

The shift to the new paradigm of international energy development and its influence on the regulatory issues of the EU gas market

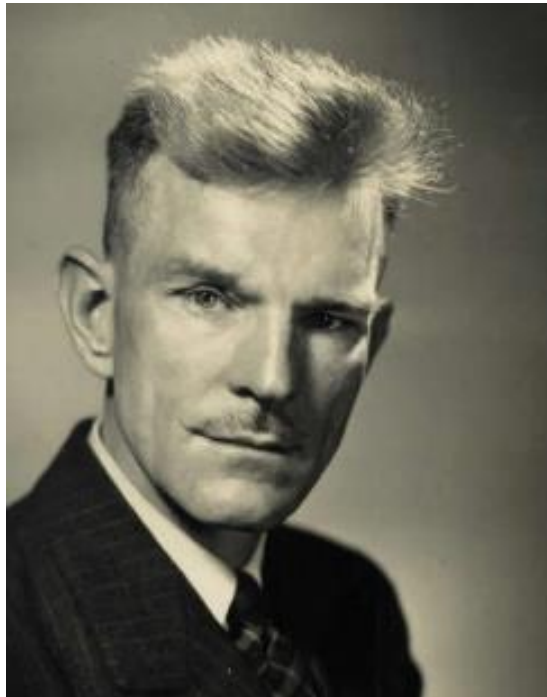
Prof., Dr. Andrey Konoplyanik,
Adviser to Director General, "Gazprom export" LLC;
Professor on International Oil & Gas Business,
Russian State Gubkin Oil and Gas University;
Co-chair Work Stream 2 "Internal Markets",
Russia-EU Gas Advisory Council

Presentation at the Seminar for Energy Regulators of Turkey, CEPMLP, University of Dundee, Scotland, UK, February 12-13, 2018

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**Past & modern paradigm of international energy development:
three classics (according to A.Konoplyanik)**



**Marion King
Hubbert**



**Harold
Hotelling**

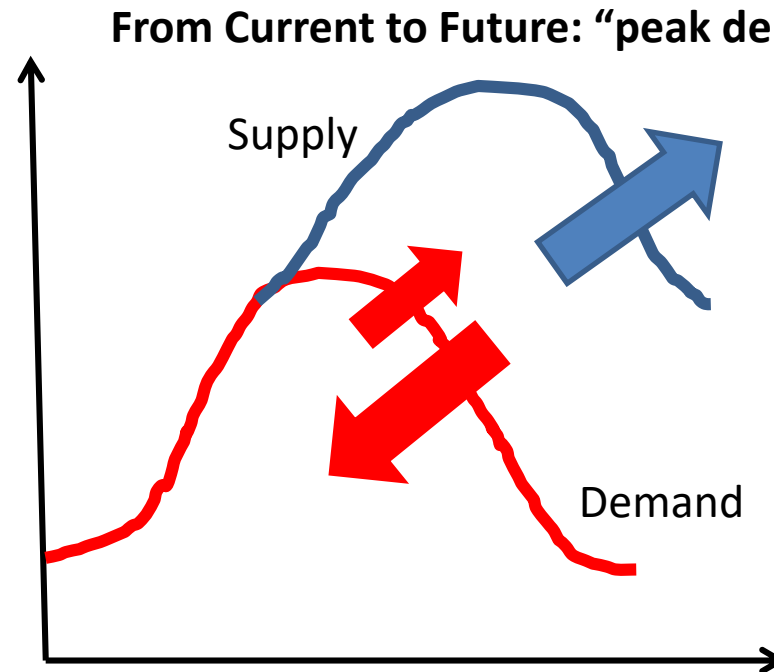
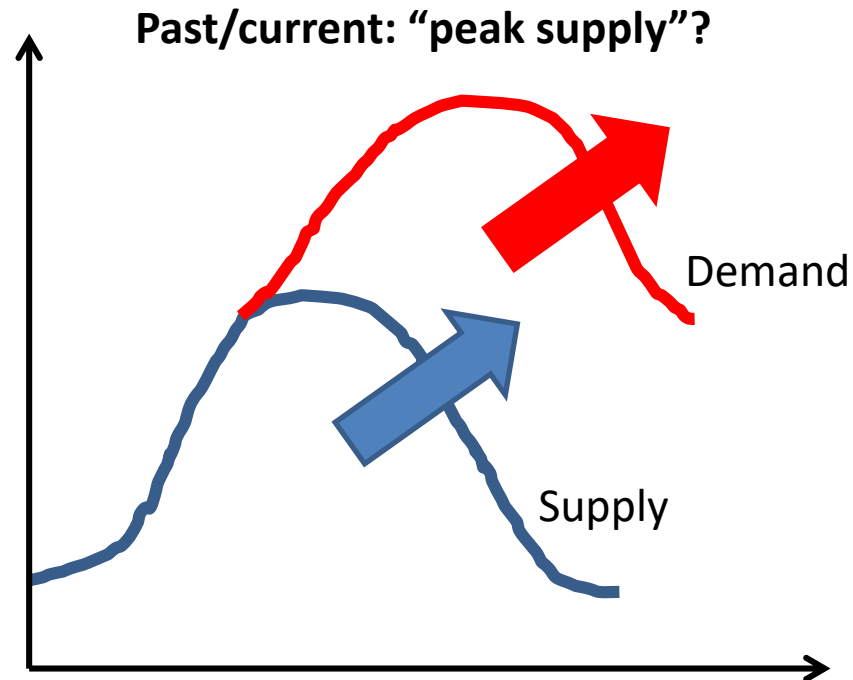


**Jean-Mari
Chevalier**

World Energy: The Change of Paradigm?

Supply	Demand
<ul style="list-style-type: none"> - Hubbert peak (curve) - Hotelling rent (theorem) - Chevalier turning point 	<ul style="list-style-type: none"> - Economic growth (industrial-type) - Population growth
Future energy resources more costly & limited (depletion rent) => low-cost win more rent, high-cost delayed	

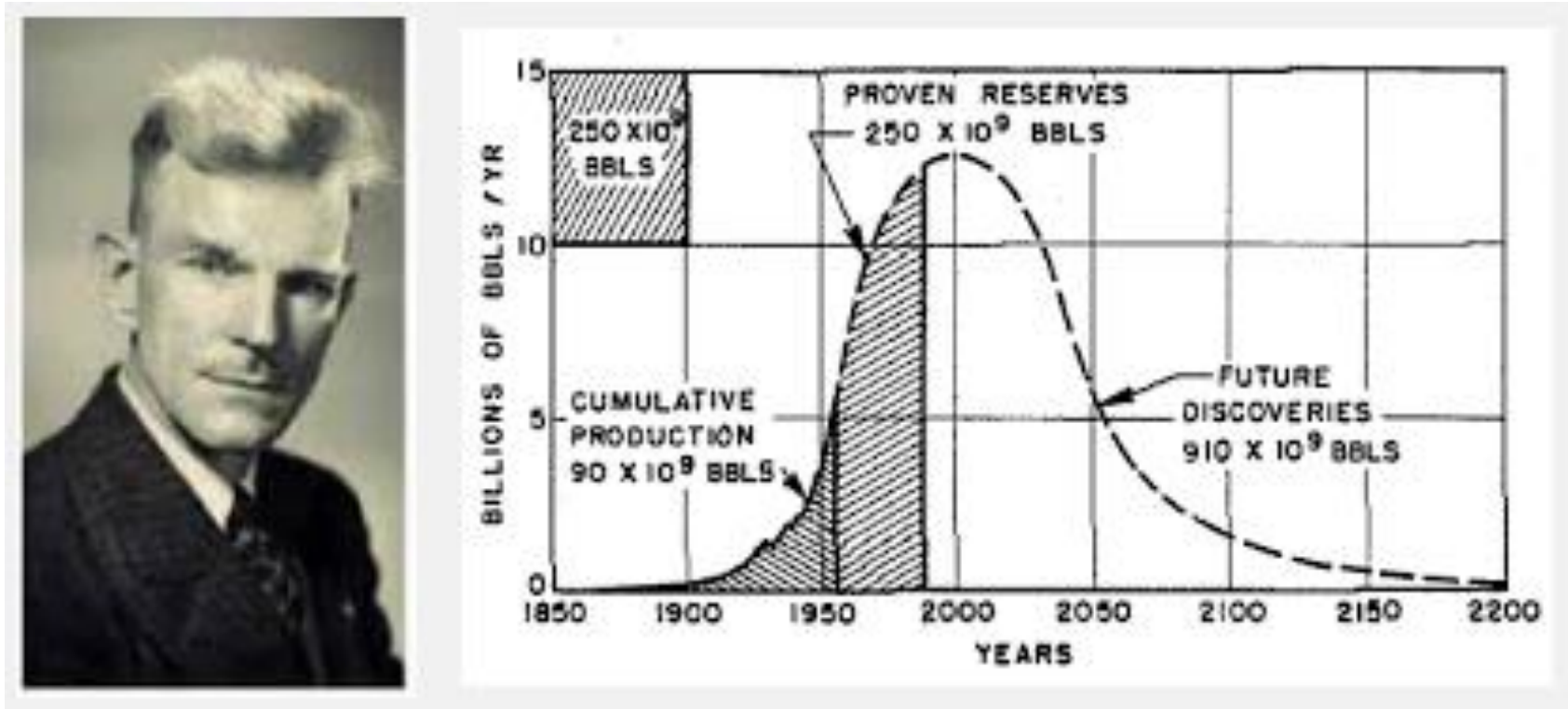
Supply	Demand
<ul style="list-style-type: none"> - Technological progress, incl. US shale revolution => => Hotelling anti-theorem 	<ul style="list-style-type: none"> - Four steps in departure from oil - Energy efficiency (delinking E&E, post-industrial-type) - COP-21 (upper limit/emissions)
Future energy supply less costly & plentiful (partly not in demand?) => competition among suppliers increases => low-cost win, high-cost cut-off	



Current Paradigm of International Energy Development

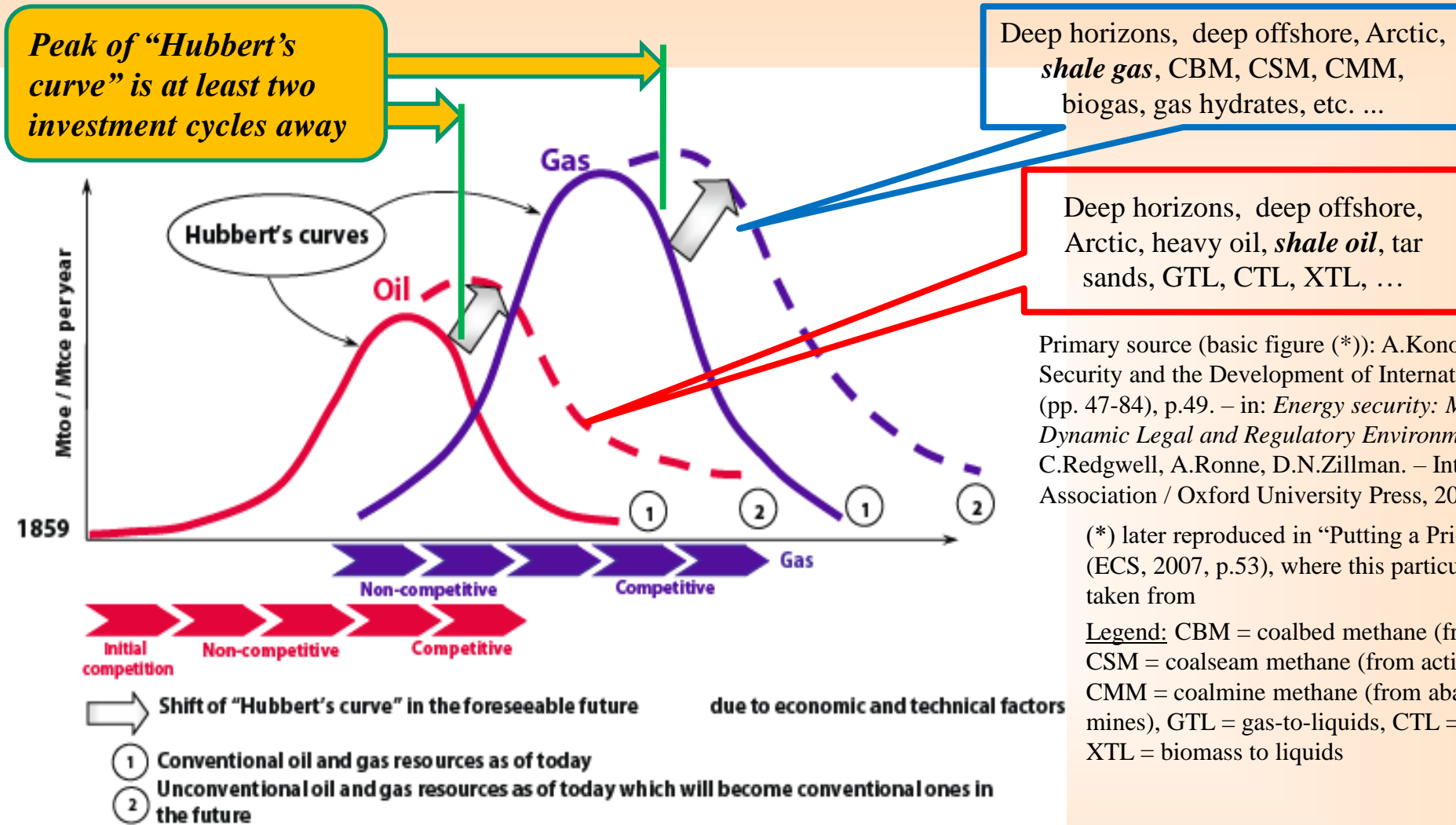
- Possible, though in a rather distant future (at least post 2 global invest cycles), if any at all, supply side limitations due to dominant non-renewable character of energy resource base =>
 - “**Hubbert**’s curve” (1949) => bell-type production curve for non-renewable resource extraction => “peak oil” theory,
 - “**Hotelling** rule” (1931) => the future value of fossil fuel in-situ increases by the value of the current interest rate within the time-frame,
 - **BUT**: both theories:
 - did not consider possible demand-side limitations (f.i. due to environmental considerations), => First (alarmist) report to the “Club of Rome” (1972) => respond of Sh. A.Z.Yamani “Stone age came to an end not because end of stones...”
 - works for increasing future cost & value of in-situ non-renewable energy resource within time-frame, at least during post-“**Chevalier**’s breaking point” period (since early 1970-ies)

Marion King Hubbert (1903-1989) and his curve



Источник: https://en.wikipedia.org/wiki/M._King_Hubbert

Author's economic interpretation of Hubbert's curves

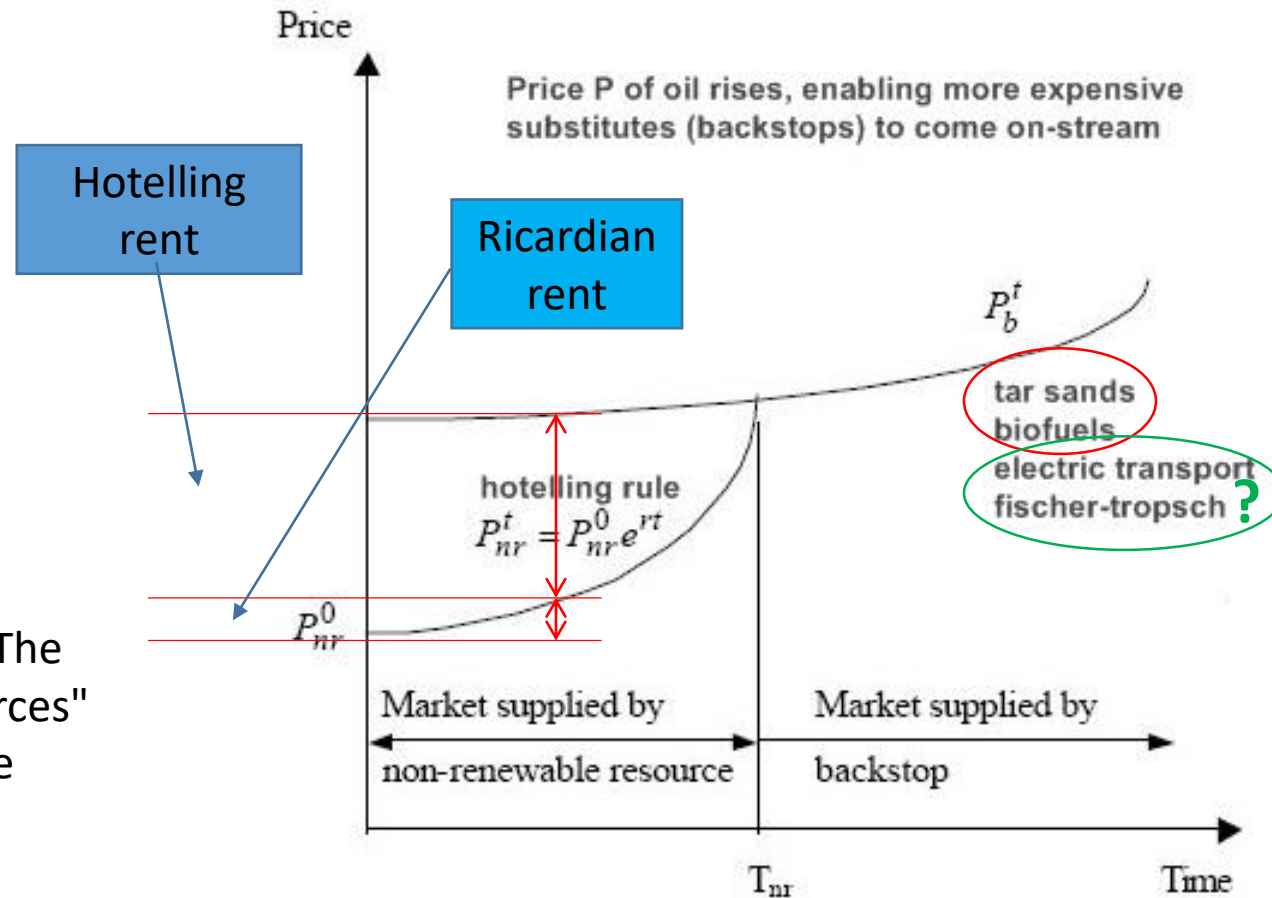


The mankind will not reach Hubbert's peaks in oil & gas at least within **TWO INVESTMENT CYCLES** (1st invest cycle = today's commercial technologies which shall pay back full CAPEX in their RD&D & commercial utilization before they will be substituted by new technologies of the new invest cycle which today stays at RD&D stage and thus predetermines this 2nd invest cycle)

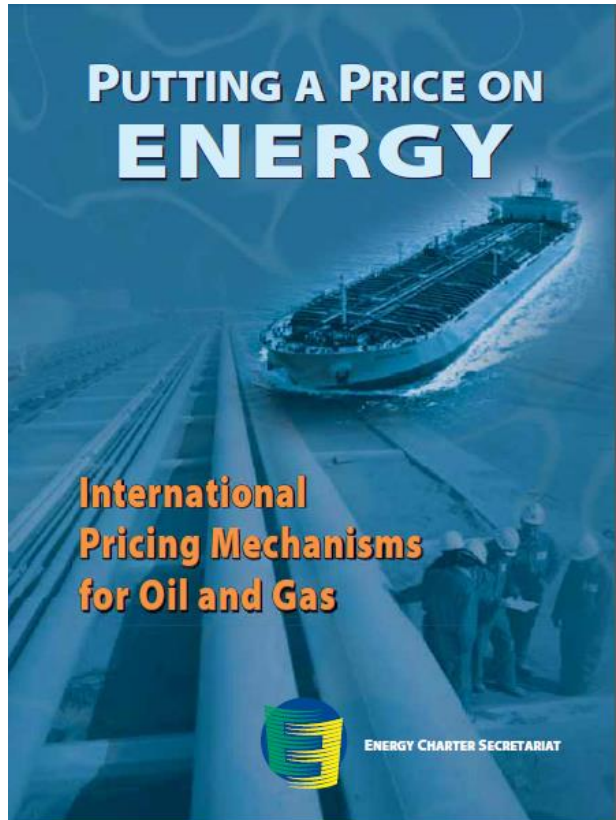
Harold Hotelling (1895-1973) and his economic rule regarding natural resource rent



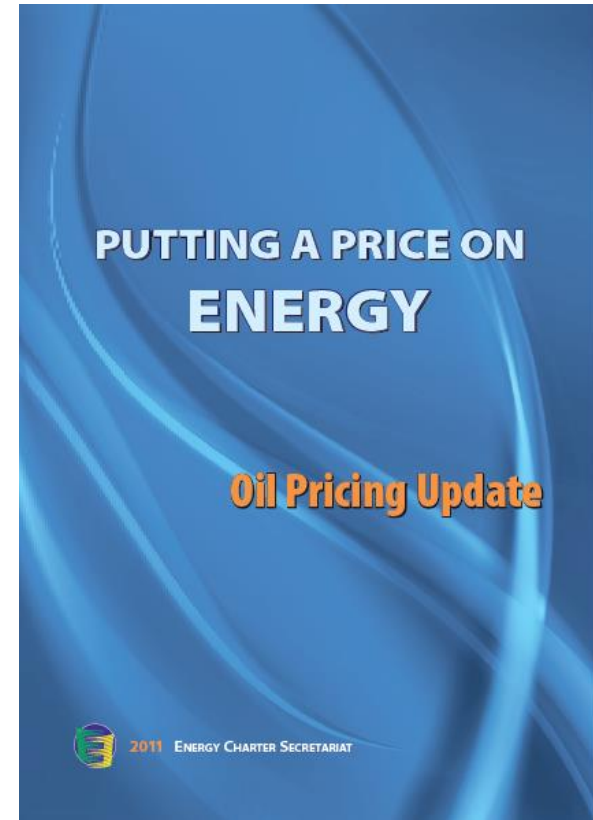
Hotelling, Harold (April 1931). "The economics of exhaustible resources" *Journal of Political Economy*. The University of Chicago Press via JSTOR. **39** (2): 137–175.



Source (basic graph): Neha Khanna, On the economics of non-renewable resources. – in: *Economics Interactions With Other Disciplines* (<http://www.eolss.net/ebooks/Sample%20Chapters/C13/E6-29-03-01.pdf>)

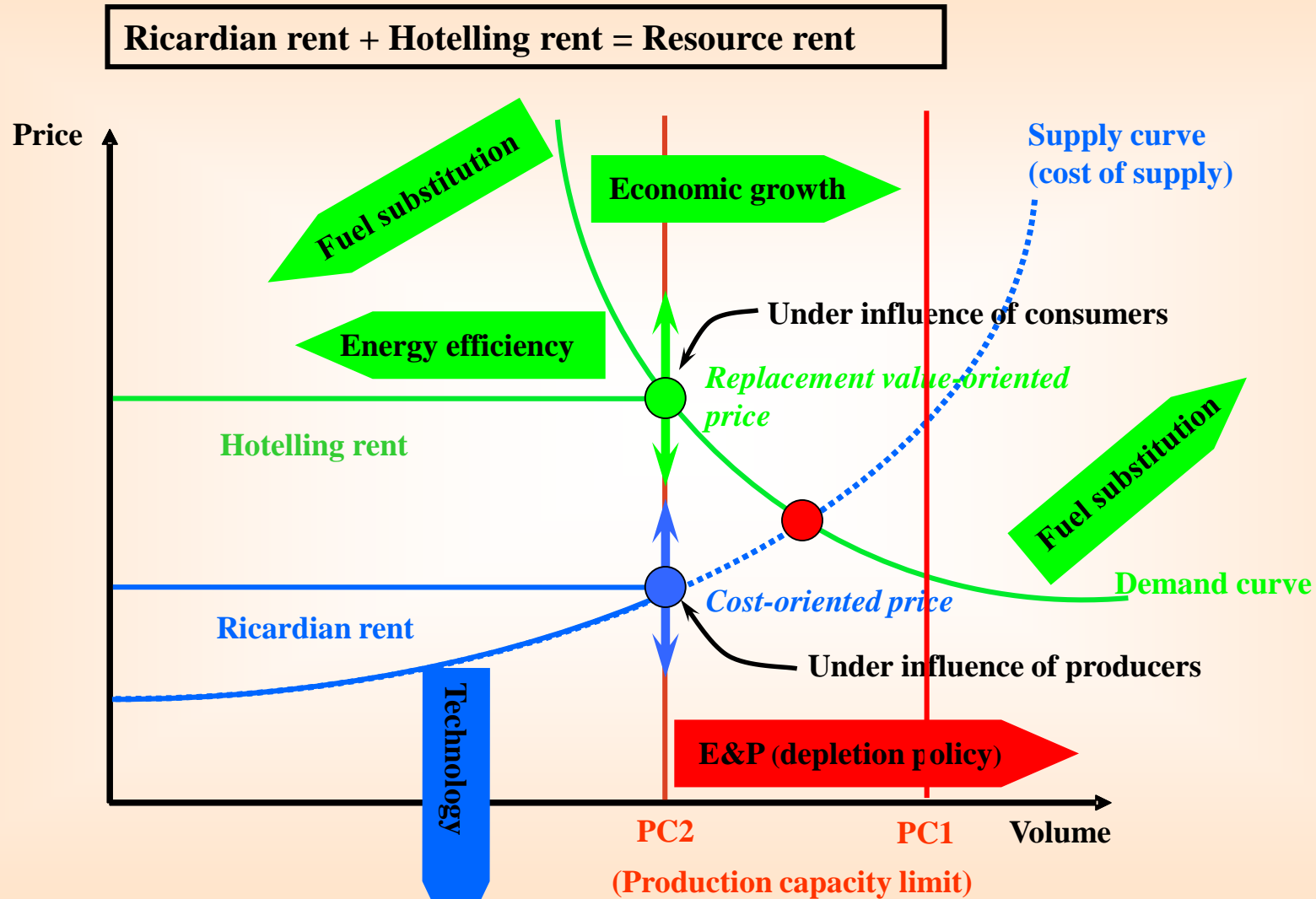


http://www.energycharter.org/fileadmin/DocumentsMedia/Thematic/Oil_and_Gas_Pricing_2007_en.pdf



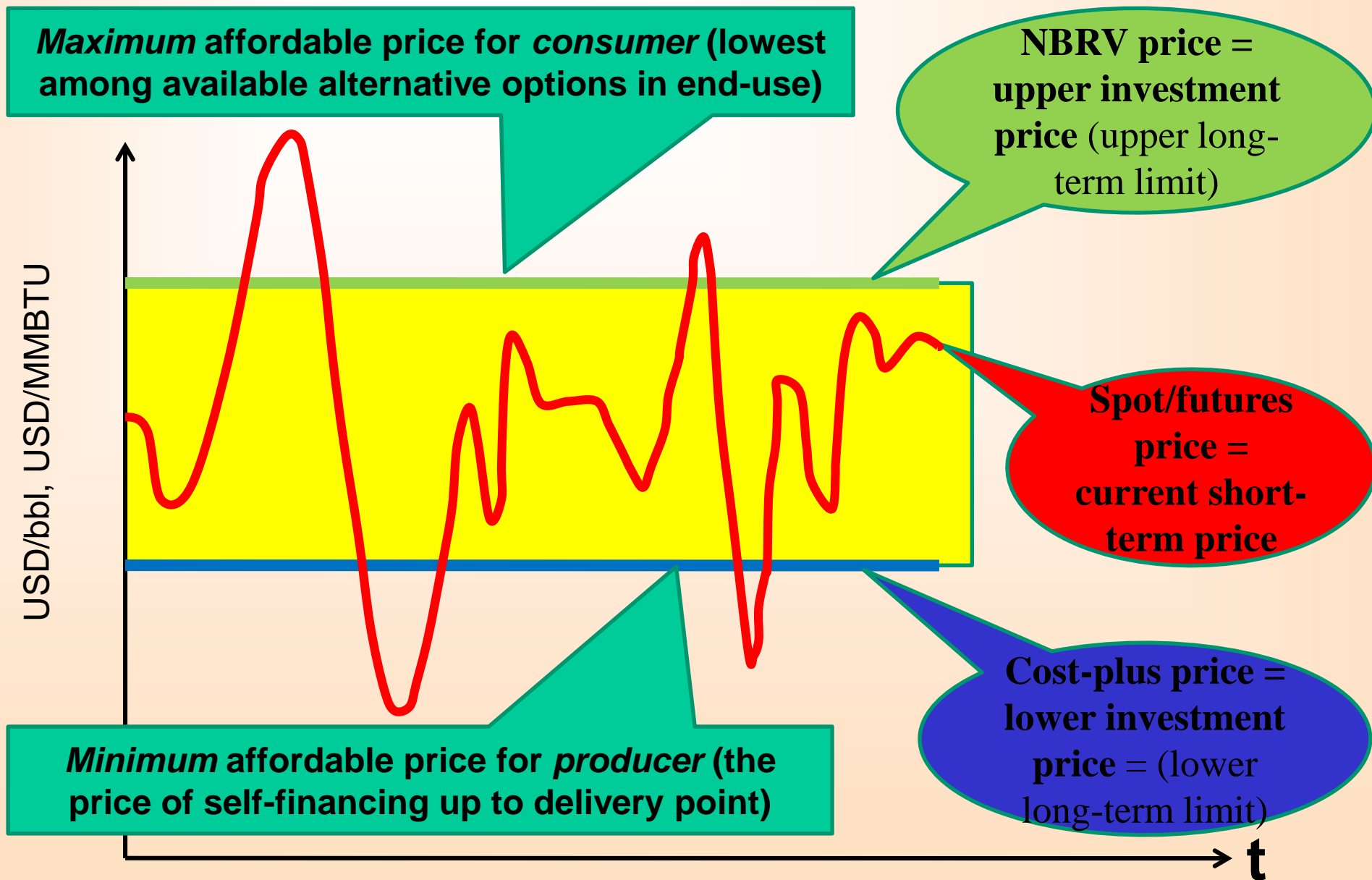
http://www.energycharter.org/fileadmin/DocumentsMedia/Thematic/Oil_Pricing_2011_en.pdf

Pricing of Non-Renewable Energy Resources: Ricardian vs. Hotelling Rents

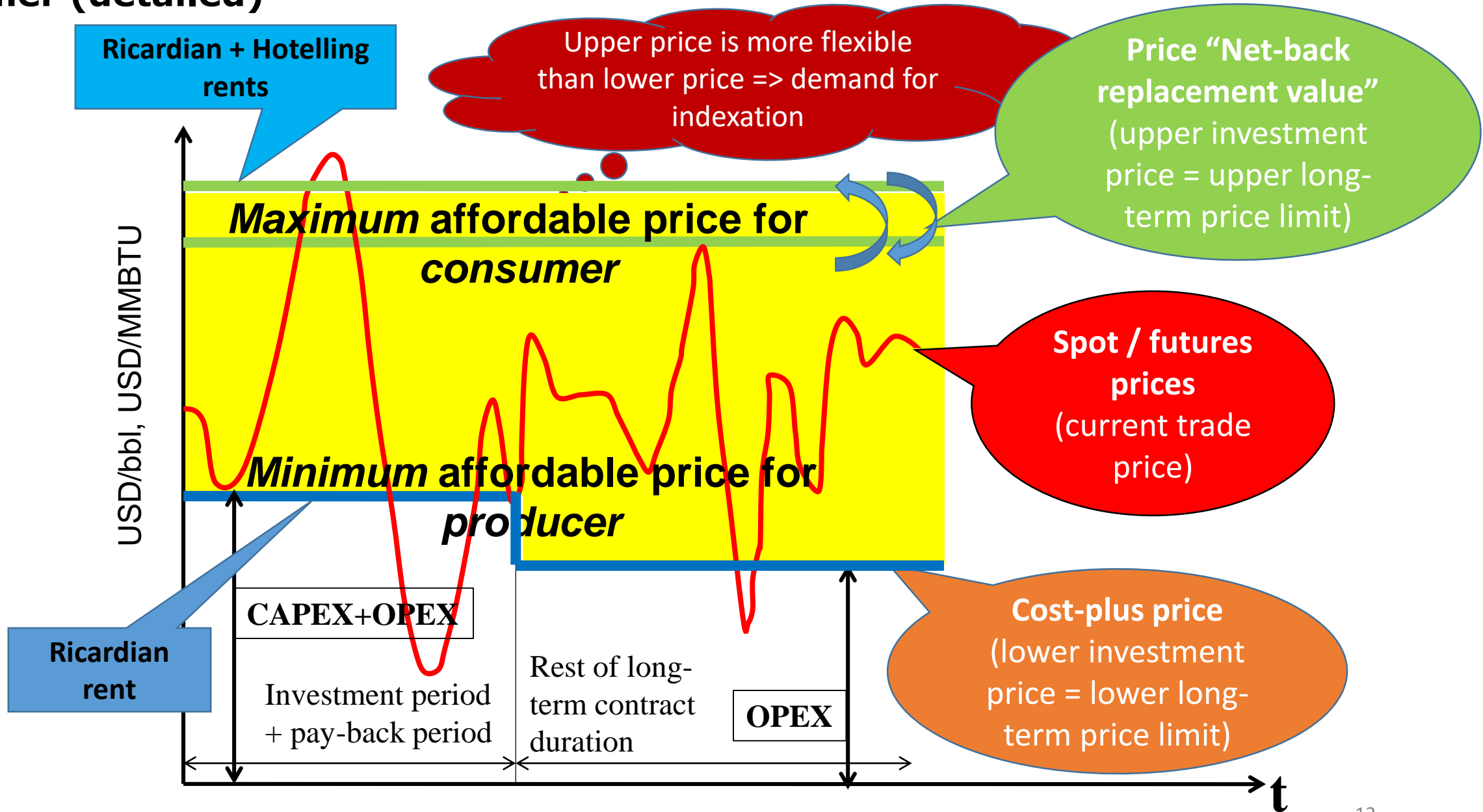


Source: A.Konoplyanik.The EU, Russia & Central Asia: new pricing mechanisms within FSU & prospects for alternative gas supplies to the EU // Lecture at the Center for Energy, Petroleum & Mineral Law & Policy (CEPMLP), University of Dundee, Dundee, Scotland, UK, October 14, 2009

