

Kazakhstan's gas market reform: major issues and legal aspects

28 December 2020

Shaimerden Chikanayev



GRATA
INTERNATIONAL

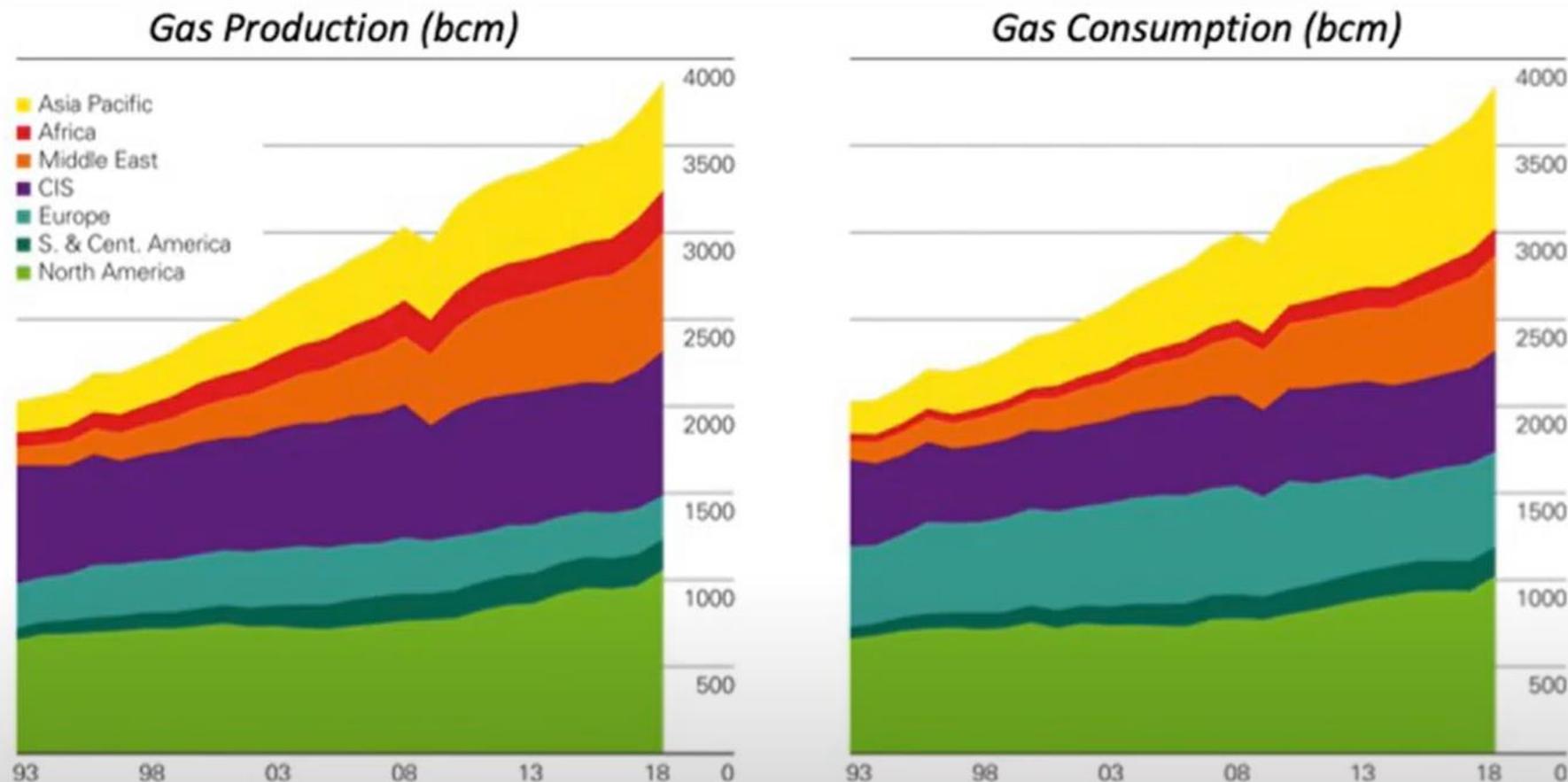


BESTPROFI
ИНФОРМАЦИОННЫЕ СИСТЕМЫ

I. Why Gas?



Gas production and consumption by region

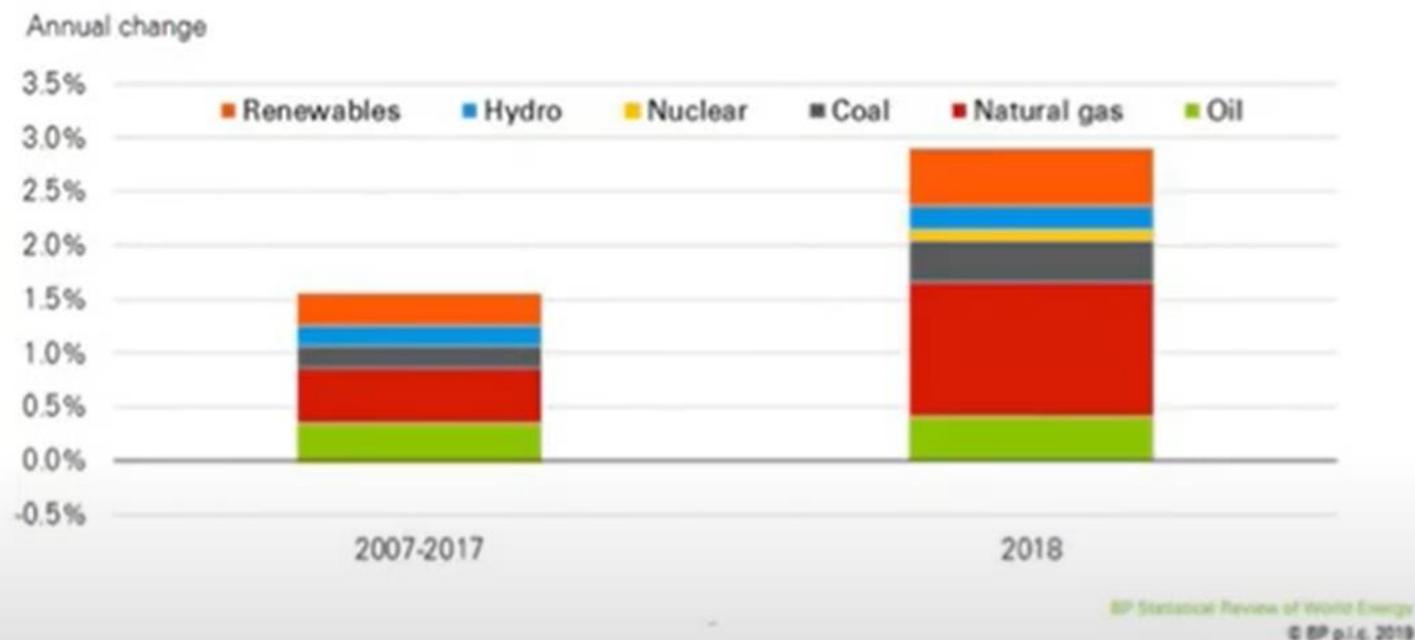


- Gas demand and production has seen a consistent increase over the past three decades
- The key recent trends have been increased output in the USA and rising demand in Asia, especially in China



The growth in gas as a share of total energy demand has been significant

Primary energy growth by fuel

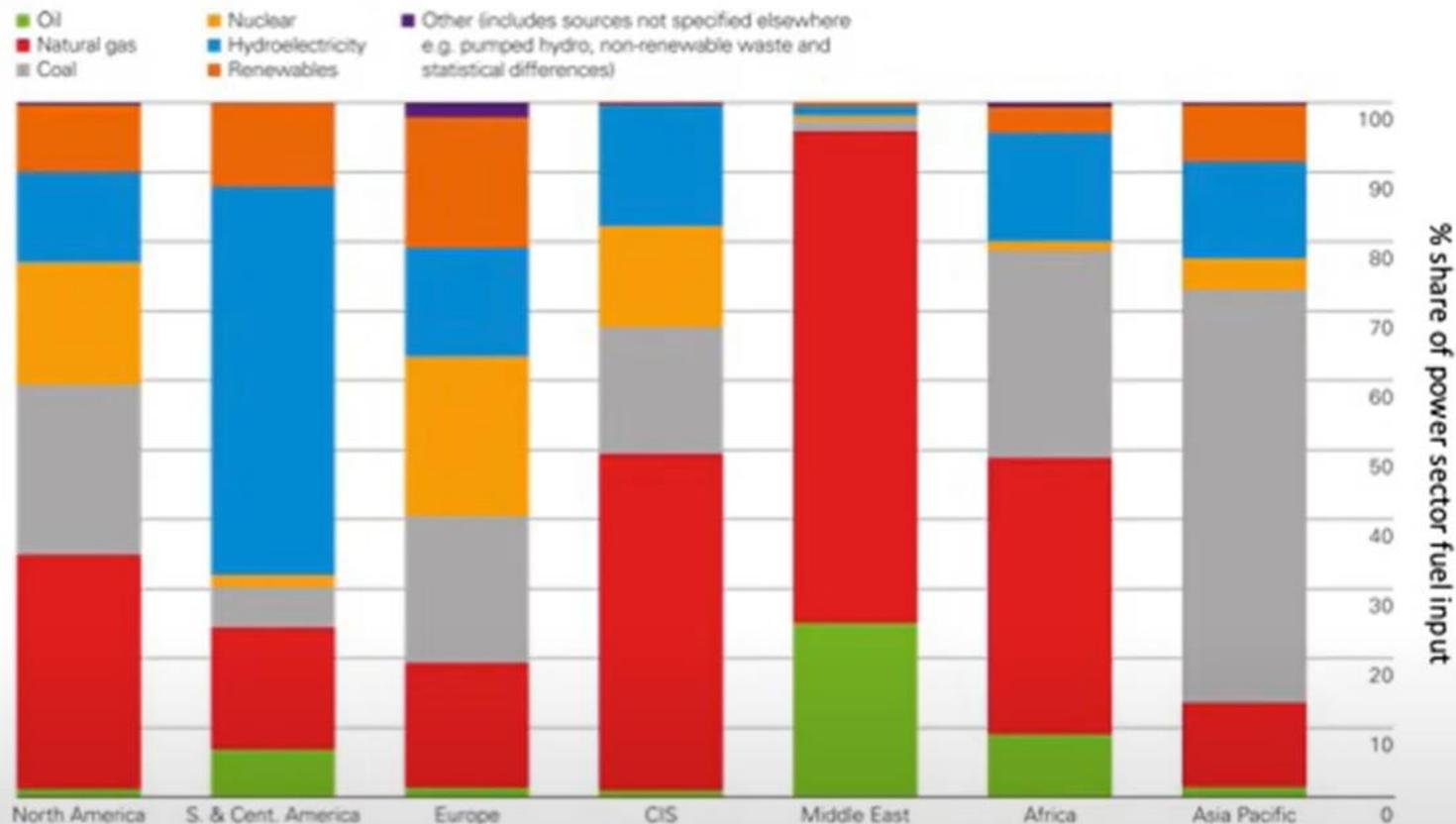


- Gas's role has increased thanks to its relatively green credentials, especially relative to coal
- In particular, it has helped to reduce emissions in Europe and the US and to improve air quality in Asia



