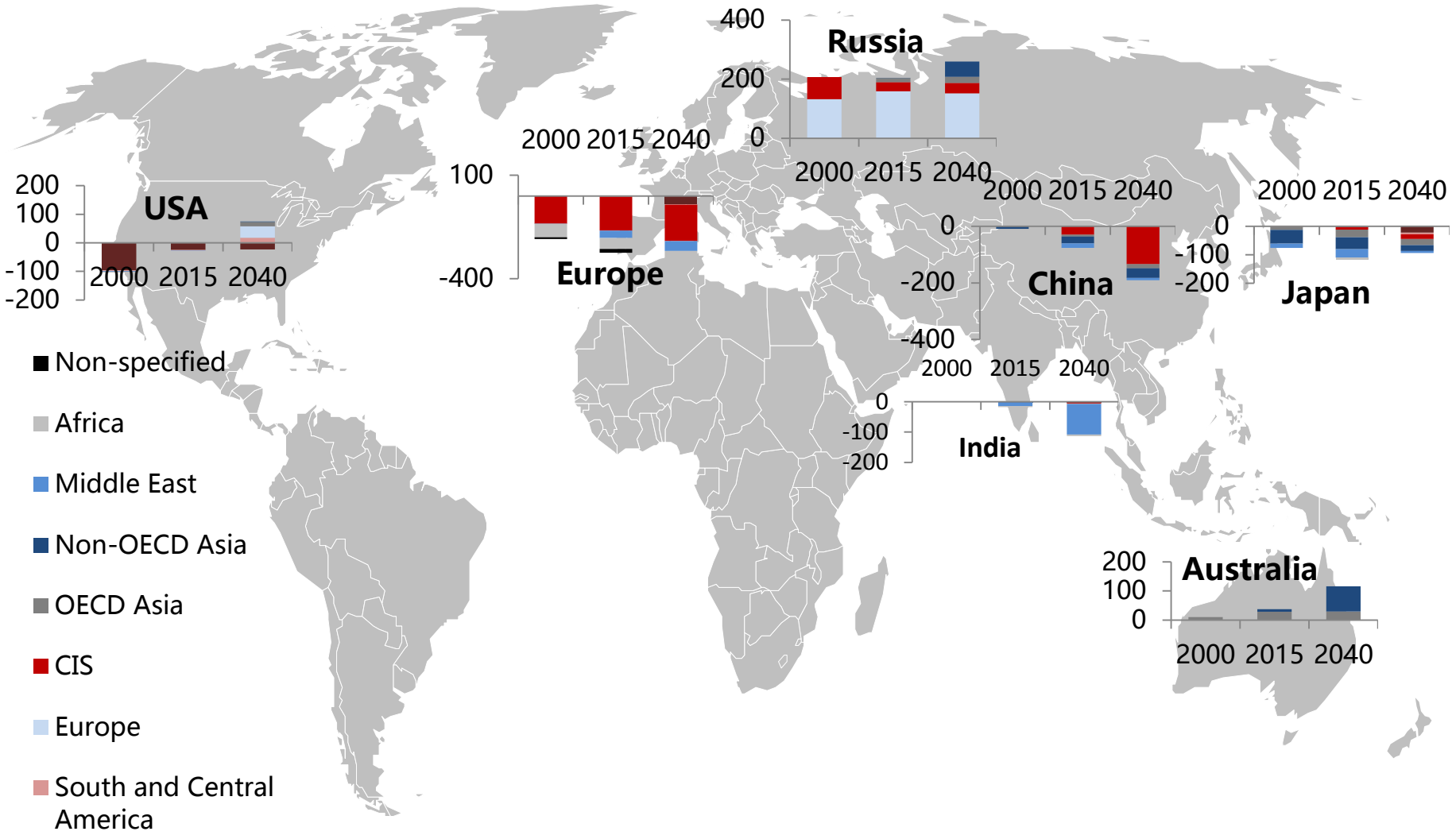
Crude oil export and import by region, Probable Scenario



