



Dr. Tatiana Mitrova,
Head of Oil and Gas Department
Energy Research Institute
Russian Academy of Sciences

**Development Of The Global Energy Markets In The Long-term Perspective:
The Role of LNG**

**Долгосрочные перспективы развития мировых энергетических рынков:
роль СПГ**



Global energy trends



Hydrocarbon markets

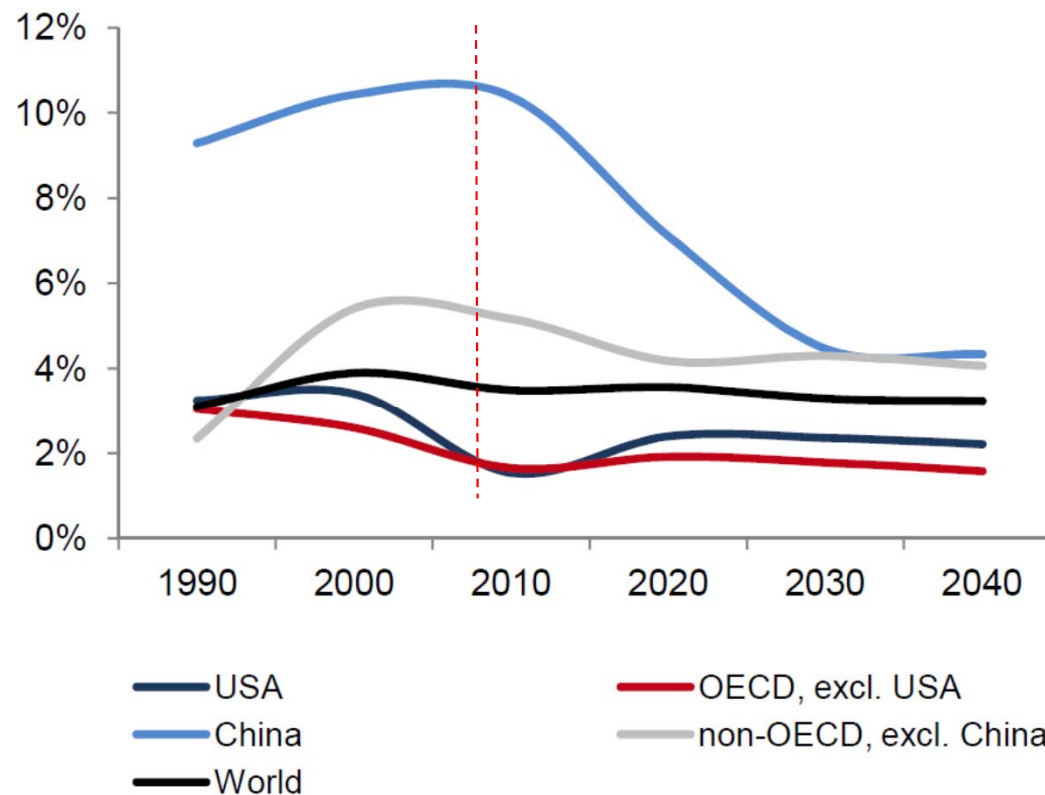


LNG



The protracted nature of the current global financial crisis reduces forecasts of economic and energy consumption growth

Average GDP growth by region

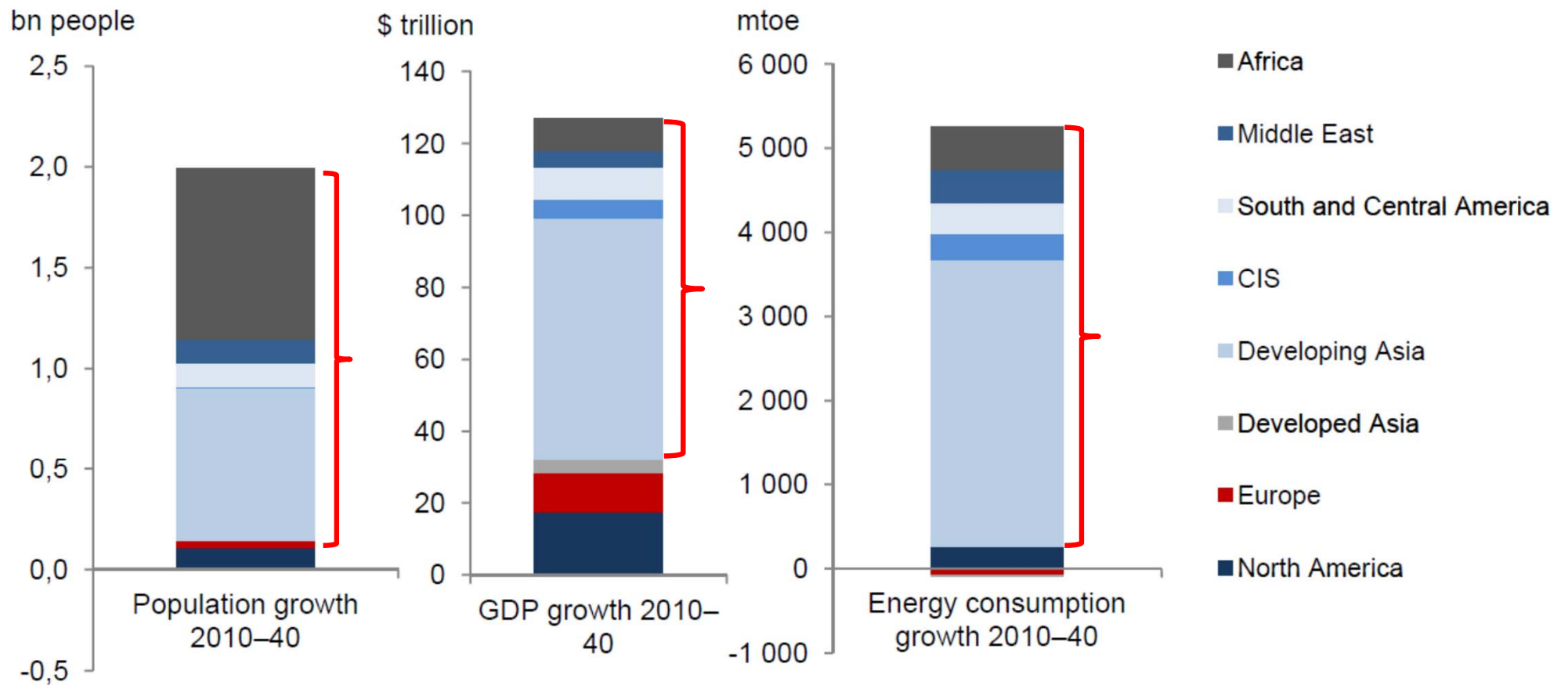


GROWTH IS HINDERED BY THE DECLINING INTENSITY OF THE MAIN FACTORS OF PRODUCTION, THE SLOWDOWN OF POPULATION GROWTH, LIMITED OPPORTUNITIES FOR TERRITORIAL EXPANSION, AGGRAVATED WATER SUPPLY PROBLEMS, AND RISING PRICES FOR MAJOR NATURAL RESOURCES.