Corridor of cut-off (affordable) prices for producer & consumer (simplified)



Corridor of cut-off (affordable) prices for producer & consumer (detailed)



Mechanism of defining replacement fuel and upper investment price within under- and oversupply expectations

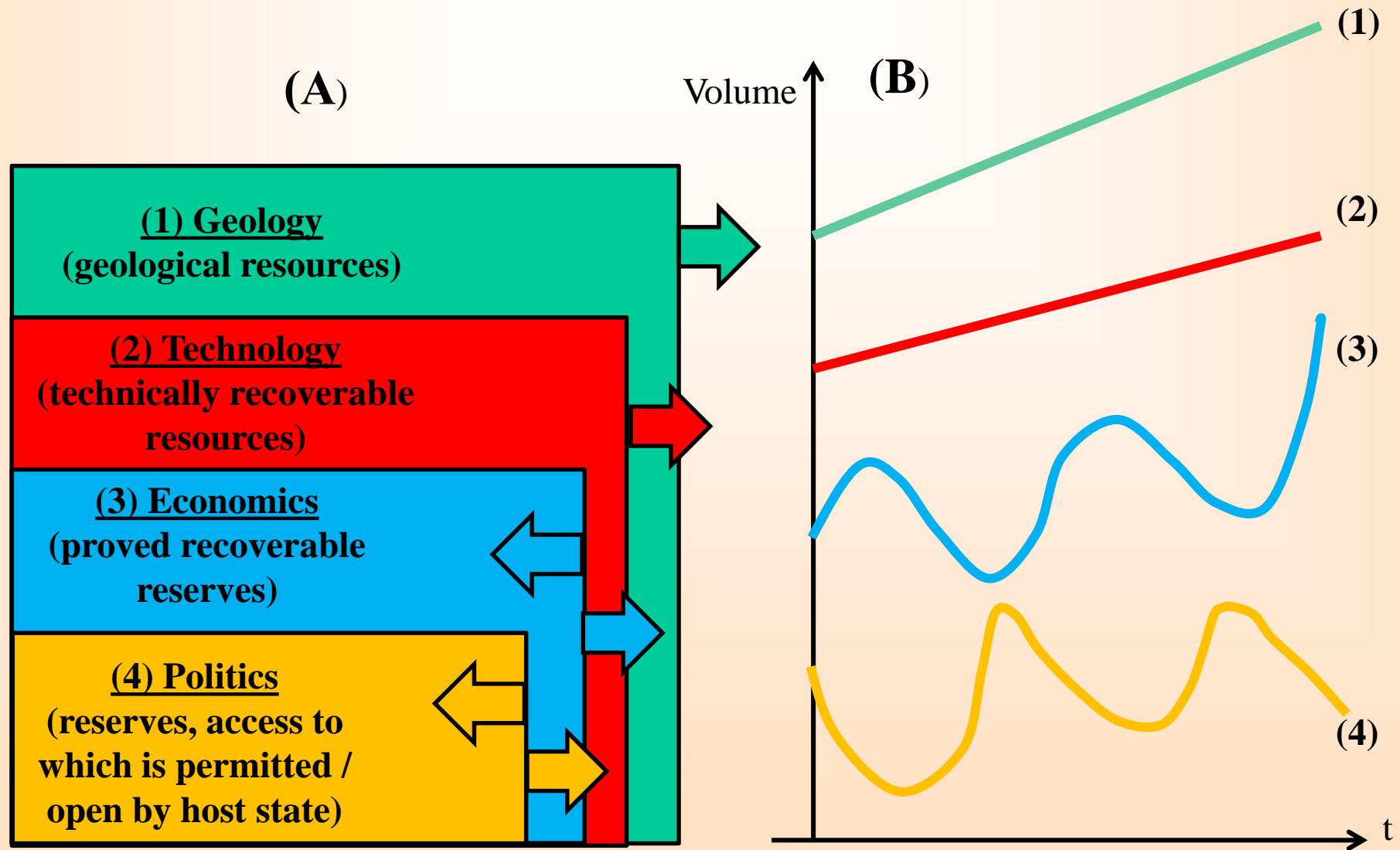
Expectation of “peak **supply**”

- Demand for energy resource **ABOVE** its supply =>
- **Under-supply** of given energy resource =>
- Replacement value (upper investment price) – in competition **BETWEEN** different energy resources (with suppliers of different energies)
- Indexation «given energy resource vs **OTHER** energy resource” (RFO vs coal; gas vs crude oil/petroleum products)

Expectation of “peak **demand**”

- Demand for energy resource **BELOW** its supply =>
- **Over-supply** of given energy resource =>
- Replacement value (upper investment price) - in competition **WITHIN** supplies of given energy resource (between suppliers of given energy resource)
- Indexation “given energy resource vs same energy resource **FROM ANOTHER** supplier” (gas vs gas)

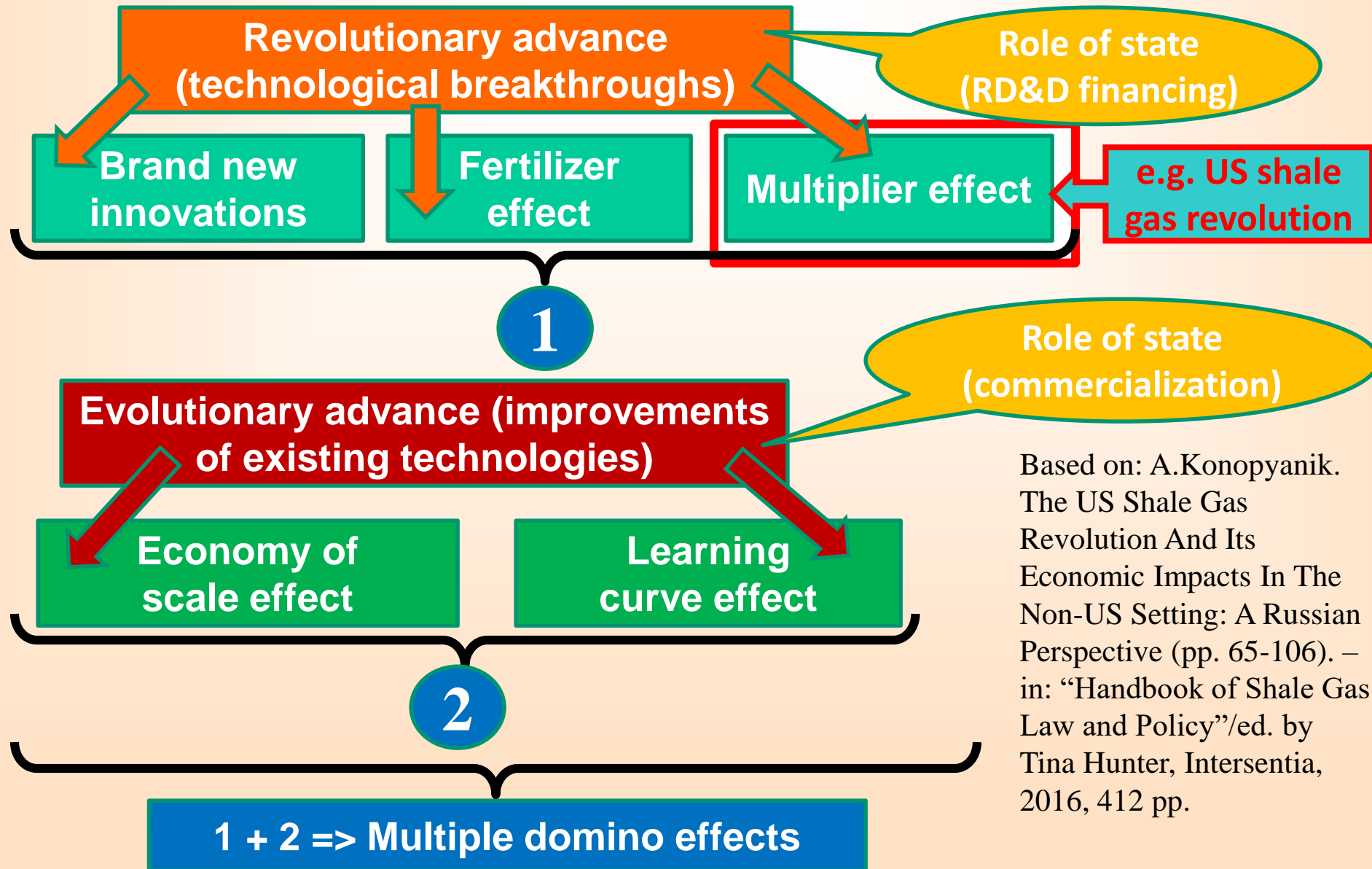
Resources vs Reserves: geology, technology, economics, politics



Добывающая промышленность: трансформация «ресурсов» в «запасы» (для чего необходимо снижать издержки)

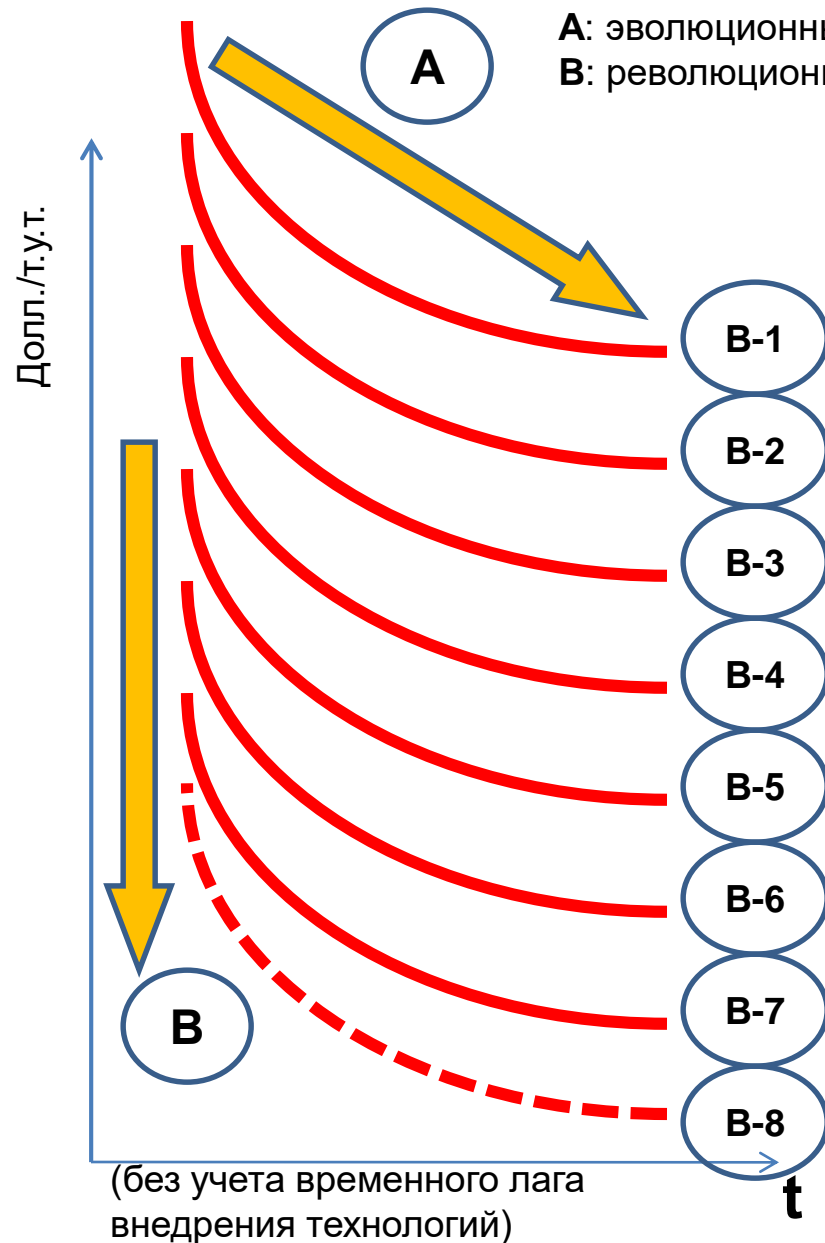


Two types of technological advance (STP)



Based on: A.Konopyanik. The US Shale Gas Revolution And Its Economic Impacts In The Non-US Setting: A Russian Perspective (pp. 65-106). – in: “Handbook of Shale Gas Law and Policy”/ed. by Tina Hunter, Intersentia, 2016, 412 pp.

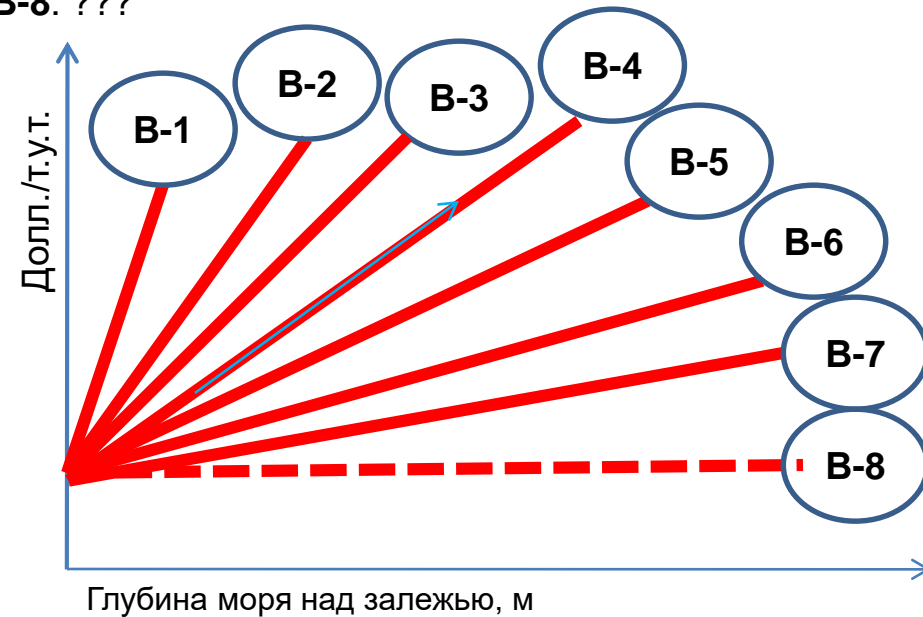
“Learning curves”: evolutionary & revolutionary STP



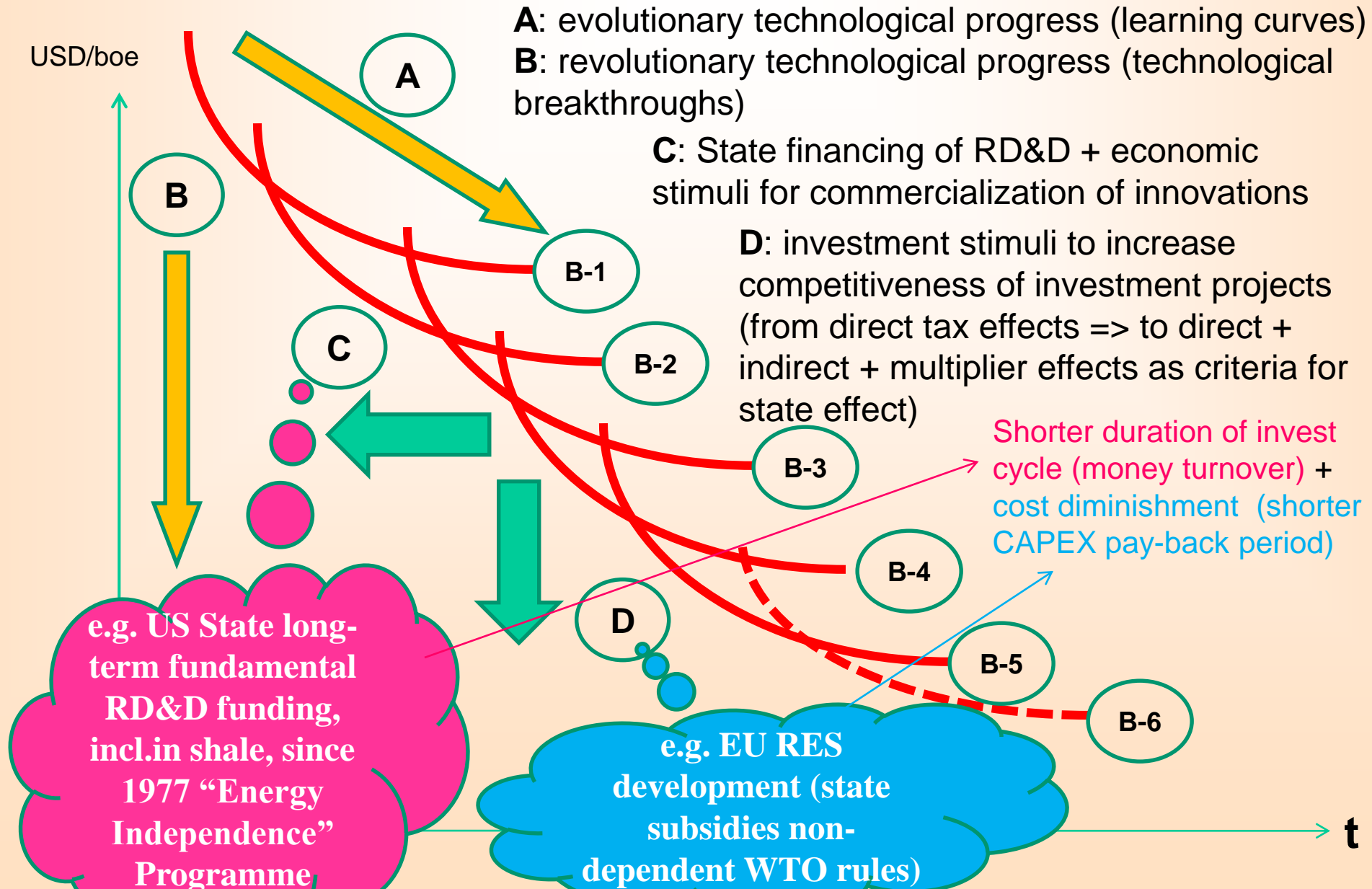
A: эволюционный НТП («кривые обучения» / learning curves)
B: революционный НТП

Технологии морской добычи:

- В-1:** эстакады (коммуникации с берега)
- В-2:** искусственные острова
- В-3:** стационарные платформы (свайные, гравитационные)
- В-4:** полупогружные платформы на натяжных тросах
- В-5:** полупогружные платформы и суда с системами динамического позиционирования
- В-6:** плавучие заводы СПГ
- В-7:** бесплатформенная морская добыча (подводное заканчивание скважин)
- В-8:** ???



STP: "Learning curves" & the role of State



J.M.Chevalier about turning point of the trends

- “In the fundament of our analysis we laid out the central hypothesis that in 1970-1971 the earlier trend of diminishing marginal production costs in petroleum industry has changed to their growth, at least in exploration of new fields and oil production. ...it is too early to prove this theory through the quantitative analysis. In the given research we have tried to provide its general assessment only.” (1972)

(Ж.-М.Шевалье, Нефтяной Кризис. – М.. Мысль, 1975, с.196)

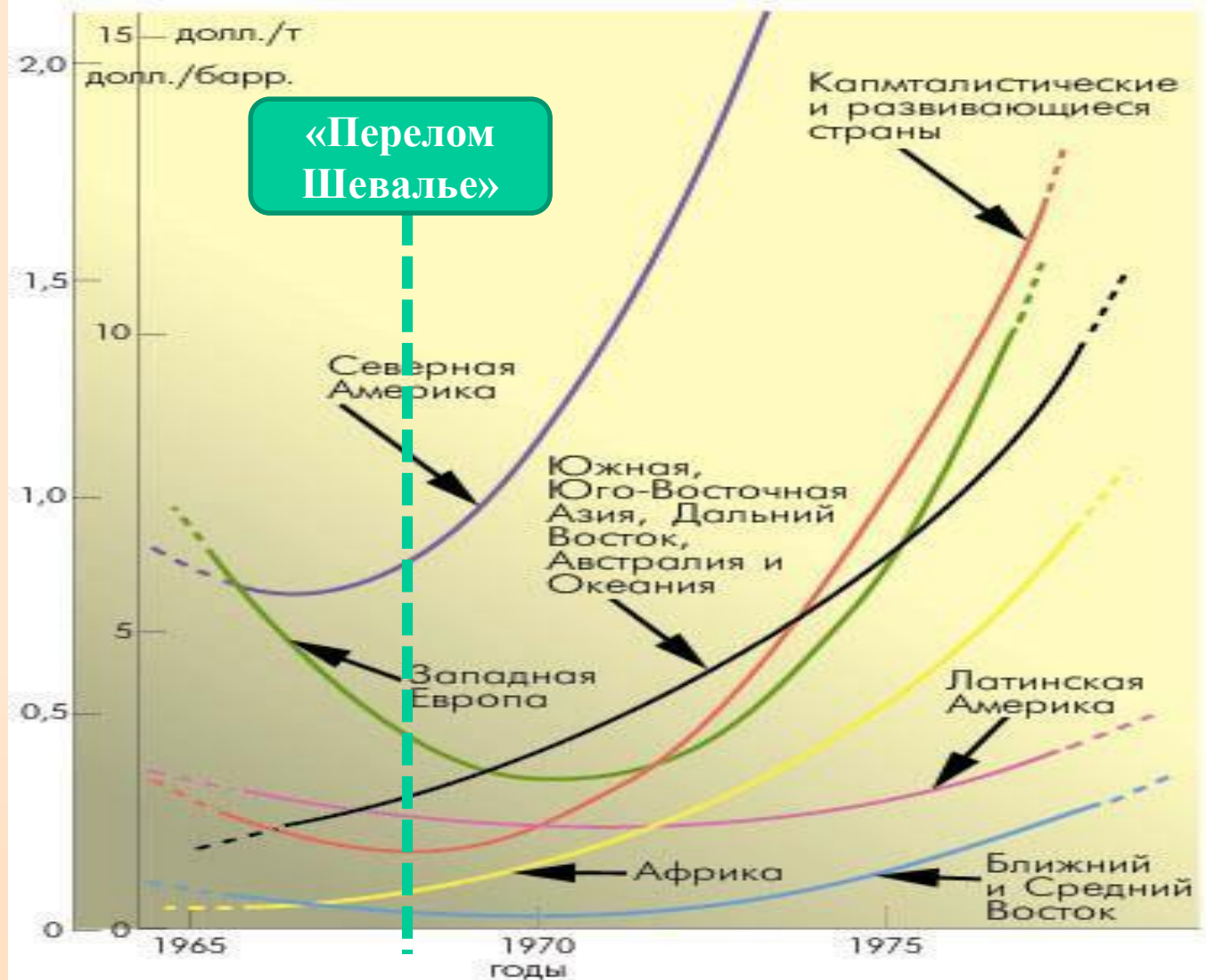
Jean-Mari Chevalier and his “Petroleum crisis”



Jean-Marie Chevalier. *Le nouvel enjeu pétrolier*, Paris, 1973
Ж.-М. Шевалье, Нефтяной Кризис. – М.. Мысль, 1975

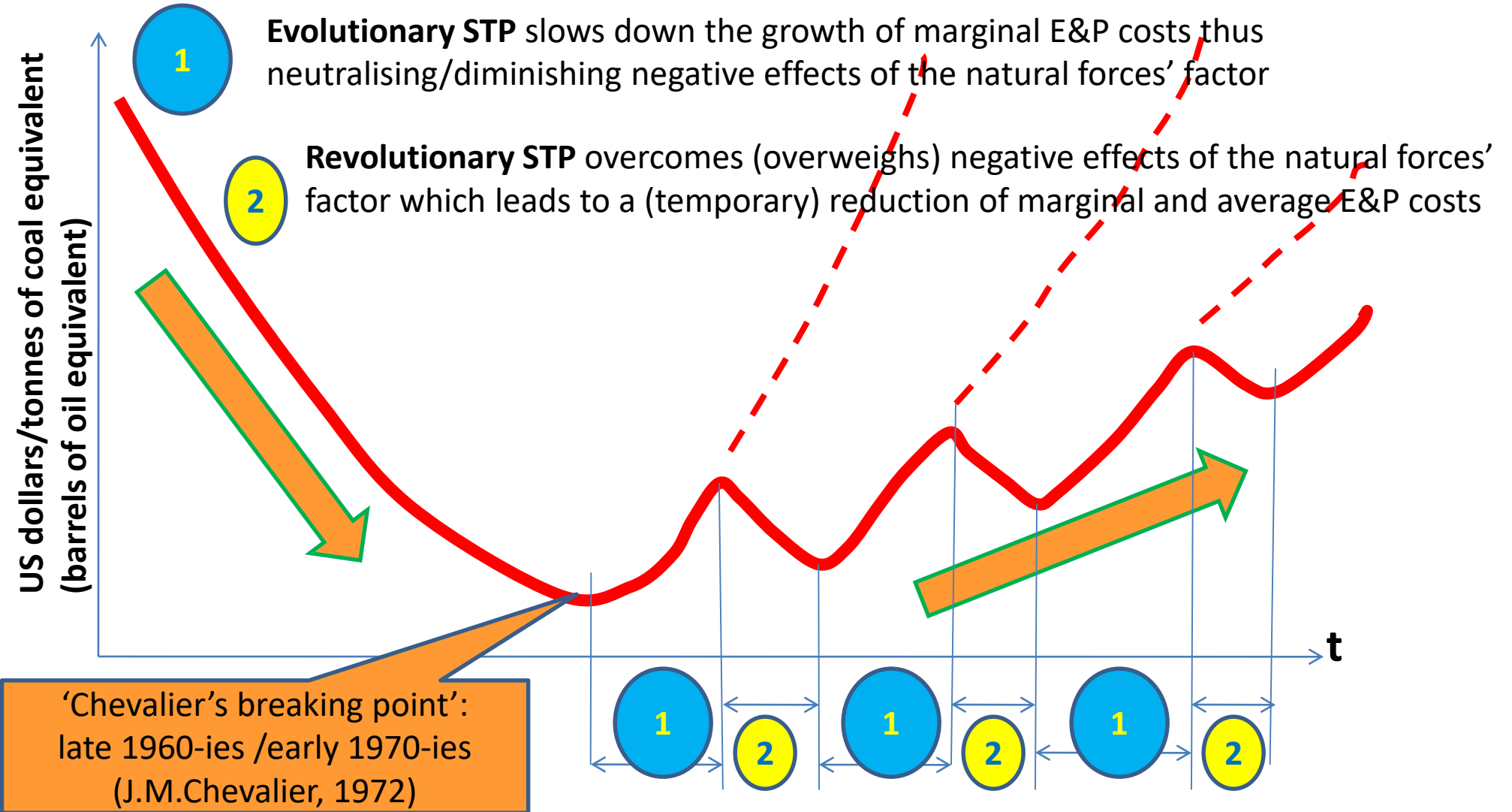


Выровненная динамика издержек добычи углеводородов в мировой нефтегазовой промышленности в период смены тенденций во второй половине XX в. (количественная оценка/проверка центральной гипотезы Ж.-М.Шевалье)

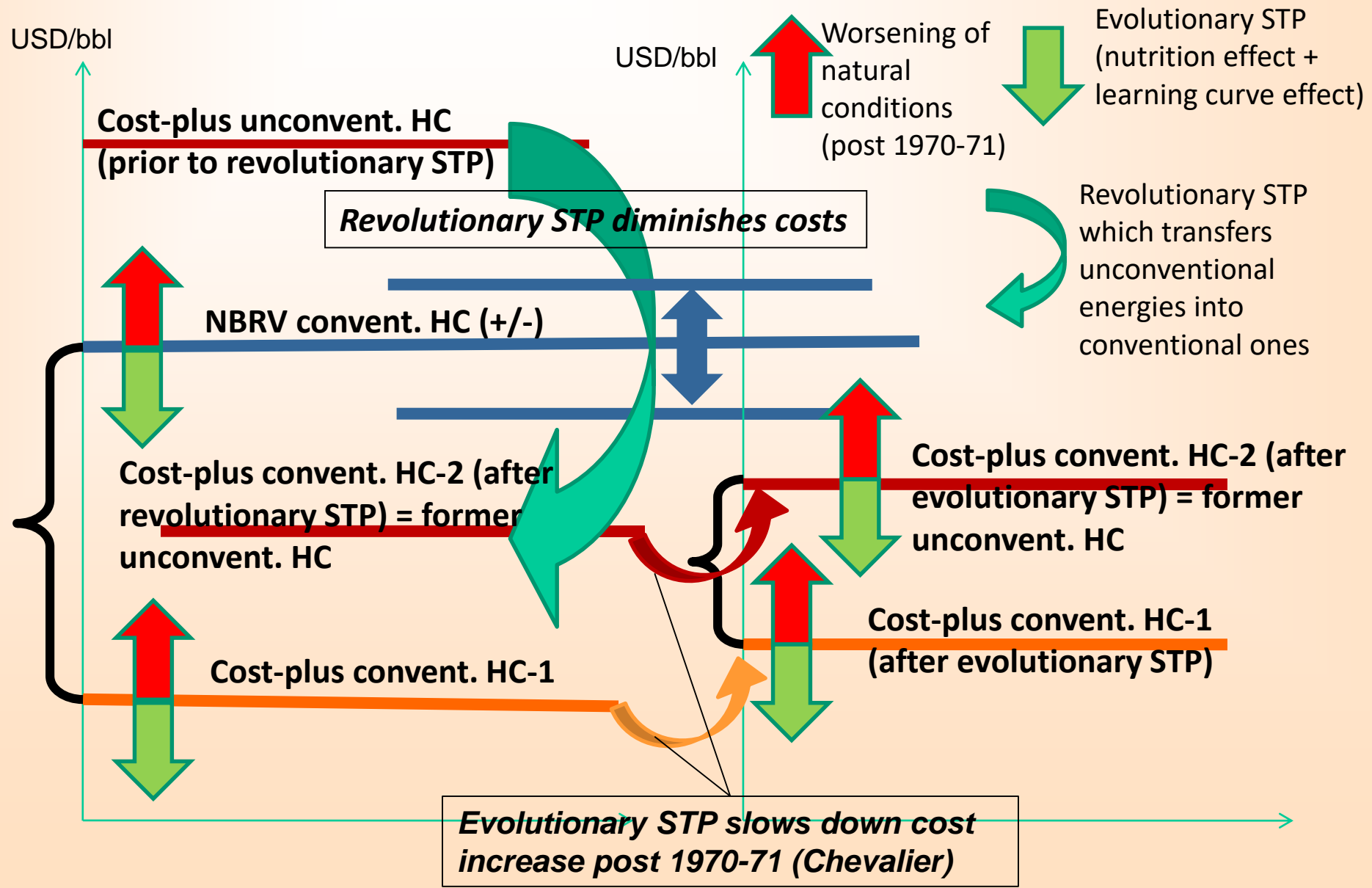


Источник:
Ю.Куренков,
А.Конопляник.
Динамика издержек
производства, цен и
рентабельности в
мировой нефтяной
промышленности. -
"Мировая экономика
и международные
отношения", 1985,
№ 2, с. 59-73