Source: Global and Russian Energy Outlook-2016, ERI RAS-AC

Global gas trade – moving to Asia

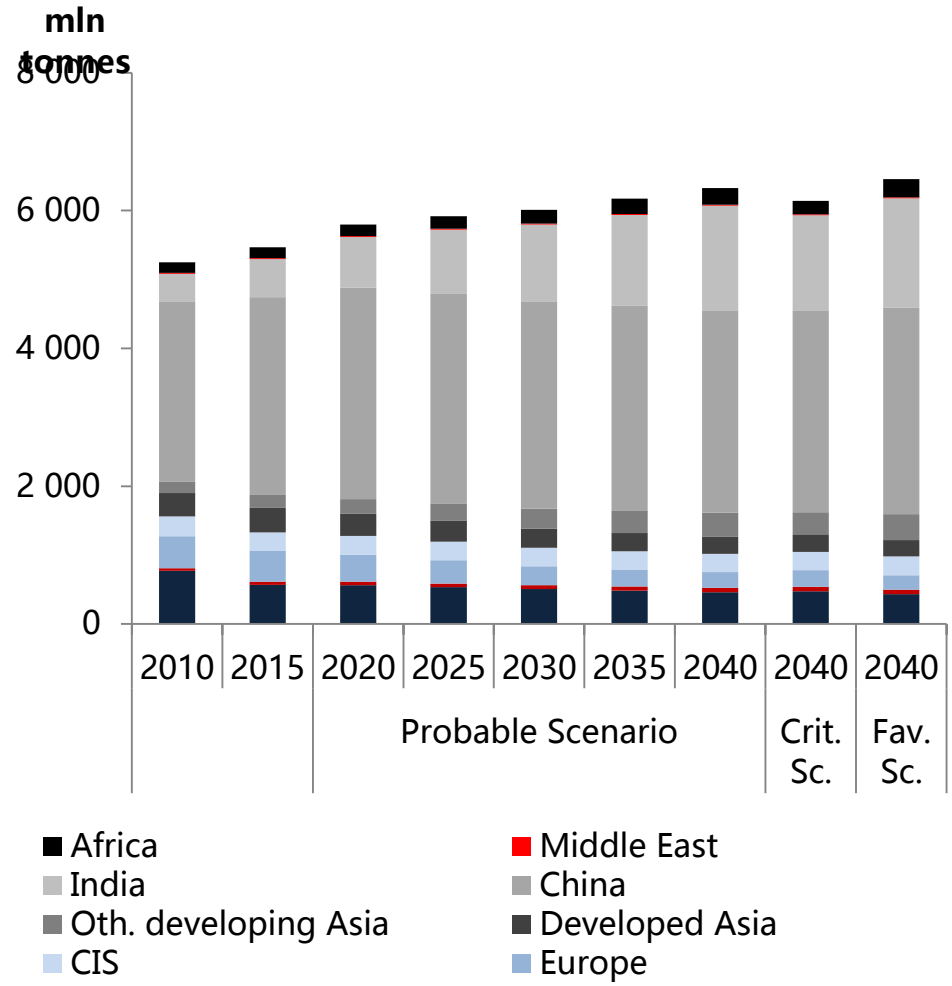
Pipeline gas and LNG export and import by the main countries, Probable Scenario



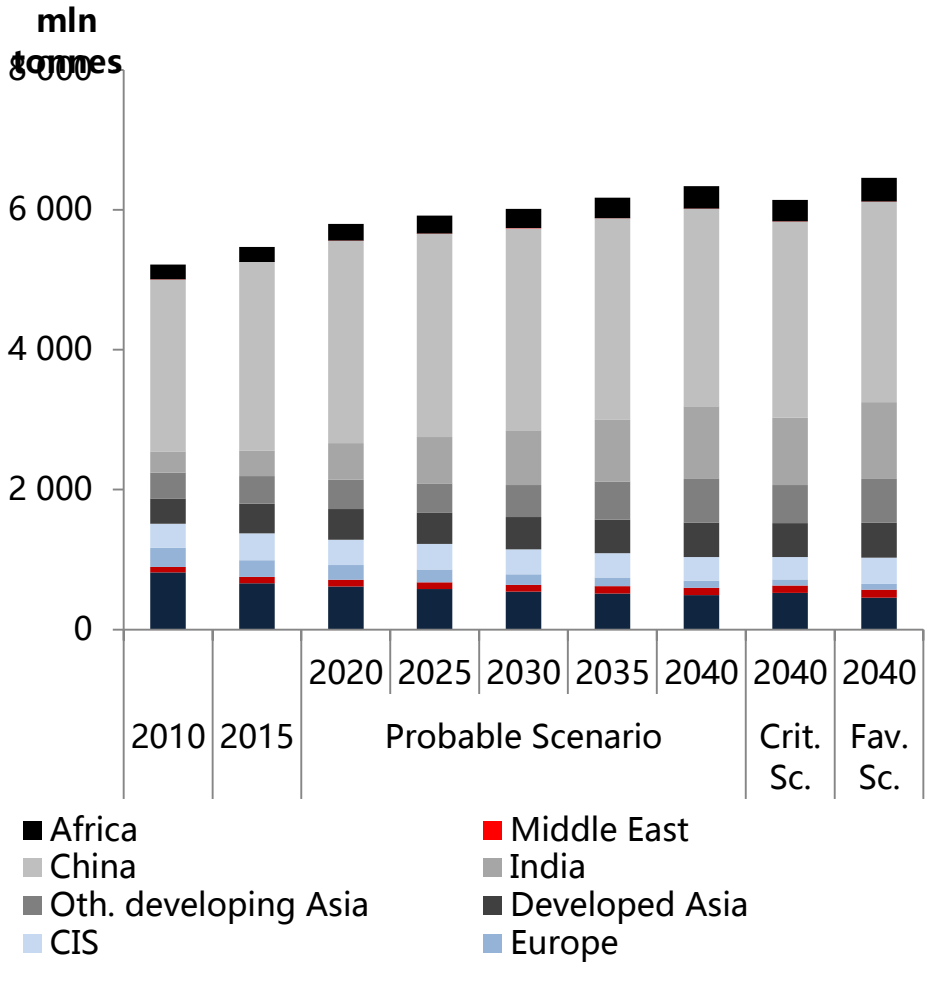
Source: Global and Russian Energy Outlook-2016, ERI RAS-AC