Growth will be mainly provided by the developing countries

Population growth, GDP, and energy consumption by region

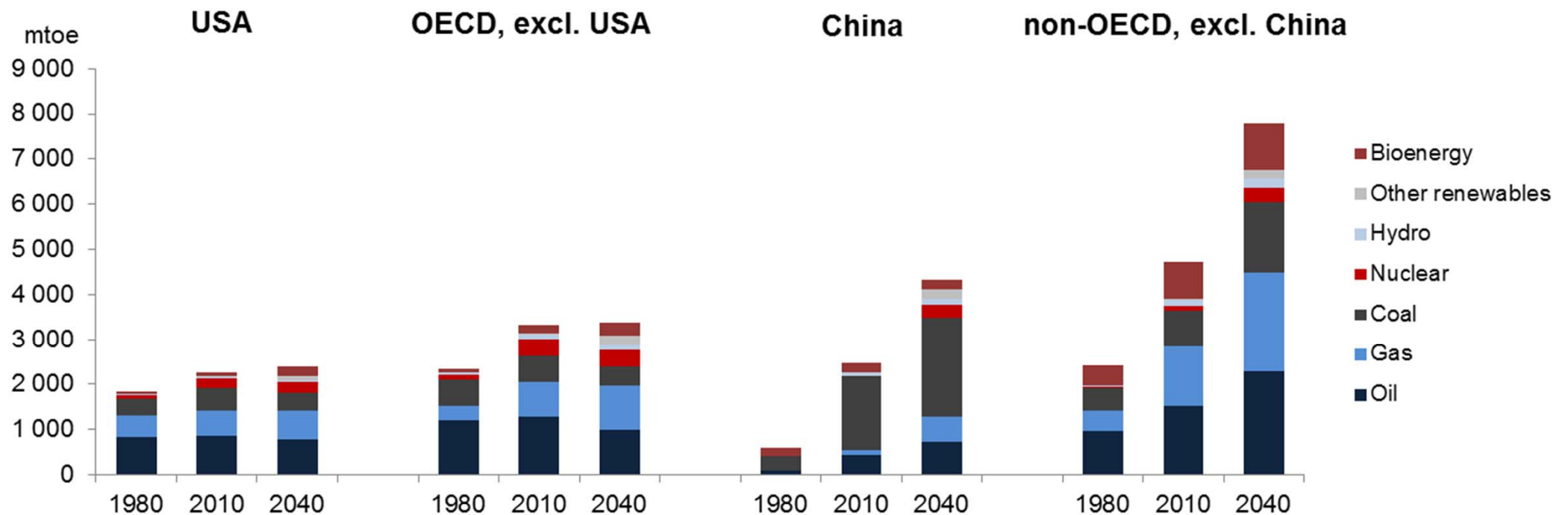


POPULATION GROWTH IN DEVELOPING COUNTRIES IS FOLLOWED BY AN INCREASING SHIFT IN THE CENTRE OF ECONOMIC AND ENERGY CONSUMPTION TOWARDS THESE COUNTRIES



Centres of energy consumption will notably change their location

The growth of primary energy consumption by region and type of fuel

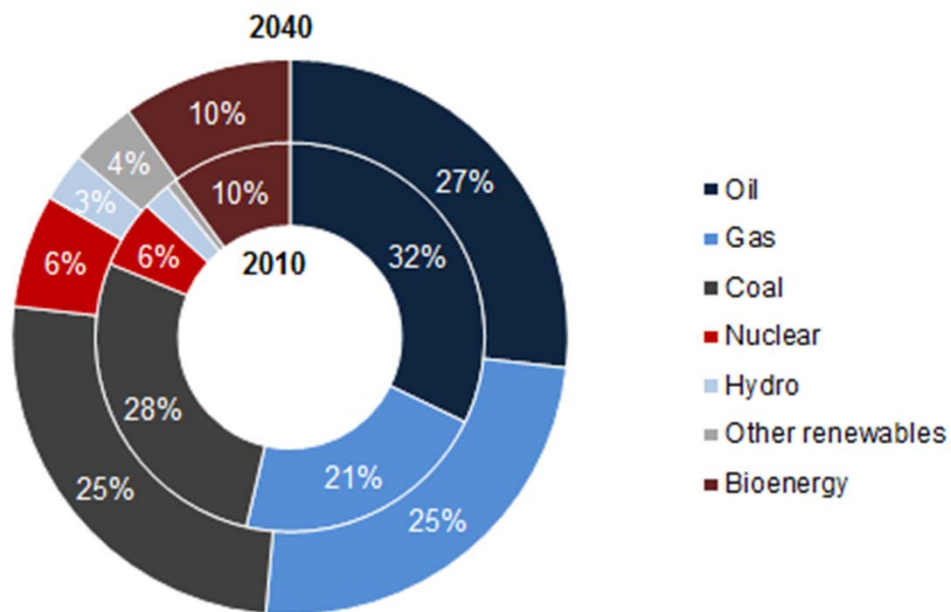


THE CONSUMPTION OF PRIMARY ENERGY IN THE WORLD WILL INCREASE BY 1.1% PER YEAR ON AVERAGE BETWEEN 2010 AND 2040, WHICH IS SIGNIFICANTLY SLOWER THAN THE GROWTH IN ENERGY CONSUMPTION SEEN FOR THE LAST 30 YEARS, WHILE DEVELOPED COUNTRIES WILL ONLY INCREASE THEIR ENERGY CONSUMPTION BY 3% BY 2040.