Electricity generation by fuel and region

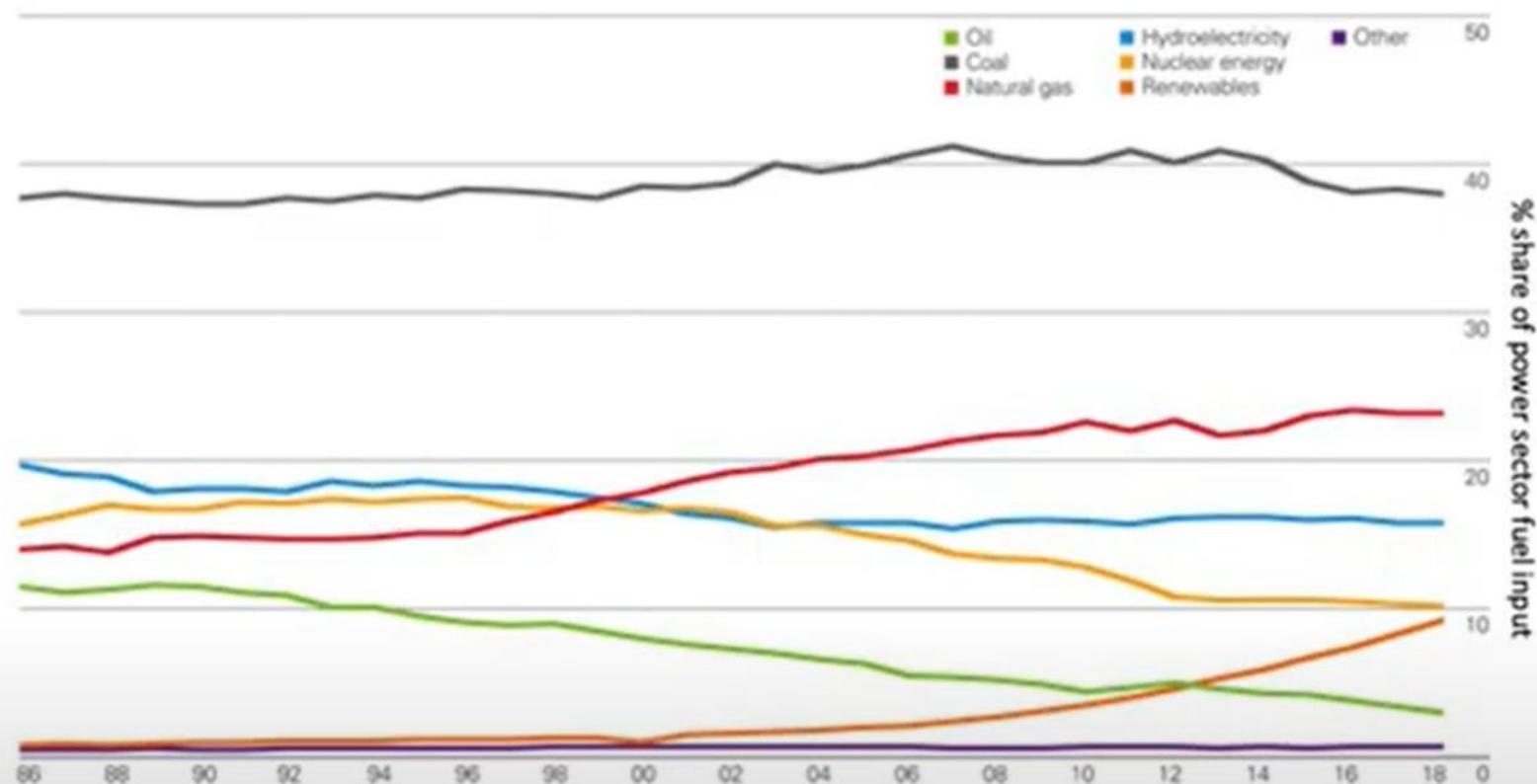
Press Esc to exit full screen



- The future of gas in the medium term looks reasonably robust, mainly because of changes in the power sector
- Coal to gas switching is becoming a major trend, led by Europe and the US but now having an impact in Asia



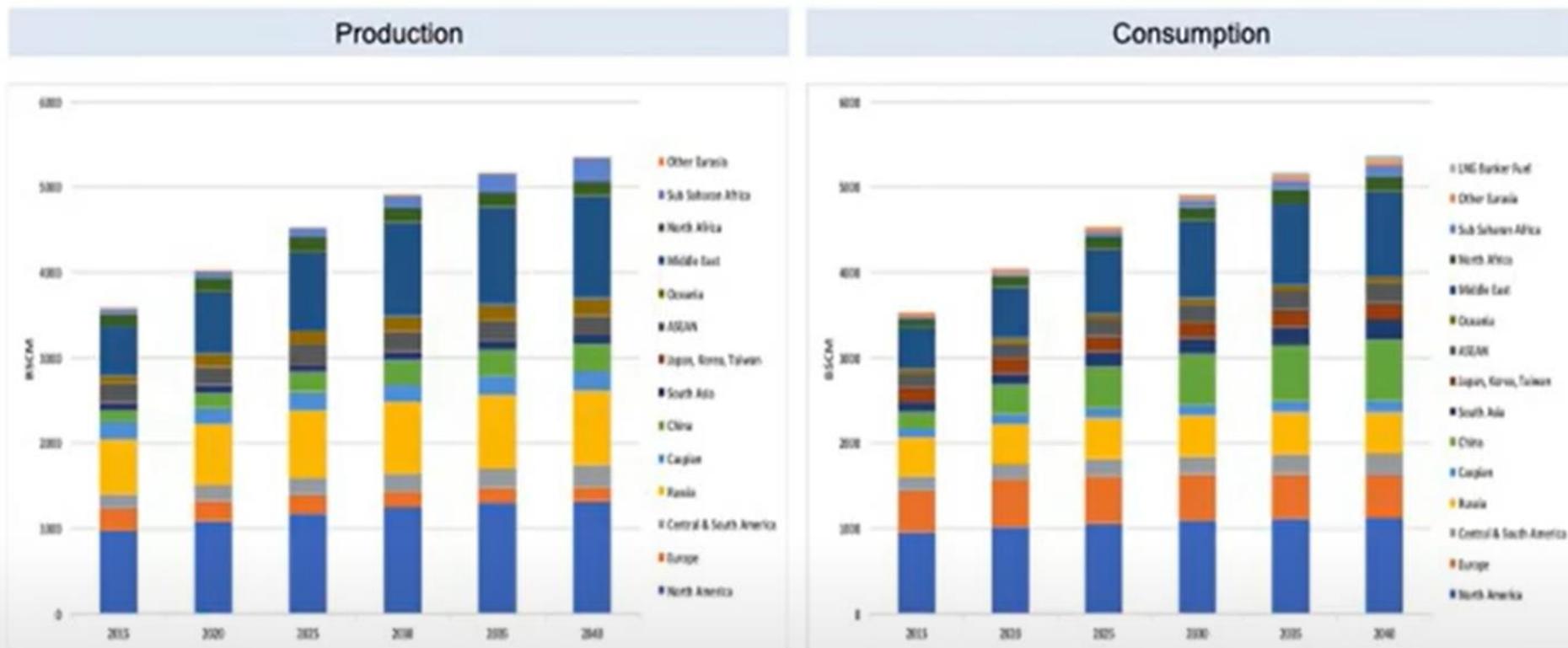
Share of fuels in electricity generation over time



- Coal is in generic decline, either for economic or political reasons
- Renewables is on a rapid growth trajectory, but gas is also increasing its share of inputs to the power sector
- The key question is how long this can continue, as it is a carbon-emitting fuel



World Gas Supply – Demand to 2040 – a positive outlook

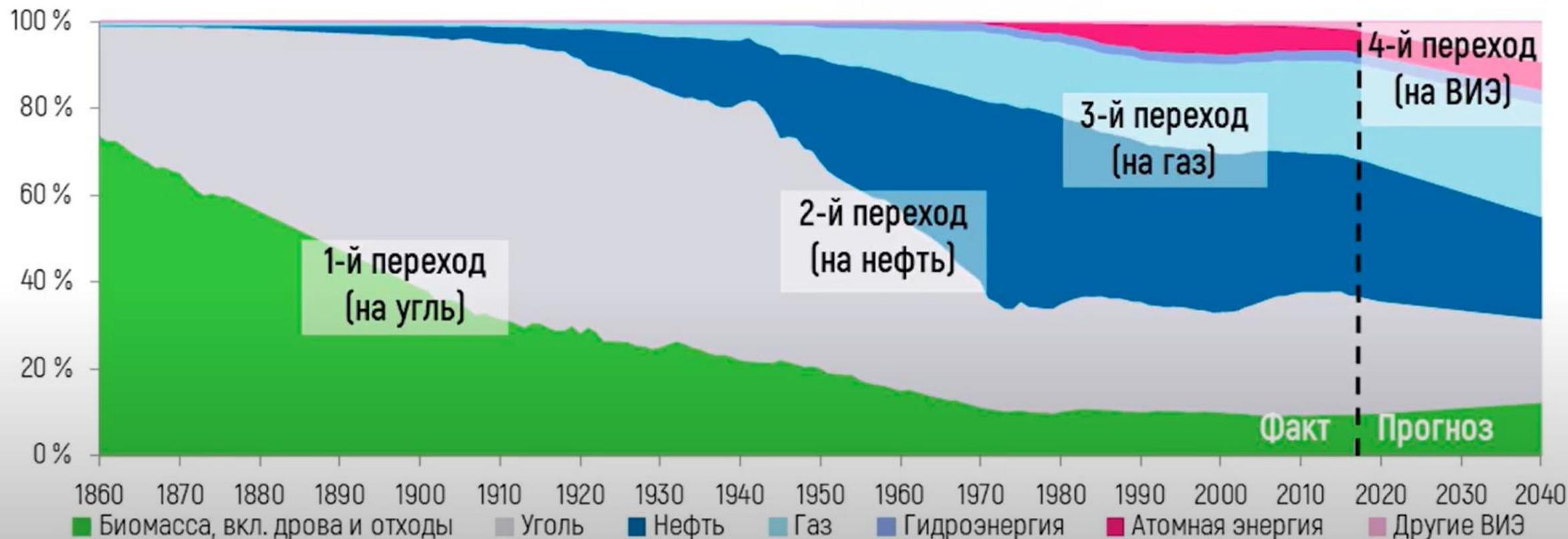


- World consumption passes 4 tcm in 2020 and 5 tcm in early 2030s
- Fastest growing regions are China and Middle East
- Production growth in North America, Russia and Middle East
- Middle East consumption growth largely met by growing production

Sources:
IEA – Historic
OIES – Projections

Мир вступает в этап 4-го энергетического перехода к широкому использованию возобновляемых источников энергии (и вытеснению ископаемых видов топлива)...