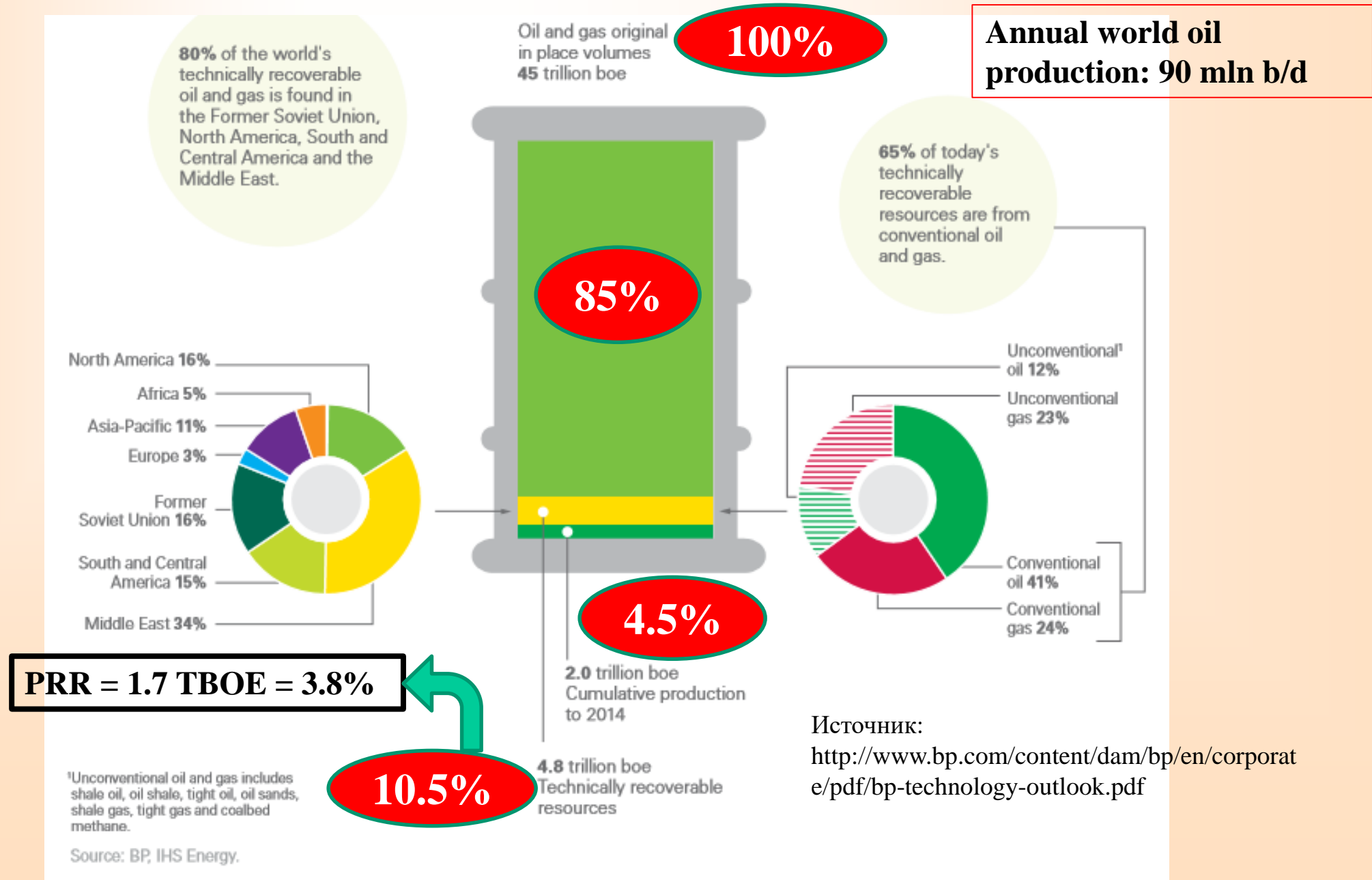
Impact of revolutionary and evolutionary STP on changing exploration and production (E&P) costs for conventional hydrocarbons in the period of growing marginal costs (after 'Chevalier's breaking point', late 1960-ies/early 1970-ies)



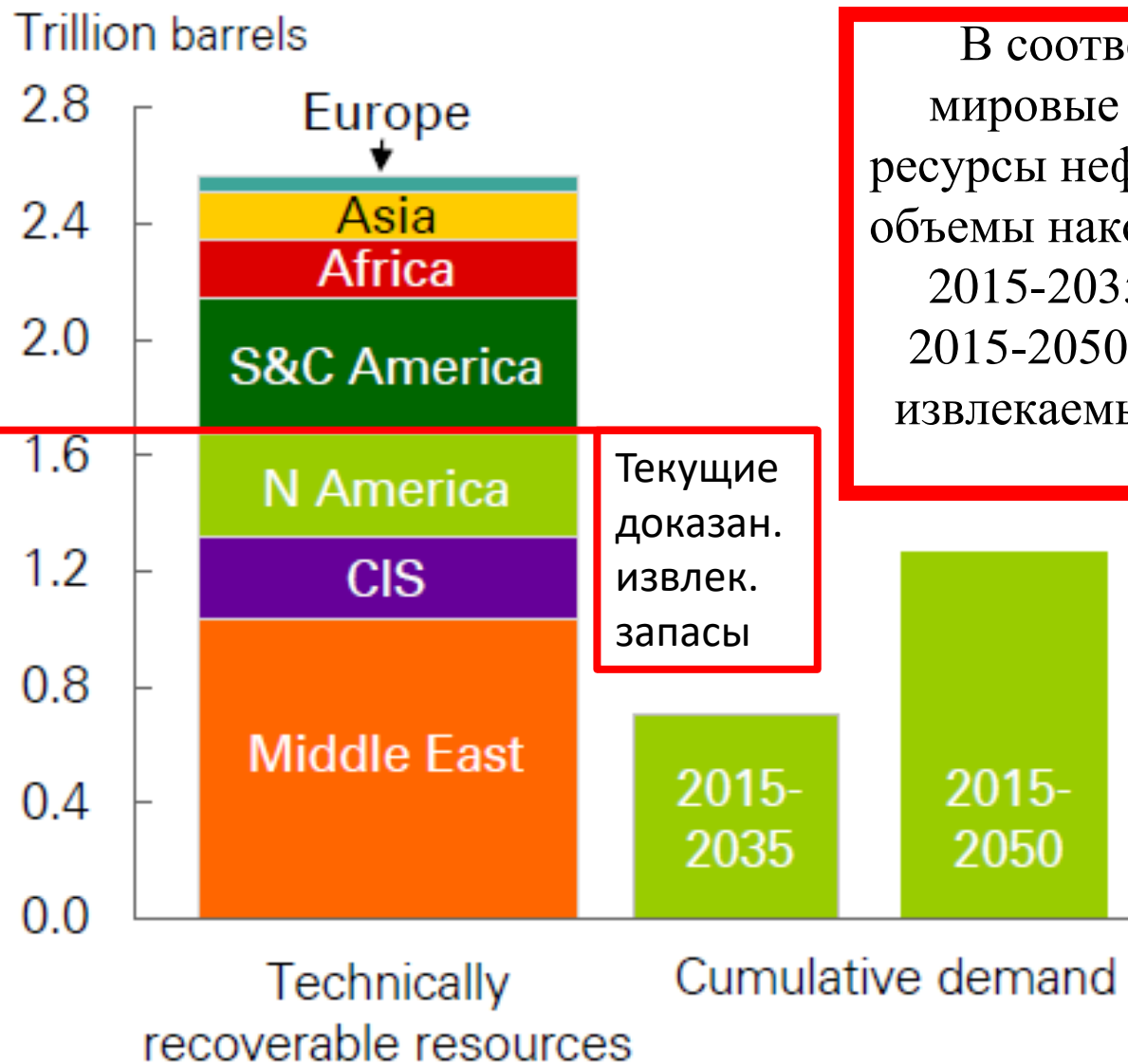
Conventional vs. unconventional energies & cost-plus vs. NBRV pricing



Oil & Gas: No limitations from resource base (greetings from Yamani)



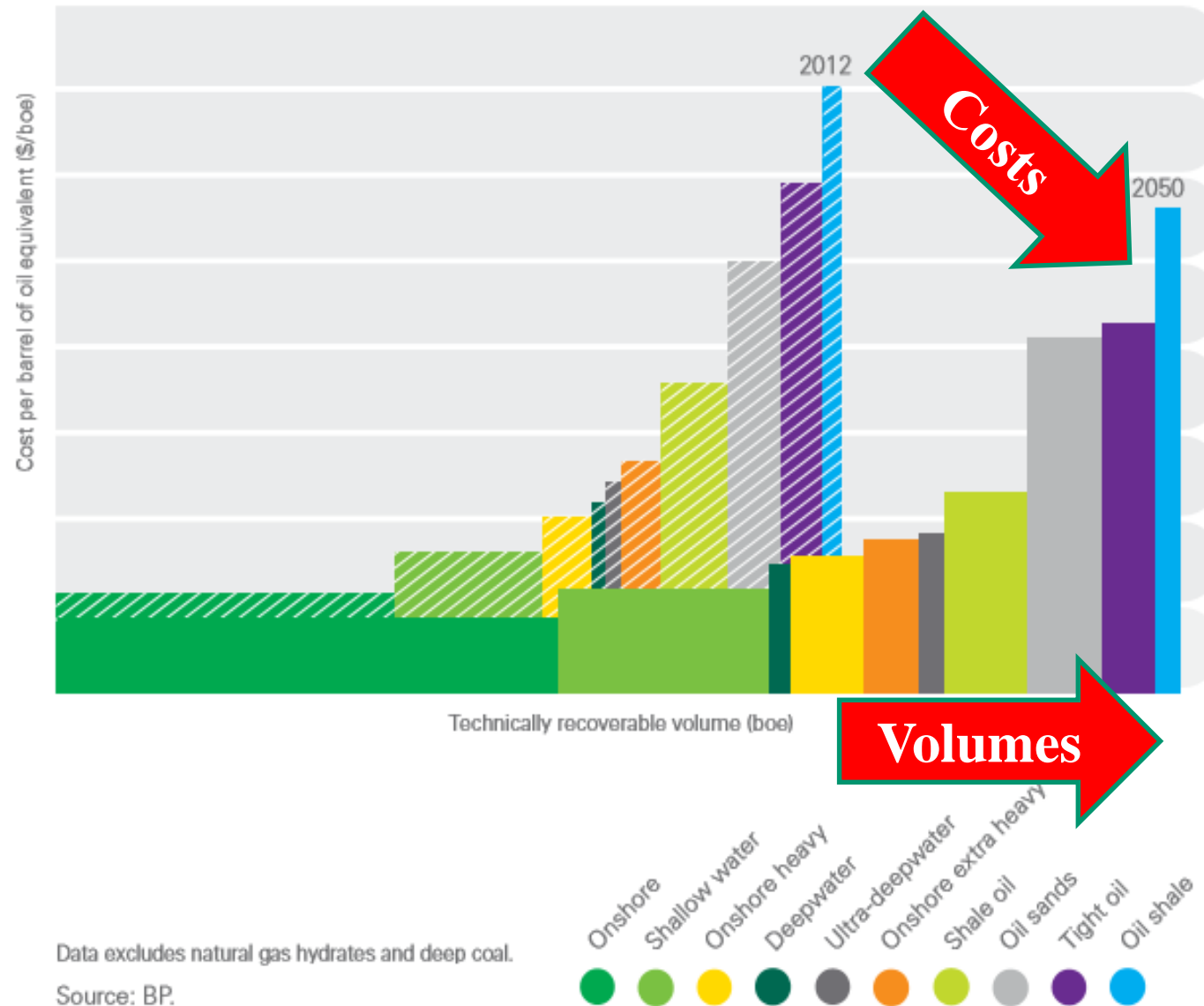
Estimates of technically recoverable resources and cumulative oil demand



В соответствии с оценками ВР, мировые технически извлекаемые ресурсы нефти превышают прогнозные объемы накопленного спроса за период 2015-2035 гг. в 3.7 раз и за период 2015-2050 гг. – в 2 раза; доказанные извлекаемые запасы – в 2.4 и 1.3 раза соответственно

Источник базового графика: **Spencer Dale**, Group chief economist. **BP Energy Outlook**, 2017 edition (<http://imemo.ru/files/File/ru/conf/2017/07022017/07022017-PRZ-EO17-Presentation-Spencer%20short.pdf>)

Technology advances will change the relative cost competitiveness of resource types



Data excludes natural gas hydrates and deep coal.

Source: BP.

Technology improvements to 2050 will enable us to recover more resources than we can today.

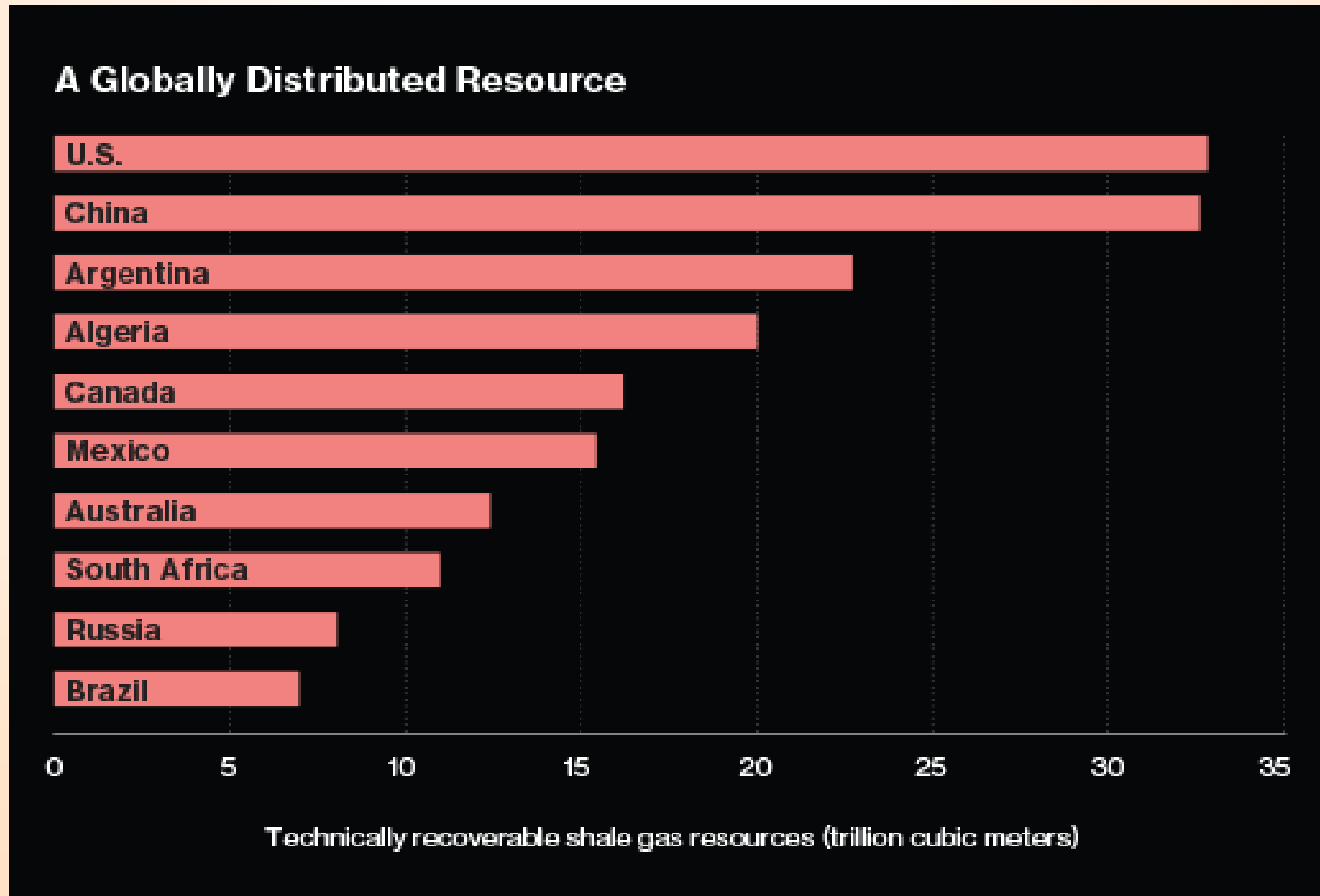
Technology innovation will enable us to access resources more cost effectively and they will have a major impact on unconventional resources that today are high cost and complex to recover.

Источник:
<http://www.bp.com/content/dam/bp/en/corporate/pdf/bp-technology-outlook.pdf>

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First top-10 states with highest technically recoverable shale gas resources (acc. to EIA DOE)

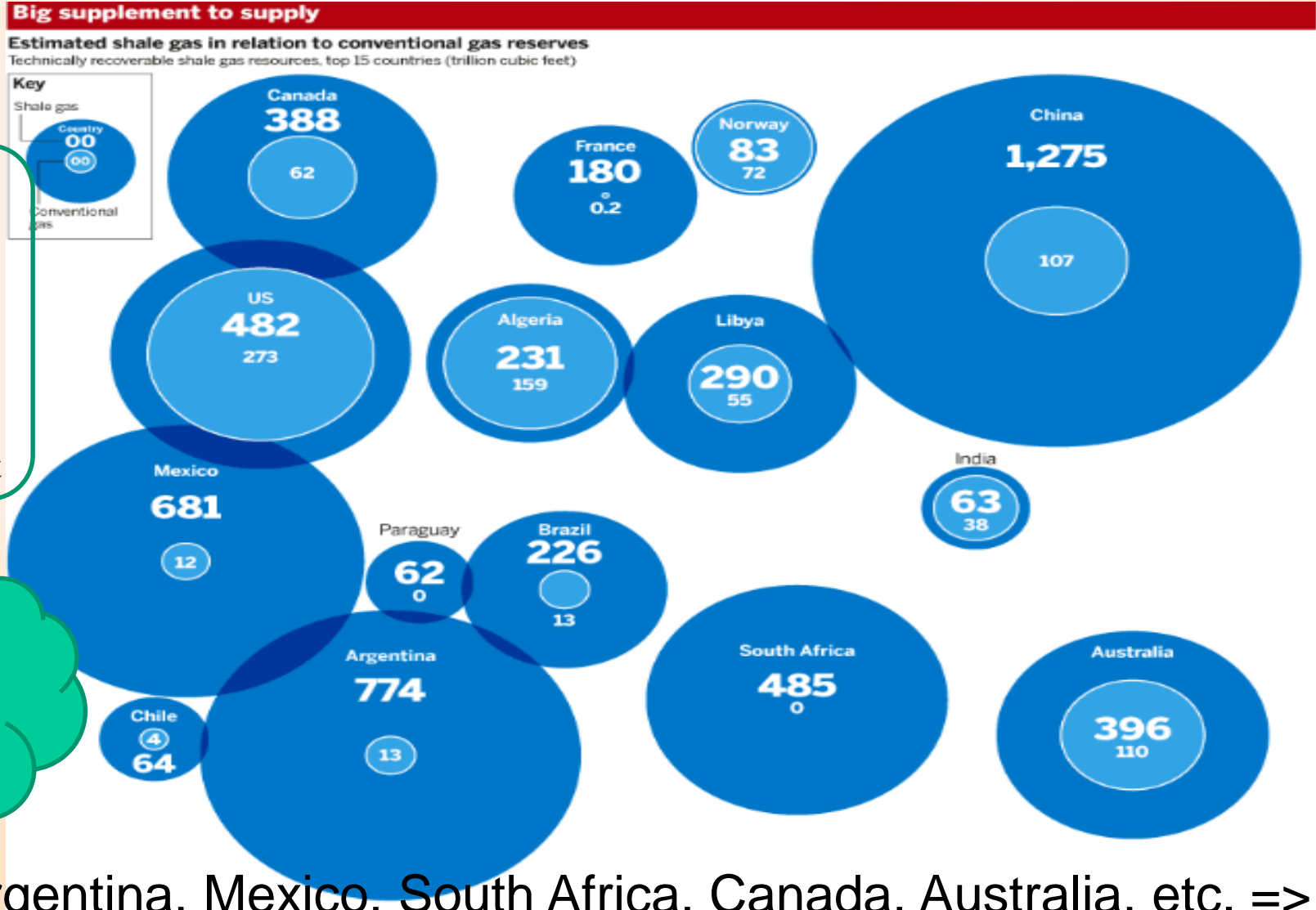


Source: Energy Information Administration

MIT Technology Review

Source: <http://www.technologyreview.com/news/539366/where-is-the-global-shale-gas-revolution/>

Conventional gas reserves vs shale gas resources



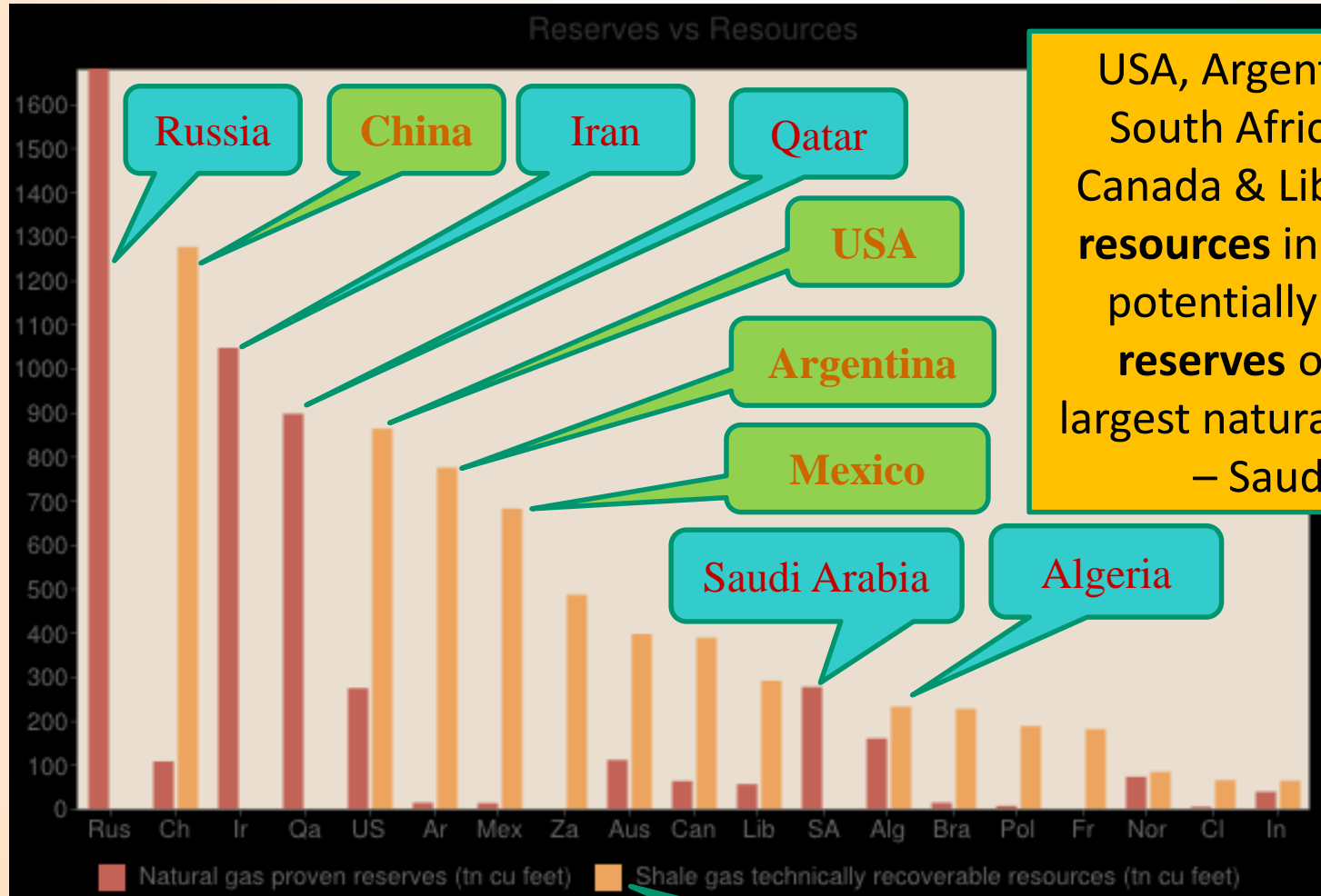
Technically recoverable shale gas resources, top 15 countries, Trillion cu ft

Just to compare the order of the figures...

China, Argentina, Mexico, South Africa, Canada, Australia, etc. => New players at the world gas map? When & at what cost?

Based on: "Financial Times" shale gas series, 22-25 April 2012

“Volume of shale gas resources, potentially, is sufficient to radically change gas market. If you can extract them...” (Financial Times)



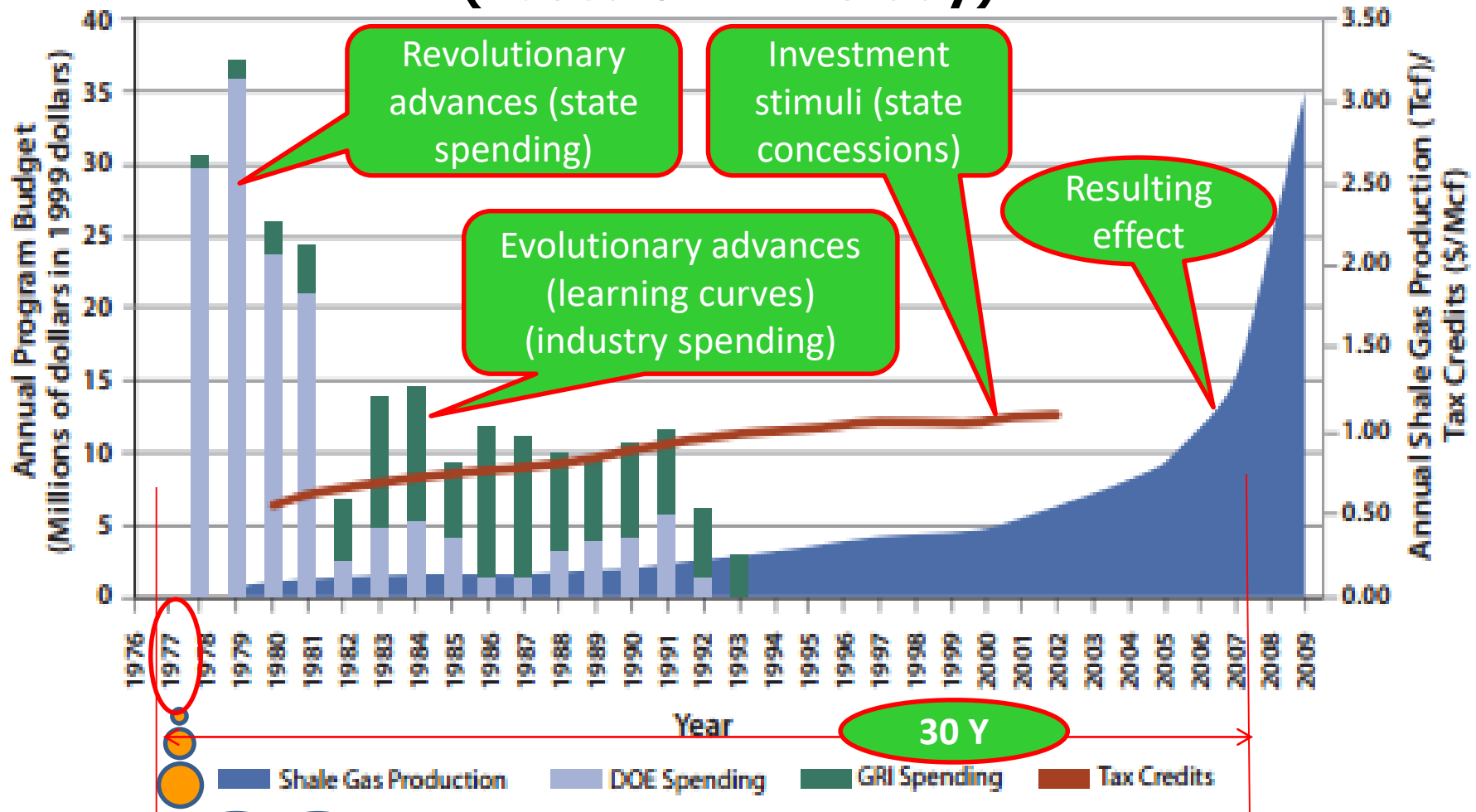
USA, Argentina, Mexico, South Africa, Australia, Canada & Libya: shale gas resources in each of them potentially exceeds gas reserves of the fourth largest natural gas producer – Saudi Arabia

Source: “Financial Times”, 09.12.2011, with reference to EIA, CIA World Factbook

Proved recoverable reserves

Technically recoverable resources

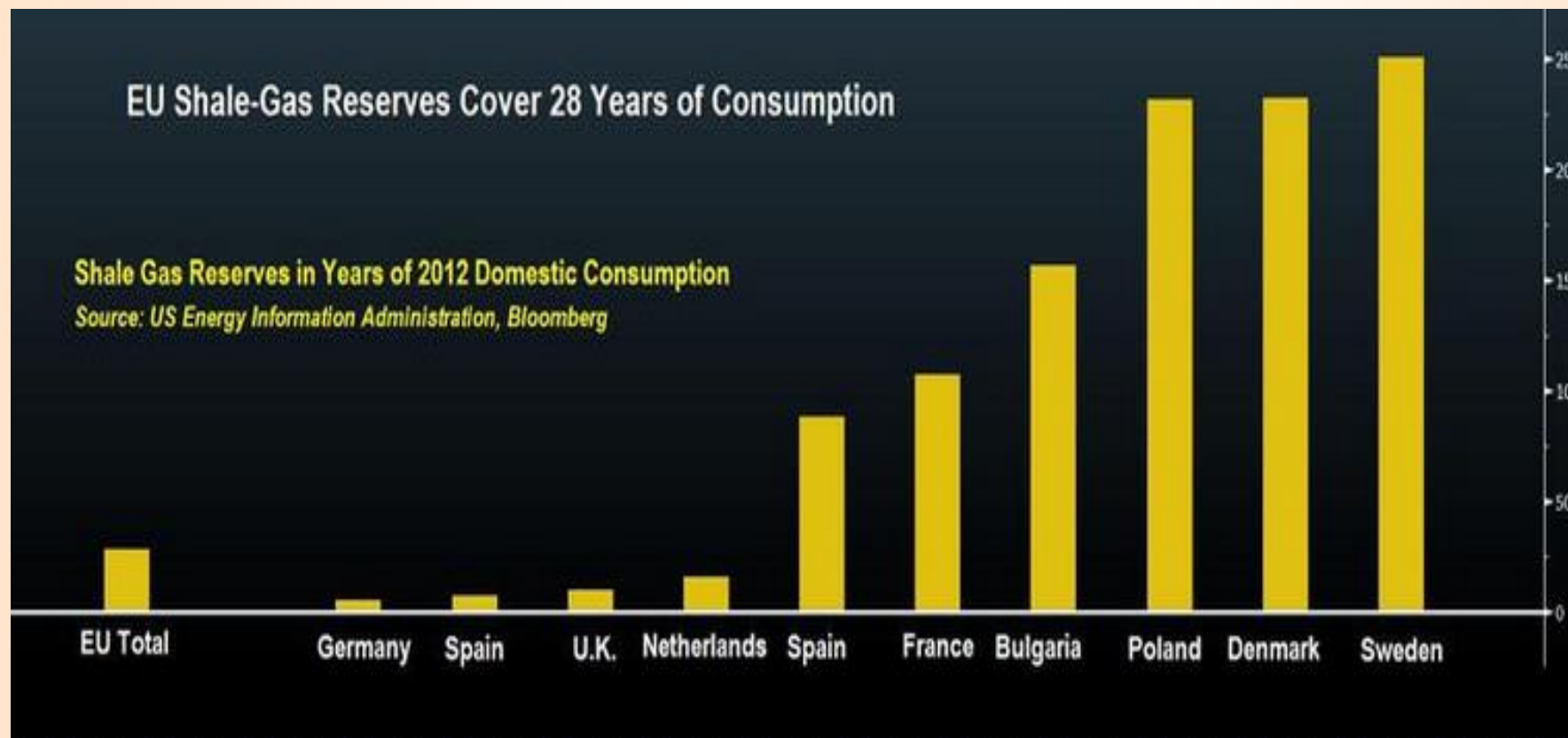
Role of US state financing in stimulating “US shale gas revolution” (based on MIT study)



1977 US “Energy Independence” Programme => 1977-2007 = 30 Y

Source of the basic Figure: Figure 8.1 “CBM RD&D Spending & Supporting Policy Mechanisms” from The Future of Natural Gas. An Interdisciplinary MIT Study, 2011, p.163; Figure adapted by this author

EU shale gas: where overestimated expectations came from...(*)



(*) it should be noted that US DOE EIA has been publishing estimates of “technically recoverable shale gas resources”, but not its “reserves” estimates, as mentioned by the authors of the cited article, since “reserves” presents only a portion of a broader “resource” category (see Box 1)

Источник: <http://www.bloomberg.com/news/articles/2014-05-19/europe-has-28-year-shale-gas-rebuff-to-russia-chart-of-the-day>