Global coal market: demand growth is slowing down, Chinese demand is peaking in 2021-2024; the market will be driven by China and India

Global coal demand outlook by region for three scenarios



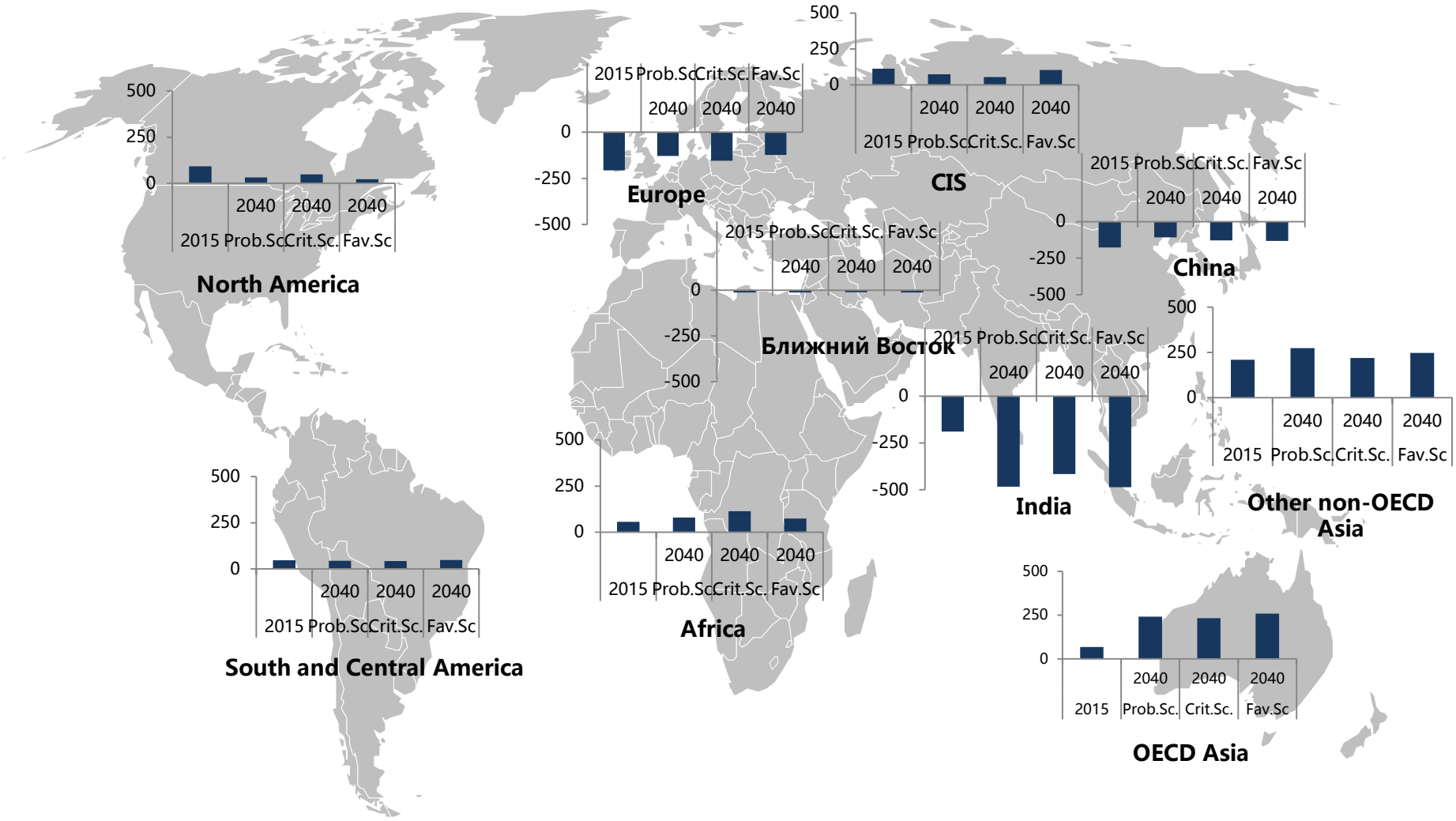
Global coal production by region for three scenarios