ИЗМЕНЕНИЕ СТРУКТУРЫ МИРОВОГО ПЕРВИЧНОГО ЭНЕРГОПОТРЕБЛЕНИЯ ПО ВИДАМ ТОПЛИВА В 1860-2020 ГГ. И ЧЕТЫРЕ ЭНЕРГЕТИЧЕСКИХ ПЕРЕХОДА



...ОДНАКО ТЕМПЫ ЭТИХ ИЗМЕНЕНИЙ И СКОРОСТЬ ПЕРЕХОДА СВЯЗАНЫ С ВЫСОКОЙ НЕОПРЕДЕЛЕННОСТЬЮ.

Gas or renewable energy - what to choose?

- ❖ The share of natural gas in the total final consumption (TFC) in Kazakhstan was only 13% in 2018. In 2019 20.2% of all electrical power in Kazakhstan was produced by gas-fired power plants. Set goal is to reach 30% share by 2050.
- ❖ Kazakhstan pledged to increase share of renewable energy in domestic electricity generation from the current 2% in 2019 to 50% by 2050
- ❖ Conclusion: To get from the present fossil fuel to the renewable future, **Kazakhstan needs to first move at least from coal to natural gas**, to reduce emissions from coal and provide the population and the industry the energy it needs in the most cost-effective way.

II. Why to reform and how to reform?

What are the major problems of the energy sector of Kazakhstan?

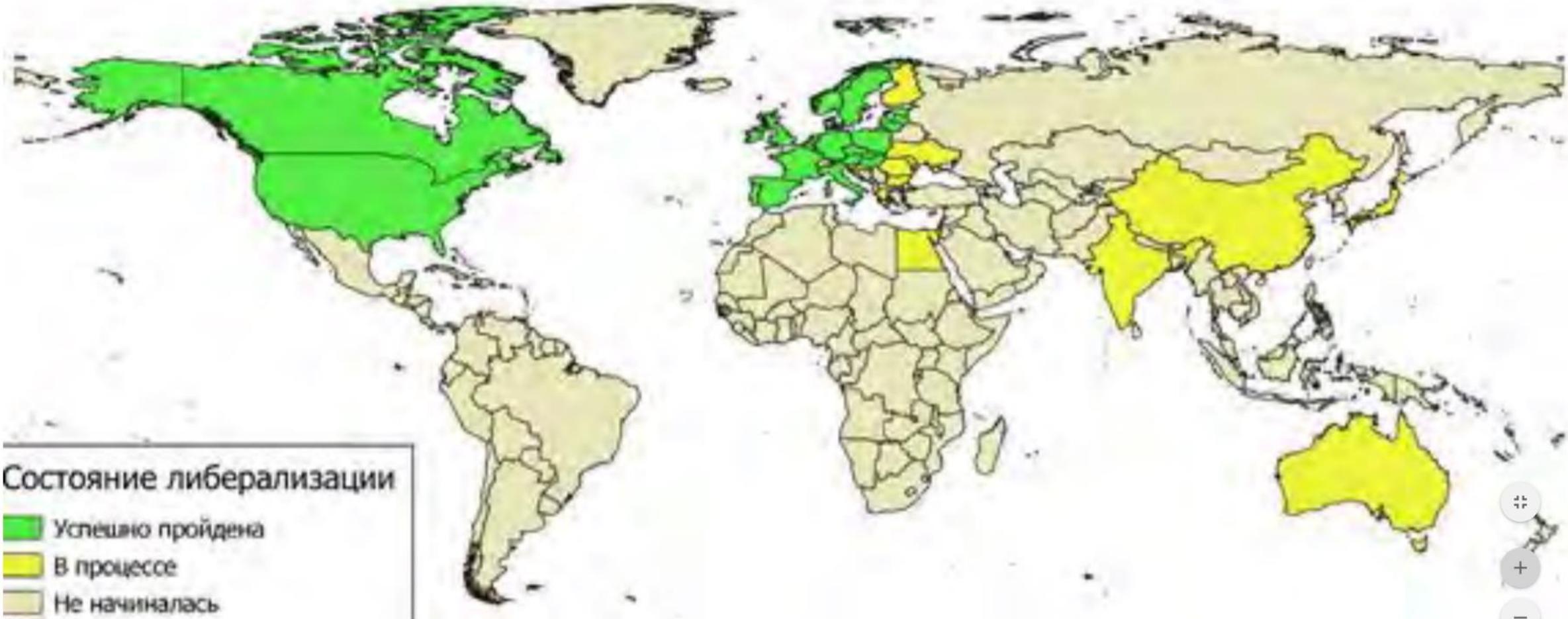
- ❖ Heavily statisted and monopolized (i.e. lack of market competition) economy, including in gas sector.
- ❖ Ever-increasing inefficiency and poor energy efficiency, largely because of practices some form of covert protectionism and cross-subsidization.
- ❖ Lack of transparency and lack of political will to proceed with long-overdue reforms and to introduce market competition, because energy sector (e.g. cheap gas) is used by Kazakh government as an “instrument” for political purposes (i.e. long-standing social contract between Kazakh population and Kazakh government).

Why Urgent Gas Market Reforms are Needed in Kazakhstan?

- The “new reality” of the COVID-19 pandemic (i.e. disappearing demand for gas in Europe and China and rock-bottom prices) and the looming official launch of the Eurasian Economic Union’s common gas market in 2025 require urgent gas market reforms.
- *Status quo* in the gas sector is not possible, because in a “new reality” KTG shall not expect same level of super profits from its export/transit of gas and, therefore, it means that soon KTG would not be able to play its current role of “instrument” and to bear its social burden of cross-subsidizing of local population and industries.
- Without reforms - no new foreign direct investments, no exploration and development of new gas fields, no further expansion of the gas networks, decline of gas production and domestic consumption after 2025, inefficiency and stagnation of the gas sector.

How to reform gas sector and what shall be the target (model) gas market for Kazakhstan?

- ❖ **European Union's** single gas market or **USA's** gas market on the basis of the Anglo-Saxon liberalization and privatization “textbook”?
- ❖ Or “**Middle East-style**” or “**Russian style**” selective reforms?



Источник: Центр энергетики Московской школы управления СКОЛКОВО

International Experience: Lessons Learned I

- ❖ Concepts “liberalisation” and “reformation” of a gas market are not coextensive”.
- ❖ Unlike “liberalisation”, “reformation” of the gas market does not require implementation of all specific measures, including TPA and unbundling, in certain sequential order.

Меры, необходимые в первую очередь (основа)

10 + лет ?

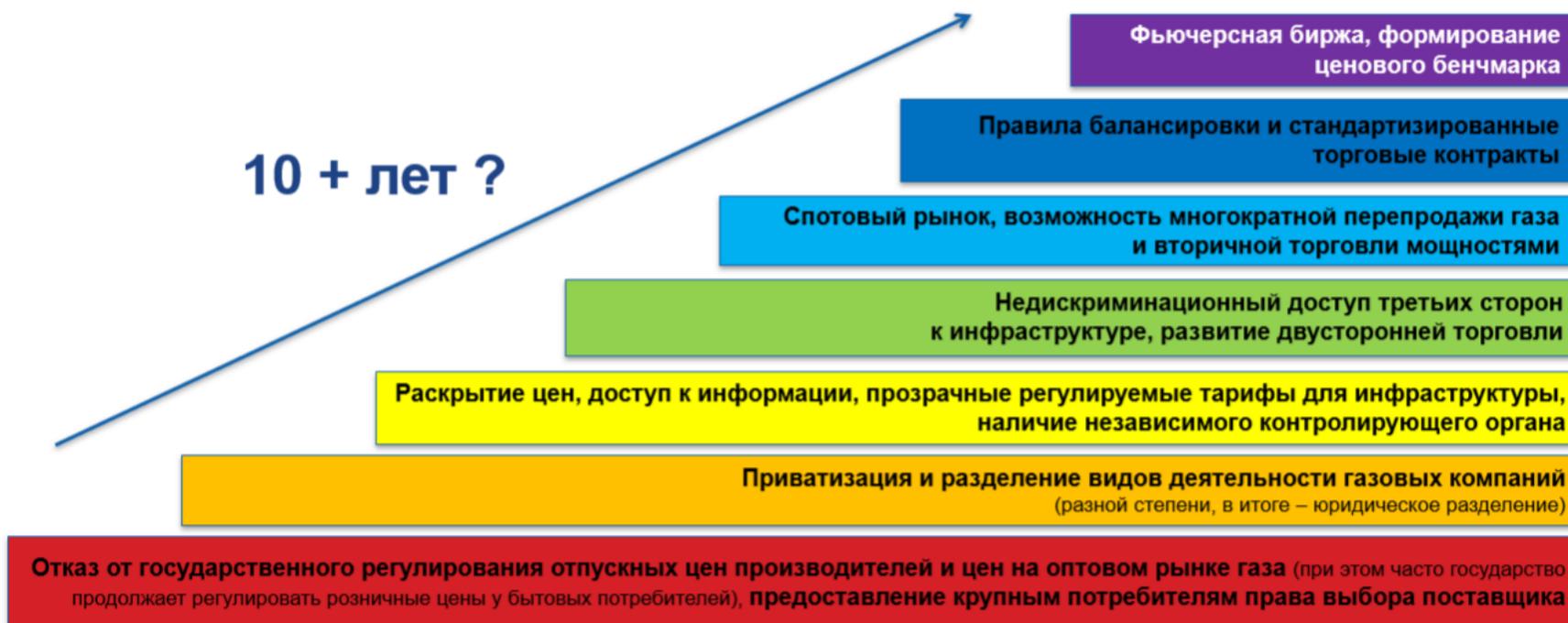


Рисунок 5. Основные пошаговые меры для либерализации

Источник: OIES [6]

Рисунок 6. Важнейшие дополнительные меры для либерализации

-  Законодательное ограничение на совмещение различных видов лицензируемой деятельности, строгое определение обязанностей газотранспортной компании
-  Регулируемый доступ и регулируемые прозрачные тарифы (трубопроводная инфраструктура, регазификационные терминалы и ПХГ)
-  Высокая степень детализации «правил игры»
-  Организация непрерывного процесса консультаций со всеми стейкхолдерами и корректировки нормативно-правовой базы; обучение работе в новых условиях
-  Предоставление качественных данных и наличие эффективной IT-инфраструктуры
-  Учет (metering), разработка механизмов выставления счетов, электронный биллинг, управление кредитными рисками поставщиков
-  Балансировка системы
-  Долгосрочное планирование и обеспечение безопасности поставок

Источник: Центр энергетики Московской школы управления СКОЛКОВО

International Experience: Lessons Learned II

- ❖ Objectives for “liberalization” and “reformation” of a gas market are different.
- ❖ The main objective of the reformation of a gas market by way of **liberalization** is to increase the efficiency of the industry and **reduce gas prices** due to increased **competition**.
- ❖ The main objective of the reformation of a gas market by way of **selective reforms** is a **reduction of cross-subsidization** and improvement of the **efficiency of public administration management**.