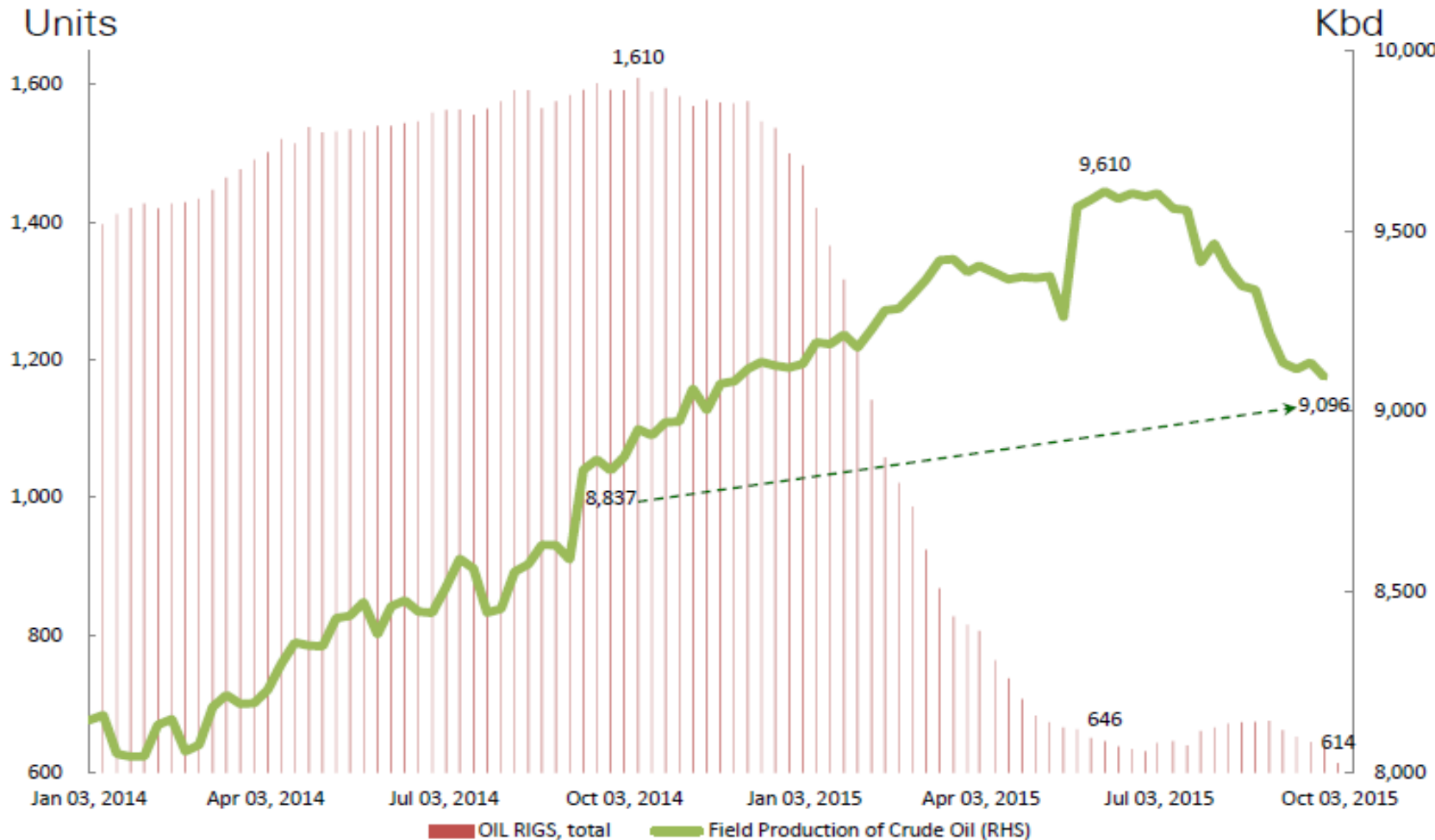
Shale & traditional oil: key differences of investment cycles

Parameters	Shale	Traditional
Fixed costs (CAPEX) to total costs	Low	High
Variable costs (OPEX) to total costs	High	Low
Economic life-cycle, years	Short (2-3)	Long (10-15+)
Time lag between FID & 1 st oil	Short (weeks)	Long (years)
Responsiveness to oil price fluctuations (short-term price elasticity)	High	Low
Type of rent extracted	Technological rent	Natural resource rent (economy of scale)
Daily production/well decline	High	Low
How this type of investment cycle influence on price volatility	Soften / “shock absorber” (*) (quick invest effect)	Intensify (delayed invest effect)
Key producers & their financial characteristics	Small & medium independents/not robust enough (lack of cash to finance from cash flow, fully dependent of debt financing)	Majors/robust (enough cash to finance from cash flow)
Financing (project finance is ...)	Conveyer/standardized (each project deal is typical), easy going	Art (each project deal is unique), sophisticated

Developed by this author ,based , inter alia, on: S.Dale (BP Group chief economist). The New Economics of Oil. Society of Business Economists Annual Conference, London, 13 October 2015, p.7; (*) term of S.Dale

A.Konoplyanik, CEPMLP seminar, Dundee, 12-13.02.2018

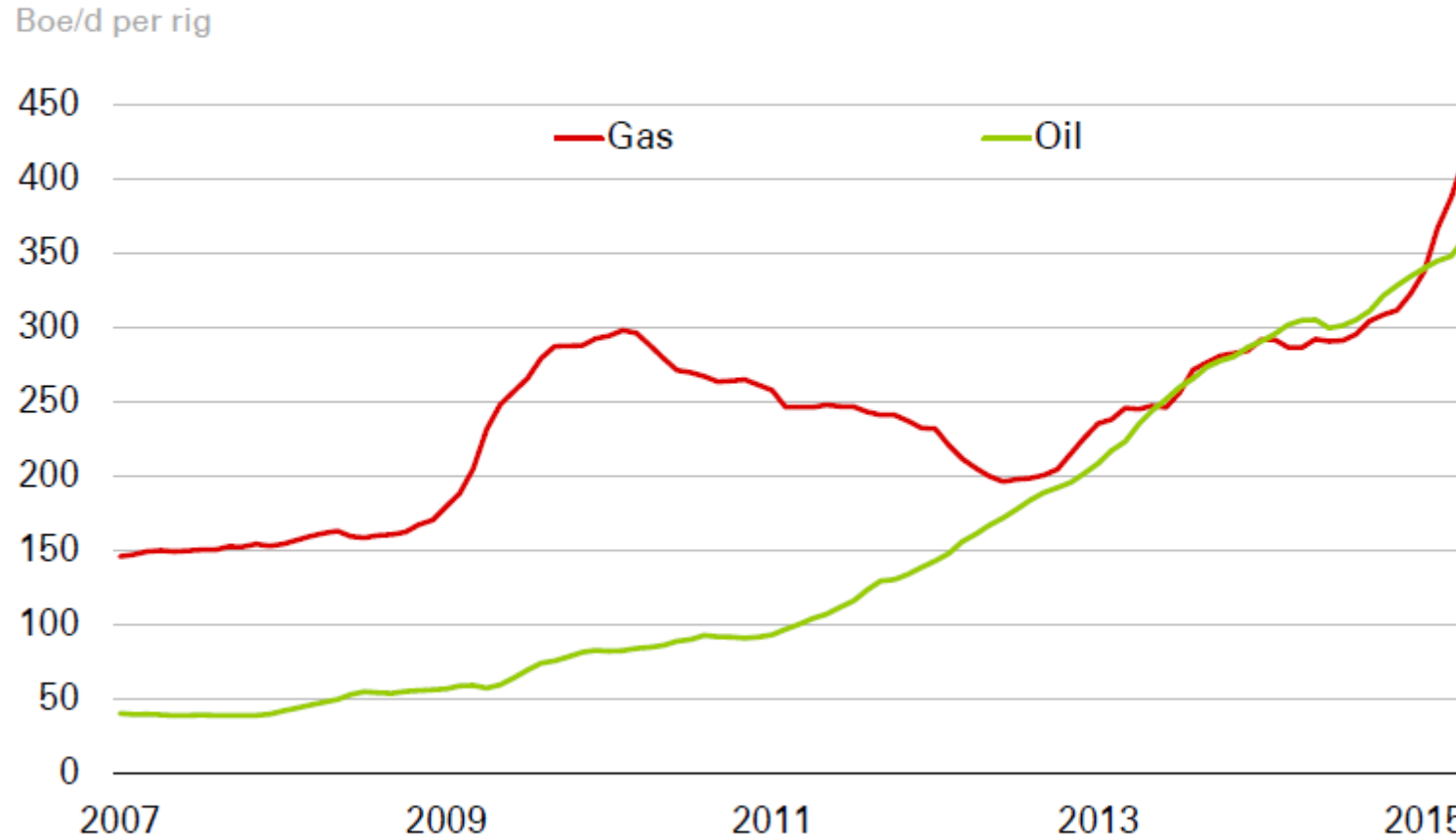
US oil output had been declining since early July, yet still was 260 kbd higher y-o-y in end-September



Source: EIA, PIRA

Source: V.Drebentsov. Oil Market Update, October 2015. IMEMO Workshop. – Presentation at the seminar “Low world oil prices and its consequences for macro-economy and oil sector of Russia” within Forum IMEMO-BP “Oil & Gas Dialogue”, Moscow, IMEMO RAS, 21.10.2015, slide 7
(http://imemo.ru/files/File/ru/conf/2015/21102015/21102015_PRZ_DRE.pdf)

US new-well production per rig



Source: US EIA

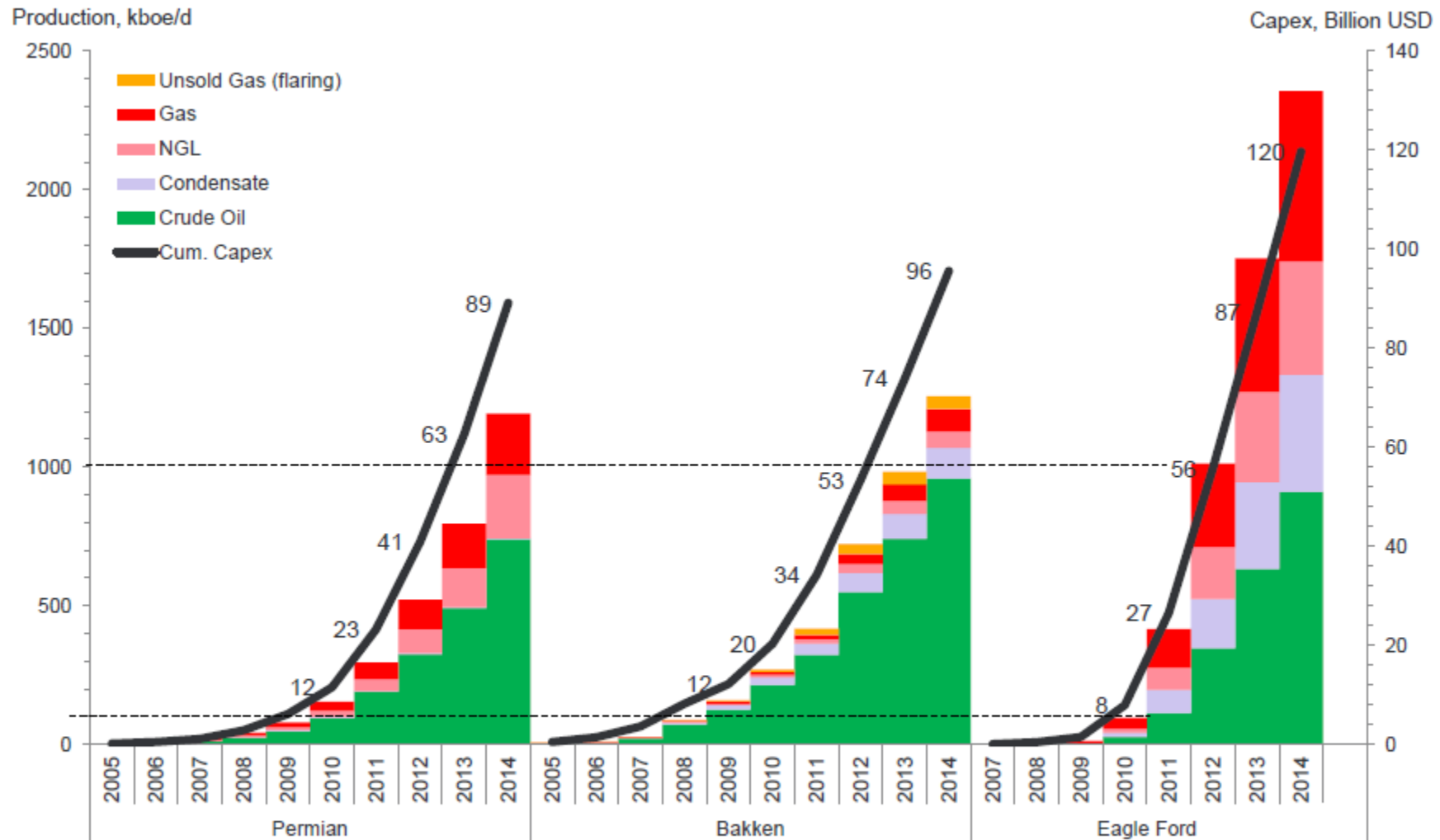
BP Statistical Review of World Energy

8

Source: V.Drebentsov. Oil Market Update, October 2015. IMEMO Workshop. – Presentation at the seminar “Low world oil prices and its consequences for macro-economy and oil sector of Russia” within Forum IMEMO-BP “Oil & Gas Dialogue”, Moscow, IMEMO RAS, 21.10.2015, slide 8 (http://imemo.ru/files/File/ru/conf/2015/21102015/21102015_PRZ_DRE.pdf)

A.Konoplyanik, CEPMLP seminar, Dundee, 12-13.02.2018

Shale production is directly proportional to spending but the ratio varies per play

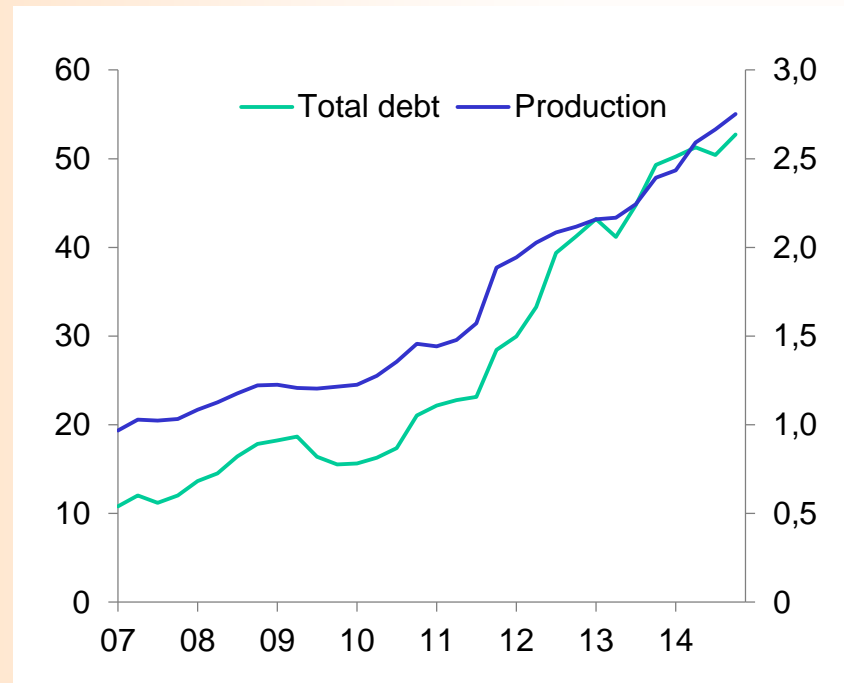


Source: Rystad Energy's NASCube

US shale is not only about production economics but also ability to raise debt (OIES)

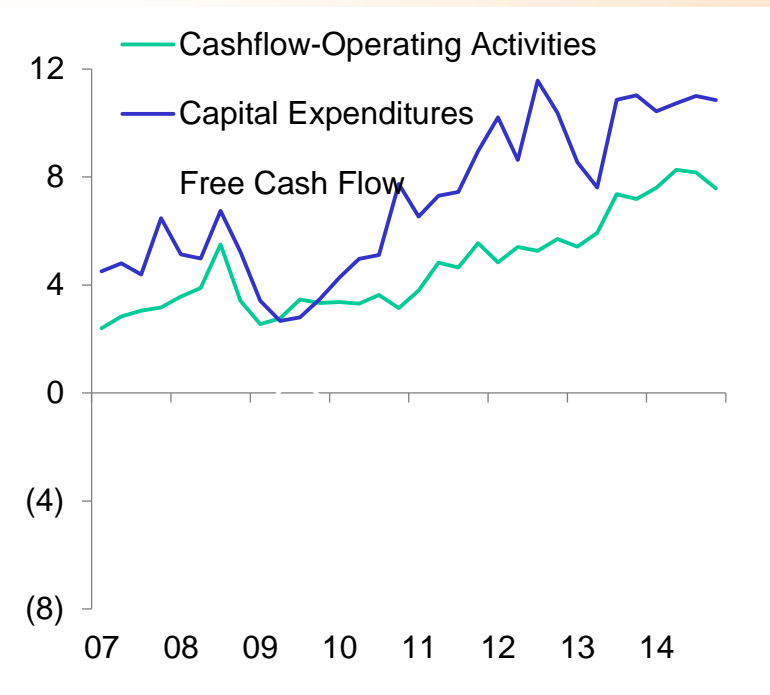
Production and debt

Debt (LHS), \$ billions, Production (RHS), mboe/d



US shale company cash flows

\$ billions



For US shale, it is not only about production economics but also about leverage, as increase in US output has been associated with increase in total debt of US shale producers

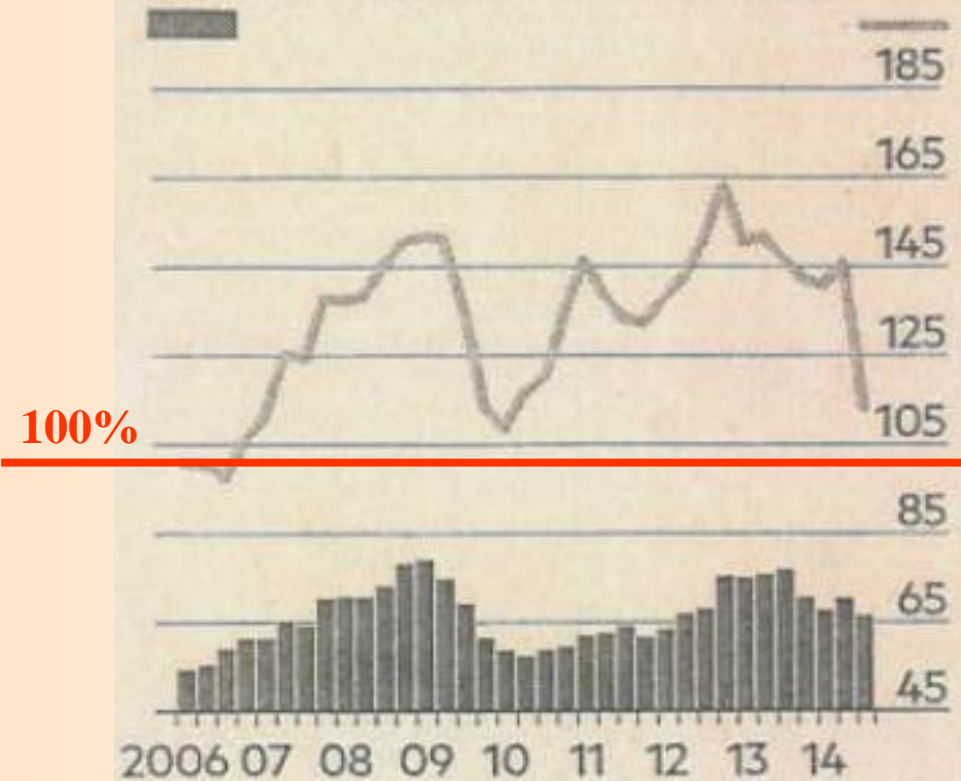
Despite negative free cash flows, financing has not yet proven to be disruptive force as US shale producers have been able to secure finance

Source: Jonathan Stern and Bassam Fattouh, Oxford Institute for Energy Studies. Lower Oil and Gas Prices: new phenomenon or history repeated? Presentation at the "ENERGETIKA-XXI", St.Petersburg, 12 Nov. 2015, slide 18.

Energy companies have been borrowing to fuel growth ...

US high-yield capital expenditure as a % of ebitda

Energy capital expenditure as a % of ebitda



100%

... making energy debt the biggest component of the US junk bond market

Sector composition of US high-yield bond market (%)



Source: Deutsche Bank

Source: Trace Alloway. Crude slide sparks oil-related debt fears. – “Financial Times”, 22/23.11.2014, p.15

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What is COP-21 & what it's future role?

- COP-21 – the Paris agreement within UN Framework Convention on Climate Change, was prepared within climate conference in Paris,
- regulates the measures on diminishing CO2 emissions post-2020,
- adopted by consensus on 12 December 2015,
- signed on 22 April 2016, came in force 4 November 2016
- 179 signatory states, account for 95% of emissions
- From my view: **Major factor of uncertainty in international oil & gas, possibly new paradigm of the international energy development**

COP-21 & New Limits to Growth

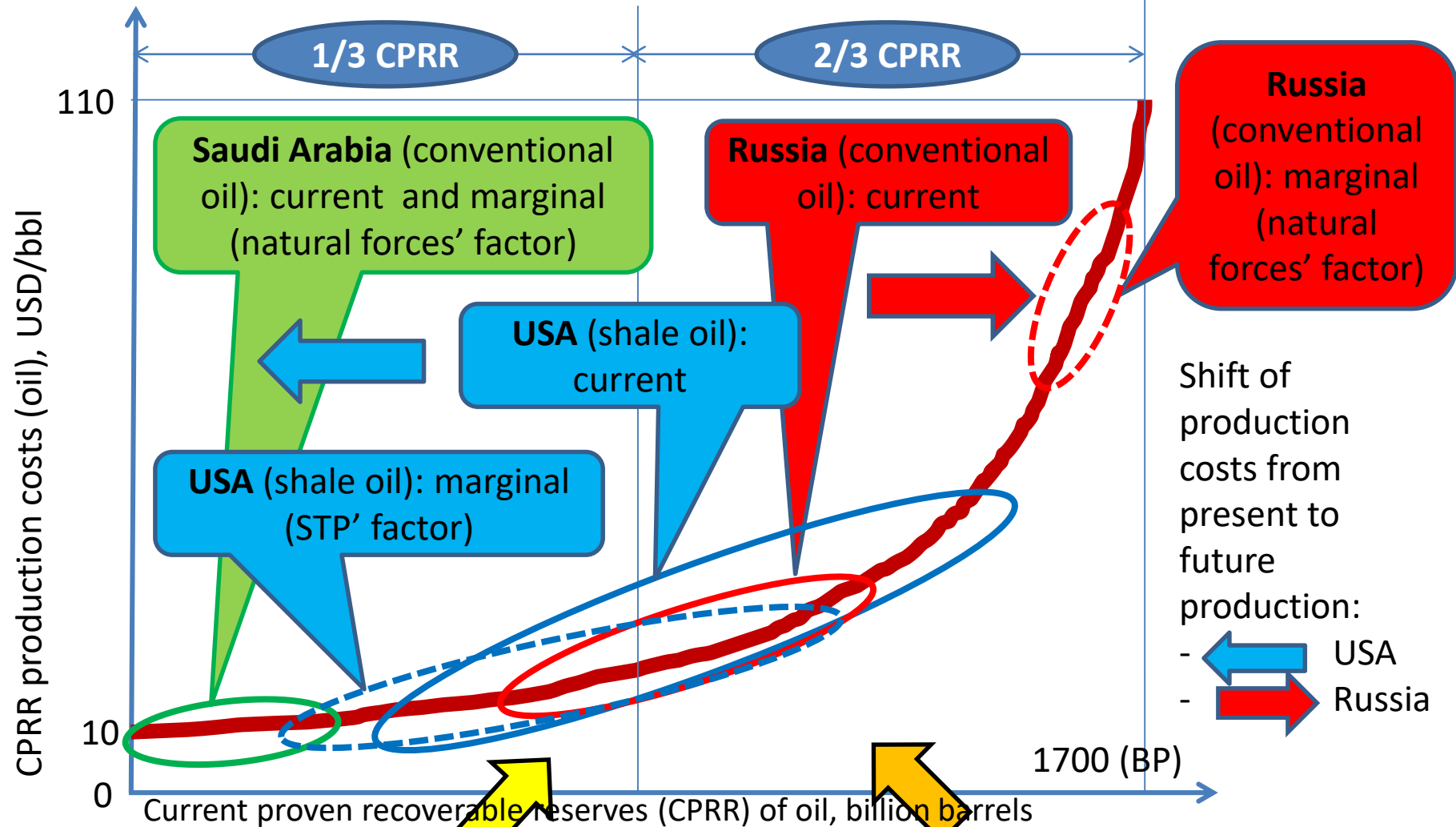
- **IEA (2012)**: to limit global warming **by 2°C** without large-scale implementation of carbon capture & storage (CCS) = not be able to consume (*) **MORE THAN ONE THIRD** of global proven recoverable reserves (PRR) of hydrocarbons (HC) up to 2050
- *OR*: cumulative future CO₂ emissions from **current** PRR HC volumes are **THREE TIMES HIGHER** than the upper limits of such emissions which are agreed upon in Paris bearing in mind sustainable global development.
- IEA: 2/3 of such potential emissions will come from coal, 22% from oil and products, and 15% from gas.

(*) through technological chains from production to end-use of each fossil fuel (coal, petroleum products, gas) in each energy/non-energy use of energy resources

COP-21 & New Paradigm of Energy Development

- **COP-21 might radically change paradigm of future energy development !!!**
- **FUTURE**: possible limitations on the demand side of global energy induced by the climatic-based restrictions on emissions (COP-21) - **???**:
 - not all today's CRR might be demanded by global economy
 - decreasing (NOT increasing) value of oil in place due to its staying potentially unclaimed (an opposite to Hotelling rule)
 - stimuli for quicker extraction and utilization of the current CRR HC
 - this will accelerate expectations of the “cheap oil” era (“cheap” means not because of decreasing production costs but because of diminishing price that the society will be ready to pay for it)
 - future possible oversupply artificially created by climate change agenda **???**

US shale oil & COP-21 influence on global oil supply curve (order of the figures): consequences for Russia



1/3 CPRR of HC= max CO₂ emissions in accordance with COP-21 (IEA)

There may be demand limitation (upper demand limit) for 2/3 CPRR of HC due to exhaustion of CO₂ maximum permissible quotes in accordance with COP-21

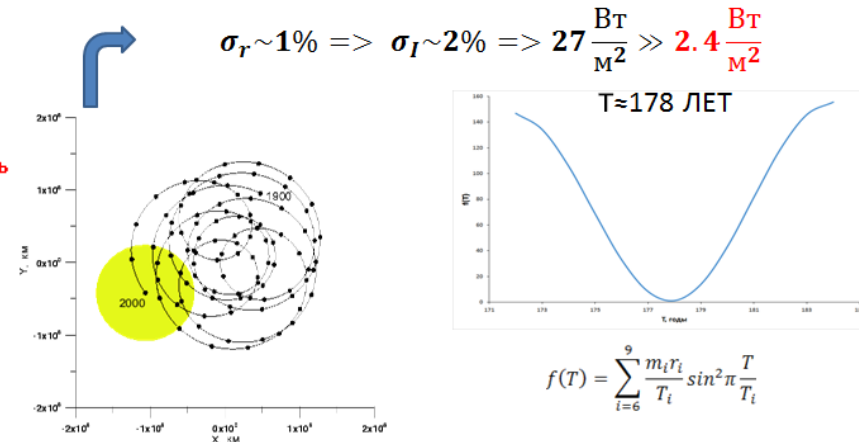
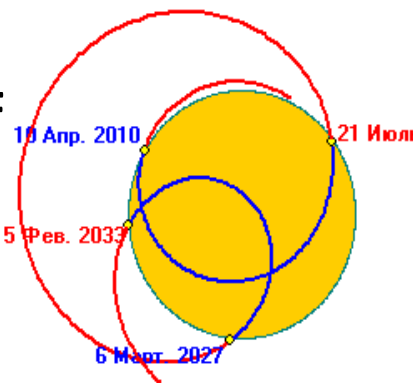
And in the end... Whether the whole concept of man's irreversible impact on climate change is well justified?

Specialists in solar activity are well aware of the climate change 178Y cycle !

As known, the Earth runs not around the Sun, but around mass center of Solar System (MCSS) which stays away of center of the Sun (CS) & constantly moves. In the period measured by decades deviation of MCSS from CS is comparable with diameter of the Sun => flow of Solar energy to the Earth fluctuates.

These fluctuations (± 24 W/sq.m) BY THE ORDER (10 times) HIGHER than increment of this flow (2.4 W/sq.m), which International Expert's Group on Climate Change called as "result of anthropogenically defined increase in GHG emissions"

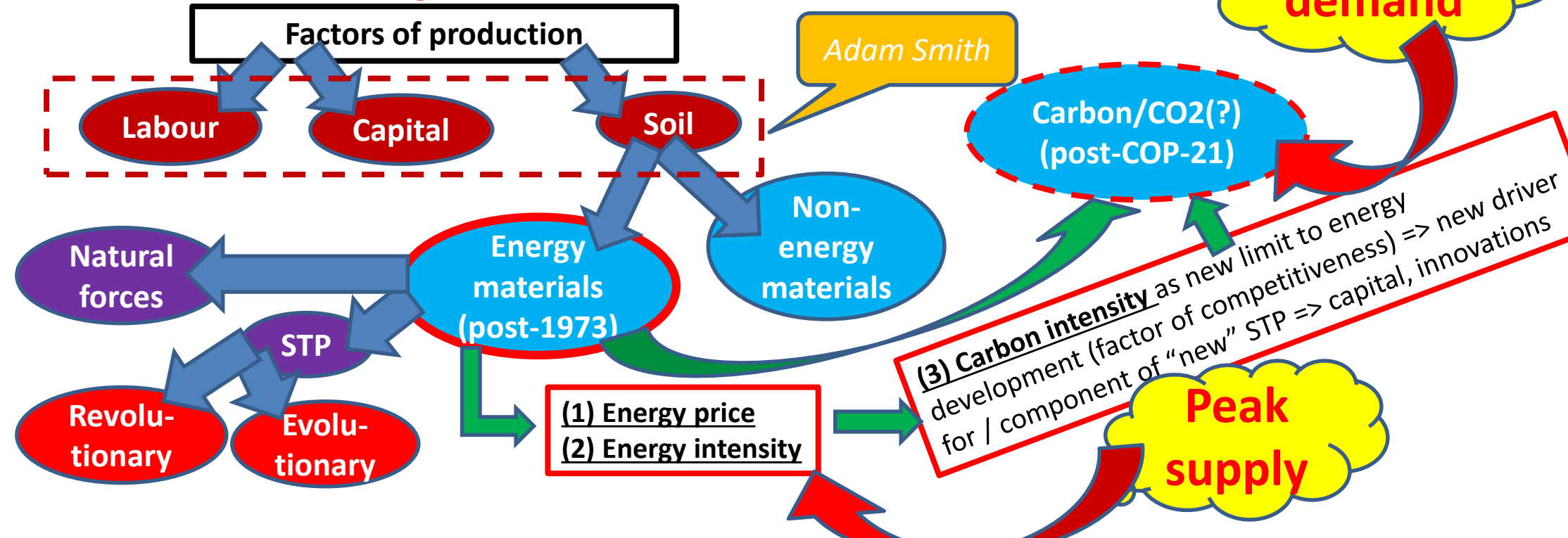
"RAS Presidium view, presented at request of RF President, on TOTAL ABSENCE OF SCIENTIFIC SUBSTANTIATION OF GLOBAL WARMING DOCTRINE is strongly justified even at the level of elementary appraisals"



Sources: Крученицкий Г.М. Климатическая доктрина РФ и защита национальных интересов России. НЕУСТРАНИМЫЕ ПРОТИВОРЕЧИЯ (в печати); он же. Презентация на Круглом столе «Риски реализации Парижского климатического соглашения для экономики и национальной безопасности России». Аналитический центр при правительстве РФ, 19.07.2016; Крученицкий Г.М., Матвиенко Г.Г. Физические причины долговременной изменчивости глобальной температуры. "Оптика атмосферы и океана" (в печати).

Political economy of energy: factors of production, inter-factors' competition, & Scientific & Technological Progress (STP) in energy

- *& current competitive niche for Russia*



Zones of competitive advantages of different groups of countries:

- Labour: developing (price), developed (quality)
- Capital (financial markets & innovations, technologies): developed (Anglo-Saxon),
- Energy (non-renewables, hydrocarbons): OPEC, USA, Russia => *the only current competitive niche for Russia (?)*

Options for increasing energy efficiency (decrease of energy costs in GDP/GNP) = its substitution by:

1. Other energies => inter-fuel &/or intra-fuel competition (STP)
2. Labour => export of energy-intensive industries to developing states
3. Capital => increase of energy efficiency (STP)
4. Non-energy materials (in non-energy use of energies) => (STP)

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- **From old to new paradigm of international energy development**
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- Gas supplies to the European gas market: historical and new development
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 - In the North
 - In the South
 - EU Quo Vadis project – from liberalization to protectionism?