Source: Global and Russian Energy Outlook-2016, ERI RAS-AC

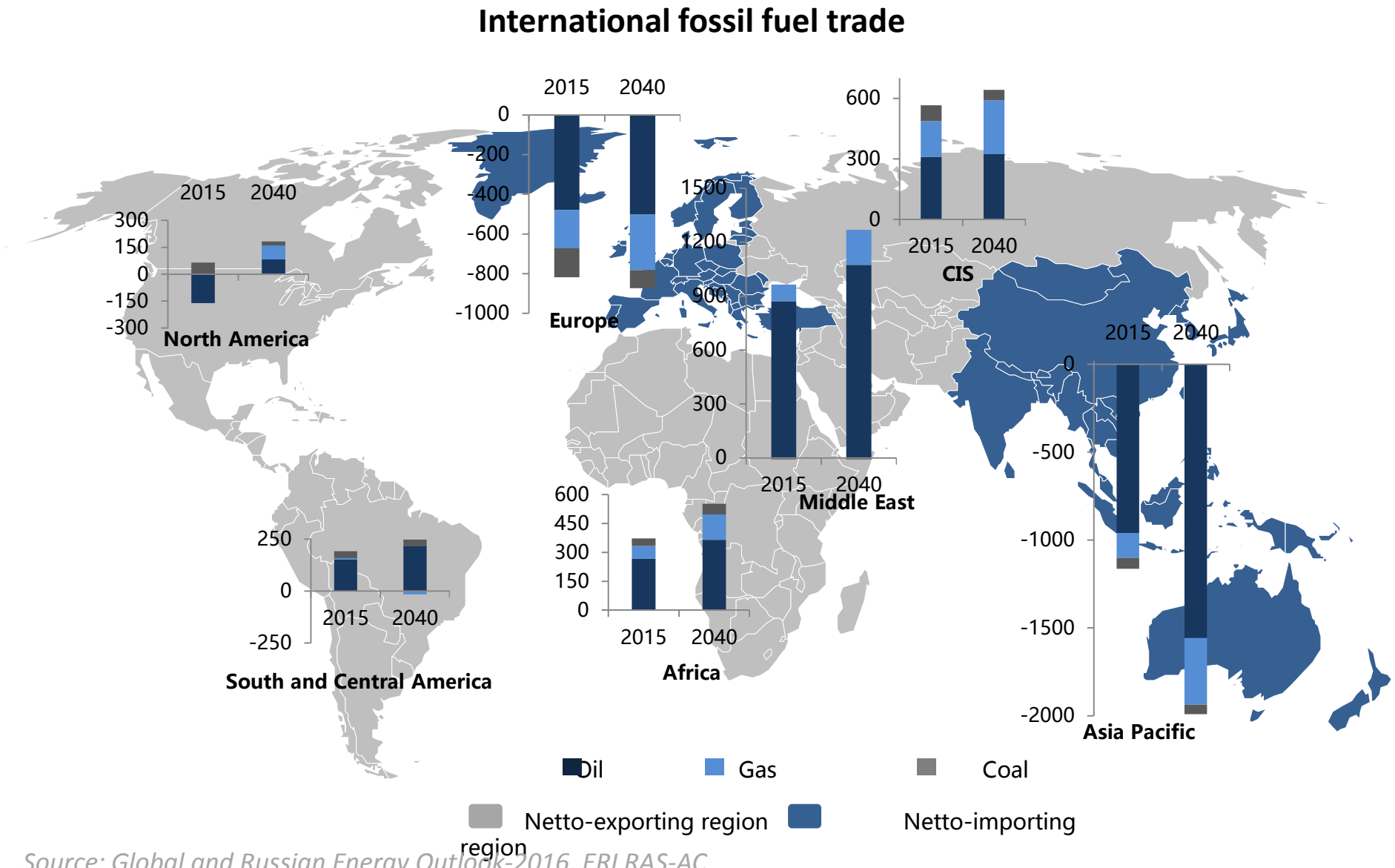
International coal flows move to Asia

Global coal trade by region for three scenarios



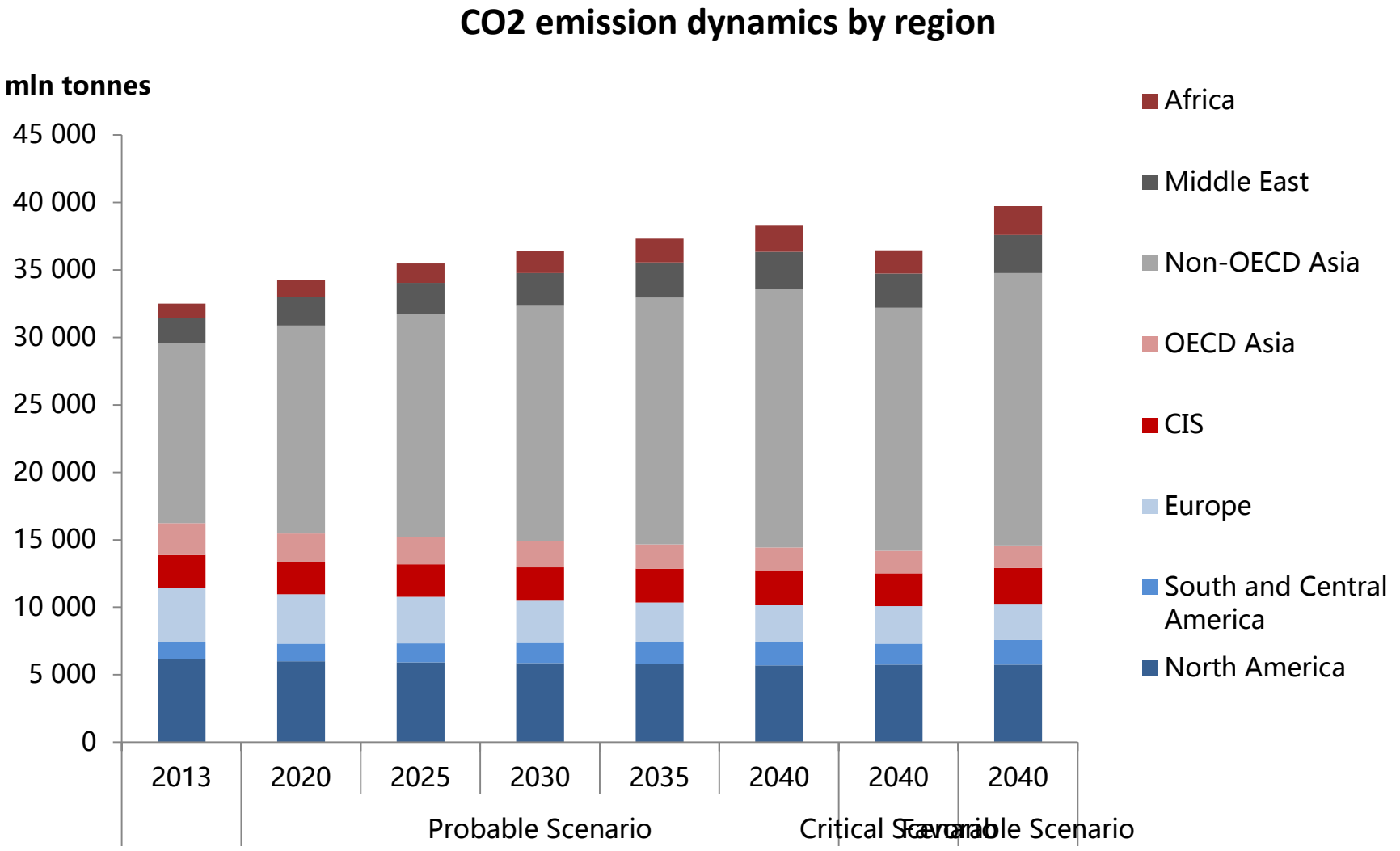
Source: Global and Russian Energy Outlook-2016, ERI RAS-AC