III. What is the History of Reforms of the Kazakh Gas Industry?

Soviet gas industry, built as a single mechanism





History of Reforms I

- What was given upon break up of the USSR: harsh climate, vast and sparsely populated territory, gas resources only in the West of the country and Soviet way of organizing gas industry .
- 1993 - the state holding companies "Kazakhgas" and "Alaugas" were established. Constant interruptions in gas supply.
- 1997 - the country's gas transportation system was transferred to the concession of the Belgian company Traktebel. Still constant interruptions in gas supply and Traktebel failed to meet expectations on investments in infrastructure.
- 2000 – KazTransGas (KTG) company was established and the entire gas transmission system of the country has been bought out for 100 mln. USD from Traktebel and transferred to KTG.

History of Reforms II

- 2003 – Kazakhstan starts to develop its transit potential. Contract between KTG and Gazprom on the transit of Turkmen and Uzbek gas through the territory of Kazakhstan is executed.
- 2009 - beginning of a large-scale modernization and expansion of the gas transmission and gas distribution network systems by KTG ("tariffs in exchange for investments" tariff methodology has been introduced in the natural monopoly legislation).
- 2013 - KazTransGas Aimak JSC has completed the stage of combining gas distribution networks in all regions of the country, becoming a single operator in the market of gas supplies to end consumers.

IV. What is Kazakhstan's Upstream Gas Market?

Gas Resources and Reserves

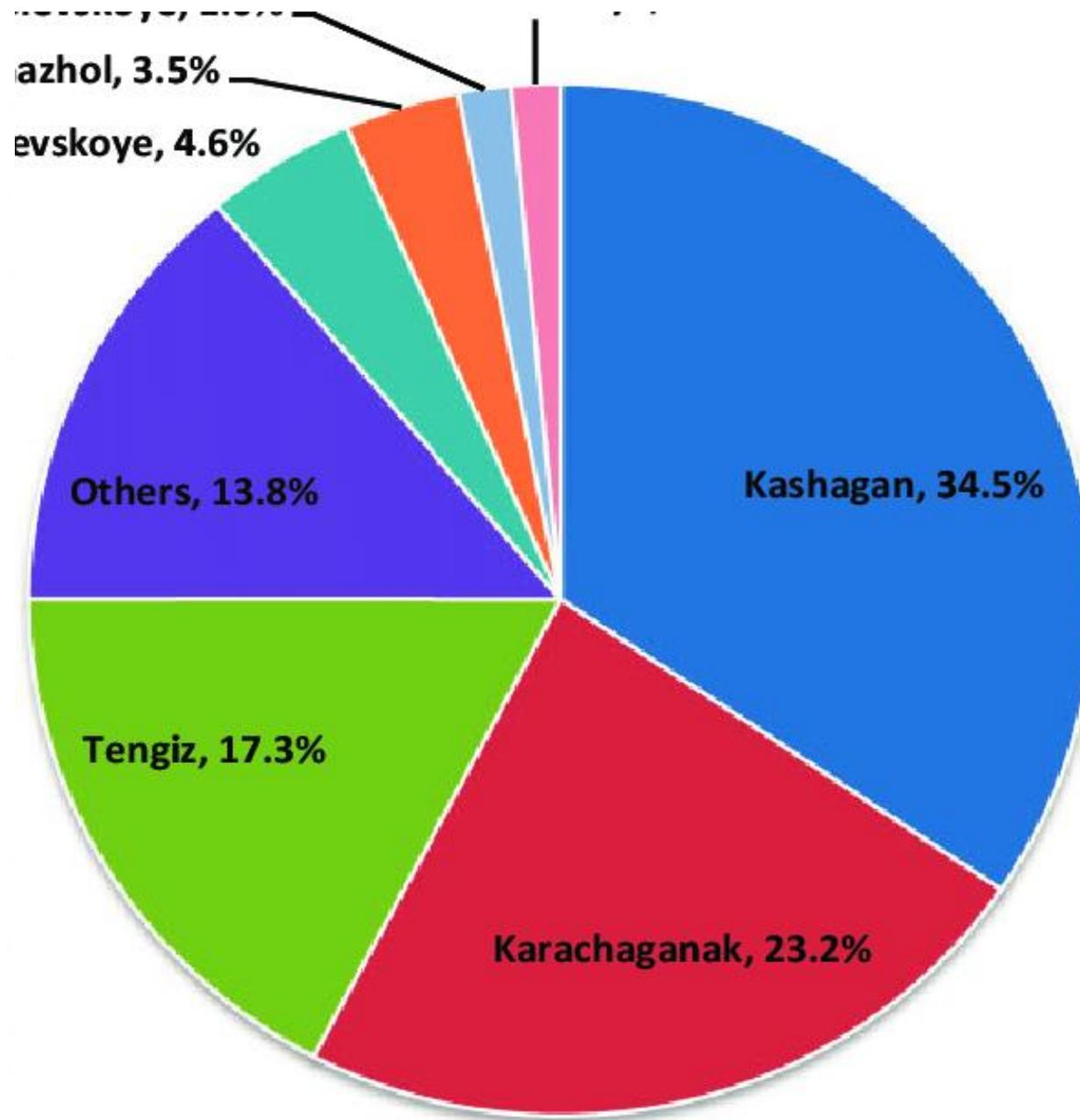
- Total proved reserves of natural gas at the end of 2019 in Kazakhstan - 2.7 trillion cubic metres.
- 90% of produced gas in Kazakhstan is an associated gas.
- 30% of Kazakhstan's gross natural gas production in 2019 was reinjected to increase oil production.
- The Kazakhstan's gas upstream market is moderately consolidated, and it is dominated by the "Big 3".
- As a general rule, burning of crude gas is prohibited (see Art. 146 of Subsoil Use Code).
- As a general rule, it is prohibited to extract hydrocarbons without processing the entire volume of crude gas produced. Unless otherwise specified in the subsurface use contract, the extracted associated gas is the property of the state (see Art. 147 of the Subsoil Use Code).

Major gas producers in Kazakhstan (Big 3)

- **Tengizchevroil LLP** that develops super giant Tengiz oilfield (272 billion cubic feet (bcf) dry marketed gas production in 2017)
- **NCOC** develops Kashagan field, the first major offshore oil and gas development in Kazakhstan (more than 100 bcf natural gas production capacity)
- **Karachaganak Petroleum Operating B.V.** develops Karachaganak field (about 300 bcf wet marketed gas production in 2017).

**"Big 3"
(about 75% of all
gas reserves):**

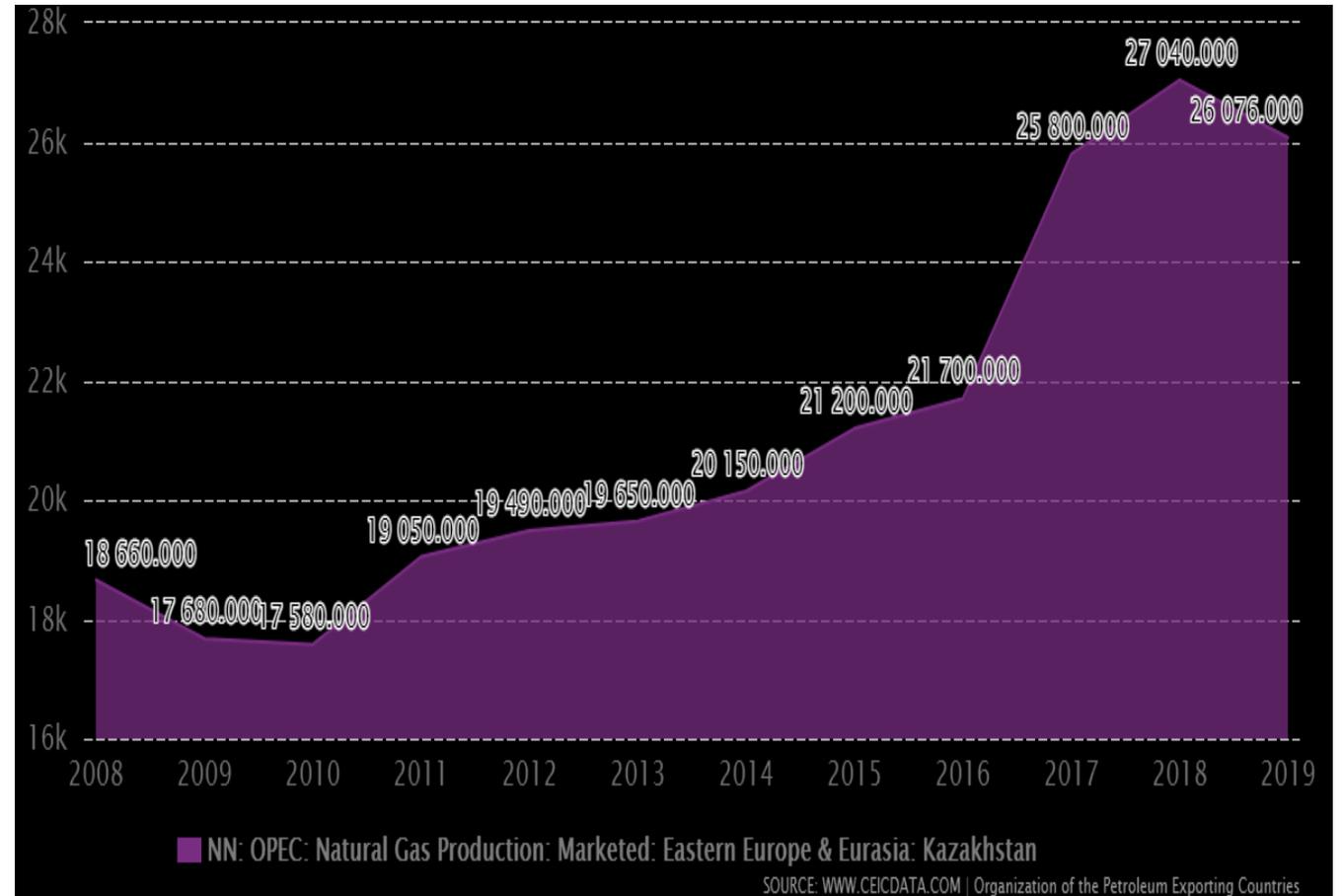
- 1) Tengiz field-
discovered in
1979.**
- 2) Karachaganak
field discovered in
1979.**
- 3) Kashagan field
discovered in
2000.**