Energy paradigm => international law priorities => areas for international governance / cooperation: PAST -> TODAY

- International energy economy based on:
 - Mostly non-renewable energies (NRE)
 - Mostly centralized commercial (industrial-type) cross-border energy value chains
 - Physical energy markets (till mid-1980s), physical & paper – afterwards
 - energy as commodity (commoditisation of energy markets)
- Sovereignty over natural resources
 - UN GA Res. 1803, Dec'1962; ECT Art.18, 1994/98 – role of national state
 - Fight for internationalization of supply (national supply vs international demand)
- Natural resource-rent generation & collection:
 - Geology risks
 - Monetization of nonrenewable resource rent
 - Cost plus (self financing) = minimum LT price
 - NBRV + indexation (maximization of marketable resource rent) = maximum LT price
 - Fight for resource rent: “resource nationalism” vs “optimization of natural resource rent collection”
- Primary attention: Access to resources (primary energy) => political risks (incl. nationalization, expropriation) & instruments of its mitigation:
 - Investor-host Gov't agreements (concessions, PSAs, risk-service, etc.)
 - International law instruments: DTTs, BITs, MITs
- Secondary attention: Access to capital, technologies, innovation within mostly non-competitive & non-transparent energy & other markets

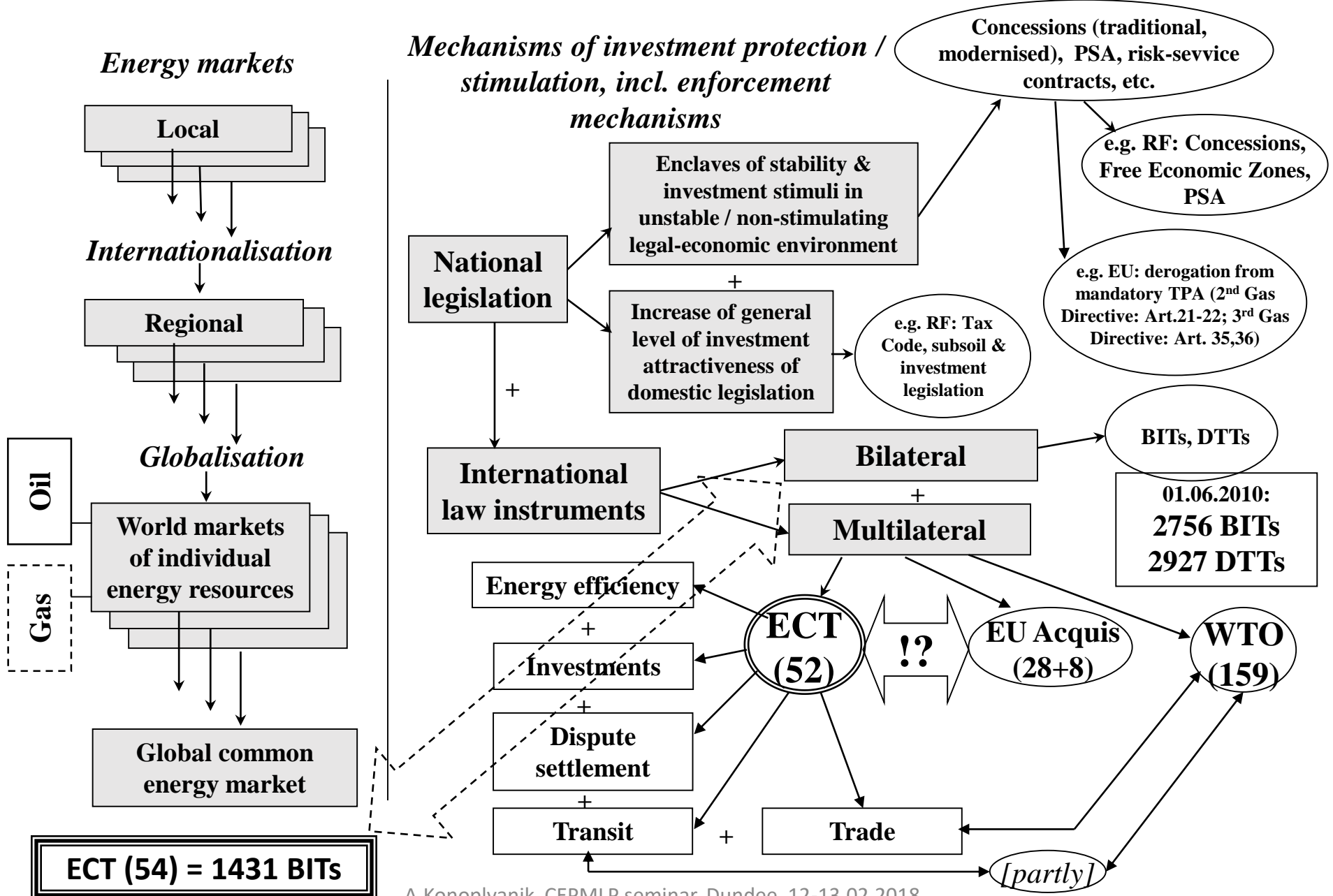
Energy paradigm => international law priorities => areas for international governance / cooperation: **TODAY -> FUTURE?**

- International energy economy based on:
 - NRE & RES (climate change, import dependence, SoS)
 - Centralized (industrial-type) cross-border (NRE) & decentralized (rural + post-industrial - RES) energy value chains
 - Physical & paper energy markets
 - Energy as financial asset (financialisation of energy markets)
- Nat.resource rent + technological rent generation & collection
- Access to capital, technologies, innovations in the more-and-more competitive & transparent energy & other markets
- Fight against energy poverty (access to end-use energy)
- Environmental considerations (pollutant pays) => “climate change” as new “production factor”
- Transition risks => financial stability/risk mitigation:
 - Re-pricing of fossil fuels due to technological change demanded by world decision to limit fossil fuels emission (COP-21) =>
 - “Unburnable carbon” => huge drop of energy assets values => how to exclude financial risk & shock
 - Financial Stability Board (FSB), the international body set up by the G20 in 2009 to monitor risks to the financial system
 - *NB: G-20 accounts for 85% of the global emissions*

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Development of international energy markets and of mechanisms of investment-trade protection & stimulation

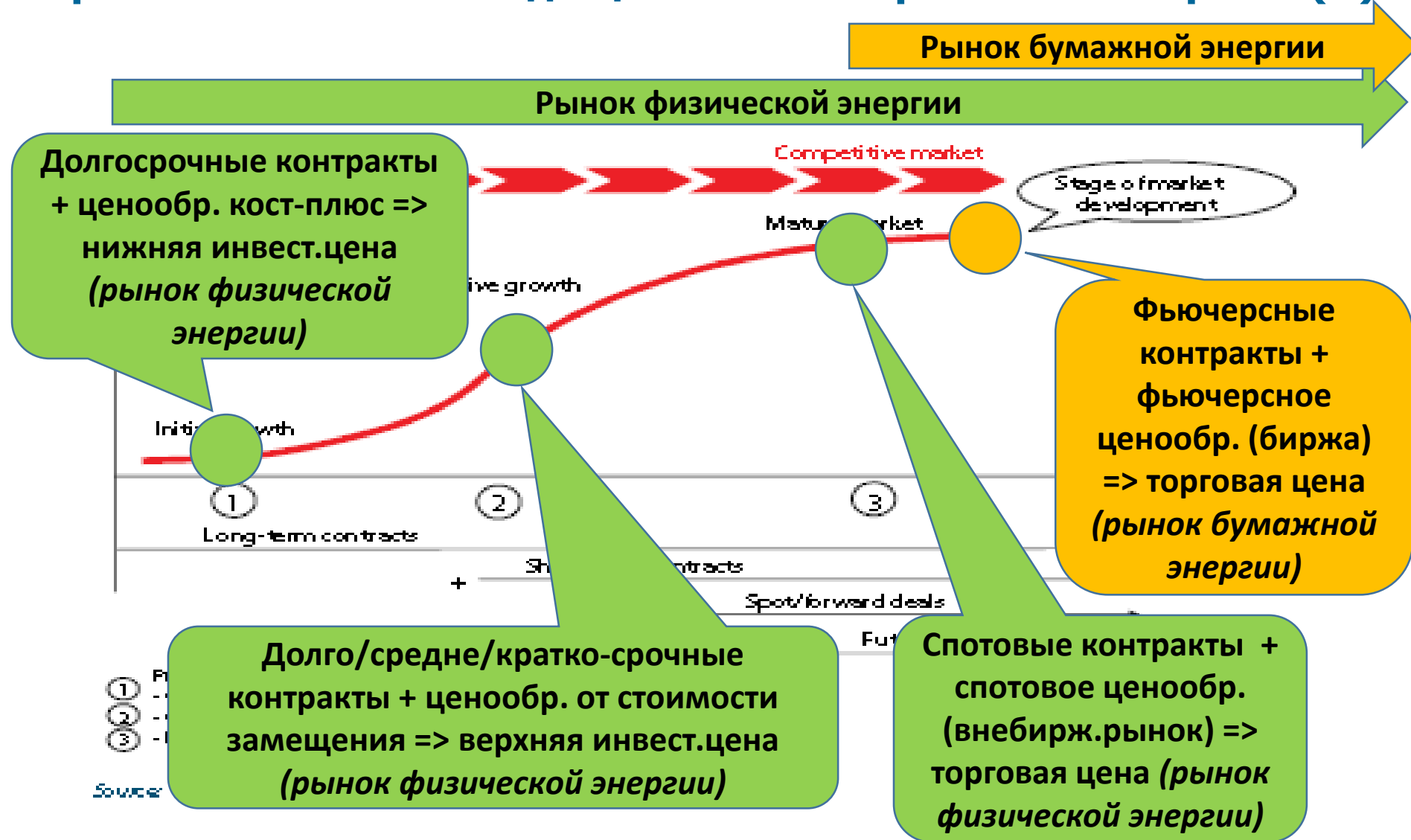


Эволюция рынков нефти и газа: соотношение стадий развития, контрактных структур и механизмов ценообразования на восходящей ветви «кривой Хабберта»



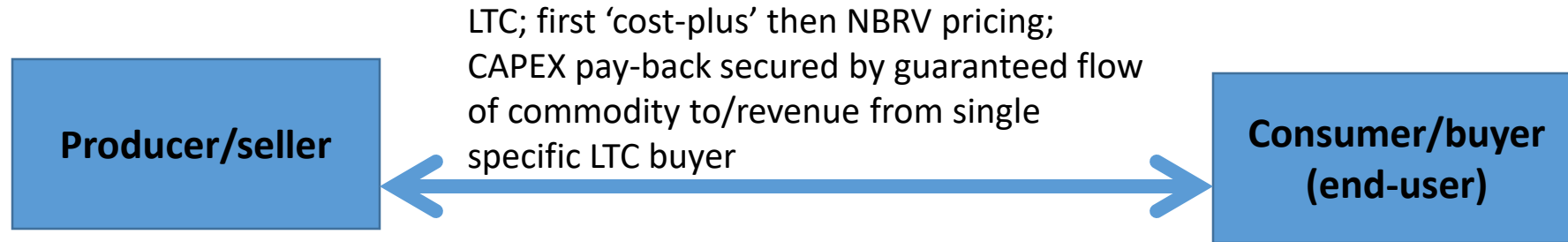
Наращение конкуренции = нарастание множественного / многовекторного набора возможностей для субъектов предпринимательской деятельности в энергетике на всех стадиях трансграничных цепочек энергоснабжения (газа)

Эволюция рынков нефти и газа: соотношение стадий развития, контрактных структур и механизмов ценообразования на восходящей ветви «кривой Хабберта» (2)



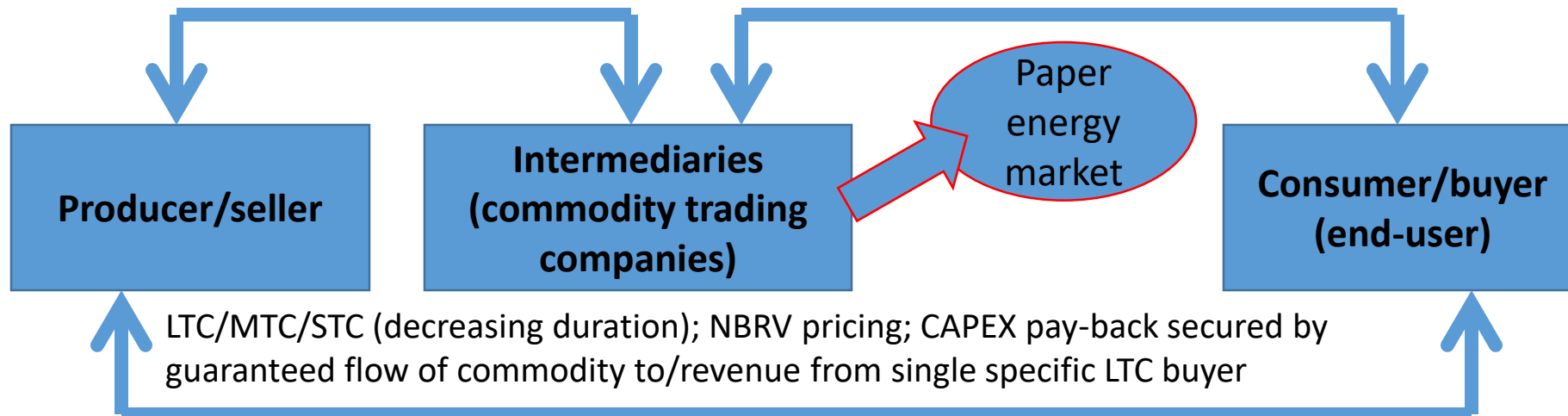
Evolution of contracting schemes with energy market developments (oil, natural gas , LNG)

(A) Initial stages of market developments (under-supplied/under-contracted markets)



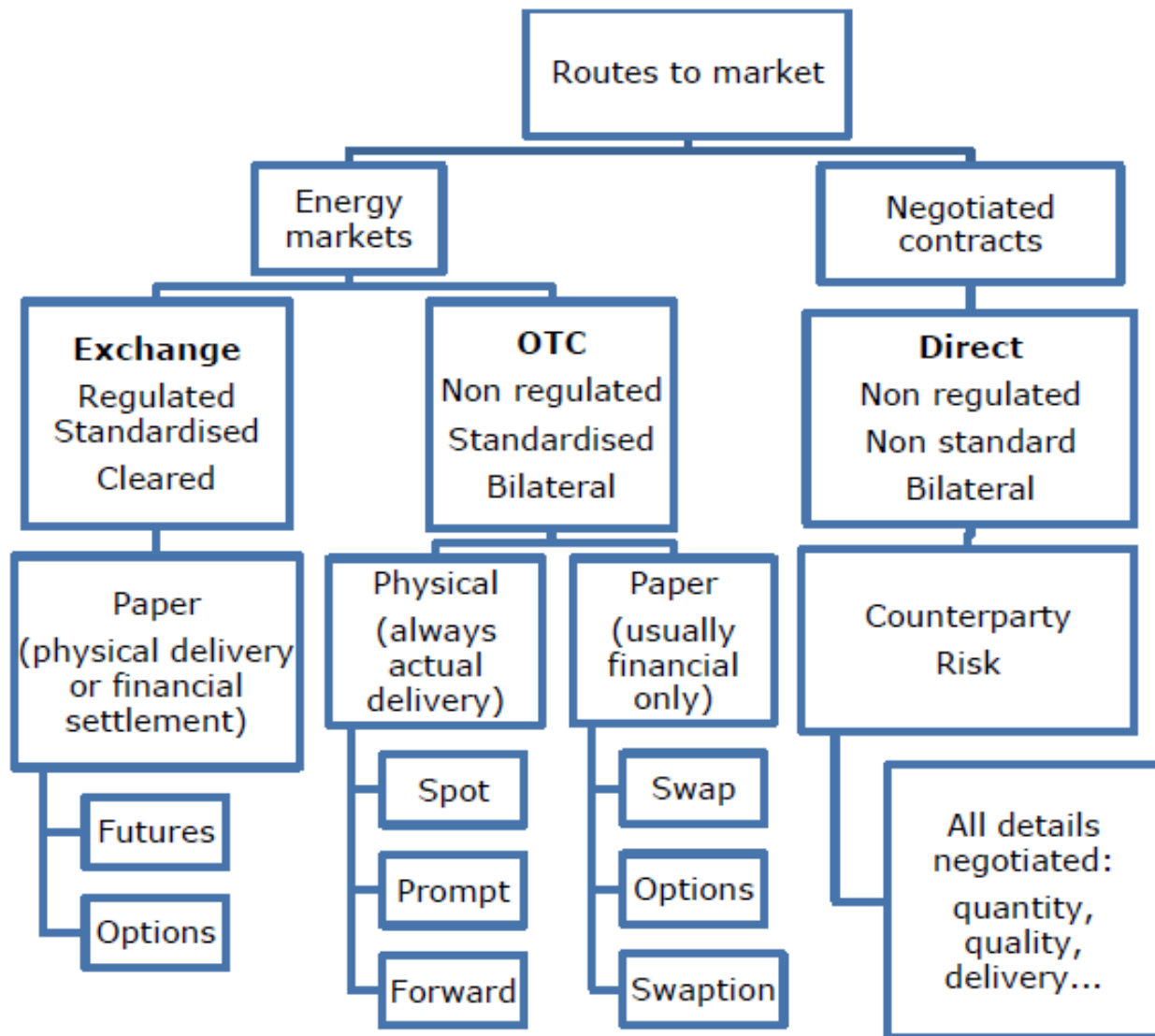
(B) Mature stages of market developments (over-supplied/over-contracted markets)

STC & spot; NBRV pricing (gas & LNG: first "oil-indexed, then "gas-to-gas" (hub-indexed)); CAPEX pay-back secured by guaranteed flow of commodity to/revenue from competitive diversified though oversupplied market => then secured by hedging at paper energy market



Contractual structures in the market (acc. to Heather, 2015)

Figure 1. The routes to the market



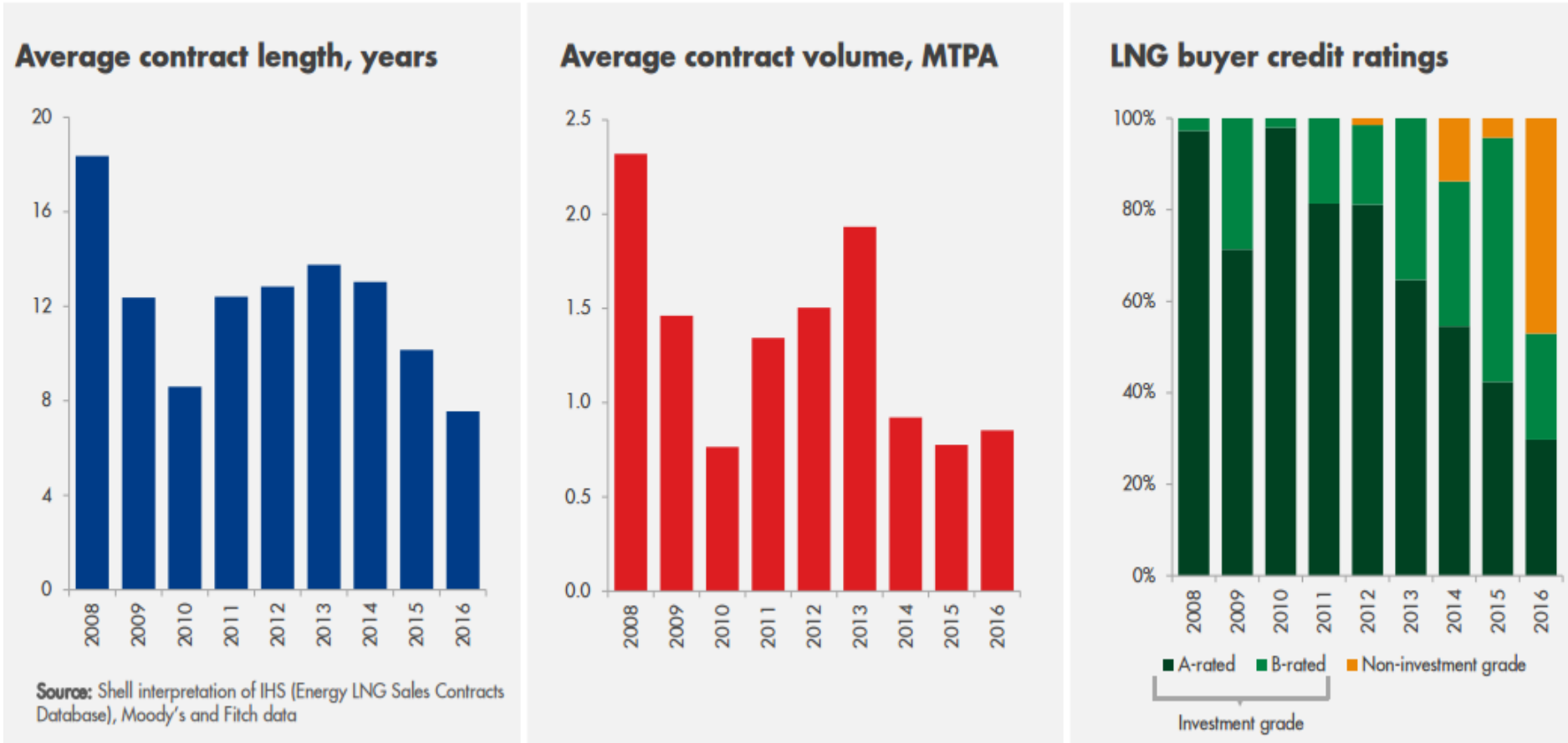
Source: (Heather 2015)

Источник: Costescu A, Manitsas E., Szikszai A. "State of implementation of the Third Energy Package in the gas sector", European Commission Joint Research Center, Science for Policy Report, 2018, EUR 29102 EN, p.14 (<https://publications.europa.eu/en/publication-detail/-/publication/59a25674-0af0-11e8-966a-01aa75ed71a1/language-en/format-PDF>)

Первоисточник: Heather P., *The evolution of European traded gas hubs*, OIES, December 2015 (<https://www.oxfordenergy.org/wp-content/uploads/2016/02/NG-104.pdf>)

Trend to shorter and smaller contracts with emerging buyers

Рынки разветвленнее, диверсификация, но институциональные риски растут



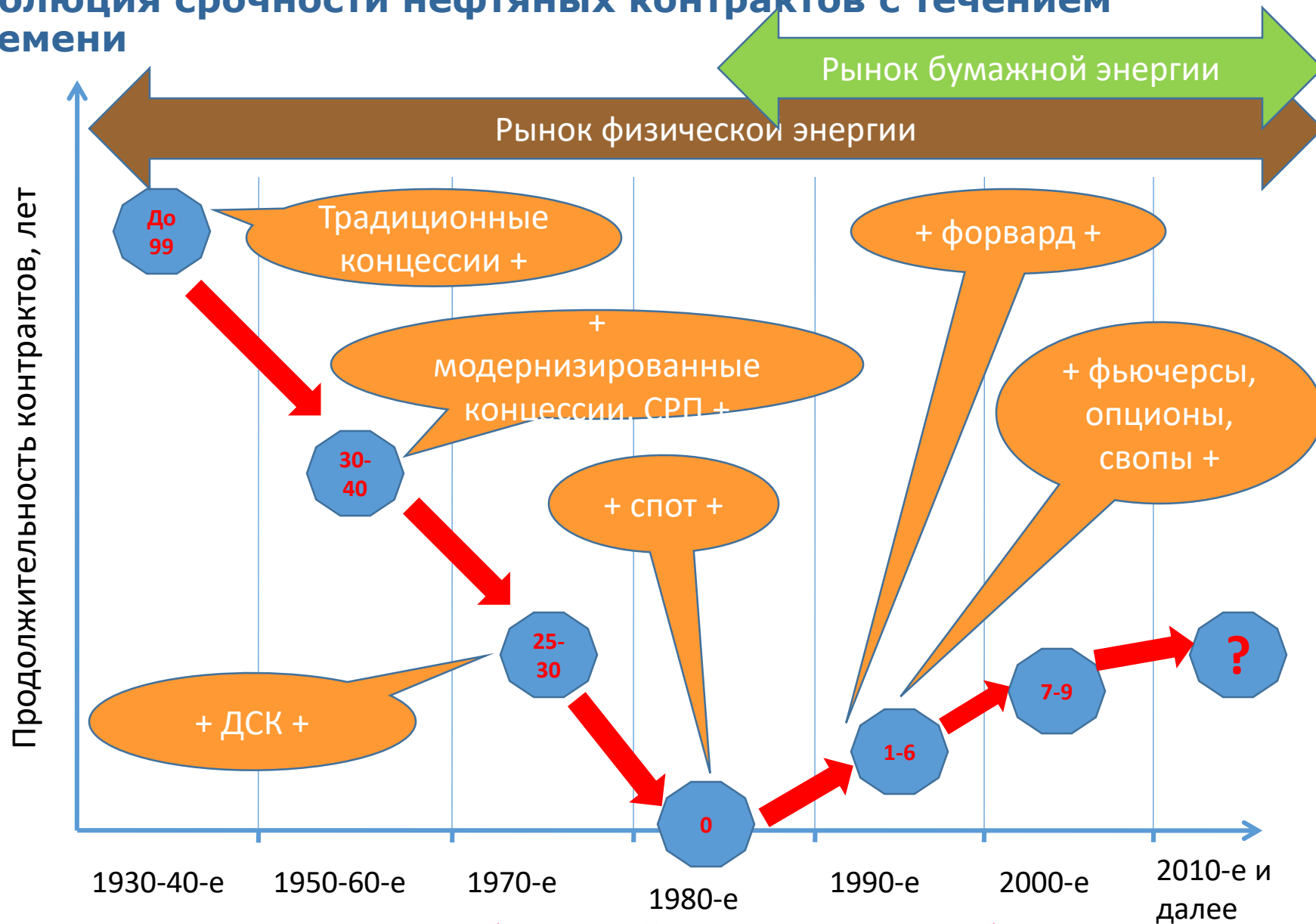
Copyright of Royal Dutch Shell plc

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Source: Shell LNG Outlook 2017 – slides, slide 12

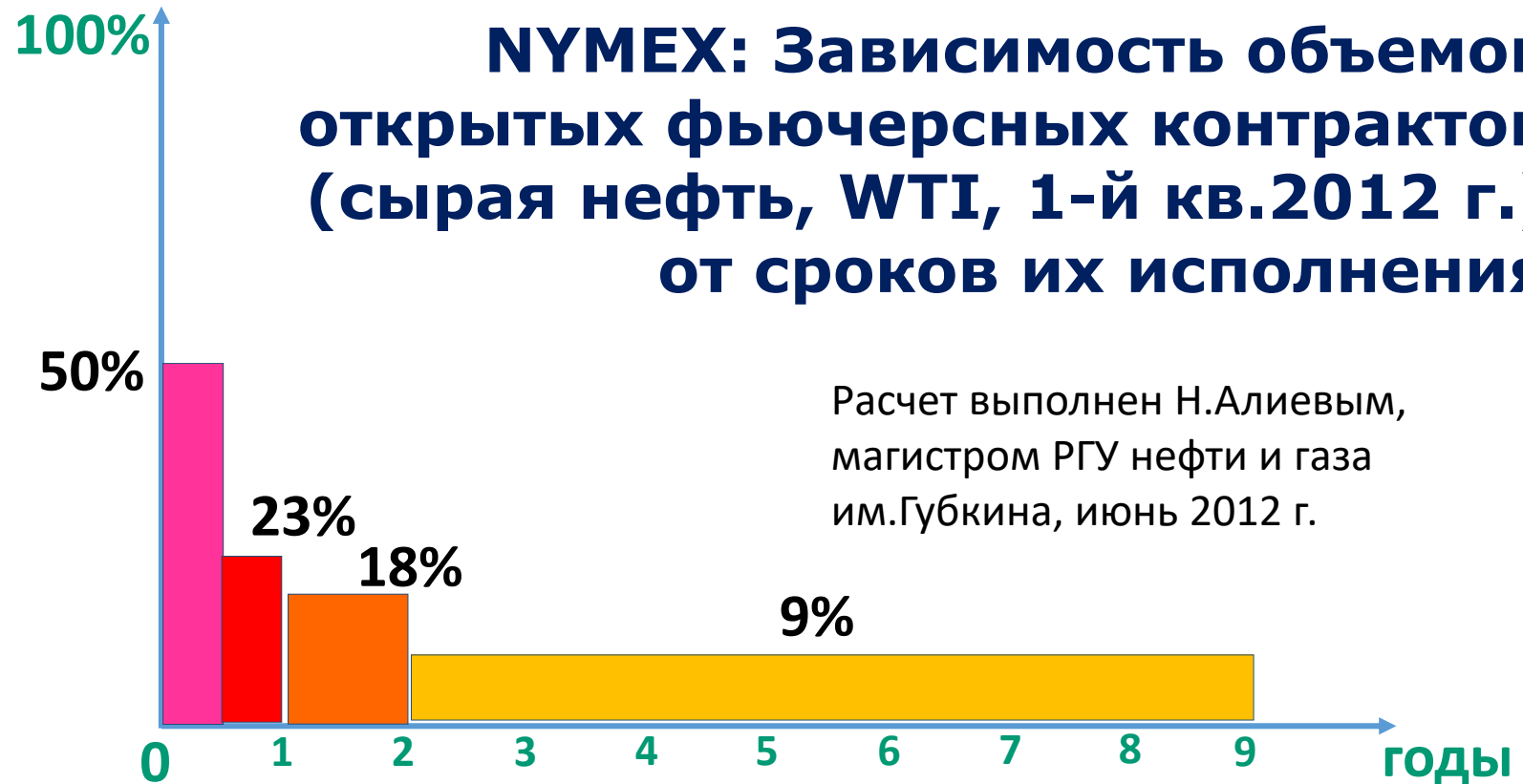
(http://www.shell.com/energy-and-innovation/natural-gas/liquefied-natural-gas-lng/lng-outlook/_jcr_content/par/textimage_1374226056.stream/1490189885482/516845c6c67687f21ff02bec2d330b97c91840f9ffa9e4348e7b875683215aaf/shell-lng-outlook2017-slides-master-march2017.pdf)

Эволюция срочности нефтяных контрактов с течением времени



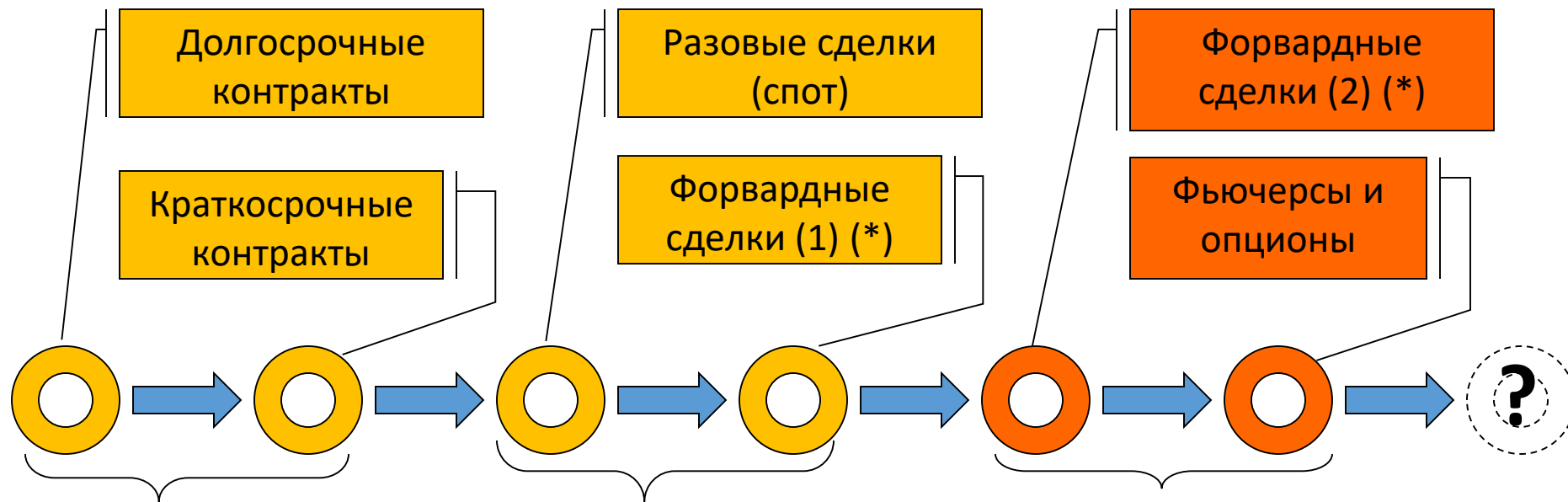
Срочность сделок на рынке бумажной нефти, казалось бы, увеличивается. Но... (см. след.слайд)

NYMEX: Зависимость объемов открытых фьючерсных контрактов (сырая нефть, WTI, 1-й кв.2012 г.) от сроков их исполнения



... но большая часть объемов торговли сконцентрирована в пределах ближайших месяцев => увеличивающаяся краткосрочность (short-termism) неблагоприятна для долгосрочных капиталоемких инвестпроектов, хеджирование же лишь отодвигает во времени инвестриски, а не ликвидирует их

Эволюция рынка нефти: объемы торговли - объемы поставок



Объемы торговли **соответствуют** объемам поставок

Объемы торговли **превышают** объемы поставок – внебиржевой рынок (последовательные перепродажи неунифицированных товарных партий – «маргариточные гирлянды»)

Объемы торговли **многократно превышают** объемы поставок – рыночные/биржевые площадки (разнонаправленные перепродажи унифицированных обязательств по поставкам)

Растущая ликвидность, но и растущая нестабильность рынка; хорошо для торговцев и спекулянтов, но краткосрочно и угнетает проектное финансирование

- Товарные рынки («физической» нефти)
- Финансовые рынки («бумажной» нефти)

(*) (1) в пределах обеспеченности накопленными товарными запасами, (2) за пределами такой обеспеченности