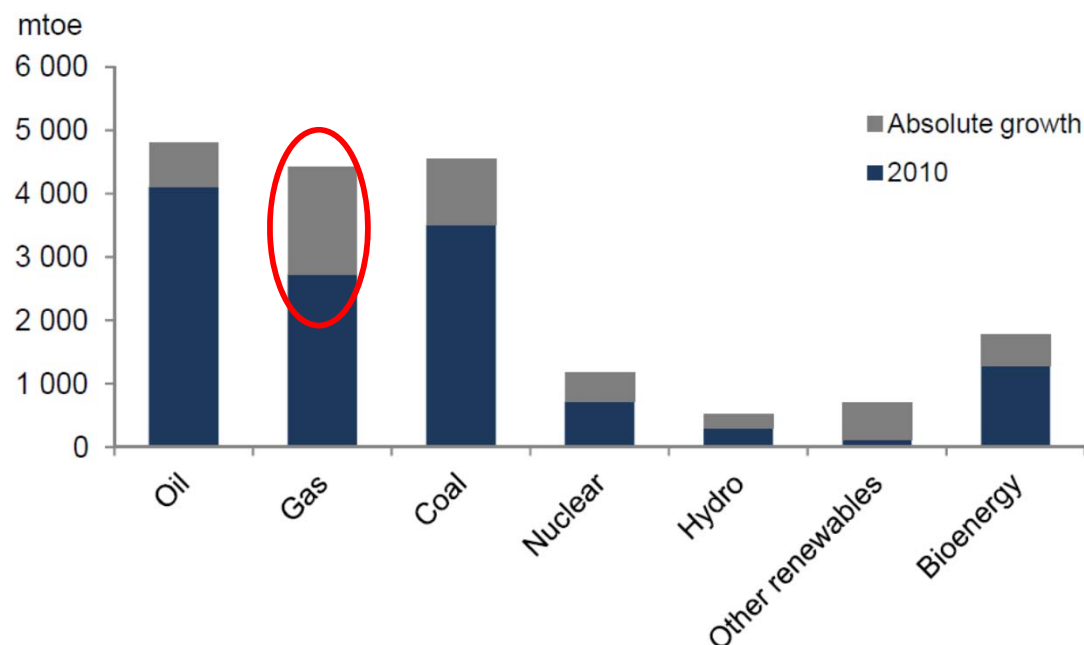


The share of oil and gas in world primary energy consumption will remain practically unchanged: 53.6% in 2010 and 51.4% by 2040

Structure of world primary energy consumption by fuel type in 2010 and 2040



The growth of primary energy consumption by fuel type

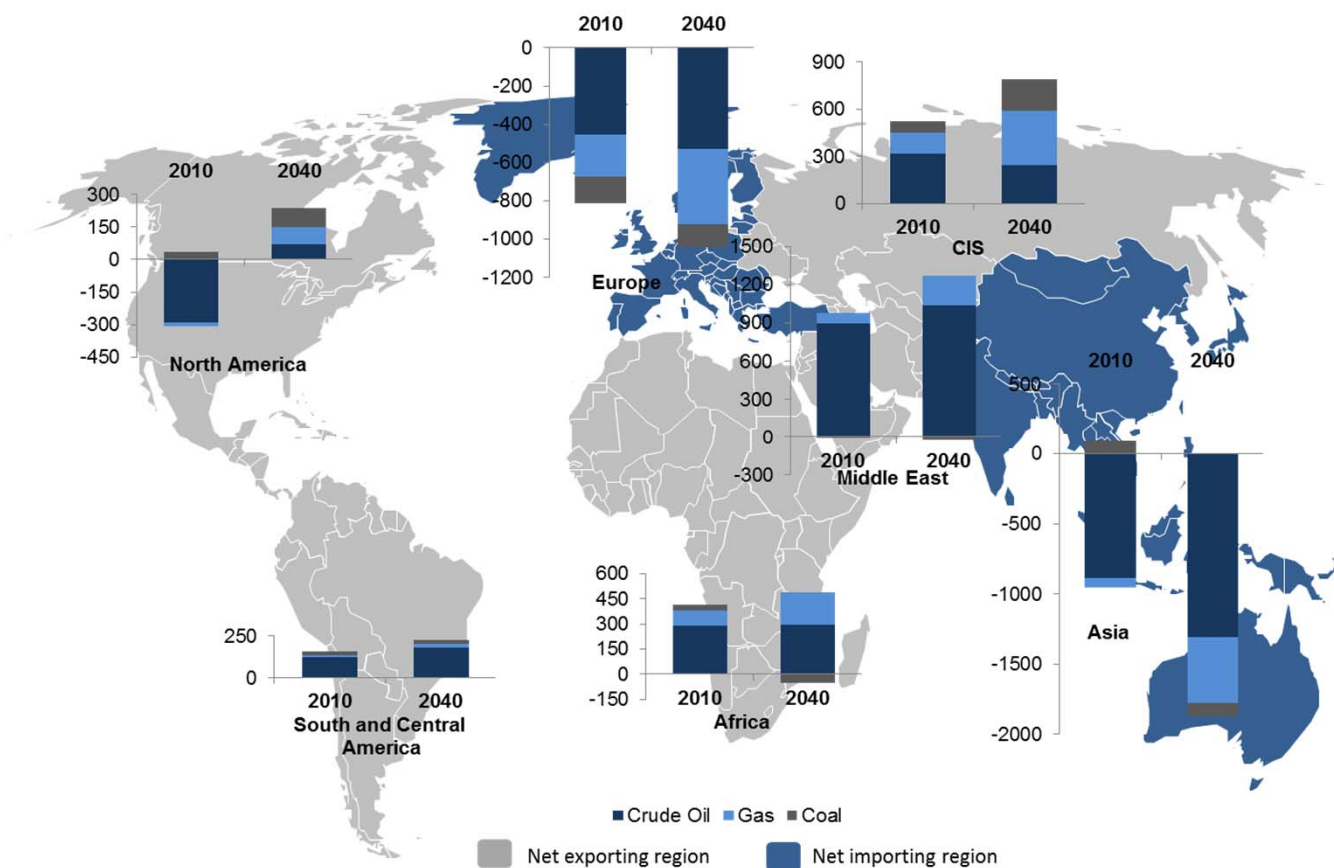


IN THE LONG TERM, FOSSIL FUELS WILL REMAIN DOMINANT, AGAINST THE BACKGROUND OF A SLOWER GROWTH IN THE SHARE OF NON-HYDROCARBON ENERGY RESOURCES. THE HIGHEST CONSUMPTION GROWTH RATES IN THE FORECAST PERIOD WILL BE FOR RENEWABLE ENERGY: BY 2040 ITS SHARE IN GLOBAL ENERGY CONSUMPTION WILL REACH 13.8%. HOWEVER, NATURAL GAS WILL TAKE FIRST PLACE IN THE ABSOLUTE VOLUMES OF CONSUMPTION GROWTH, AND IT WILL HAVE THE LARGEST NICHE IN THE FUEL MIX, MAKING IT THE MOST DEMANDED TYPE OF FUEL FOR THE NEXT 30 YEARS.



Directions of the international energy trade are changing considerably

International energy trade, mtoe



THE DEVELOPMENT OF THE WORLD'S ENERGY TRADE WILL CONTINUE AGAINST THE BACKGROUND OF NORTH AMERICA'S GROWING SELF-SUFFICIENCY, DUE TO UNCONVENTIONAL OIL AND GAS RESOURCES. A SIGNIFICANT INCREASE IN SUPPLY VIA THE PACIFIC AND INDIAN OCEANS WILL CHANGE THE DIRECTIONS AND VOLUMES OF INTER-REGIONAL ENERGY TRADE.