Kazakhstan's natural gas production (gross extraction) increased from 19 billion cubic metres (bcm) in 2009 to **23.9 bcm** in 2018

For comparison – Gazprom alone produced in 2019 500.3 bcm



Domestic Consumption vs Export to China

- Domestic consumption of natural gas increased significantly, from 10.1 bcm in 2009 to 19 bcm in 2018 and it expected that Kazakhstan's domestic natural gas consumption will grow at about 1.9% per year on average out to 2040.
- Most of the gas delivered by pipelines in Kazakhstan is consumed in power generation (50%), followed by residential-commercial users (domestic sector) (36%), and industry (14%).
- **Tough choice** for the Kazakh Government – to continue to prioritize domestic consumption and in this way to receive less profit than one's due or instead opt for a more lucrative option of exporting limited gas volumes available to China at the expense of domestic consumption?
- Conclusion: urgent gas market reforms are needed if Kazakh government does not want to sacrifice one of the above.

press [esc] to exit full screen



Sairau Bizhanov

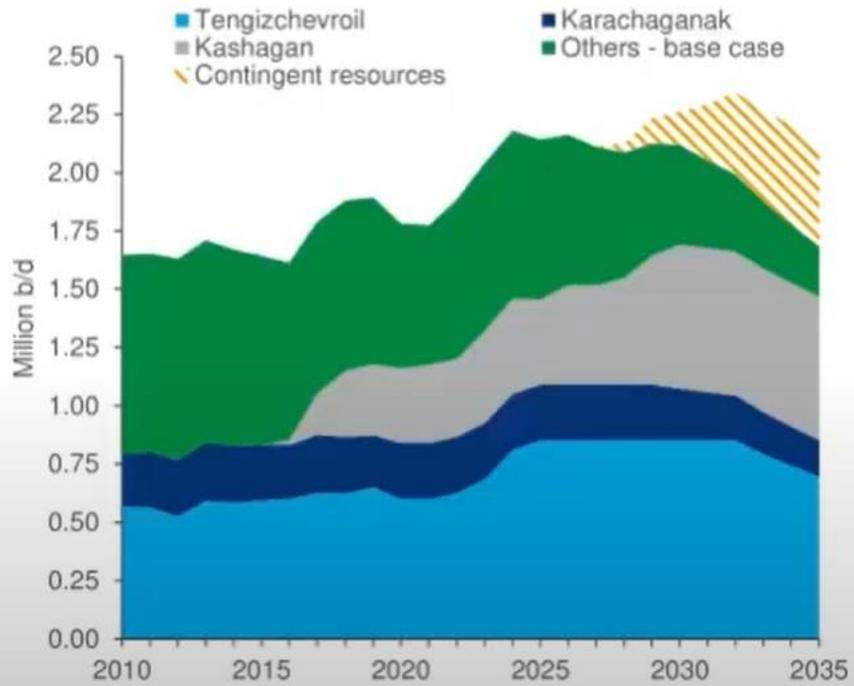
Kazakhstan upstream oil and gas

woodmac.com

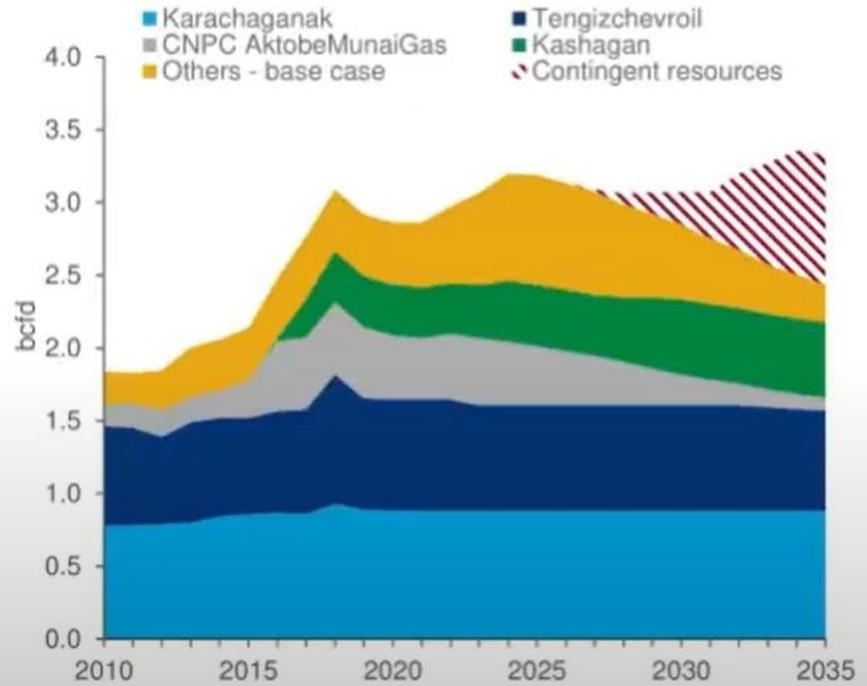
Kazakh production outlook for 2020s is comparatively robust

But a chronic need for further diversification of supply mix and improved commerciality for gas

Kazakhstan oil and condensate production



Kazakhstan sales gas production



Source: Wood Mackenzie Lens Upstream. Sales gas outlook accounts for marketed gas volumes only (net of re-injection etc.)

irene dallas

IRENE DALLAS - DALLAS AND CO SOLICITORS

Ania Wisniewska

Kairat Nurmolda

Excuse me my video doesn't work

KPMG in Kazakhstan and Central Asia

Kairat, please refresh the page.

V. What are Kazakhstan's Midstream and Downstream Gas Markets?



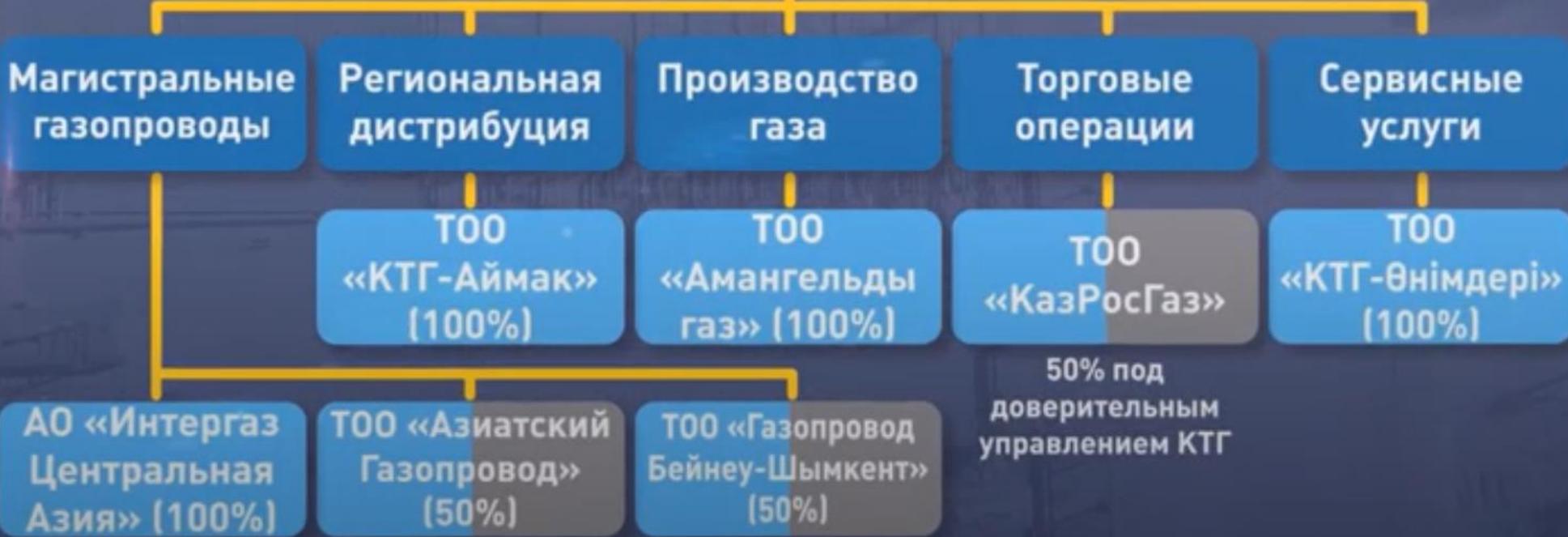
КазМунайГаз
NATIONAL COMPANY ҰЛТТЫҚ КОМПАНИЯСЫ

АО Национальная компания «КазМунайГаз»
(100%) (ВааЗ/ВВВ-/ ВВВ)