Станет ли газ, как и нефть, (мировым) биржевым товаром?						
Северная Америка и Великобритания				Континентальная Европа и Япония / Корея		
<ul style="list-style-type: none"> ➢ развитие на базе собственных ресурсов, изначально нет зависимости от импорта 				<ul style="list-style-type: none"> ➢ с самого начала высокая зависимость от импорта 		
<ul style="list-style-type: none"> ➢ поставки на основе малых и средних газовых месторождений 				<ul style="list-style-type: none"> ➢ поставки на основе импорта с гигантских и сверх-гигантских месторождений 		
<ul style="list-style-type: none"> ➢ стандартизованное взимание ренты, решения по развитию принимает частный сектор 				<ul style="list-style-type: none"> ➢ максимизация ренты странами-экспортёрами, решения о развитии принимают страны-экспортёры 		
<ul style="list-style-type: none"> ➢ эластичность спроса благодаря электроэнергетике 				<ul style="list-style-type: none"> ➢ ограниченная эластичность спроса 		
<ul style="list-style-type: none"> ➢ конкуренция между поставщиками газа, но цены на газ всё ещё следуют ценам на нефть 				<ul style="list-style-type: none"> ➢ ценовые формулы привязаны к ценам на нефть 		
			Связь			
реструктуризация рынка с 1980-х годов			⇨ модель для реформ	реструктуризация рынка с конца 1990-х годов		
Северная Америка		Великобритания	Торговля СПГ	ЕС (конт. страны)		Япония / Корея
узлы (спотовой торговли) созданы промышленностью, чётки 100, много участников, потенциал поглощения больших объёмов СПГ	⇨	НПР создана не ради регулирования, чётки 15-10, много игроков, потенциал поглощения ограниченных объёмов СПГ	нет узлов (спотовой торговли) СПГ, но СПГ передаёт ценовые сигналы ⇨	мало узлов, созданных промышленностью, чётки <10, мало сильных участников, доминируют долгосрочные контракты	⇨	пока нет узлов (спотовой торговли), несколько сильных участников, доминируют долгосрочные контракты

Источник: «Цена энергии: формирование международных механизмов ценообразования на нефть и газ», Секретариат Энергетической Хартии, 2007, с.113

Исторически сложившаяся контрактная структура сегодняшней трансграничной производственно-сбытовой цепи газоснабжения Россия - ЕС

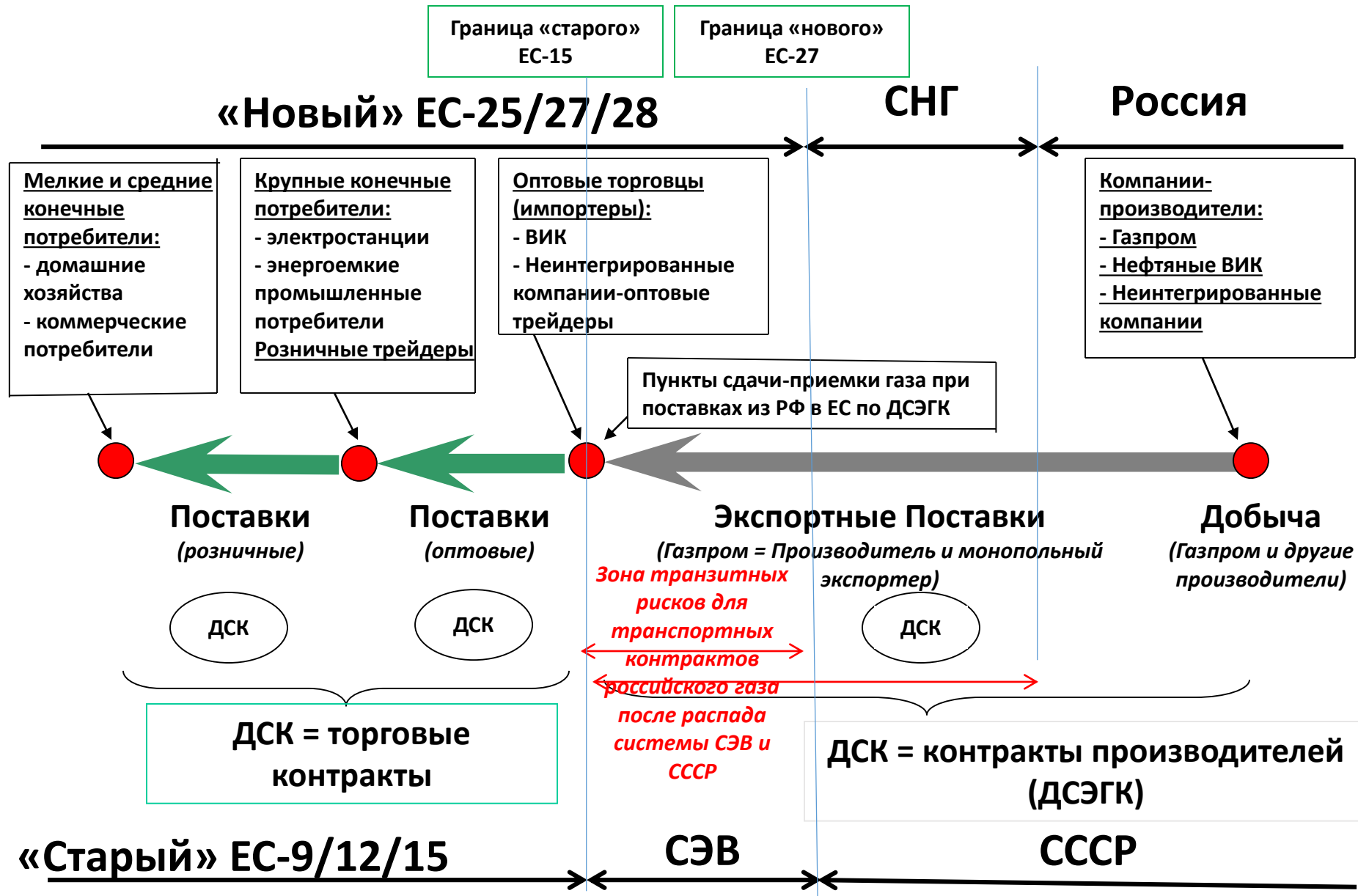
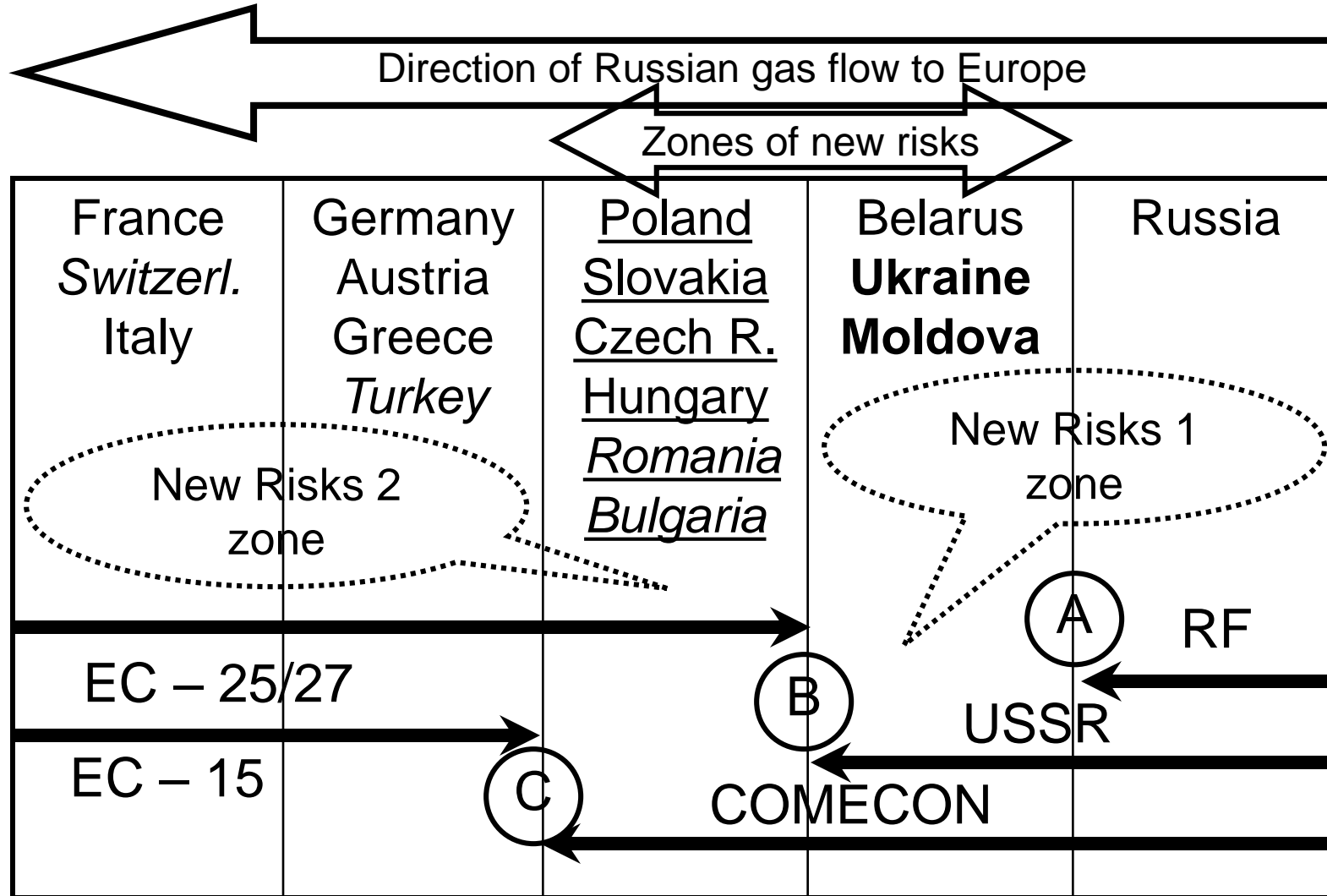
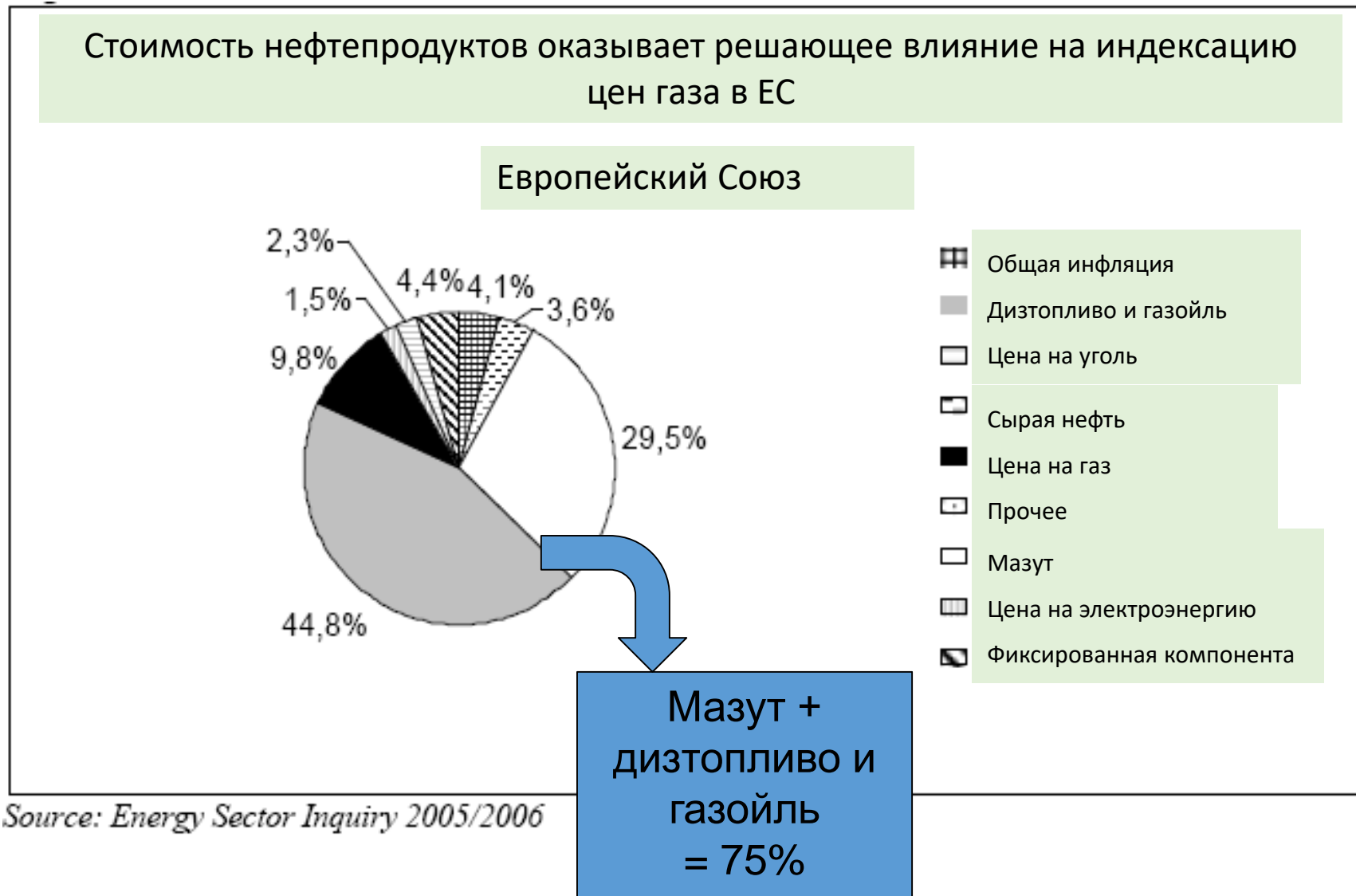


Figure 4. Russian Gas Supplies to Europe: Zones of New Risks for Existing Supplies Within Russia's Area of Responsibility

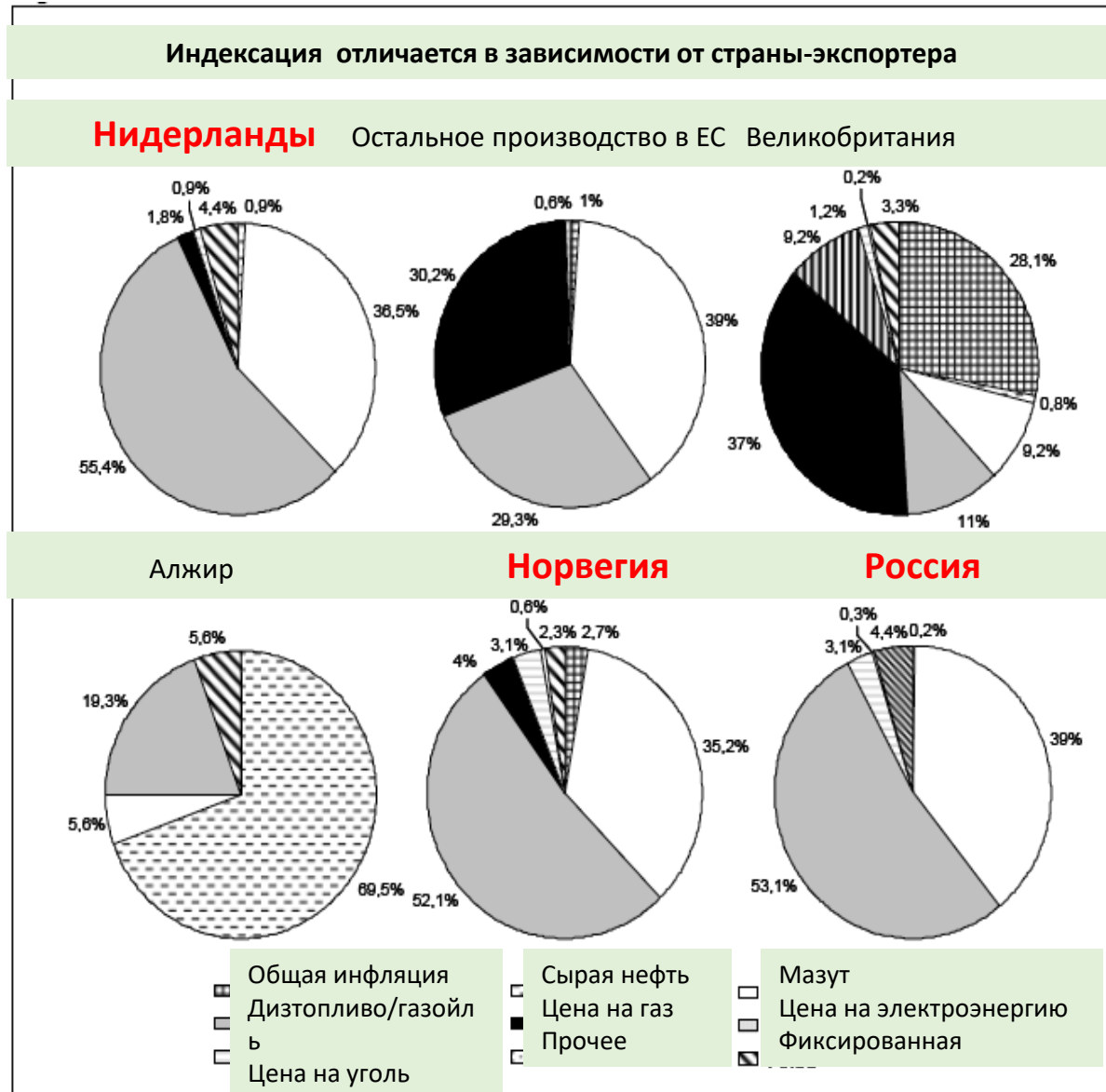


Italic – non-EU countries; New EU accession states: underlined – since 01.05.2004, underlined + italic – since 1.01.2007; **Bold** – FSU states members of ECOMT; A, B, C – points of change of ownership for Russian gas and/or pipeline on its way to Europe

Структура индексации цен газа в ЕС до 2009 г.



ДСЭГК в ЕС до 2009 г.: Индексация производителем

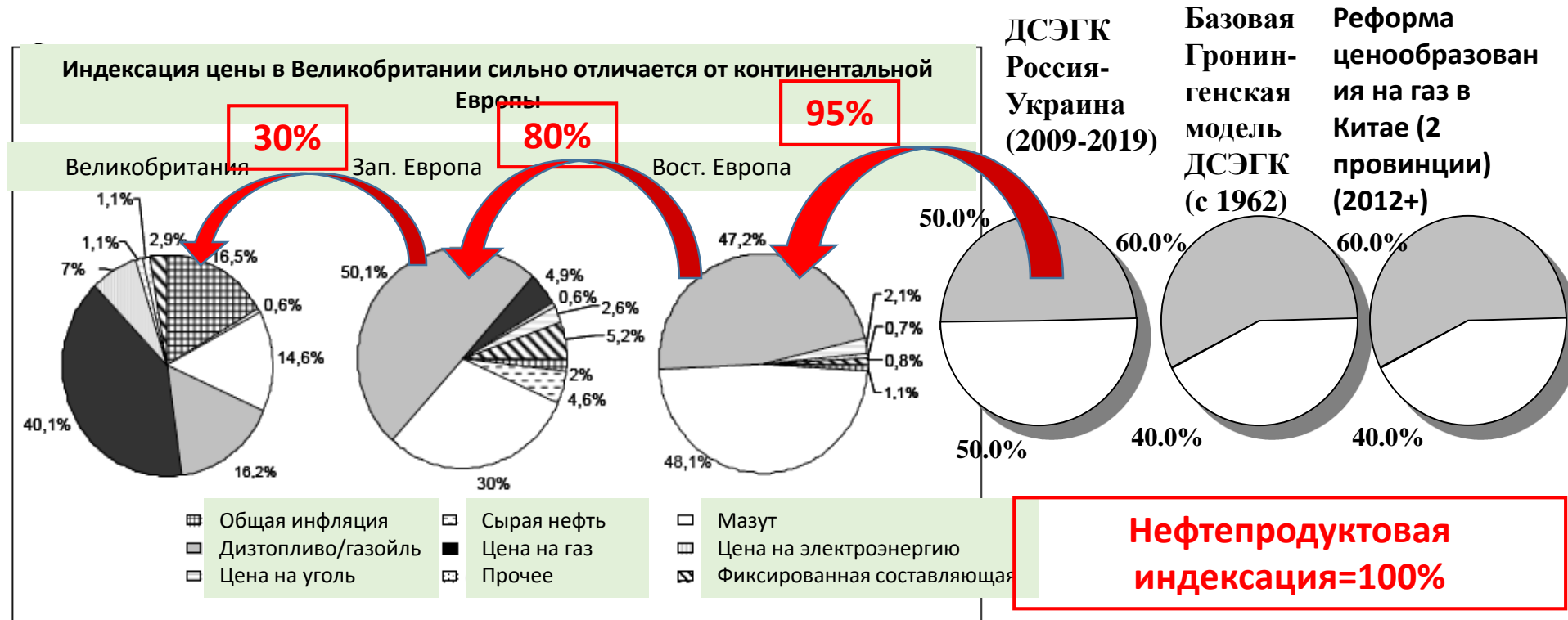


Source: Energy Sector Inquiry 2005/2006

Нидерланды, Норвегия, Россия:
 мазут = 35-39%;
 дизтопливо и газойль = 52-55%;
 В сумме М+ДТ/Г:
Нидерланды = 92%,
Норвегия = 87%,
Россия = 92%

Основные экспортеры газа в ЕС:
 преимущественно нефтяная индексация

Эволюция структуры ценовой индексации европейских ДСЭГК при движении от менее к более либерализованным рынкам



Source: Energy Security Inquiry 2005/2006

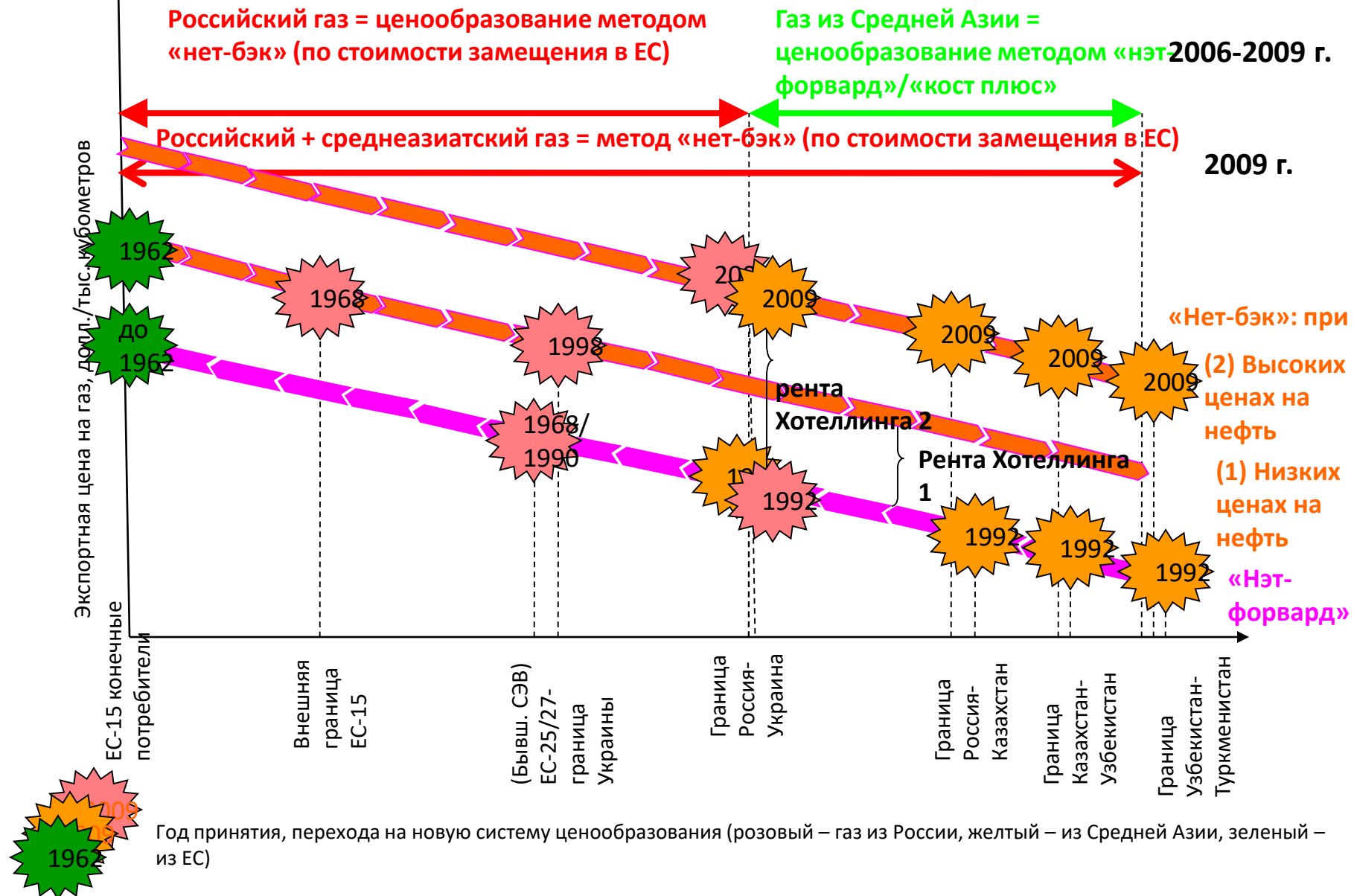
← Эволюция структуры ценовой формулы ДСЭГК: от простого к более сложному

Обоснование структуры ДСЭГК Россия-Украина (2009) и Китай (2012): практичнее (понятнее и надежнее) начинать с менее сложной формулы ценообразования, схожей с отработанной на практике базовой Гронингенской формулой

Вероятная дальнейшая эволюция структуры формулы: в сторону «диверсификации» индексации цены по траектории Вост. Европа => Зап. Европа => Великобритания =>

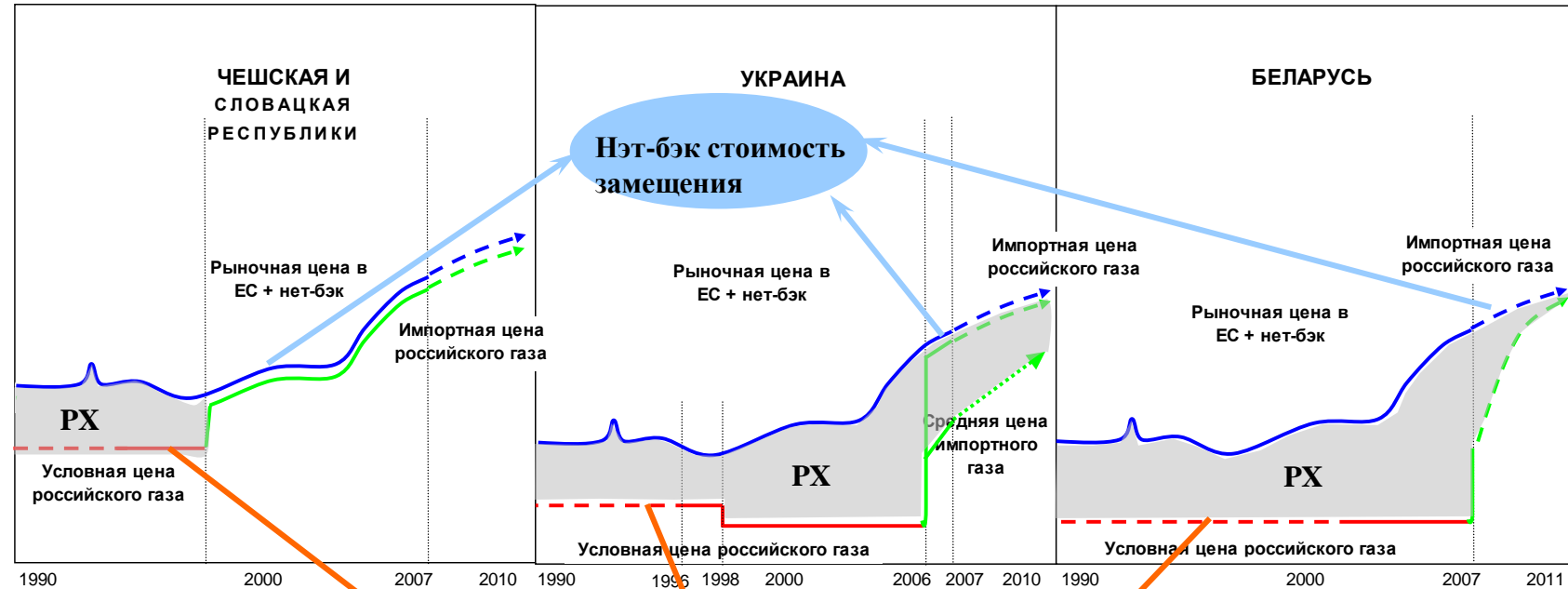
=> УХОД ОТ НЕФТЯНОЙ ПРИВЯЗКИ ???!!!

Эволюция экспортной цены на газ в континентальной Европе и странах бывшего СССР с 1962 по 2009 г.