International fossil fuel trade is expanding, first of all – in Asia



Source: Global and Russian Energy Outlook-2016, ERI RAS-AC

CO_2 emissions are not peaking in all scenarios driven by non-OECD Asia

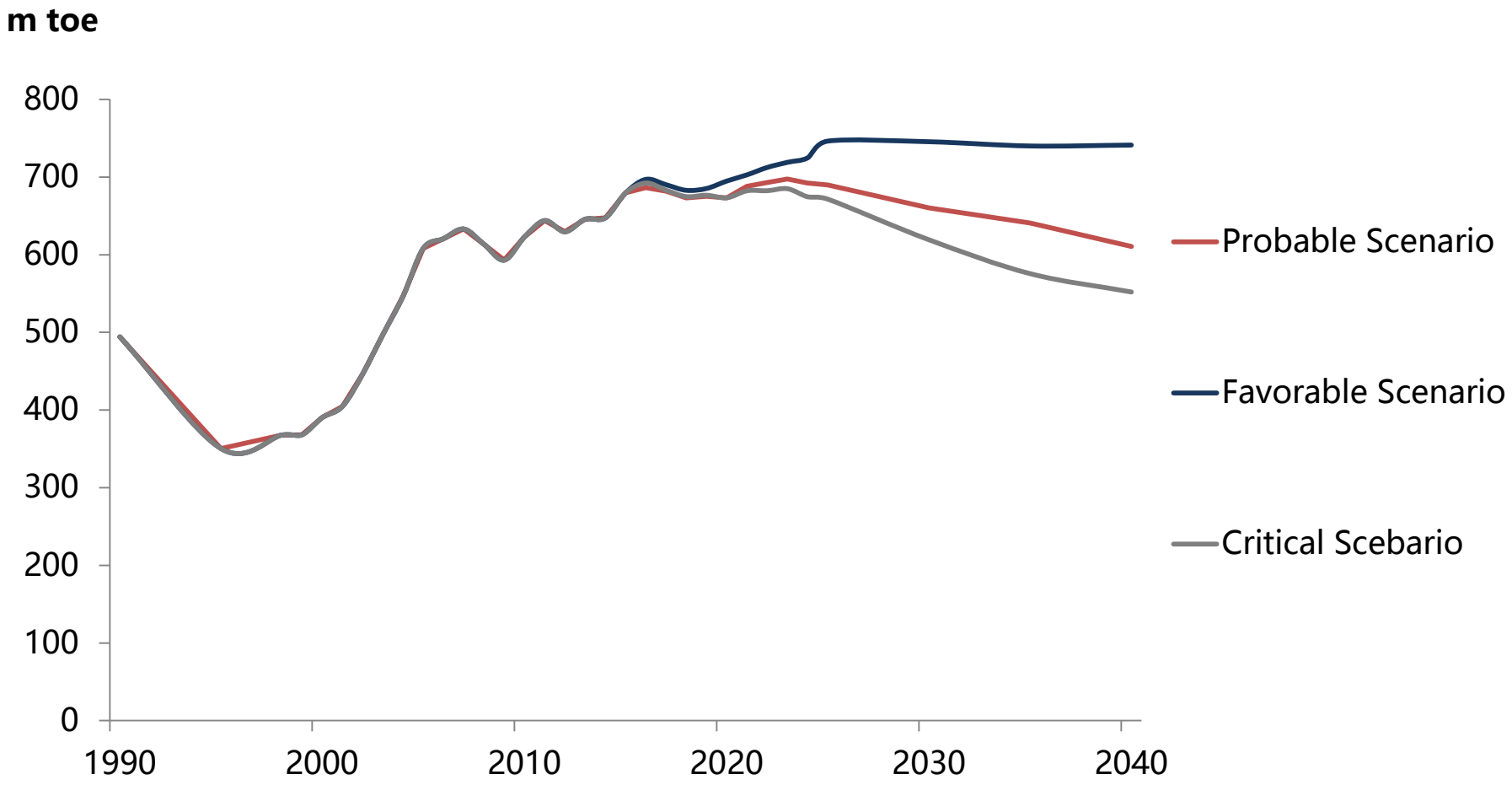