ҚазТрансГаз
ҒАЗ ЖӘНЕ ҒАЗБЕН ЖАБЫҚТАУ САЛАСЫНДАҒЫ ҚИТТЫҚ ОПЕРАТОР

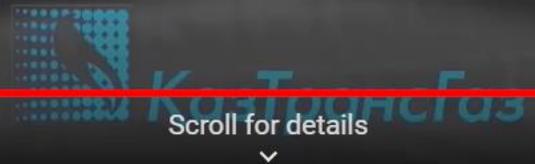
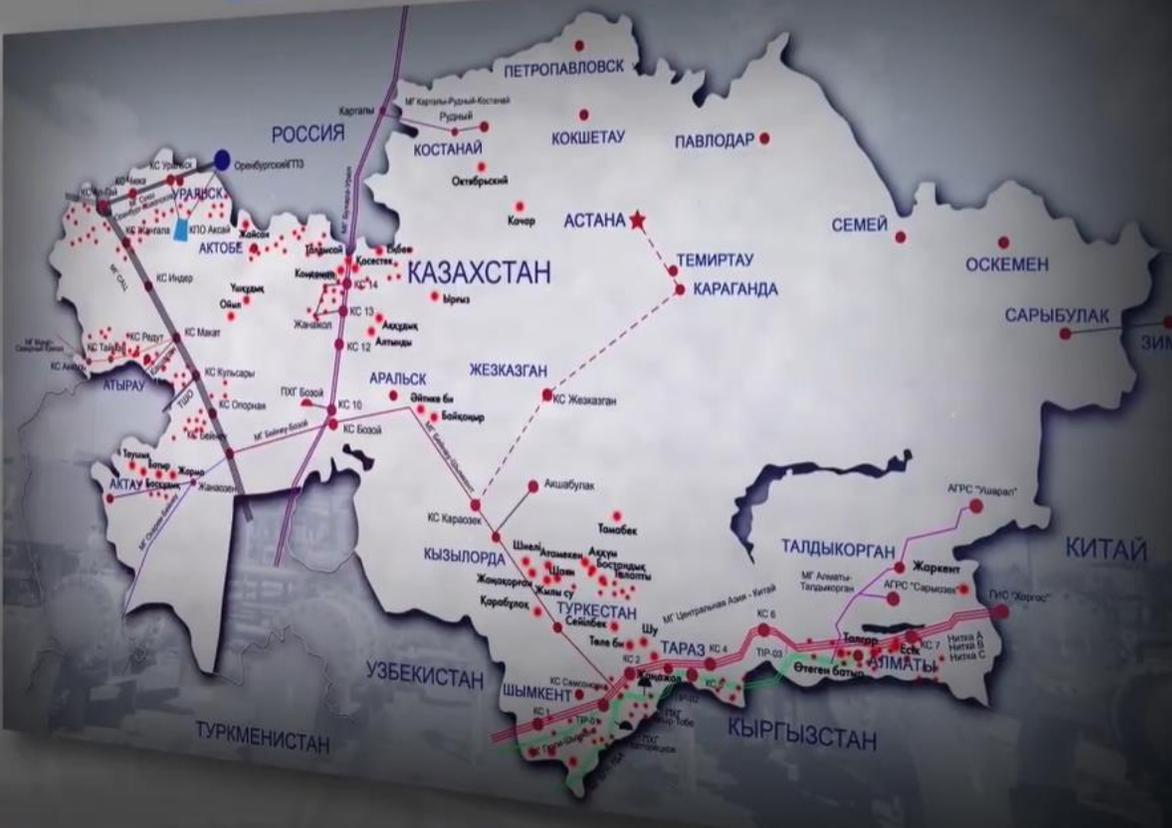
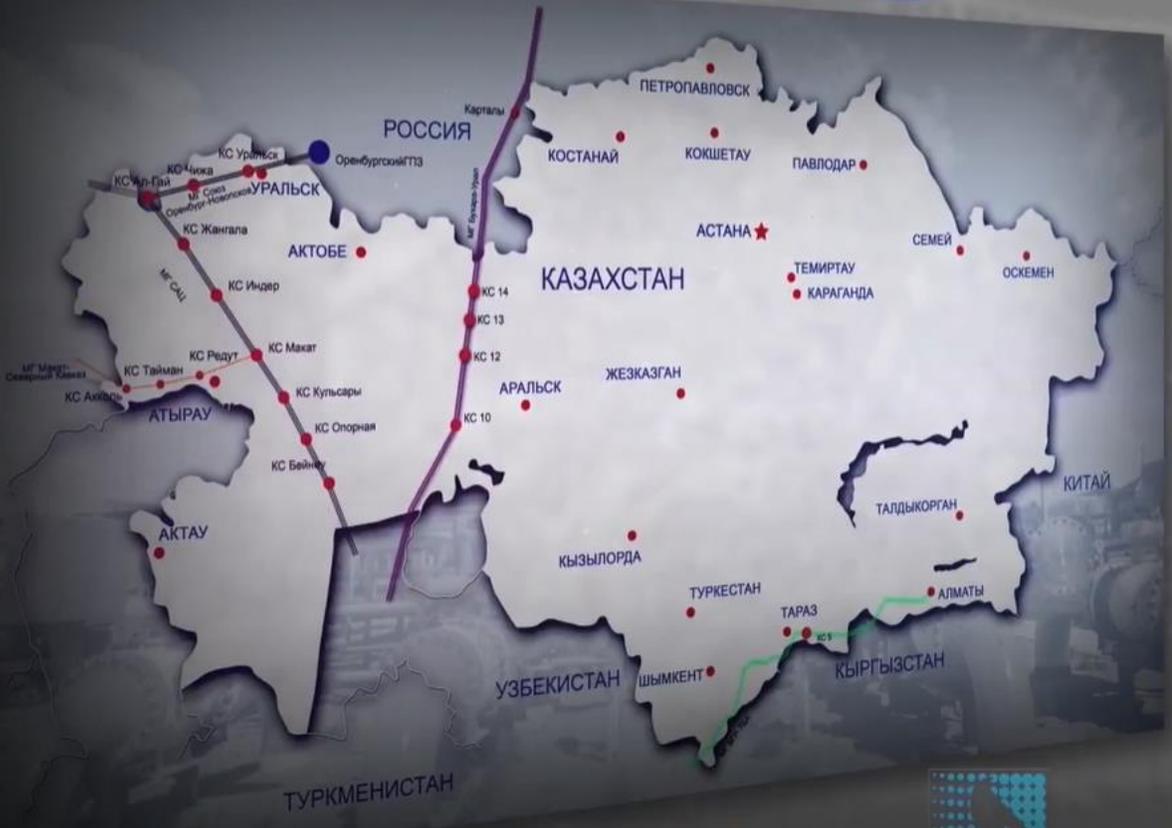
АО «КазТрансГаз»
(100%) (ВааЗ/ВВВ-/ ВВВ)



Unified Gas Supply System (UGSS) of Kazakhstan

- As of 2019 twenty-one subsoil users were connected to the UGSS.
- KTG operates the gas pipeline network with a total length of 19 146 km and an annual throughput capacity of 230 billion m³ and gas distribution networks of over 49 000 km.
- KTG also operates 3 largest underground gas storage facilities (Bozoy, Akyrtope, Poltoratskoye) with a total active storage capacity of 4.6 billion m³.
- Kazakhstan so far relies on gas imports from Russia and Uzbekistan to meet domestic demand: a gas-swapping arrangement between Kazakhstan and Russia entails the replacement of Karachaganak gas, which has historically been supplied to Orenburg for processing, with imports of Central Asian gas to the southern part of Kazakhstan and Russian gas to the Kostanay region.

2008 2018



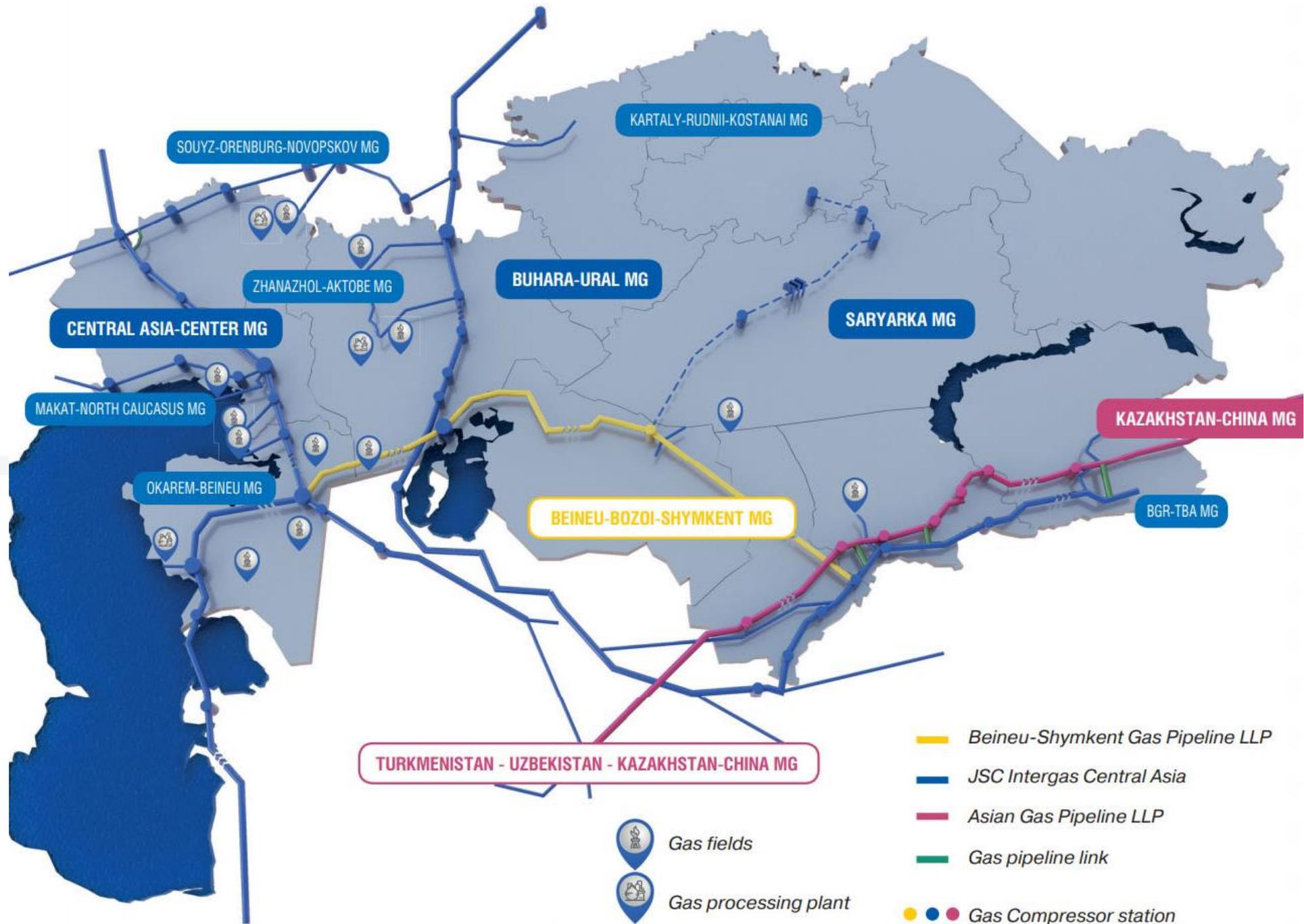
Domestic gas distribution network

- Kazakhstan's distribution pipelines reached a total length of 49,000 kilometers (km) in 2019. Still just about 9.5 million people out of 18.5 million population of Kazakhstan have access to gas in 2020.
- As of 2020, out of 16 of regions in Kazakhstan, 12 are already gasified regions, with the 4 remaining regions in the north and centre of Kazakhstan relying on coal and LPG.
- More than 3 million people have gained access to piped gas in the past seven years, with connections expanding from 30% in 2013 to **51.47%** in 2019. New target is 60% of population to get access to piped gas by 2025.
- **Beineu-Bozoy-Shymkent** and **Saryarka** trunk gas pipelines (south and, to certain extent, north of the country are now connected with gas producing west of Kazakhstan). There is now ongoing discussion with Gazprom to build a trunk pipeline from Russian to give access to piped gas to east of Kazakhstan (2.1 million people).