Global energy trends



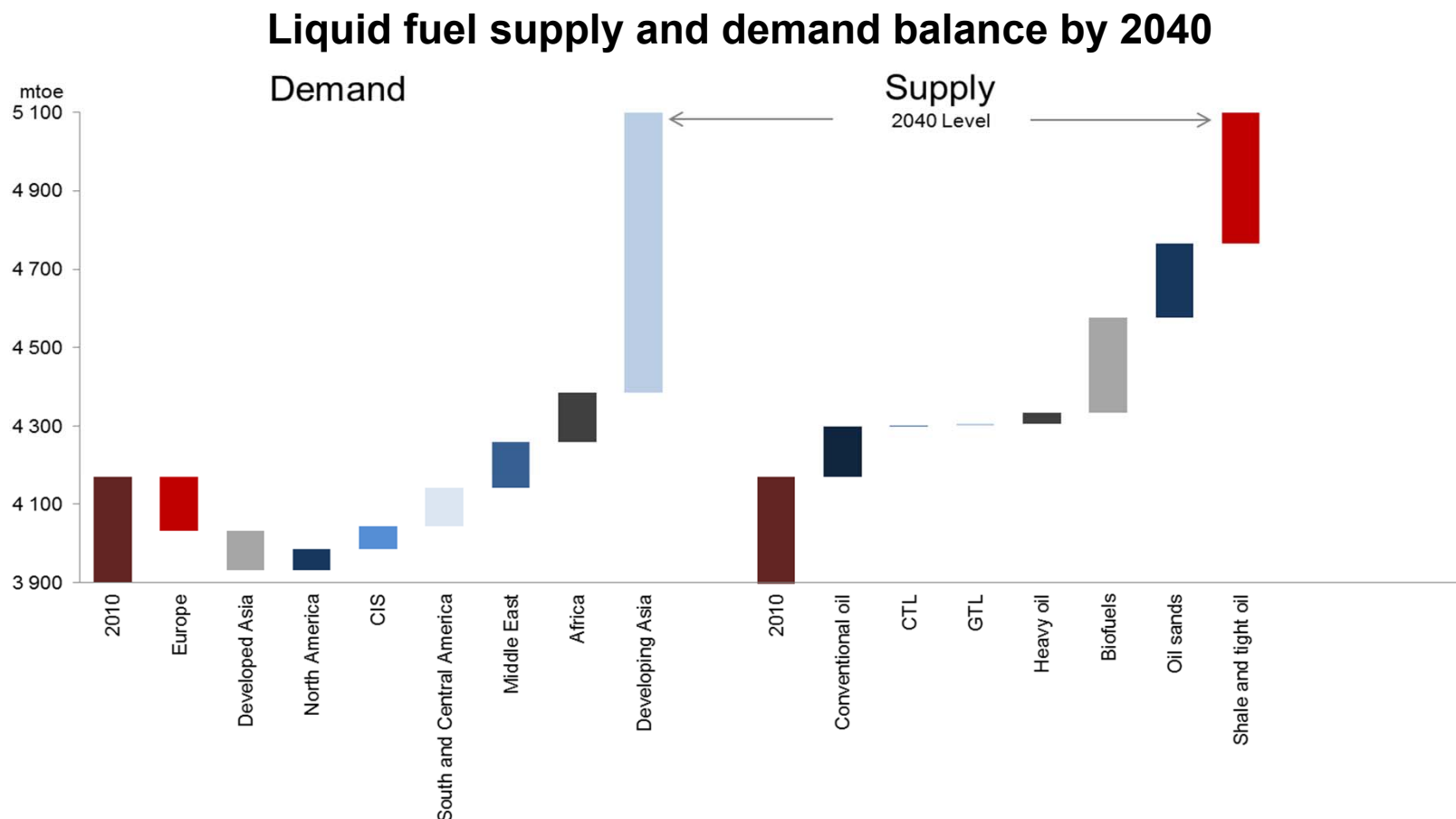
Hydrocarbon markets



LNG



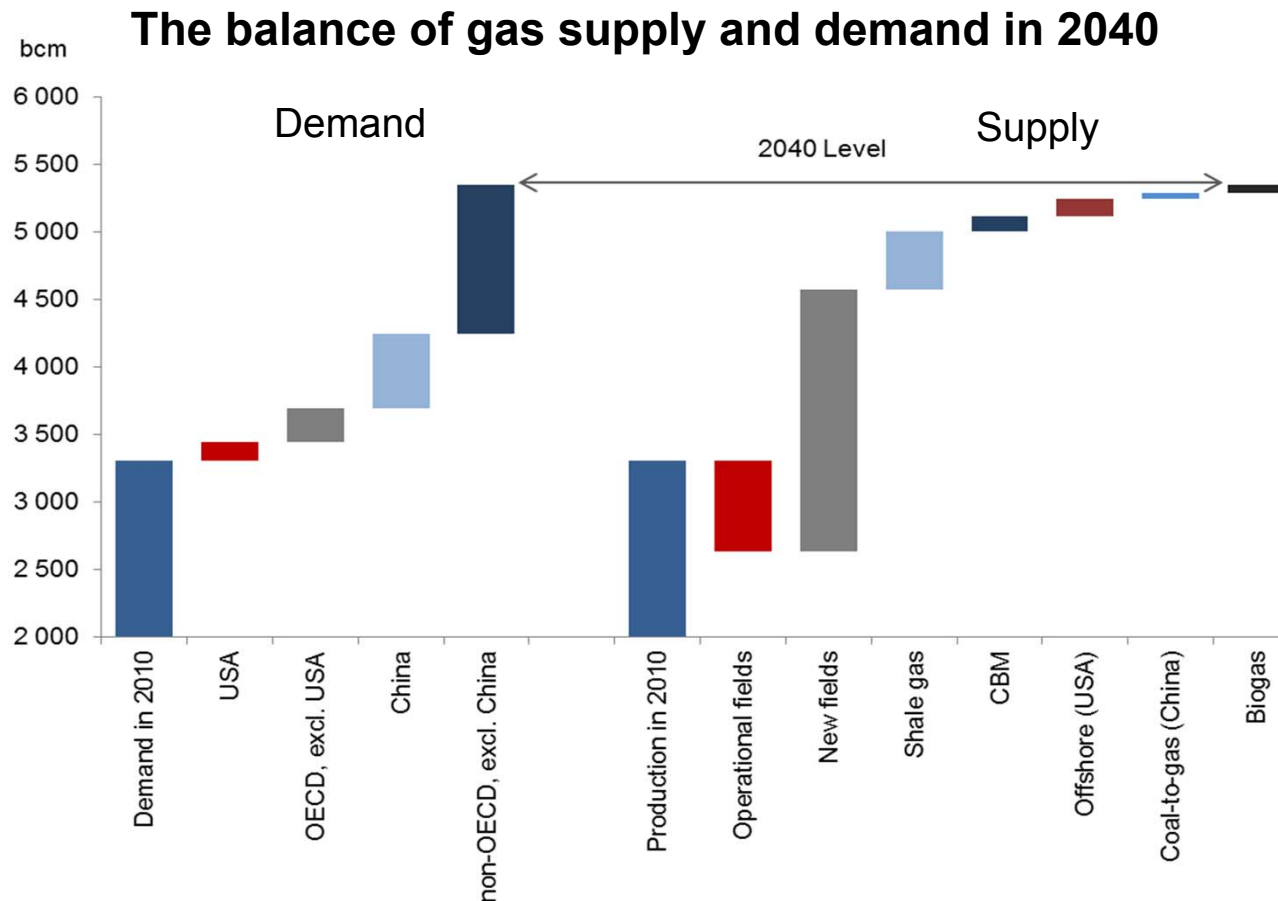
Tremendous shifts on the liquid fuels market