Source: Global and Russian Energy Outlook-2016, ERI RAS-AC

Russian Energy Outlook

Conjuncture of the external energy markets does not allow to increase energy exports by more than 10%

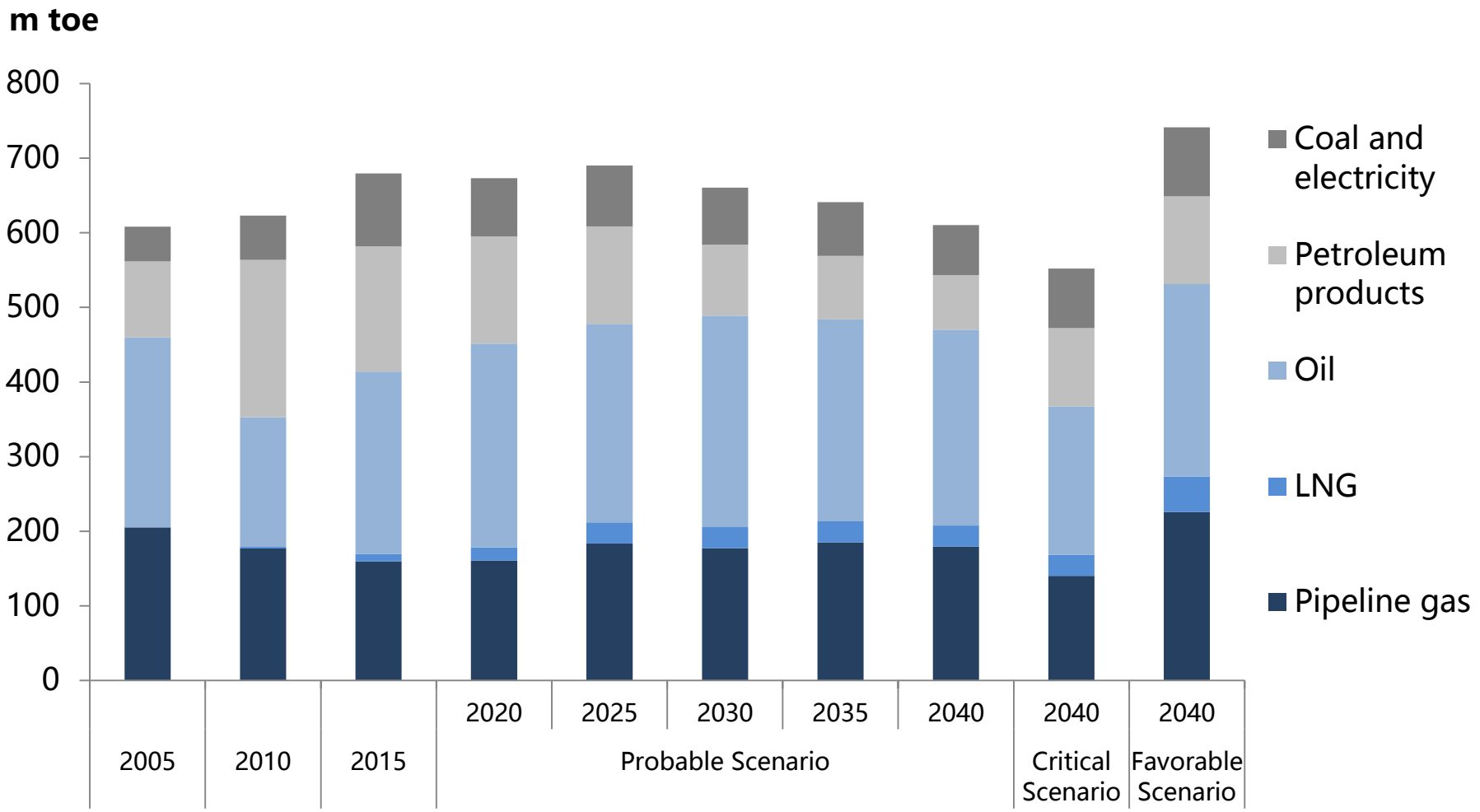
Total Russian energy export in 1991-2040