Export and Transit Network

- Contribution of the gas industry to the country's GDP has reached 1.8% in 2019 and it is expected to double by 2030.
- Two of the three longest main gas pipelines in the world nowadays pass through the territory of Kazakhstan:
 - 1) **Central Asia-Centre** Gas Pipeline System which traverses the western edge of Kazakhstan on its way to Russia and points further west to Europe; and
 - 2) the **Kazakhstan-China** pipeline which traverses the southern edge of the country on its way to China.



Gas Export and Transit to China

- Special legal framework has been created for Kazakhstan – China gas pipeline project by way of international agreement.
- Kazakh export of gas reached a historical maximum of 9.5 bcm in 2019, of which 75% was exported to China.
- In 2019 China has replaced Russia as the main export destination for Kazakh gas.
- On 12 October 2018, Kazakhstan and China signed a five-year contract for the export of up to 10 bcm/y of gas via Central Asia-Centre China Gas Pipeline System (**CAGP**) during this period
- Many experts expect that Kazakh gas export to China will probably fall, from 7–8 bcm each to China and Russia in the early 2020s, to less than half that in the late 2020s.

МГ «Центральная Азия-Китай»



4:33 / 7:45

Scroll for details

⏮ ⏪ ⏩ ⏭ ⚙️ 🔍



▶ ⏩ 🔊 4:24 / 7:45

Scroll for details

🔇 📺 ⚙️ 🗉

VI. Proper Gas Market Design is Crucial



Contradictions between Gazprom vs. IGPs on the Russian domestic market

	Gas production	Gas sales (domestic market)	Transportation and storage	Social responsibility	Export (pipeline gas)
Gazprom	Growing fiscal burden. • Low MET rates for hard-to-extract gas projects only (e.g. Achim formation with Wintershall and OMV)	Regulated prices for industrial consumers, inability to offer more attractive terms to consumers. • Almost 90% share in SPIMEX sales	Monopoly position, transfer-pricing art.21 Federal Law №69 "About gas supply of RF".	Obligation to supply gas to low-margin regions; differentiated approach to prices indexation; gasification program; social responsibilities	Single export channel • BUT Potential challenges with new pipelines (TEP rules)
Independent gas producers	Lower MET rates	Satisfied with the current gas price regulation. • Not willing to increase sales on SPIMEX	Non-equal terms for IGPs in access to gas transportation and storage infrastructure, non-transparent tariffs, suppose tariffs are excessive.	Obligation in the regions of dominance	No access to export pipelines • Rosneft has resources in Eastern Siberia; • Rosneft and Novatek have agreements with European consumers (BP, EnBW)



Current Gas Market Design in Kazakhstan

- The Kazakh gas market continues to be organized on the basis of central command and control, and quasi-monopolistic principles, with KMG as the state-owned and vertically integrated oil and gas company dominating gas production, supply and transportation through its direct and indirect subsidiaries.
- The wholesale market for the sale of commercial gas is monopolized - the sole supplier of gas for retail sellers is KTG.
- The retail market is dominated (95% concentration) by KazTransGas-Aimak.



Is There Real Gas Market At All?

- 1) KTG as the national operator executes the state's statutory preemptive right and buys raw or commercial gas from subsoil users at the price determined in accordance with the statutory formula.
- 2) KTG sells than commercial gas to KazTransGas Aimak in all regions of Kazakhstan at the regulated wholesale prices, that are annually approved by the Ministry of Energy and are different for each region of Kazakhstan.
- 3) KazTransGas Aimak in its turn sells gas to the population and other consumers at final (i.e. retail) prices, that are regulated by the Committee on Regulation of Natural Monopolies of the Ministry of National Economy of the Republic of Kazakhstan (hereinafter – the “**CRENM**”) as “socially significant market”.

(see Art. 116 of the Commercial Code)

Major Shortcomings of the Current Gas Market Design I

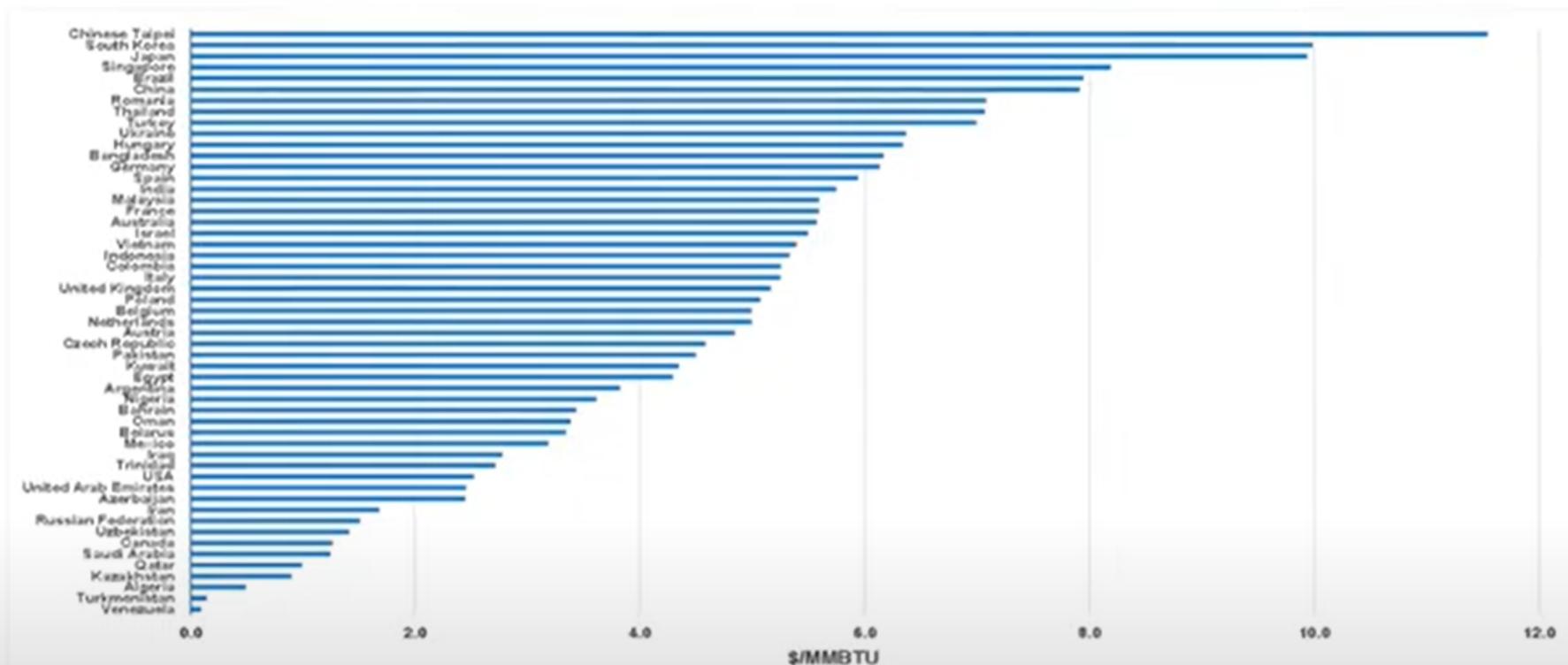
- 1) State regulation of the wholesale and retail gas prices and issue of cross-subsidization of local consumers at the expense of foreign consumers and of remote or poor regions of Kazakhstan at the expense of gas producing regions as well as Kazakh gas producers.
- 2) Lack of transparent and cost-reflective gas transportation tariff.
- 3) Undeveloped exchange (i.e. gas hubs) trading of natural gas.

Major Shortcomings of the Current Gas Market Design II

- 4) State's preemptive right of KTG and the need to liberalize gas exports.
- 5) Incomplete privatization and division of the activities of the monopolists (KMG and KTG) by type of activity (i.e. ownership unbundling).
- 6) Unresolved issue of non-discriminatory third-party access to trunk and distribution gas pipelines.

VII. Liberalization of Gas Prices in Kazakhstan – to be or not to be?

Оптовые цены в различных странах мира в 2019 году: Есть ли у природного газа общие закономерности в ценообразовании при таком разбросе цен?



Источник: IGU 2020 Report



Международный газовый союз (МГС) выделяет 8 механизмов ценообразования, половина из которых являются регулируруемыми ценами с долей в 30%. Два механизма являются рыночными.

Таблица 1 – Основные механизмы ценообразования в мировом потреблении газа

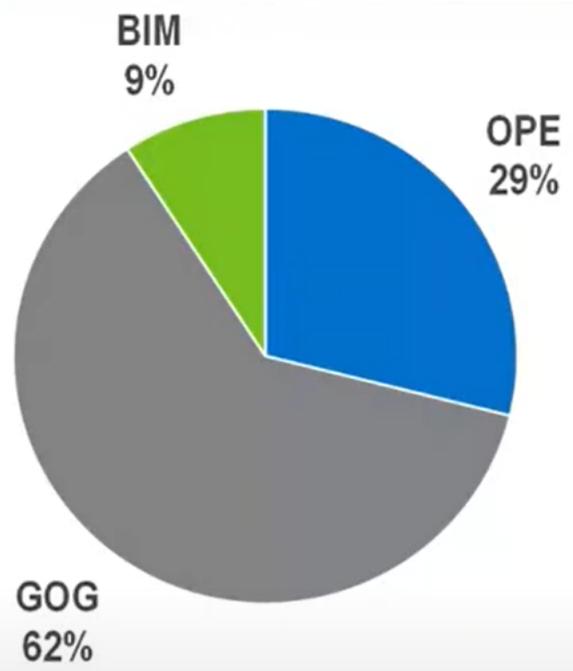
Название категории	Характеристика категории
Oil price escalation (OPE)	Цена, имеющая привязку к котировкам нефти и нефтепродуктов
Gas-on-gas competition (GOG)	Цена, определяемая взаимодействием спроса и предложения на газ
Bilateral Monopoly (BIM)	Цена, установленная в результате двустороннего соглашения компаний монополистов (поставщика и покупателя)
Netback from final product (NET)	Цена газа является производной от цены конечного продукта (например, аммиака или метанола)
Regulation: cost of service (RCS)	Регулируемая цена, покрывающая издержки и установленную норму прибыли
Regulation: social and political (RSP)	Регулируемая цена, установленная для реализации социально-политических целей
Regulation: below cost (RBC)	Регулируемая цена, установленная ниже уровня издержек
No price (NP)	Цена отсутствует (например, если газ выступает субпродуктом или осуществляется поддержка отдельных групп населения)