MORE THAN 60% OF INCREMENTAL DEMAND FOR LIQUIDS WILL COME FROM THE DEVELOPING ASIA. MORE THAN 70% OF THE INCREMENTAL SUPPLY WILL BE COVERED BY DIFFERENT TYPES OF UNCONVENTIONAL LIQUIDS. UNCONVENTIONAL OIL (SHAPE OIL, TAR SANDS OIL, ETC.) WILL REACH 16.4% OF TOTAL PRODUCTION - 837 MLN TONS BY 2040 – AND DRAMATICALLY CHANGE ALL STRUCTURE OF THE GLOBAL OIL TRADE AND PRICING.



Gas market remains more traditional



BY 2040 GLOBAL GAS DEMAND WILL INCREASE BY 60%, MAINLY DRIVEN BY THE POWER SECTOR, WHERE GAS IS AN IDEAL ENVIRONMENTALLY FRIENDLY FUEL TO COVER GROWING DEMAND FOR FLEXIBLE ELECTRICITY SUPPLY. ANOTHER EXTREMELY PROMISING GAS APPLICATION IS GAS USE FOR THE TRANSPORTATION SECTOR – IT IS DRAMATICALLY IMPROVE AIR QUALITY AND HAS MUCH SMALLER FOOTPRINT FOR LOWER PRICE. GAS SUPPLY ADDITIONS WILL BE MAINLY PROVIDED BY THE NEW CONVENTIONAL FIELD DEVELOPMENT.