ЦЕНЫ И ЦЕНООБРАЗОВАНИЕ НА РОССИЙСКИЙ ГАЗ ДЛЯ ЕС И СТРАН ПО ТРАССЕ ЭКСПОРТНОГО ТРУБОПРОВОДА – И РЕНТА ХОТЕЛЛИНГА

ЦЕНА РОССИЙСКОГО ГАЗА ДЛЯ ВОСТОЧНОЙ ЕВРОПЫ И СНГ



- Прим:
- 1- Показатели представлены исключительно в иллюстративных целях и, таким образом, отражают примерно текущие уровни и изменения цен
 - 2- График "Рыночная цена нет-бэк в ЕС" построен по данным публикации МЭА "World Energy Outlook 2006"
 - 3- Динамика цен после 2007 - исключительно иллюстративна.
 - 4- Цены для Украины и Беларуси, по информации открытых источников, в последние годы
 Украина - цена российского газа: 230 \$/млн.м3 (2006) ; Средняя цена газа (для смеси российского/среднеазиатского газа): 95 and 135 \$/млн.м3 (2006 и 2007, соотв.)
 Беларусь - цена российского газа : 100 \$/млн.м3 (2007). Цена достигла рыночного уровня к 2011 в соответствии со след. установленными шагами (67, 80, 90 и 100% с 2008 по 2011)
 - 5- Условная цена российского газа - для определения объемов газа в качестве компенсации за транзитные услуги.
 Украина: 80 \$/млн.м3 до 1998; 50 \$/млн.м3 с 1998 по 2006

PX

Рента Хотеллинга (PX) или ее часть, передаваемая от страны-экспортера стране-импортеру

Издержки-плюс

Источник: «Цена энергии: Международные механизмы формирования цен на нефть и газ», СЭХ, 2007, с.194; <www.encharter.org>

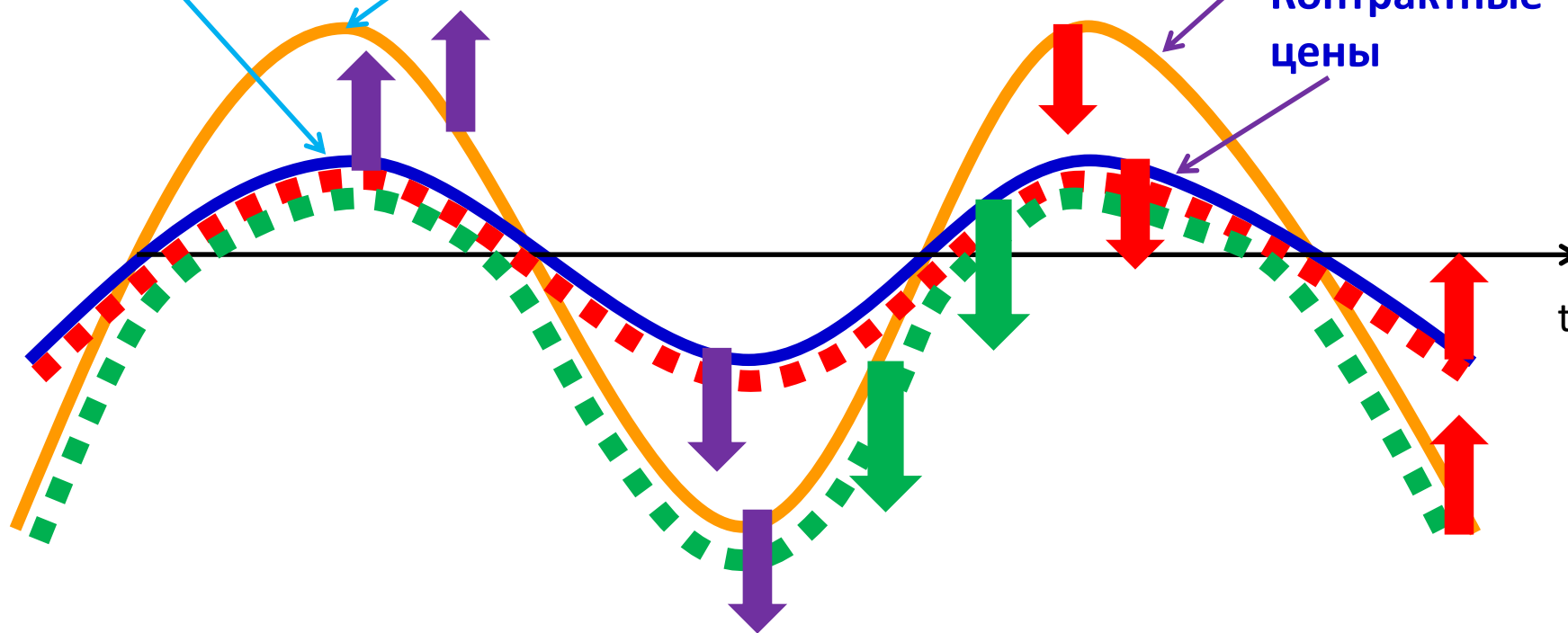
Ценовые предпочтения производителей, потребителей и биржевых игроков

Поставки по ДСЭГК с формульным ценообразованием

Разовые сделки с фьючерсным ценообразованием

Спотовые цены

Контрактные цены

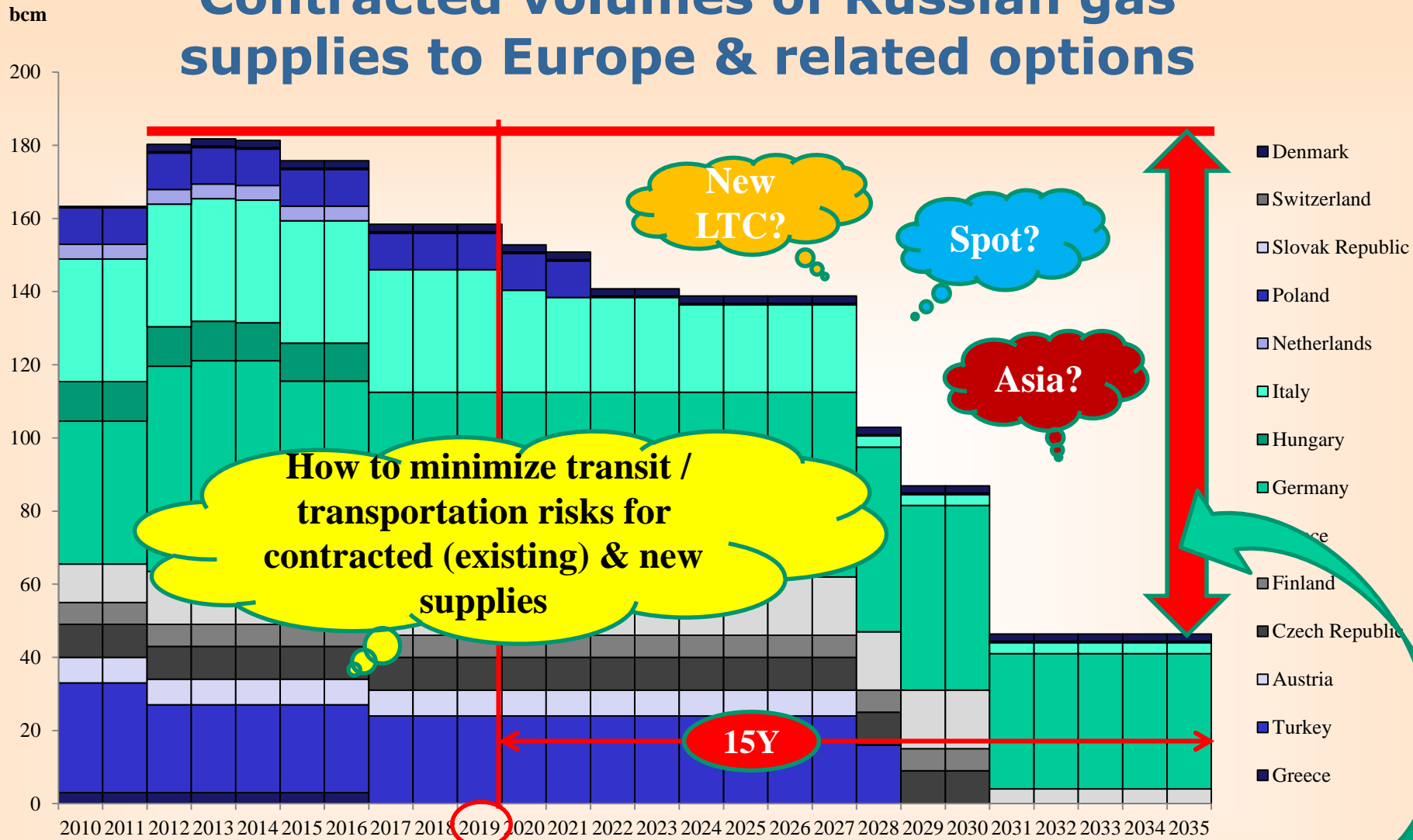


- ■ ■ ■ ■ ■ ■ ■ ■ ■ Предпочтения производителей/экспортеров/хеджеров
- ■ ■ ■ ■ ■ ■ ■ ■ ■ Предпочтения импортеров/потребителей
- ■ ■ ■ ■ ■ ■ ■ ■ ■ Предпочтения спекулянтов

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 - Russian pipeline gas vs US LNG in Europe
 - US LNG story
 - Russian new gas pipelines story
 - In the North
 - In the South
 - EU Quo Vadis project – from liberalization to protectionism?

Contracted volumes of Russian gas supplies to Europe & related options



Source of primary graph:
T.Mitrova (ERI RAS) in: «The Russian Gas Matrix: How Markets Are Driving Change», Ed. by J.Henderson & S.Pirani, Oxford University Press, 2014, Fig.3.1/p.53.

Expanding niche for (at least partial?) substitution of terminating EU-destined LTC supplies at the border by new (adapted) LTCs, spot deliveries & trade at EU hubs; or partial redirection of terminating EU-destined LTCs to the East?

Transit risks through the territory of Ukraine has increased post-2014 (1)

- Physical security of transit system has been worsening in the absence of necessary investments in its modernization (reports on damages & emergencies, panic repairs) & due to terrorist threats,
- Adopted UA laws enables to stop Russian gas transit as a means of sanctions against Russia and forbid Russian investments in UA GTS,
- Unilateral decision of UA NRA in 2015 to increase transit tariffs since 2016 (contrary to acting transit contract) in result of implementation of EU legislation within UA due to UA's membership in the Energy Community Treaty,

Transit risks through the territory of Ukraine has increased post-2014 (2)

- Administrative pressure on Gazprom, incl. decision of UA antimonopoly body to penalize Gazprom (3+ USD bln) as if for “abuse of dominant position at the gas transit market of UA” (*NB: Gazprom does not provide, but receives transit services*)
- Lack of mutual trust between the two parties (crisis in relations) prevents to coordinate mutually acceptable conditions of transit after current transit contract expires
- Low level of gas injection into UA UGS (14.3 BCM early October contrary to appr. 19 BCM needed to safely pass through Winter season) increases the risk of unauthorized off-takes from transit flows (precedents at least in Jan’2006 & Jan’2009)
- => **transit risks are still there & increasing**

Minimization instruments of transit risks

- To settle transit dispute/crisis after/in case it occurs :
 - International law instruments (Energy Charter Treaty, Art.7) are aimed at minimization of negative consequences of the dispute/crisis which is already in place (by accident), but
 - Availability of mutually agreed rules does not preclude that they will/might not be violated (like transit crises Jan'2006, Jan'2009)
 - Especially if there is no mechanism of inescapable punishment for violation of the mutually agreed rules => they oriented mostly on goodwill of the parties (sort of "idealization" of international law), => in the post-Cold War 1990-ies nobody can even imagine, after 30Y+ of stable and non-interruptible transit through the Cold War era, that transit flows can be interrupted by purpose
 - Risk that transit dispute/crisis will occur still remains
- To prevent (to exclude/decrease probability of) the very fact of transit dispute/crisis occurrence :
 - Diversification of routes ("multiple pipelines") = liquidation of transit monopoly => diminishment of transit risks, and/or
 - Full abandonment from transit routes = non-transit bypasses to the destined markets (escaping third countries, if possible) => nullification (total liquidation) of transit risks

Historical preconditions for alternative (risk-avoidance) pipelines:

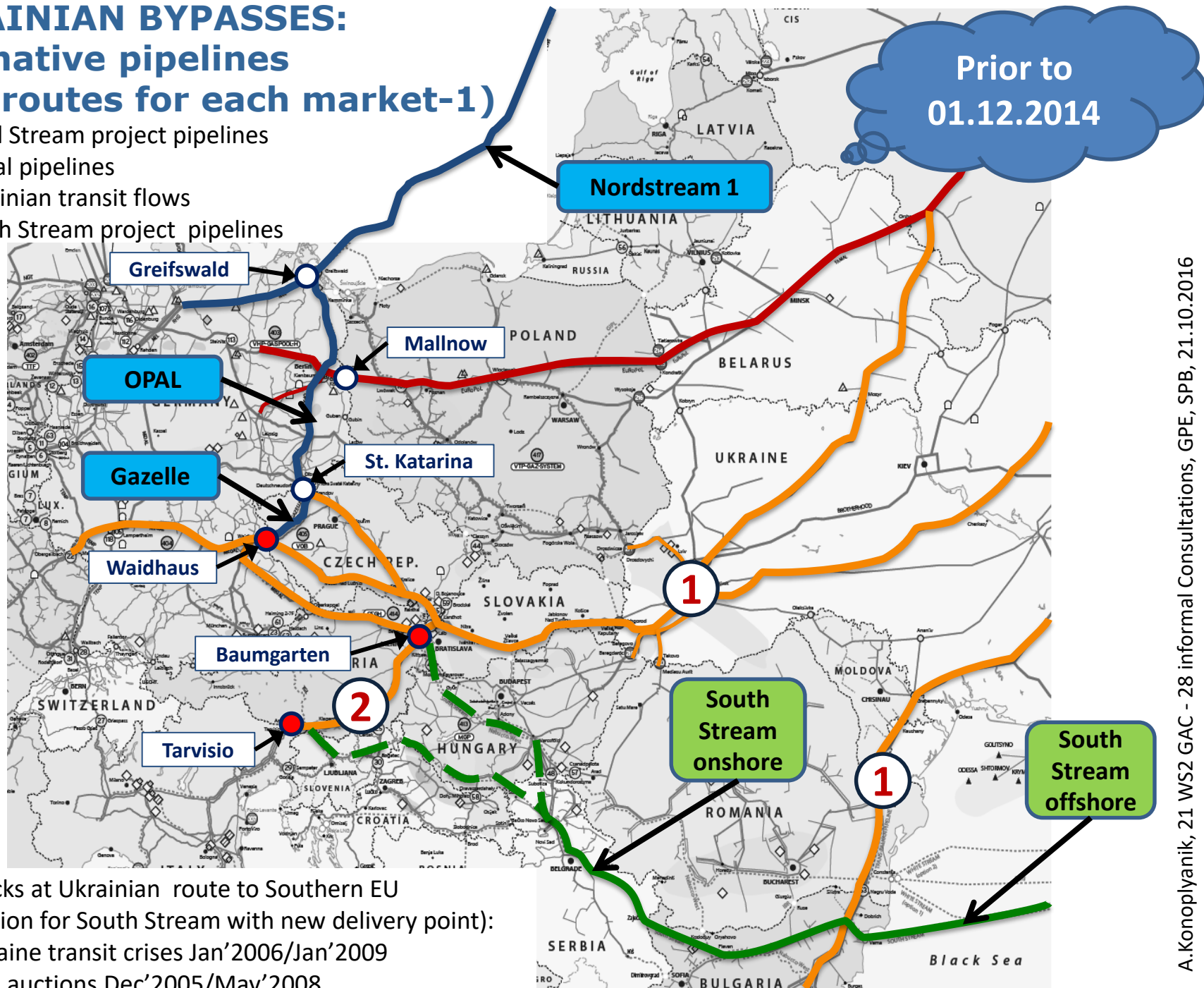
- Russia: from historical USSR GOSPLAN's *“single pipeline”* concept of risk mitigation / minimization (“one market – one pipe”) to current *“multiple pipelines”* concept (“one market – two pipes”)
 - Historically: when producer/exporter (USSR) controlled both the pipe & gas in the pipe through the whole cross-border gas supply chain within USSR/COMECON territory to delivery points at the EU-COMECON border
 - Currently: when preconditions for such control does not exist anymore after dissolution of the COMECON/USSR, enlargement of the EU & evolution of institutional structure of the EU gas market (unbundling, MTPA, etc.)

Legal & economic motivation for alternative (risk-avoidance) pipelines

- Legal motivation: Sovereign right for producer / exporter to evaluate supply / transit risk since:
 - it is his responsibility to timely deliver contractual gas volumes to delivery point/customer
 - “Sovereignty” means that development of natural resources *“must be exercised in the interest of their national development and of the well-being of the people of the State concerned”* (Res.1803 UN GA of 14.12.1962)
- Economic motivation: EU unbundling (since 2nd EU Energy Package 2003) predetermines free choice for supplier to choose least risky transportation route, if he considers it to be necessary, to fulfill its supply obligation, incl. after expiration of existing transit/transportation contract
- Resulting change of export strategy: **from “one market – one pipe” to “one market – two pipes” concept**

UKRAINIAN BYPASSES: alternative pipelines (two routes for each market-1)

- Nord Stream project pipelines
- Yamal pipelines
- Ukrainian transit flows
- South Stream project pipelines

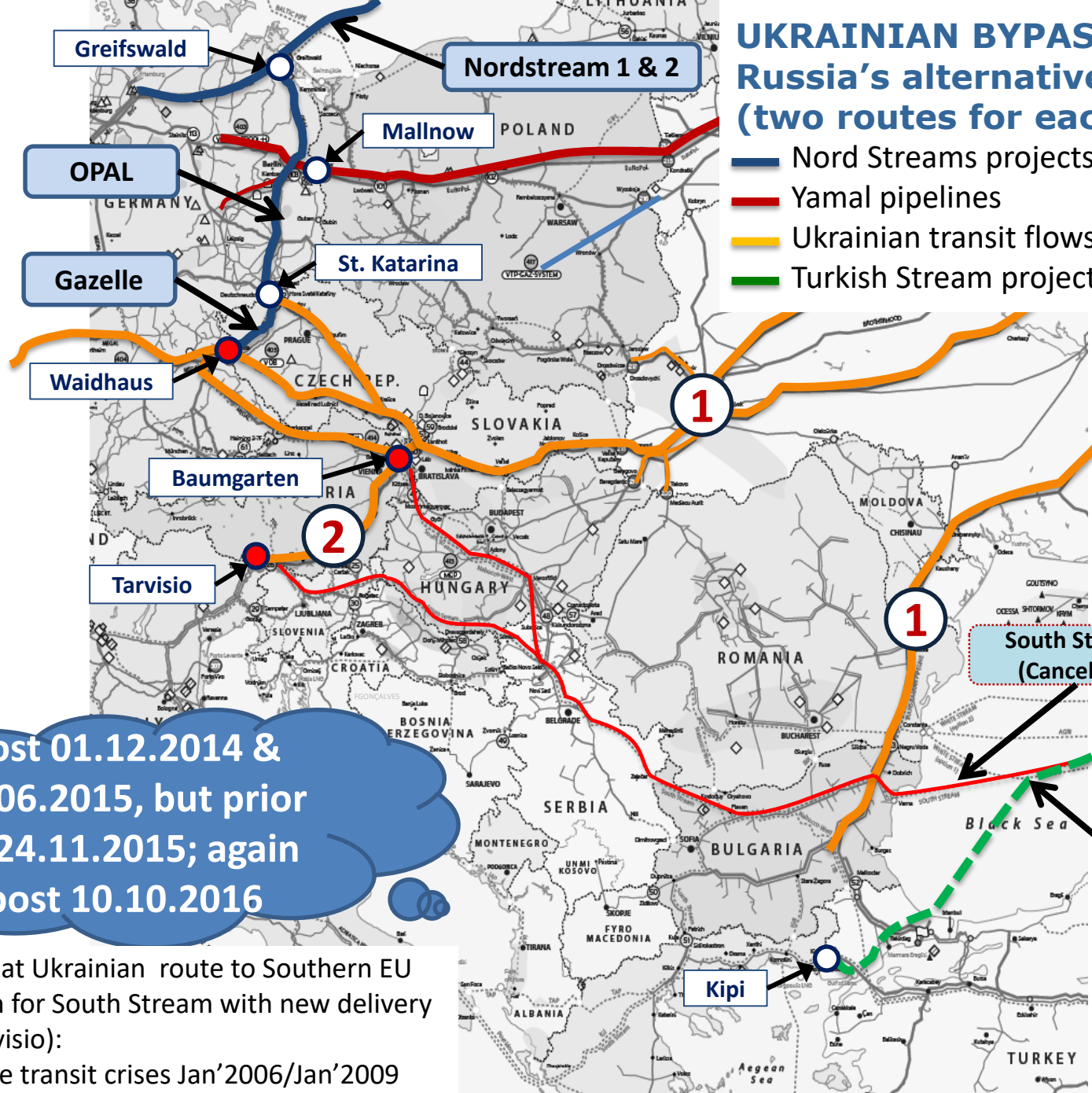


Bottlenecks at Ukrainian route to Southern EU
(justification for South Stream with new delivery point):

- ① Ukraine transit crises Jan'2006/Jan'2009
- ② TAG auctions Dec'2005/May'2008

UKRAINIAN BYPASSES: Russia's alternative pipelines (two routes for each market-2)

- Nord Streams projects pipelines
- Yamal pipelines
- Ukrainian transit flows
- Turkish Stream project (to EU border)

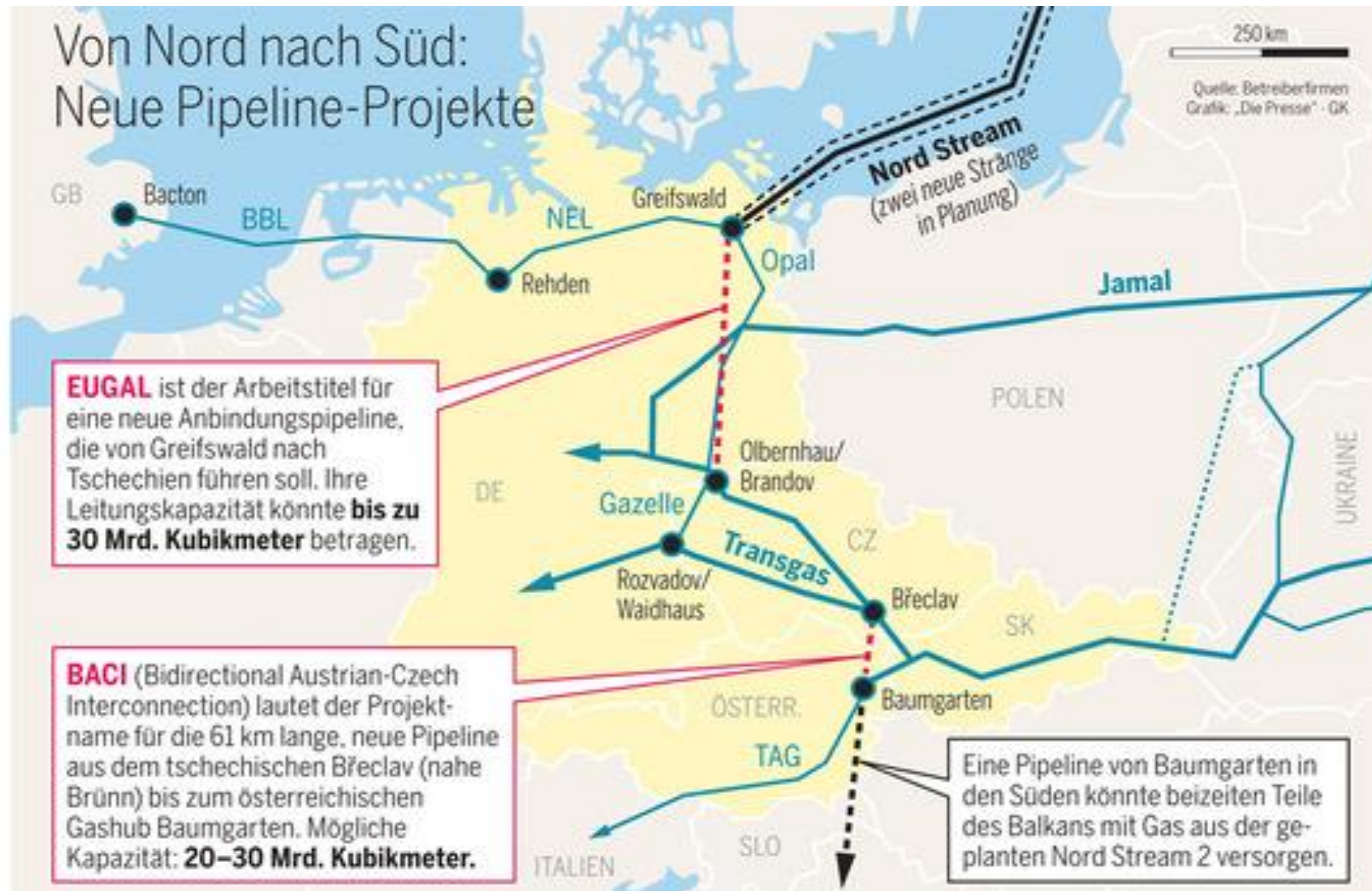


Post 01.12.2014 & 18.06.2015, but prior to 24.11.2015; again post 10.10.2016

Bottlenecks at Ukrainian route to Southern EU (justification for South Stream with new delivery point at Tarvisio):

Ukraine transit crises Jan'2006/Jan'2009
TAG auctions Dec'2005/May'2008

Nordstream-2 system within Russian gas ring: view from Austria



Source: http://diepresse.com/home/wirtschaft/international/4956692/Gas_Neue-Rohren-fur-sieben-Mrd-Euro?_vl_backlink=/home/index.do

Legal & economic motivation for alternative (risk-avoidance) pipelines: sovereignty

- It is **exporter's responsibility** to timely deliver contractual gas volumes to delivery point/the customer (Groningen LTGEC concept)
- Sovereign right for producer/exporter to evaluate supply/transit risk **by himself** since:
 - Res.1803 UN GA of 14.12.1962 "Permanent Sovereignty over Natural Resources": "1. The right of peoples and nations to permanent sovereignty over their **natural** wealth and **resources** must be exercised in the interest of their **national** development and of the well-being of **the people of the State concerned.**" =>
 - **International** demand vs **national** supply
 - **Maximization** of the **marketable resource rent** (both Ricardian & Hotelling rents) = sovereign right of the resource-owning state =>
 - Maximization of the exporter's net-revenue = **minimization** of production and (especially within cross-border gas value chains like in Russia-EU case) **transportation (transit) costs & risks** leading to cost increase:
 - *Maximization of revenue = **commodity** market (EU post-2003)*
 - *Minimization of transportation costs = **capacity** market (EU post-2003)*

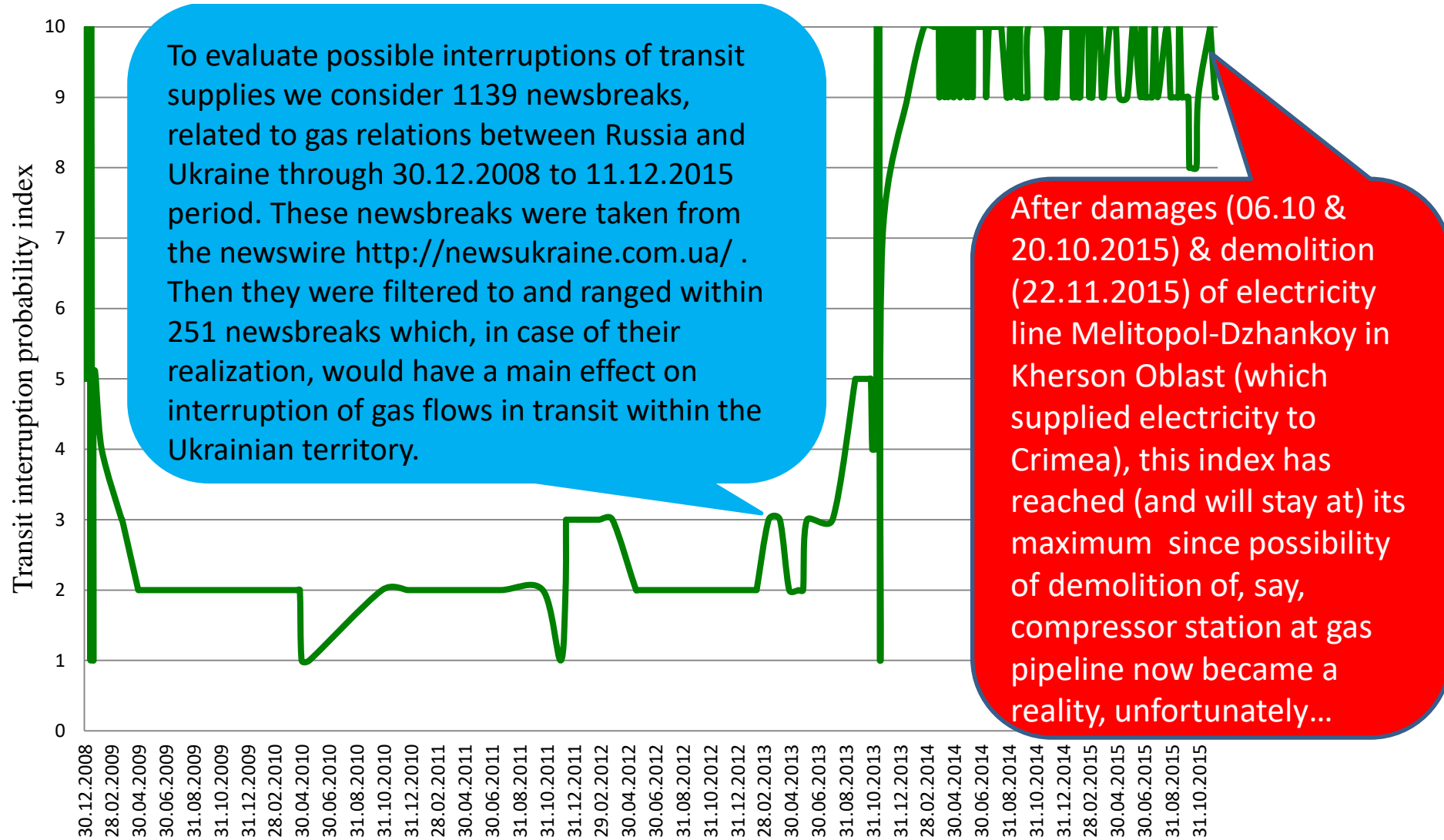
Legal & economic motivation for alternative (risk-avoidance) pipelines: EU legal system

- EU legislation (since 2nd EU Energy Package 2003) predetermines:
 - Unbundling (separation of commodity & capacity markets/contracts): **free choice for supplier to choose less/least risky transportation route**, if he considers it to be necessary, to fulfill its:
 - continued supply obligation **after expiration of existing transit/transportation (capacity) contract** while supply (**commodity**) contract continues (contractual mismatch), &/or
 - new supply obligations
 - Supply to the single EU MS = supply to the EU =>
 - This means: (Potential) transit states between RF & EU **cannot force supplier** to the EU to pass through their territory, but can only **stimulate supplier** to choose its transportation route to go via their territory =>
 - Transit states to work at diminishing transit costs & risks

Ukraine: gas transit risks & costs for RF

- **Transit risks:**
 - “transit interruption probability index” at maximum,
 - nevertheless EU (& US) insists on continuation of RUS gas transit to EU via UA, why?
- **Transit costs:**
 - UA is a member of Energy Community Treaty & thus implements EU energy rules domestically not being EU Member-State => from “distance tariffs” to “entry-exit tariffs” => UA NRA / Naftogas demanded for immediate (as of 01.01.2016) increase by (at least) 25-35% of acting transit tariffs for Gazprom, **BUT:**
 - “Pacta sunt servanda” = current transit tariffs governed by 2009-2019 Gazprom-Naftogas transit contract (UA TSO = Ukrtransgas), but what about post-2019 transit tariffs level?
 - What means “European methodology”? If E-E tariffs, then:
 - How CAPEX in modernization & development of UA GTS were calculated (ingredients of tariff to cover the costs/ to pay back investment)?
 - Whether cumulative debt of NAK “Naftogas of Ukraine” was (or was not?) included in “investment” part of tariff? Etc.
- => Why Gazprom shall continue with UA transit after 2019 if it is **more risky & more costly**? If it has the legal (EU law) & sovereign (international law) right & economic motivation to choose?

Ukraine: "transit interruption probability index" (2009–2015)



Calculated by M.Larionova, Russian Gubkin State Oil & Gas University, Chair "International Oil & Gas Business", Master's programme 2013-2015, on methodology, jointly developed with A.Konoplyanik, based on principles of credit ratings evaluation by major international credit agencies

EU support for transit via Ukraine: the end (real final aim) or just the means? (1)

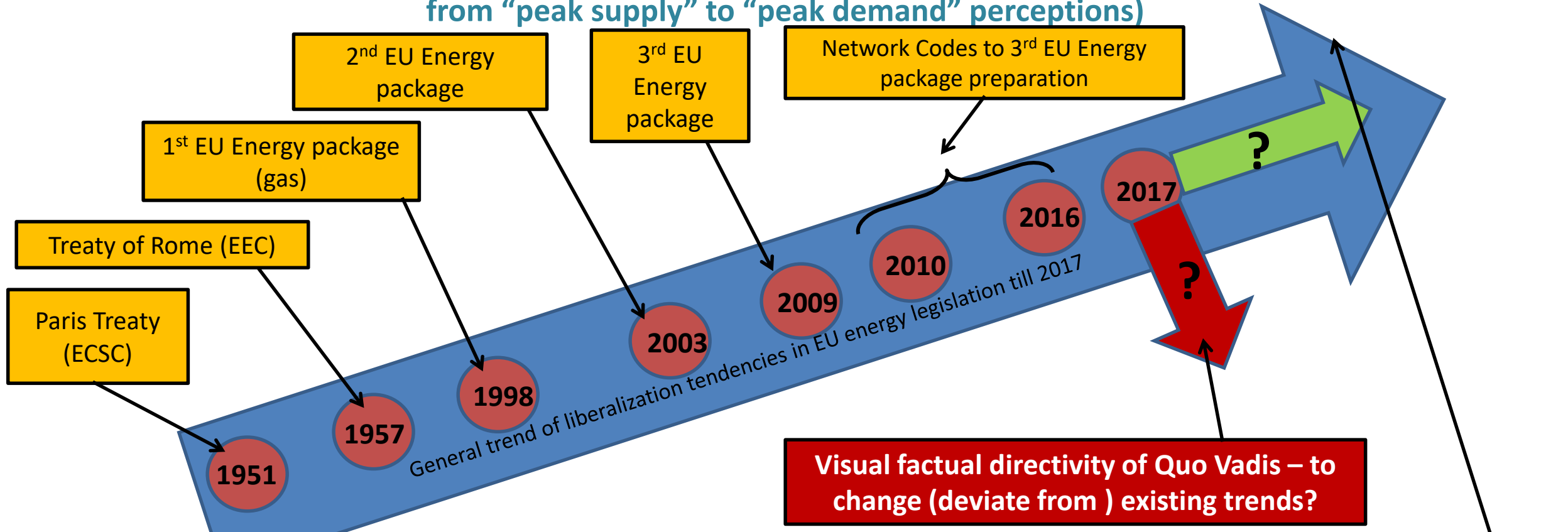
- It seems that EU & US support for existing & future transit of RUS gas via UA is not the end, but just the means; the real goal is (?):
 - to provide UA with steady financial flow of transit revenues from RUS supply contracts to EU via UA (USD 2bln/a) – instead of donating corresponding EU/US financial aid to UA, and
 - to finance/guarantee pay-back of potential investment of trilateral UA-EU-USA GTS consortium (acc.to UA Law 4116a) in modernization of UA GTS (*NB: continued transit of RUS gas is the only way to make consortium financeable*);
 - either under existing formula of RUS supply to EU (RUS supplies directly to inside EU through UA transit) => RUS will continue taking transit risk via UA,
 - or by new CEC proposed formula: delivery of RUS gas at RUS-UA border, in which case:
 - either EU companies will take the transit risk via UA by themselves (*which they are not willing yet*),
 - or there might be a possible role for de facto *EU Single Purchasing Agency* mentioned in the Energy Union Package (?) [*“options for voluntarily demand aggregation mechanisms for collective purchase of gas during a crisis and where Member States are dependent on a single supplier”*] => *whether this idea is still alive?*
 - BUT: cost of debt financing for UA GTS modernization to be relatively higher (Russia to provide transit revenues to pay-back such higher costs?)

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- From old to new paradigm of international energy development
 - Hubbert curve, Hotelling rule, Chevalier break-even point
 - Role of US shale gas revolution
 - Role of COP-21
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- Competition of existing and new gas supplies to Europe within the new paradigm of international energy development
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 - EU Quo Vadis project – from liberalization to protectionism?

Quo Vadis 2017: continued liberalization of EU energy legislation – **OR** factual deviation from liberalization trends (i.e. same rules for all?) to protectionism and discrimination of (selective preferences for) some players?