Источник: IGU 2020 Report



Рыночные механизмы ценообразования доминируют в международной торговле трубопроводным газом

Press Esc to exit full screen



Источник: IGU 2020 Report



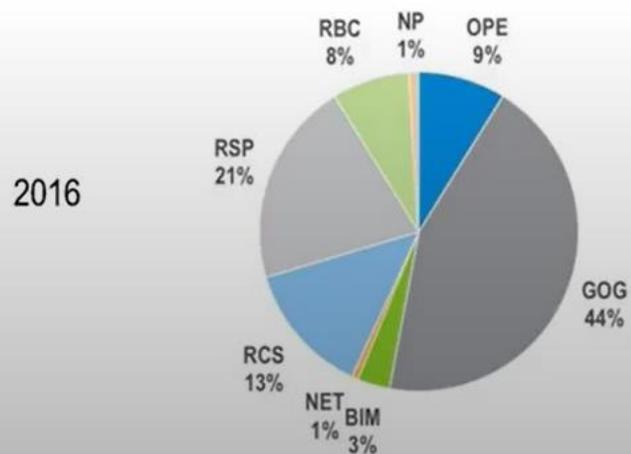
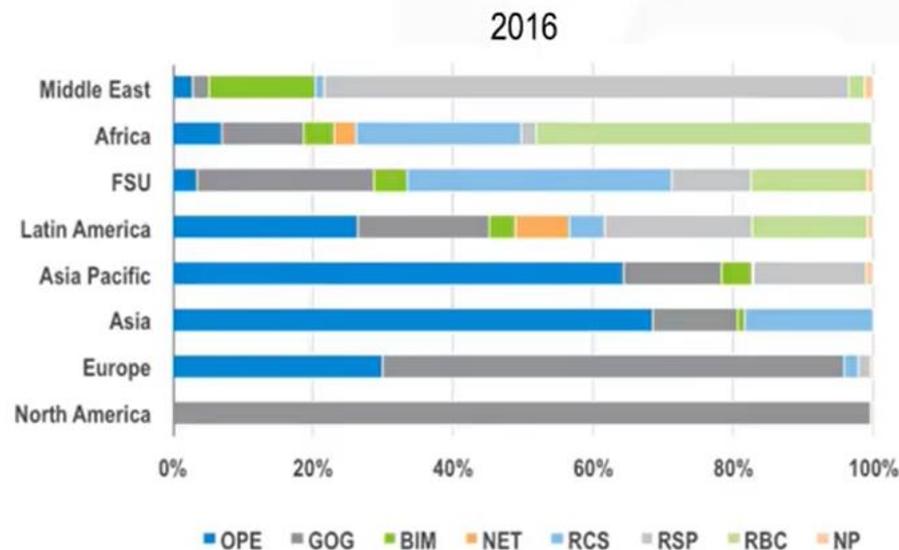
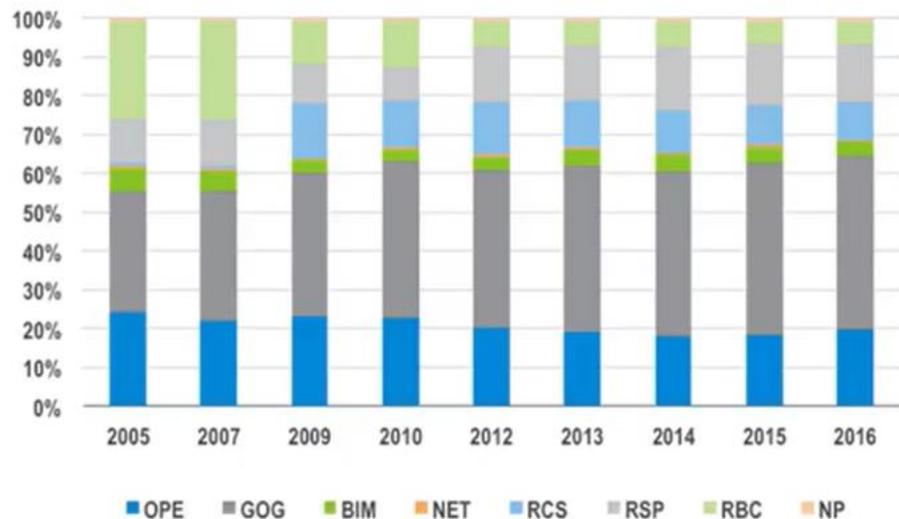


Газовые модели ценообразования для международной торговли газом: старые стены рушатся





Газовое потребление: Ценообразование на основе фундаментальных показателей газовых рынков потеснило нефтяную индексацию, но доля регулируемых цен еще велика



Источник: Международный газовый союз

Gas Pricing - Russian Experience

- 1) Russian Energy Strategy provides for step-by-step transition from regulation of wholesale gas prices to market pricing mechanisms.
- 2) For now, Russian domestic gas market consists of regulated and unregulated segments: Gazprom and independent gas producers.
- 3) SPIMEX – success or failure?
- 4) Gradual switch from RBC to GOG.
- 5) Since 2014 the regulated pricing to the population saw a move to RSP.
- 6) In future “метод эталонных затрат” will be introduced for determination of gas transportation tariffs.

Gas Pricing and Transportation Tariffs Regulation in Kazakhstan

- 1) There are currently 3 layers of state regulation of gas prices in Kazakhstan
- 2) Current gas pricing model in Kazakhstan is RBC.
- 3) No gas exchanges/hubs in foreseeable future? Eurasian Trade System Commodity Exchange JSC (ETS)?
- 4) One of the biggest deficiencies of the current model of the Kazakhstan's internal gas market is the lack of the cost-reflective gas transportation tariffs (need to introduce new tariff methodology).

VIII. EAEU's Common Gas Market



What is the EAEU?

1. Eurasian Economic Union (EAEU) is an international organization created in 2015, that has its own legal capacity.
2. EAEU has its own (supranational) law and its own supranational bodies, including EAEU court.
3. EAEU is 1/5 of the world's gas reserves and more than 50% of the world gas exports.
4. EAEU's common gas market will be officially launched in 2025.

What is the EAEU's common gas market?

- Common gas market is a free purchase and sale of gas between businesses (suppliers and consumers) of the participating countries of the common market, that is secured by way of non-discriminatory access (TPA) of these businesses to the main gas pipelines in the territory of each state-members of the common market.
- In the EAEU's common gas market, unlike the EU's single gas market, domestic gas markets are preserved with a full-fledged national state regulation, as well as individual barriers to access to the national markets.

Proposed Approaches to Gas Pricing and Gas Transit Pricing in the EAEU

- 1) EAEU's gas market target model expects that all EAEU member countries would switch at some point in future from regulation of wholesale gas prices to regulation of gas transport tariffs.
- 2) EAEU Treaty does not clearly provide gas price setting model for the future common gas market, but only fixes the desire of the EAEU member states to achieve **equal netback pricing** on the territory of the EAEU.
- 3) EAEU Treaty is not clear whether it understands “equal netback pricing” as a pricing model or price level.
- 4) Unified gas transportation tariff in the EAEU?
- 5) Abolishment of gas price regulation in the future and SPIMEX and ETS as hubs?

Competing interests of the EAEU member-states

- Russia and Kazakhstan, apparently, are still not ready for equal treatment of all consumers on the EAEU's common gas market, irrespective of their country of origin, because it means they would have first to abandon current practice of cross-subsidization and to establish **fair competition** in their respective domestic gas markets.
- A failure to reform Kazakhstan's domestic gas market by 2025 will jeopardize proper functioning of the EAEU's common gas market.

Russia - Energy Empire



IX. Conclusions and Recommendations

Lack of political will?

- 1) Lack of political will in Kazakhstan, evidently, threatens long overdue gas sector reforms in Kazakhstan.
- 2) For some reason, however, there is no panel discussion in Kazakhstan on this topic, whereas in Russia expert community actively participates in discussion and different scenarios for reformation of Russian gas market have been prepared by, among others, Gazprom, the Center for Strategic Research (CSR) and FAS.

Need for Energy Strategy and Responsible State Body

- 1) Unlike Russia, Kazakhstan does not have comprehensive and up-to-date national energy strategy which clearly formulates the main parameters, aims, and directions of the current Kazakh energy policy, including deregulation of wholesale gas prices.
- 2) Like FAS in Russia, Kazakh Agency for Protection and Development of Competition (“**Competition Agency**”) shall be given explicit authority, in conjunction with the Ministry of Energy of Kazakhstan, to adopt the national energy strategy and to reform the gas sector by way of the introduction of competition.

What can be done as selective reforms?

- Separation of retail sales of gas from transportation through distribution networks (by analogy with the electricity supply market).
- Transfer of distribution networks of KazTransGas-Aimak JSC to the balance sheet of Intergas Central Asia JSC.
- Abolishment of the exclusive pre-emptive right of the KTG as the national operator.
- Fostering wholesale sales of gas through commodity exchanges (ETS).
- Introduction of the capacity market for gas transportation organizations.
- Abolishment of wholesale gas price regulation and instead introduction of the targeted subsidies to socially vulnerable segments of the population.

References and Recommended Reading I

- James Henderson, director of the Natural Gas Programme, Oxford Institute for Energy Studies
(<https://www.youtube.com/watch?v=xrxNoavNmJQ&list=PLZWnvmqHFxphEDUmGXmcjHp2ujmO3Hzml&index=21>)
- Ashley Sherman, Principal Research Analyst, Wood Mackenzie:
(<https://www.youtube.com/watch?v=gIk9yUdrirw>)
- Виталий Викторович Ермаков. Заведующий Центром изучения Энергетической политики Института энергетики НИУ ВШЭ
(<https://www.youtube.com/watch?v=ErKzloW1MTM&list=PLt3UHIQuQ6NZVvKlhsIPiRQC2CSG67mzc&index=16&t=36s>)

References and Recommended Reading II

- Мищенко Вячеслав
(<https://www.youtube.com/watch?v=Y7VwYWSovf4&list=PLt3UHIQuQ6NZVvKlhsIPirQC2CSG67mzc&index=5&t=847s>)
- Tatiana Mitrova, director, Energy Centre at the Moscow School of Management SKOLKOVO
(<https://www.youtube.com/watch?v=Pgb1McqaTXE&list=PLZWnvmqHFxphEDUmGXmcjHp2ujmO3Hzml&index=23>)
(<https://www.youtube.com/watch?v=8uEy8AhsOE4&t=2047s>)
<https://energy.skolkovo.ru/ru/senec/research/transformation/>

**ANY
QUESTIONS?**

Shaimerden Chikanayev

Advocate. Partner. GRATA Law Firm

Almaty, Kazakhstan

E-mail: schikanayev@gratanet.com

Mobile: +77017878020