Global energy trends



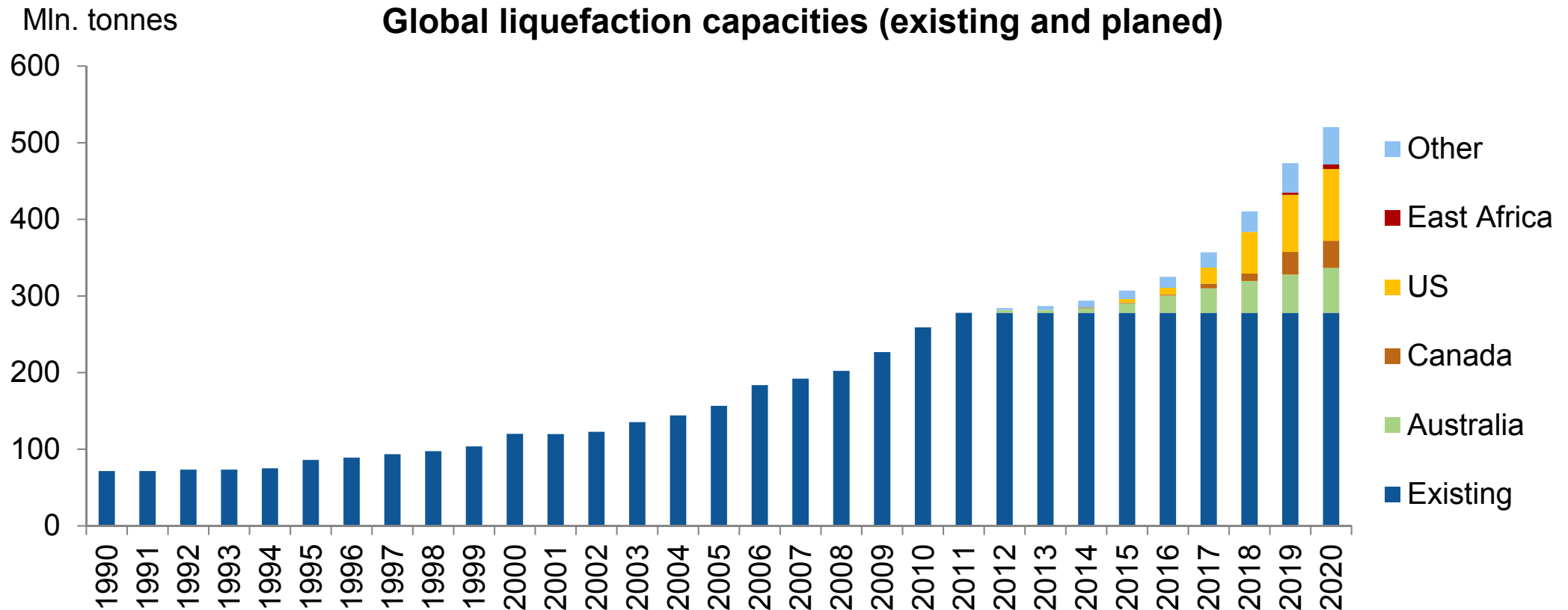
Hydrocarbon markets



LNG



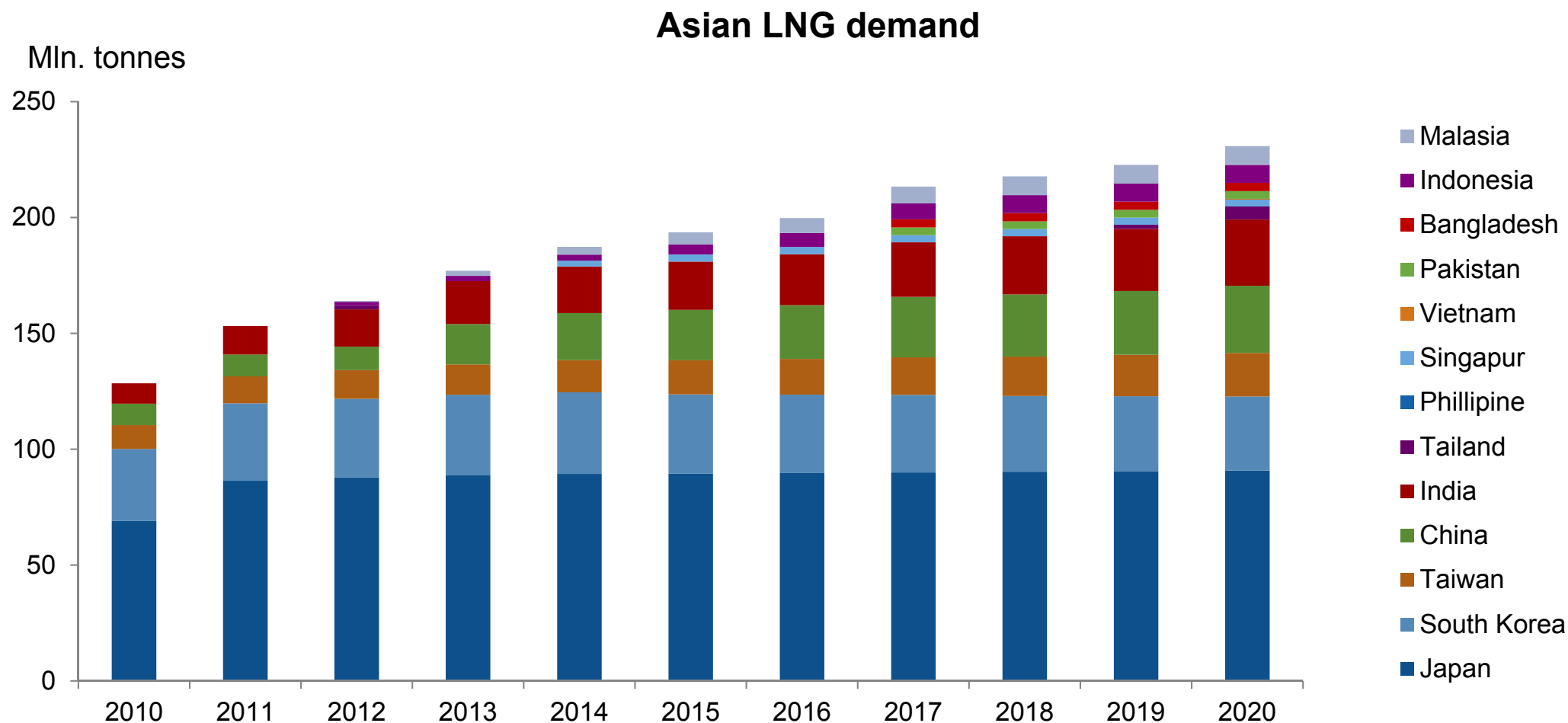
Global LNG supply is expected to boom



BY 2040 LNG WILL PROVIDE FOR NEARLY 60% OF THE INTER-REGIONAL GAS TRADE. NEW MAJOR PLAYERS IN THE LNG MARKET WILL EMERGE (THE USA AND CANADA; AUSTRALIA, WHICH WILL BY 2018 LEAVE QATAR BEHIND IN TERMS OF LIQUEFACTION FACILITIES; AND EAST AFRICA), WHICH COULD SIGNIFICANTLY REDIRECT THE ROUTES OF TRADITIONAL PRODUCERS, INCREASINGLY FOCUSING LNG EXPORTS ON ASIA – BUT WE DON'T KNOW WHICH PART OF THESE CAPACITY ADDITIONS IS SPECULATIVE.



Asian LNG market will show the highest growth rates with the new consumer-countries joining it

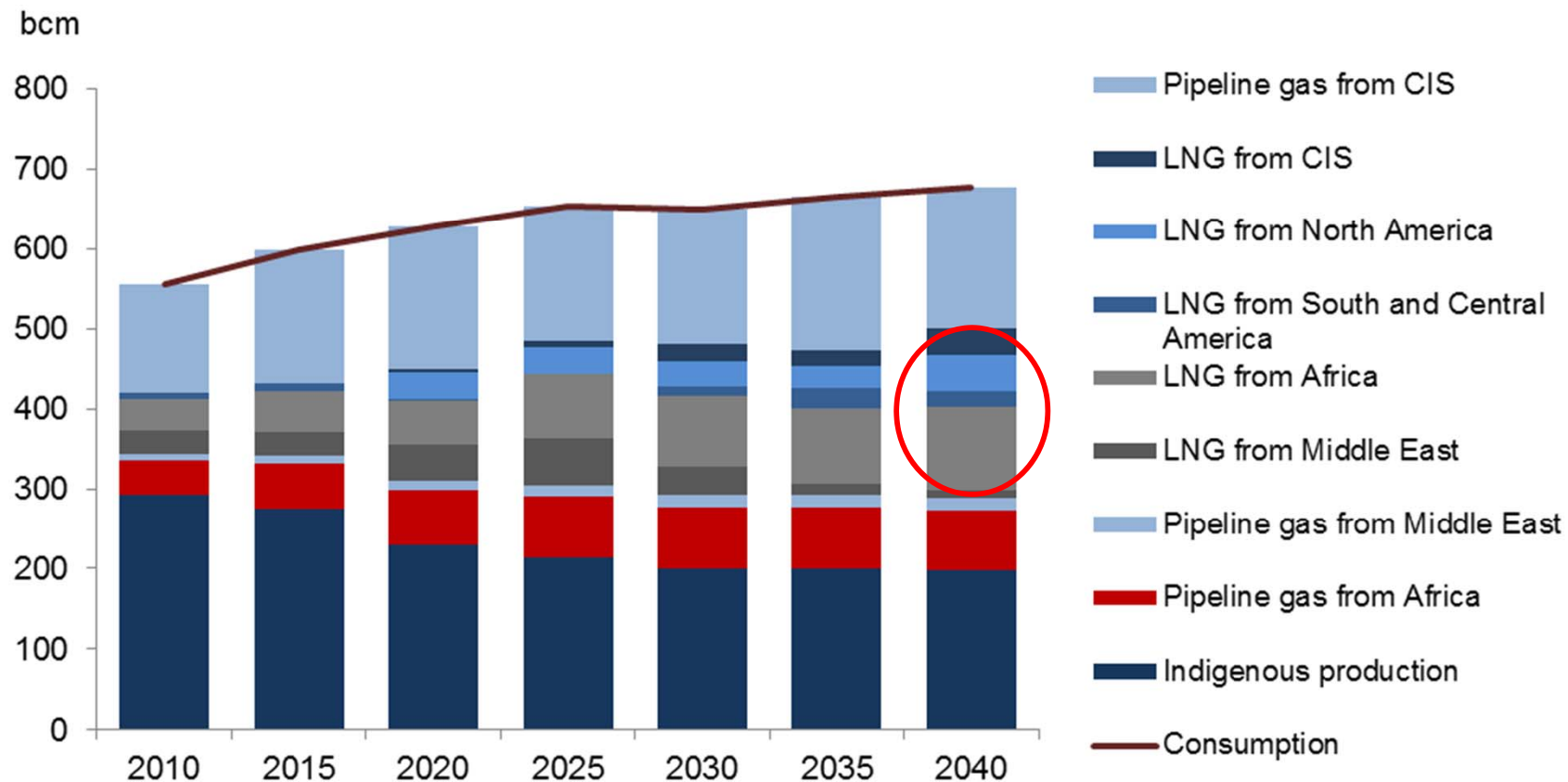


THERE IS A HUGE POTENTIAL FOR GAS CONSUMPTION GROWTH IN THE NEW DEVELOPING CONSUMER-COUNTRIES WITH VERY DENSE POPULATION AND INCREASING ENVIRONMENTAL PROBLEMS LIKE CHINA, INDIA, PAKISTAN, BANGLADESH, MALAYSIA AND INDONESIA, AND ETC. GAS CAN DRAMATICALLY IMPROVE THEIR QUALITY OF LIFE.