Source: Global and Russian Energy Outlook-2016, ERI RAS-AC

Russian energy export structure will change with the declining role of oil and oil products

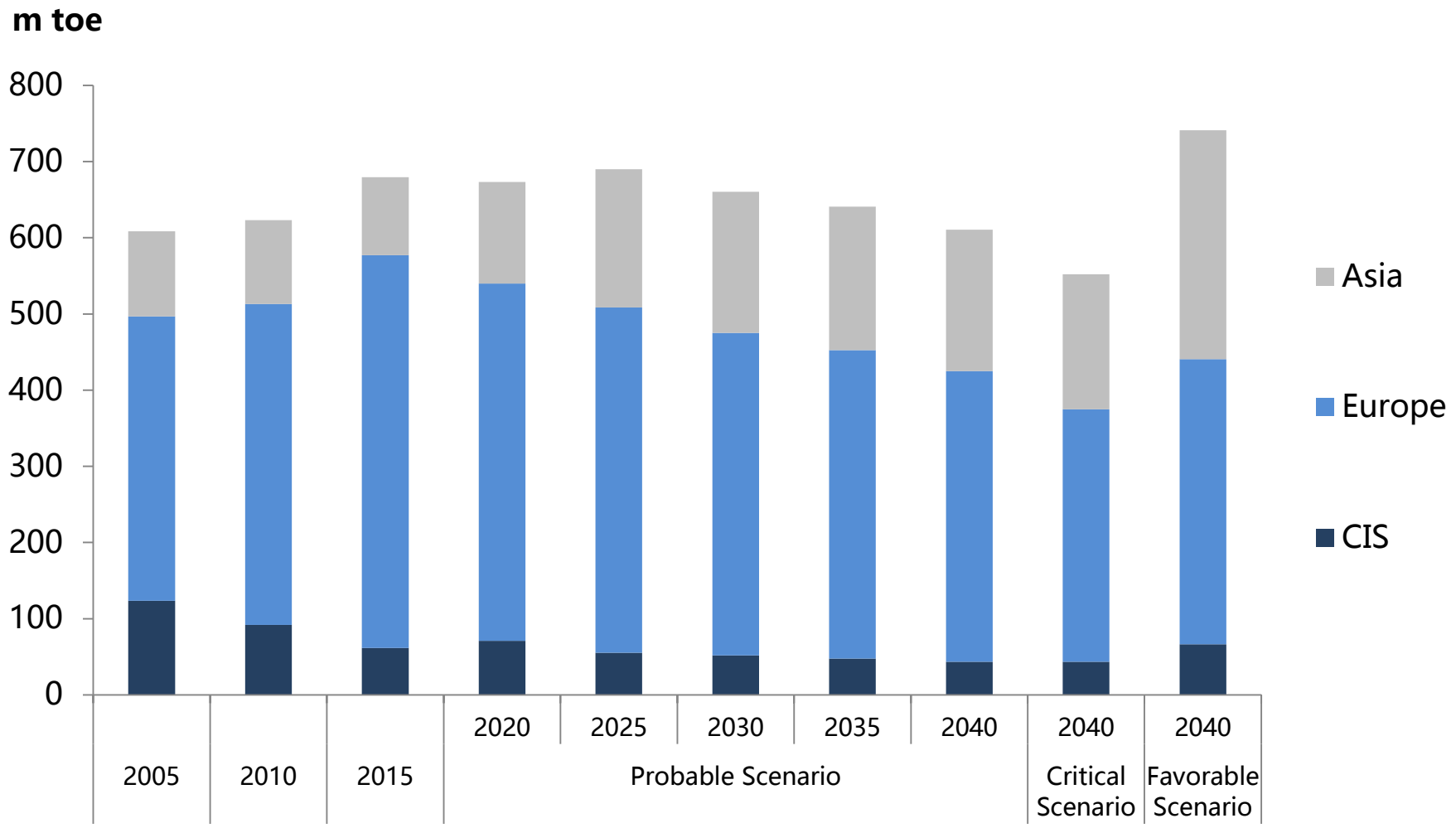
Russian energy export by product



Source: Global and Russian Energy Outlook-2016, ERI RAS-AC

All additional energy export potential is related to Asia and requires new infrastructure development