In the mature European gas market LNG will mainly serve to diversify supply sources

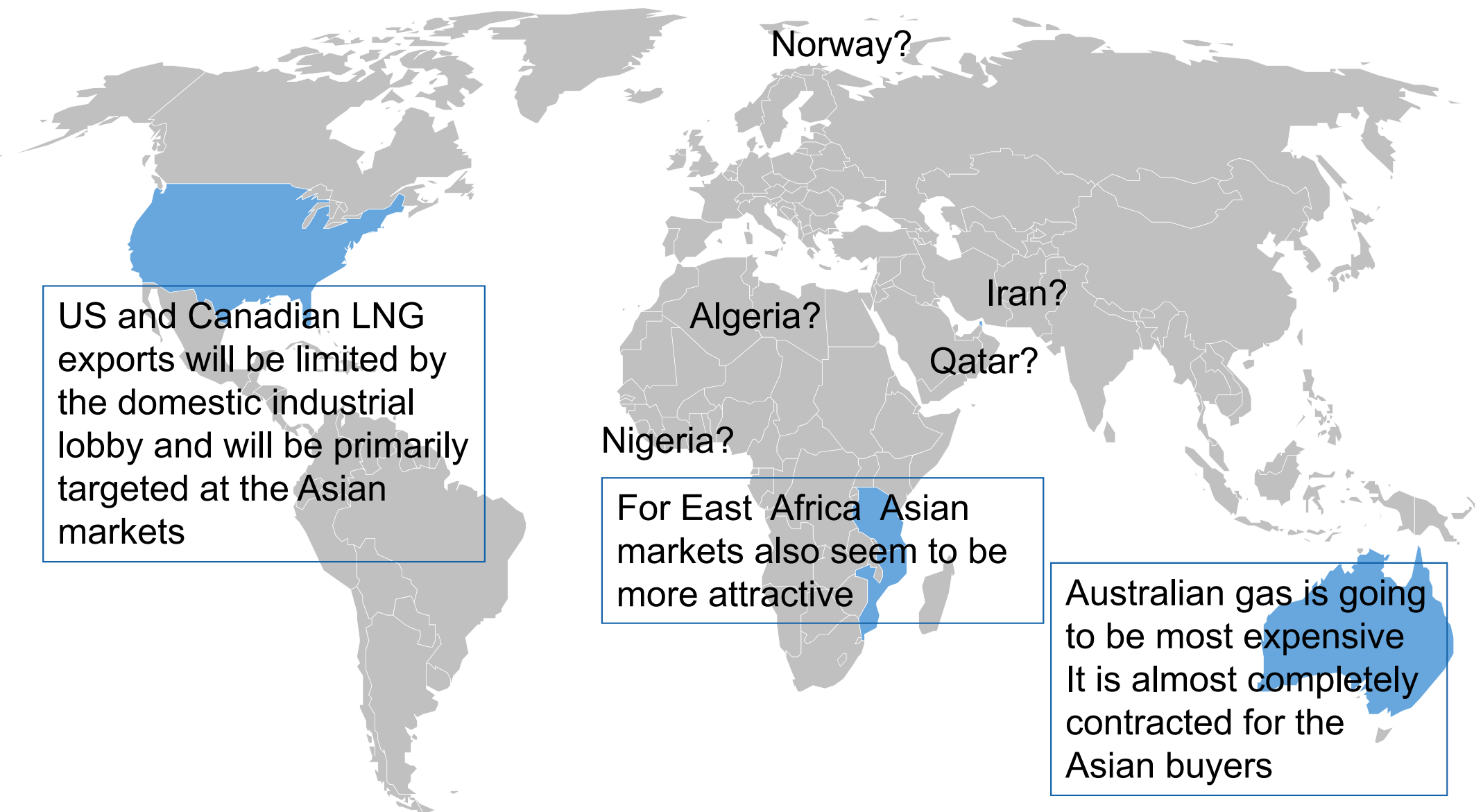
Gas balance in Europe



THE EUROPEAN MARKET WILL SHOW LOW RATES OF GROWTH, BUT AGAINST THE BACKGROUND OF WEAK DOMESTIC PRODUCTION ITS NEED FOR GAS IMPORTS WILL INEVITABLY GROW. SOME OF THESE NEEDS WILL BE COVERED BY PIPELINE GAS, BUT A GROWING SHARE IN GAS DEMAND (31% OF EUROPEAN CONSUMPTION BY 2040) WILL BE COVERED BY LNG SUPPLY.



Devil is in detail: where will new LNG to Europe come from?



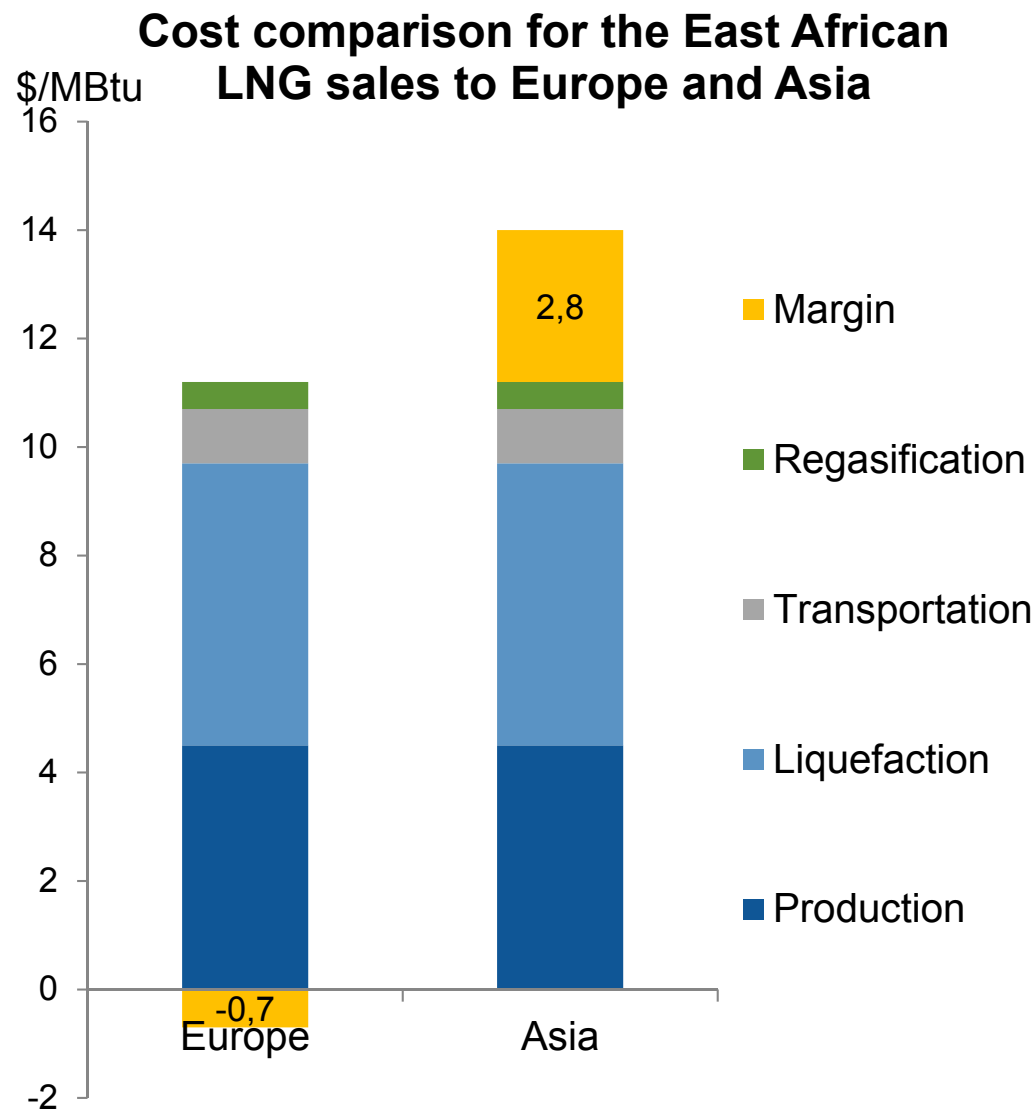
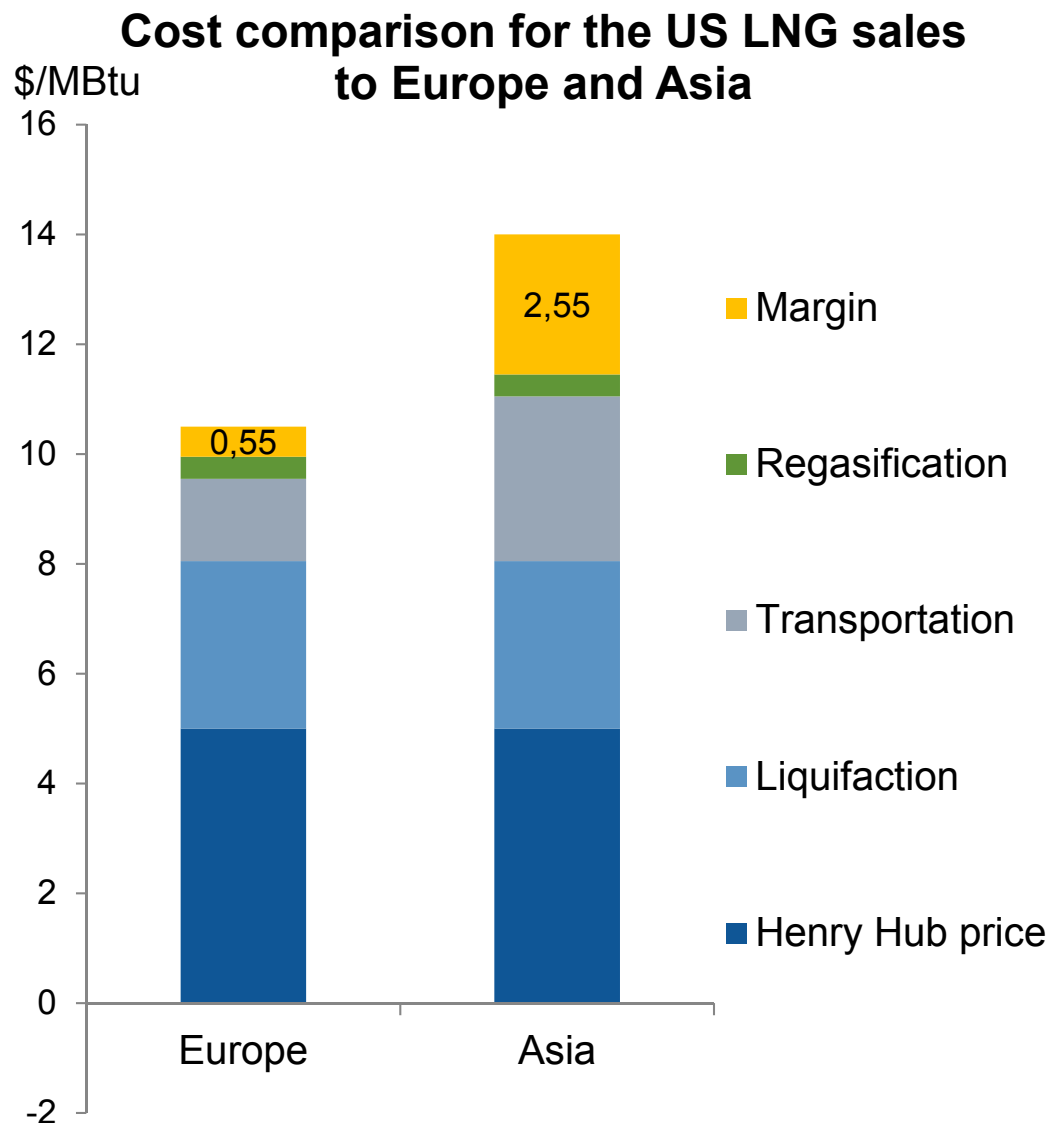
US and Canadian LNG exports will be limited by the domestic industrial lobby and will be primarily targeted at the Asian markets

For East Africa Asian markets also seem to be more attractive

Australian gas is going to be most expensive
It is almost completely contracted for the Asian buyers



Both for the North American and for East African LNG Asia seems to be much more attractive market





Conclusions

- ❑ Global energy markets are undergoing fundamental changes, with energy demand slowing down in the OECD countries and booming in the non-OECD countries. As a result, directions of the international energy trade will change considerably.
- ❑ Gas will considerably improve its role in the global energy mix – it will be the most demanded fuel in the long-run.
- ❑ There will be tremendous shifts on the liquid fuels market – shale oil promises to be a much more important game-changer than shale gas.
- ❑ International gas trade will be strongly driven by LNG. There are huge plans to expand LNG capacities (though part of these plans is speculative) and there is booming LNG demand in Asia.
- ❑ Assuming the costs of the projects and long investment cycle it is highly probable that the cyclical nature of LNG market will remain with the periods of oversupply and periods of LNG deficit.
- ❑ Import dependent Europe has to be very cautious with its LNG plans, as part of the potential LNG supplies are highly risky, and another part might be redirected to the more attractive Asian markets.



Energy Research Institute of the Russian Academy of Sciences (ERI RAS)

Институт энергетических исследований Российской Академии Наук (ИНЭИ РАН)

"Global and Russian Energy Outlook up to 2040"

http://www.eriras.ru/files/Global_and_Russian_energy_outlook_up_to_2040.pdf

"Прогноз развития энергетики России и мира до 2040 года"

<http://ineiran.ru/articles/prognoz-2040.pdf>