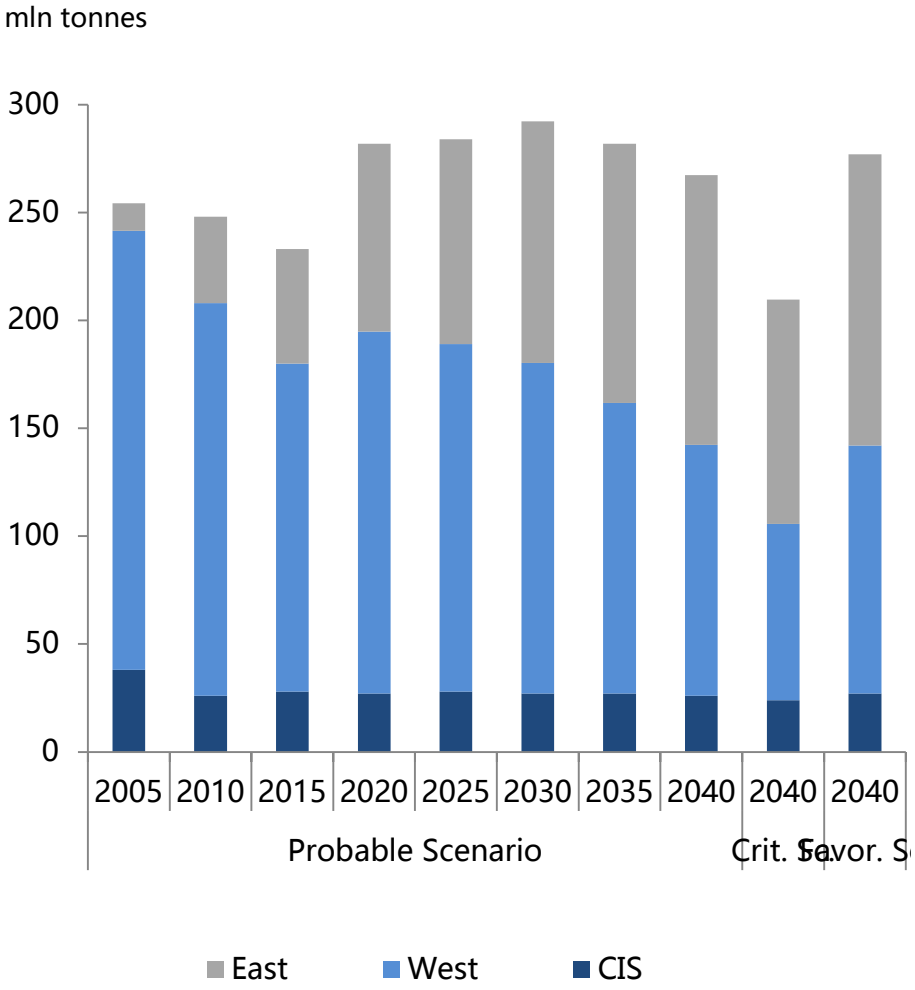
Russian energy export by destination



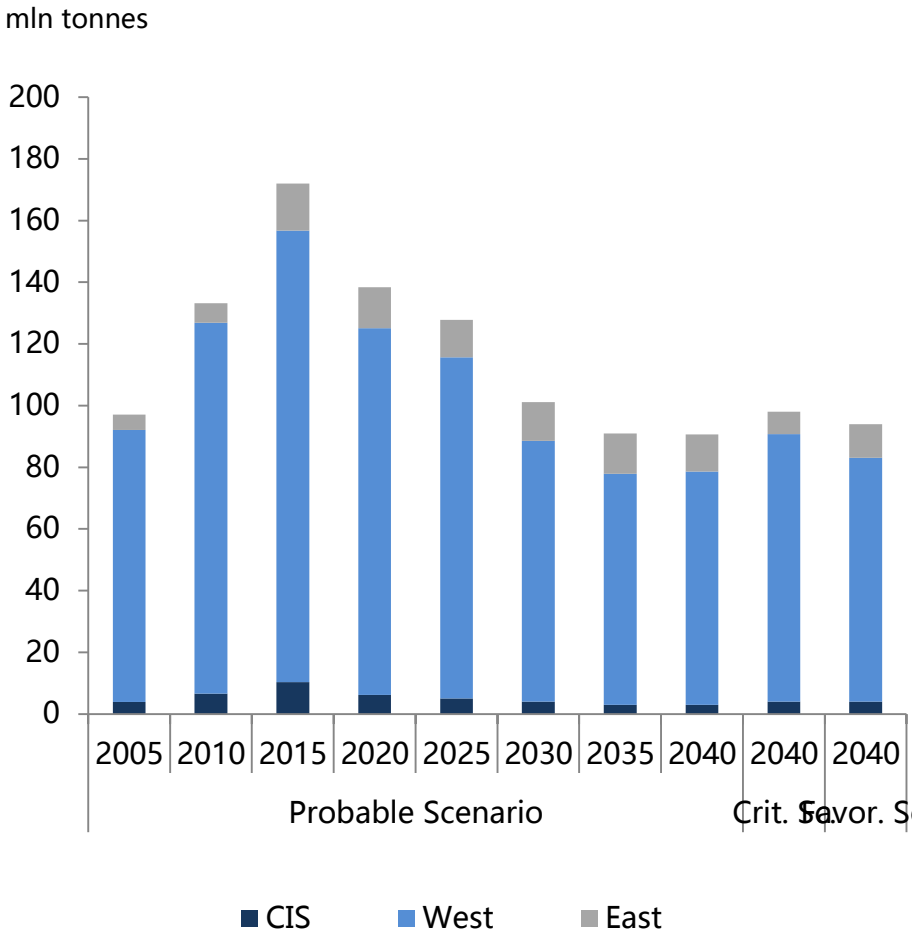
Source: Global and Russian Energy Outlook-2016, ERI RAS-AC

Russian oil exports are driven by the Asian expansion

Russian oil exports by destination



Russian petroleum product exports by destination



Source: Global and Russian Energy Outlook-2016, ERI RAS-AC

Thank you for your attention!