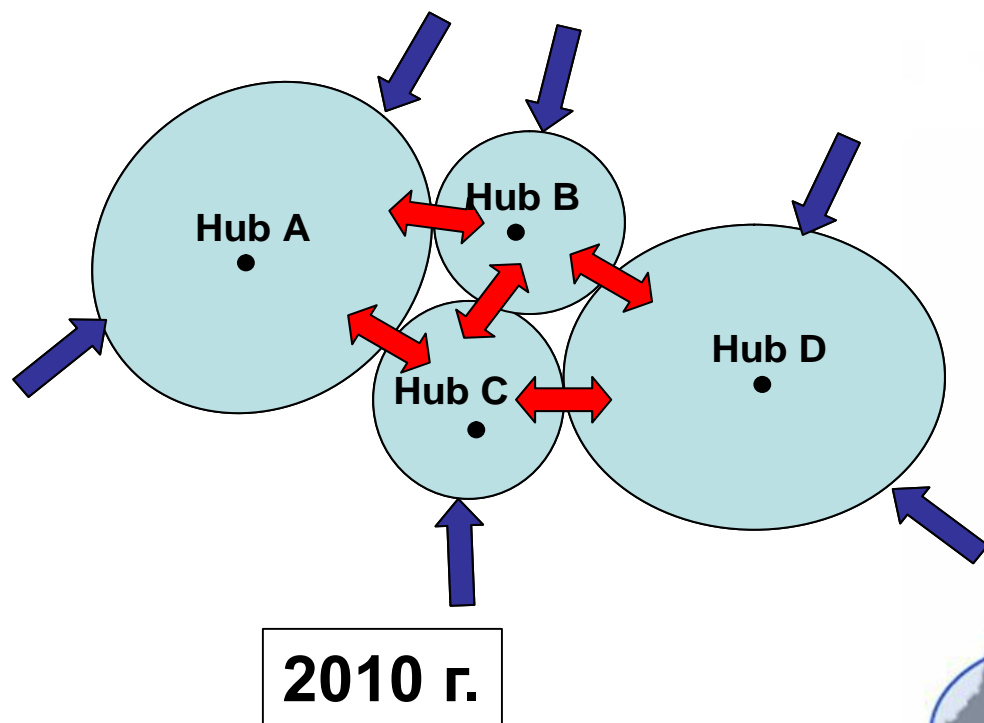
(in the narrowing relative demand niche for fossil fuel within changing paradigm of world energy development: from “peak supply” to “peak demand” perceptions)



Suggestion of expected directivity of Quo Vadis:

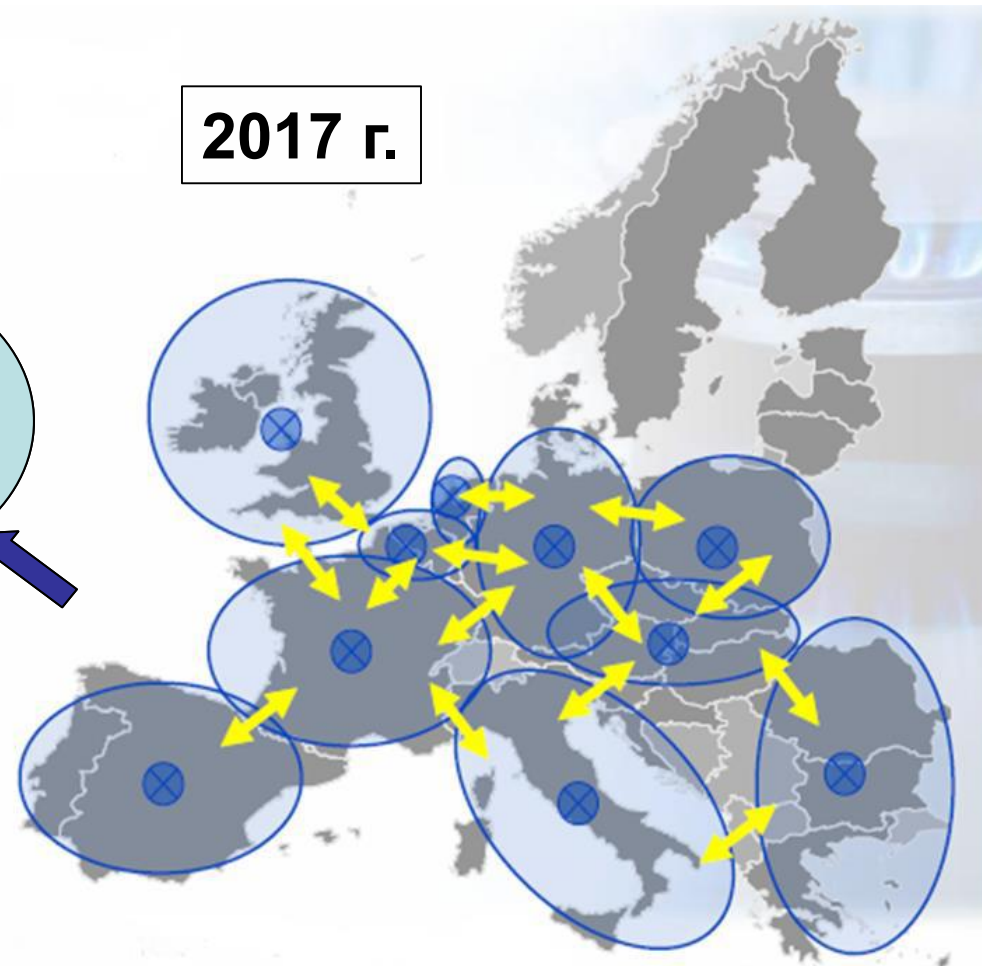
- (i) this comes from the logic of prior 60Y+ historical development of common EU economic space, incl. in energy;
- (ii) it is expected to be the project for efficiency evaluation of the gas regulatory system of the still emerging internal EU energy market;
- (iii) the latter has been teleologically developed through the past 60Y based on provisions of the Treaty of Rome and progressively liberal instruments of their implementation

Организация единого внутреннего рынка газа ЕС в соответствии с Третьим Энергетическим пакетом



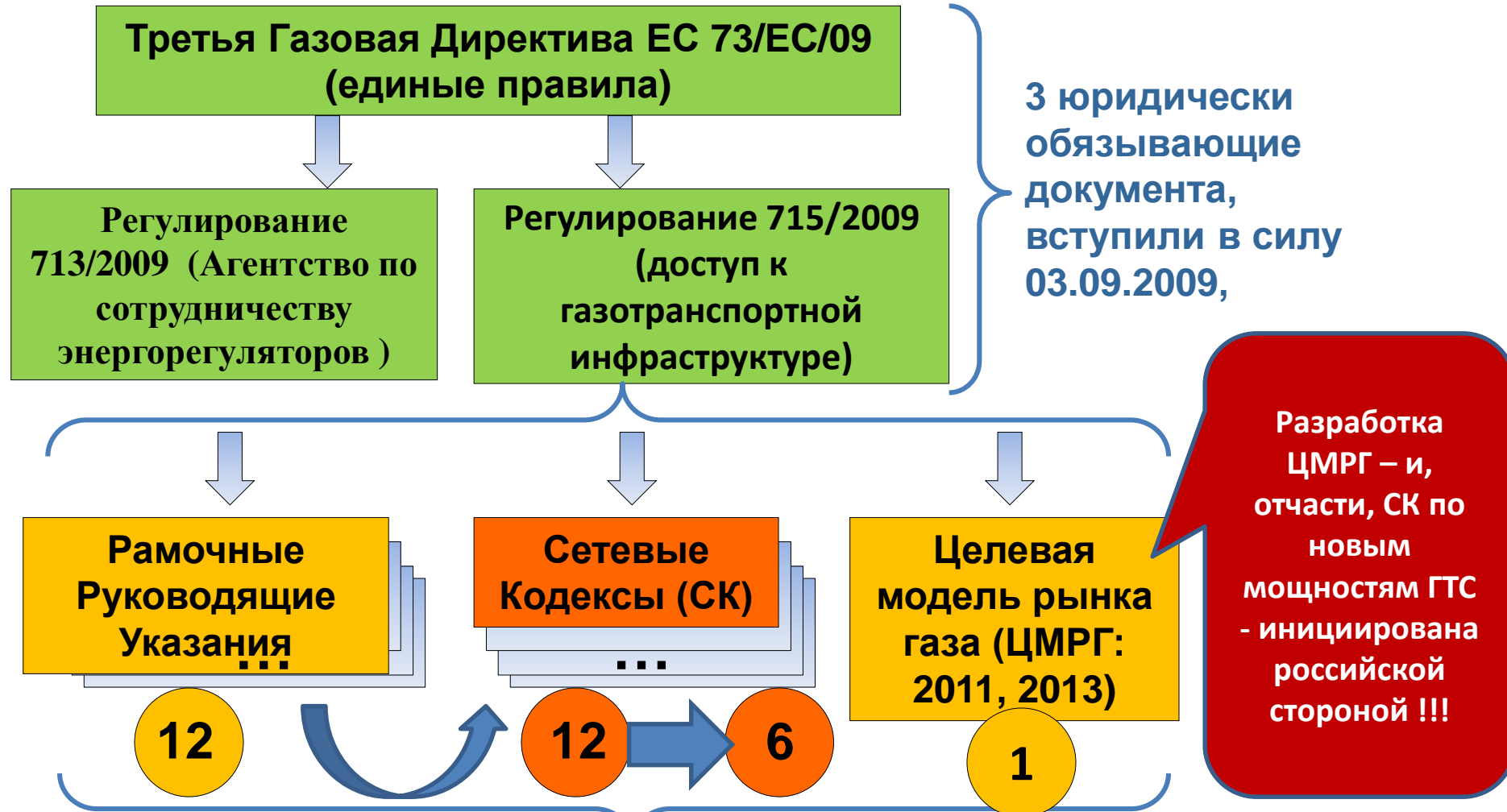
- Трубопроводы-интерконнекторы между региональными зонами внутри ЕС
- Поставки в ЕС извне ЕС

Источник: 17-й Мадридский Форум (январь 2010), энергетические регуляторы стран-членов ЕС



Источник: ACER Gas Target Model, 30-й Мадридский Форум (октябрь 2017)

Формирование Третьего Энергопакета ЕС (газ): 2009-2017

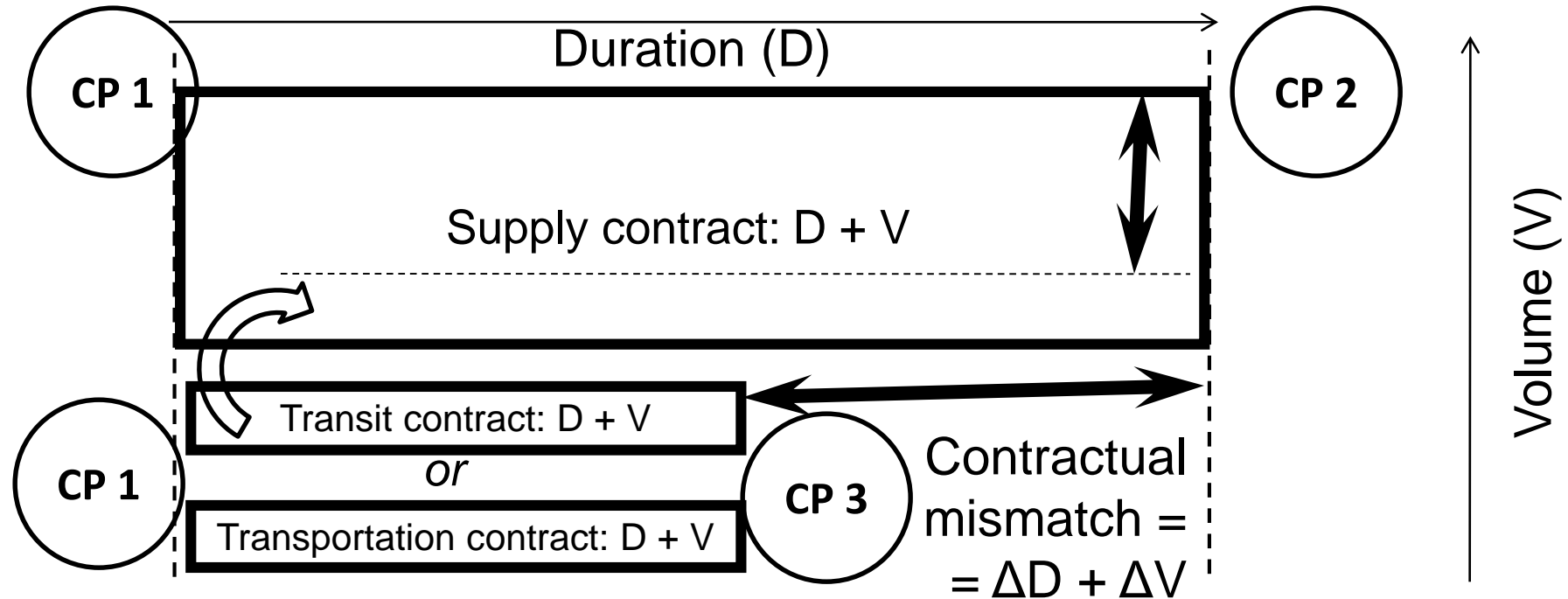


Предыдущая Еврокомиссия отчиталась в конце 2014 г., что подготовка документов Третьего энергопакета в основном завершена, но де факто завершилась только в начале 2017 г.: два последних СК (по новым мощностям ГТС и по тарифам): публикация 17.03.2017, вступление в силу 06.04.2017 => Теперь (2017): Quo Vadis => оценка эффективности (остановиться, оглянуться...)

Whether 3rd EU Energy Package will overcome investment-related inefficiencies of 2nd EU Energy Package?

- **2nd EU Energy Package (2003):**
 - Unbundling => separation of commodities & capacities markets => risk of “contractual mismatch”
 - MTPA => risk for Project Financing (risk for pay-back of CAPEX)
 - 2nd Gas Directive Art.21-22 => derogation from core EU rules as a mainstream for investing in infrastructure => about 40 major EU infrastructure projects (pipelines + LNG terminals) developed on the basis of Art.21-22
- **3rd EU Energy Package (2009):**
 - Investors expectation: 3rd package will establish rules which will enable to develop infrastructure projects WITHOUT any derogations, BUT
 - Real life: concentration on derogations from the rules (3rd Gas Directive Art.35-36) as mainstream of investor-friendly EU regulatory development

Figure 5. Contractual Mismatch Problem



Mismatch between duration/volumes (D/V) of long term supply (delivery) contract & transit/transportation contract as integral part to fulfill delivery contract => risk of non-renewal of transit/transportation contract at **existing** capacity *or* non-creation of adequate **new** capacity => risk of non-delivery for existing/new **supply** contract (incl. arbitration consequences).

Core issue: to guarantee access to/creation of adequate transportation capacity for volume/duration of long term contracts; **shipper's contracts (booking guarantees) best financial security for debt/project financing**

Изъятия из законодательства ЕС для новых инфраструктурных проектов в газовой отрасли



Exemptions for New Gas Infrastructure from EU Regulation

Exemptions for New Infrastructures Gas

1. PIPELINES

Decision date	Decision name
12/07/2005	BBL (UK/NL) – CAB D(2005) 674 Decision: English
22/5/2007	Poseidon (HE/IT) – SG-Greffed(2007) 203046 Decision: English Italian
8/2/2008	Nabucco - AT – CAB D(2008) 142 Decision: English German
22/10/2008	Nabucco - AT – C (2008) 6254; Decision: English German
23/06/2009	Nabucco - RO – C (2009) 5135; Decision: English Romanian
20/04/2009	Nabucco - BG – C (2009) 3037; Decision: English Bulgarian
20/04/2009	Nabucco - HU – C (2009) 3034; Decision: Hungarian
12/6/2009	OPAL (DE/CZ) – C (2009) 4694 Decision: German
20/05/2011	Gazelle (CZ/DE) – C (2011) 3424 Decision: English Czech
1/12/2011	Gazelle II (CZ/DE) – C(2011) 8777 Decision: English Czech
16/05/2013	Trans Adriatic Pipeline – C(2013) 2949 Decision: English
16/05/2013	Nabucco - AT – C(2013) 2947; Prolongation Decision: English
17/09/2013	SK-HU Interconnector - HU – C(2013) 6159 Decision: English Hungarian

2. LNG Terminals

Decision date	Decision name
10/02/2005	LNG Grain (UK) – TREN D(2005)101791 Decision: English
10/02/2005	South Hook (UK) – TREN D(2005)101791 Decision: English
10/02/2005	Rovigo (IT) – TREN D(2005)101791 Decision: Italian
29/3/2005	Dragon (UK) – TREN D(2005) 105942 Decision: English
13/09/2005	LNG Brindisi (IT) – TREN D(2005)119076 Decision: Italian
26/03/2007	Gate Terminal (NL) – TREN D(2007) 306919 Decision: English
18/10/2007	LionGas (NL) – TREN D(2007) 324685 Decision: English
15/5/2009	LNG Eemshaven (NL) – C (2009) 4006 Decision: Dutch English
11/12/2009	LNG Livorno (IT) – C (2009) 10172 Decision: Italian English
26/07/2010	LNG Shannon (IE) – C (2010) 5300 Decision: English
20/1/2010	LNG Dunkerque (FR) – C (2010) 381 Decision: French
07/05/2012	LNG Porto Empedocle (IT) – C (2012) 3123 Decision: English Italian
04/06/2013	National Grid Grain LNG (UK) – C(2013) 3443 Decision: English

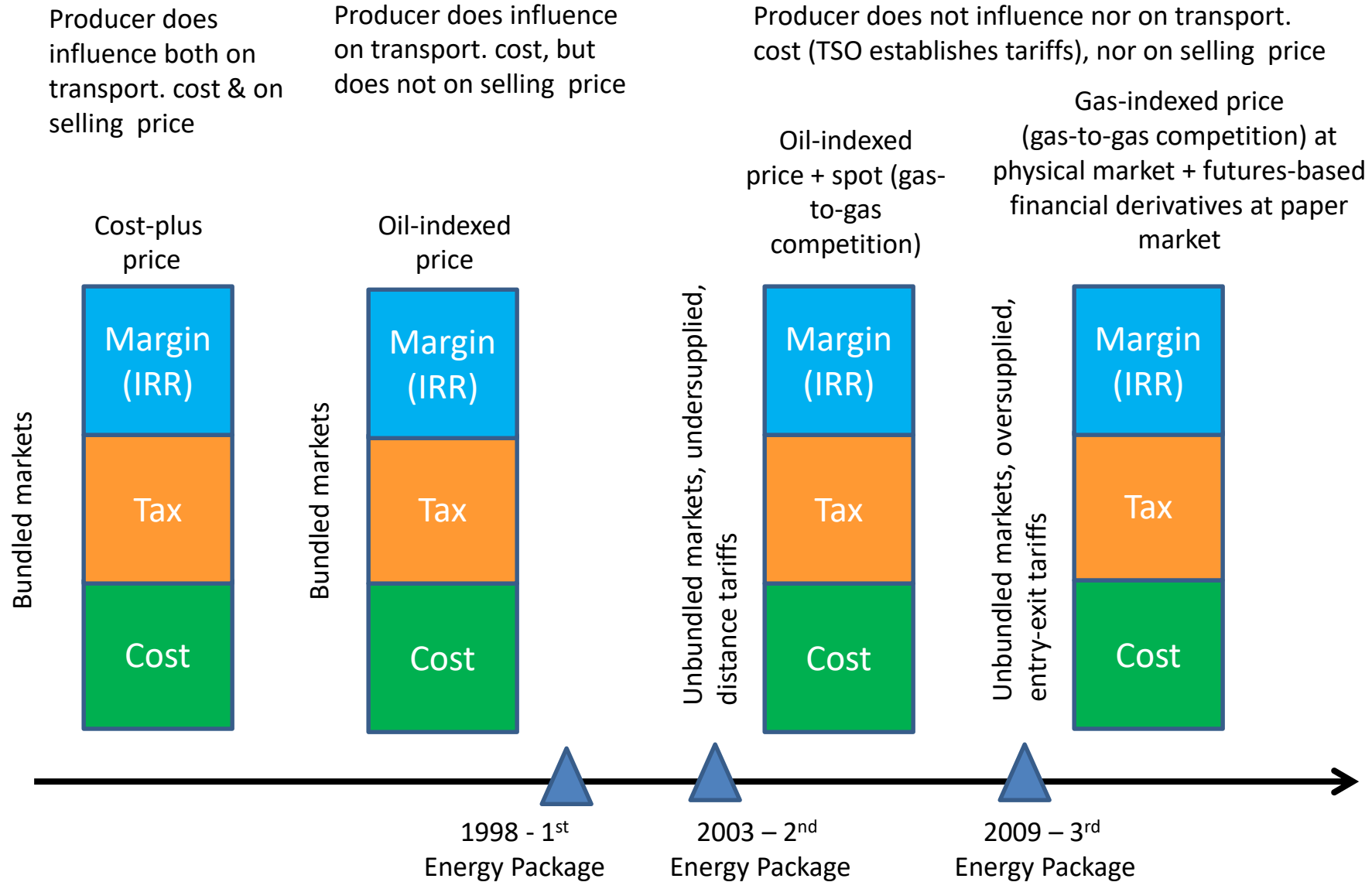
3. GAS STORAGE FACILITIES

Decision date	Decision name
27/06/2011	Damborice (CZ) – C (2011) 4509 Decision: English Czech

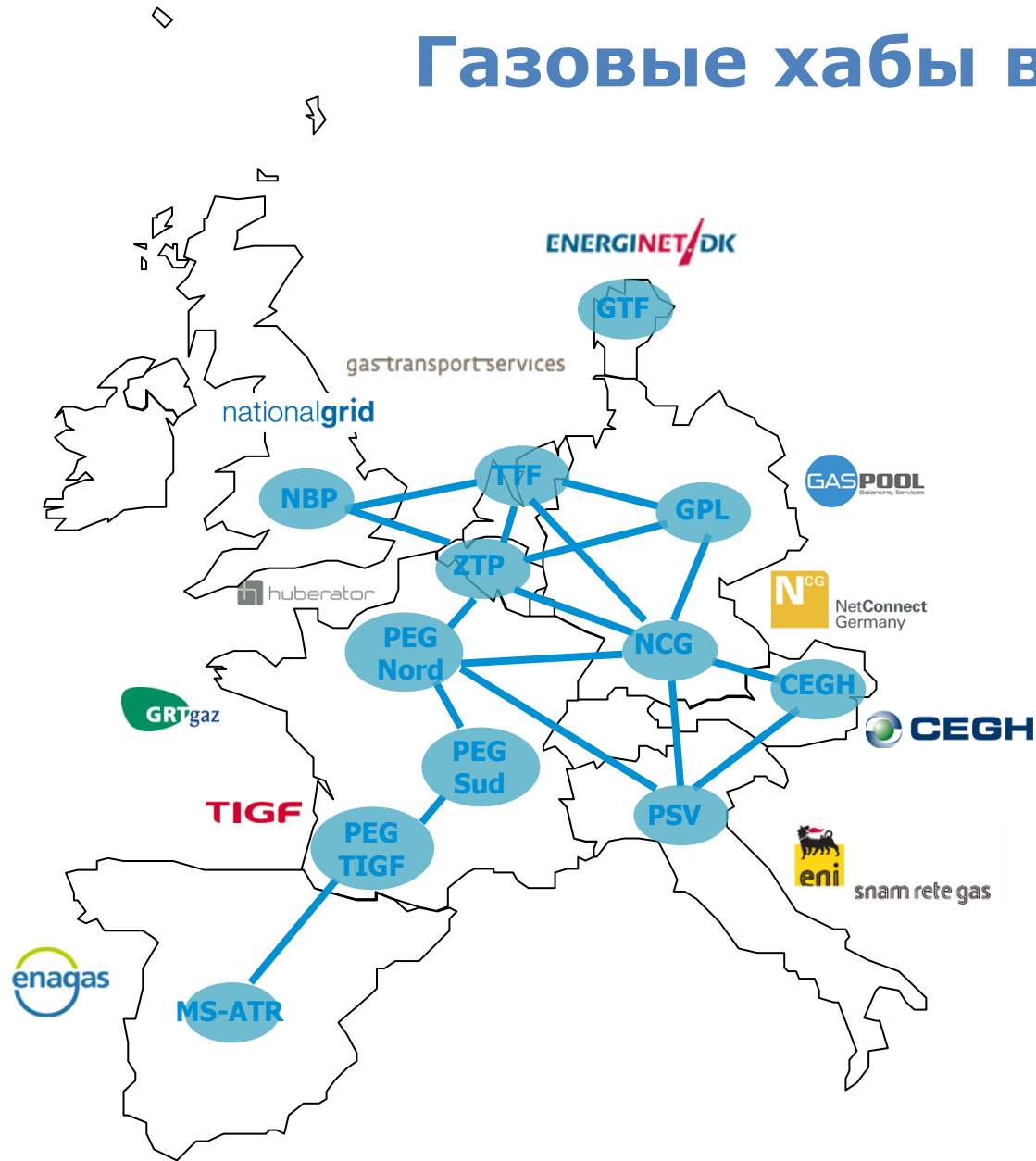


Источник: Д.Хандога, презентация на IX Международной конференции «Энергетический диалог: Россия – ЕС. Газовый аспект», 14.05.2014 г., Брюссель

Evolution of EU gas market organization & pricing



Газовые хабы в ЕС

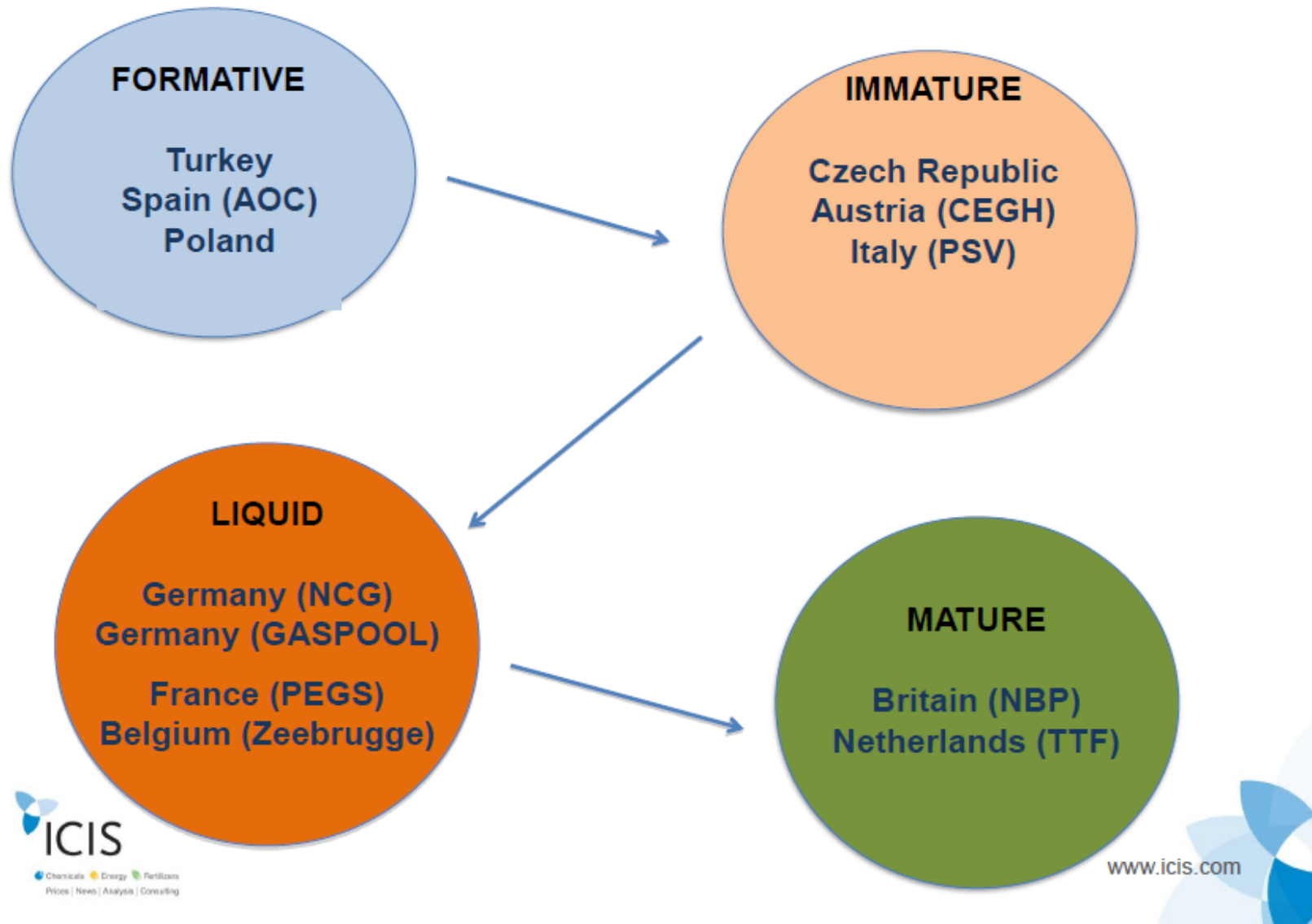


European Hubs :

NBP : National Balancing Point
 TTF : Title Transfer Facility
 ZTP : Zeebrugge Trading Point
 PEG : Point d'Echange de Gaz
 NCG : NetConnect Germany
 GPL : GASPOOL
 CEGH : Central European Gas Hub
 GTF : Gas Transfer Facility
 PSV : Punto di Scambio Virtuale
 MS-ATR : Mercado Secundario - Acceso de Terceros a la Red

Источник: Warner ten Kate,
 GasTerra B.V. "A changing NW-
 European natural gas market",
 5th International conference
 'ENERGETIKA-XXI', Saint-Petersburg,
 17-18 October 2012

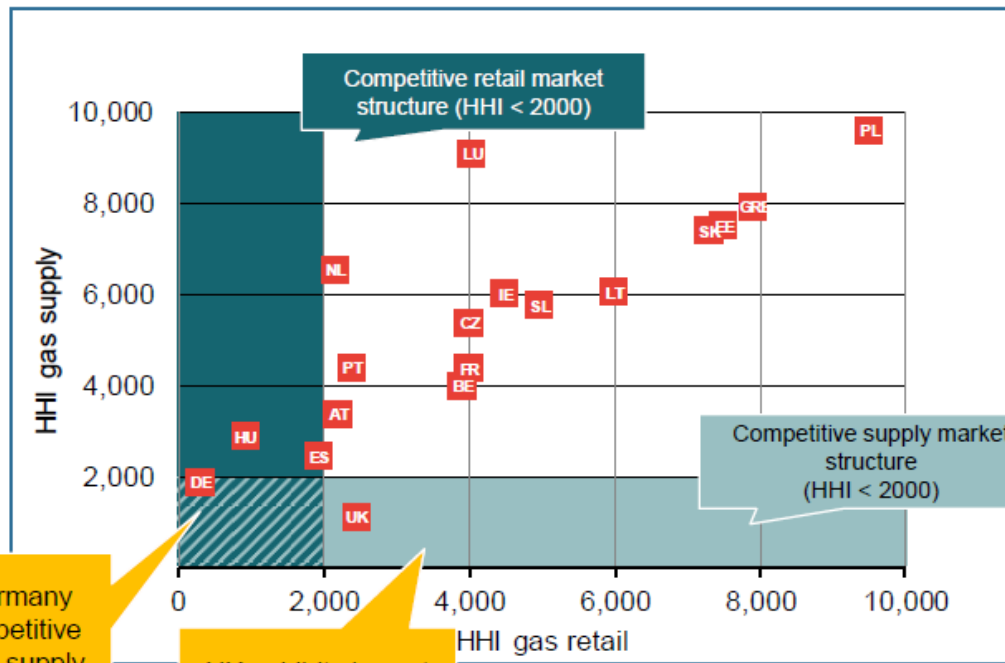
European gas hubs by development phase



Источник: Louise Boddy. Hub price formation and the role of price reporting. – 7th European Gas Conference, Vienna, 30.01.2014

Целевая модель рынка газа ЕС, ее основные параметры – и соответствие им: индекс рыночной концентрации HHI

Remaining barriers inhibit new entry in retail markets



Only Germany with competitive retail and supply market structure

UK exhibits lowest supply side HHI

* Source: Frontier based on EC country fiches (2011)

Measure	CEER criteria
Size of Entry-Exit zones	≥ 20 BCM (215 TWh)
Pluralism of sources of supply	≥ 3 significant sources
Market concentration	HHI < 2000
Liquidity of the market	Churn rates > 8

Сравнительная ликвидность европейских газовых хабов

Газовые хабы Европы:

NBP (Соед.Королевство) и TTF (Нидерланды)	10-15
Zee (Бельгия)	5
Остальные хабы континентальной Европы	3 и менее

Для сравнения:

США (нефть): NYMEX (WTI) (Feb.2010)	1680-2240
Соед. Королевство (нефть): ICE (Brent) (Feb.2010)	2014
США (газ): NYMEX Henry Hub (av.2009)	(377) (26*)

Пороговое значение «чёрн» для ликвидных рыночных площадок : - общепринятое мнение бизнеса	15
- Целевая модель рынка газа ЕС (2012)	8

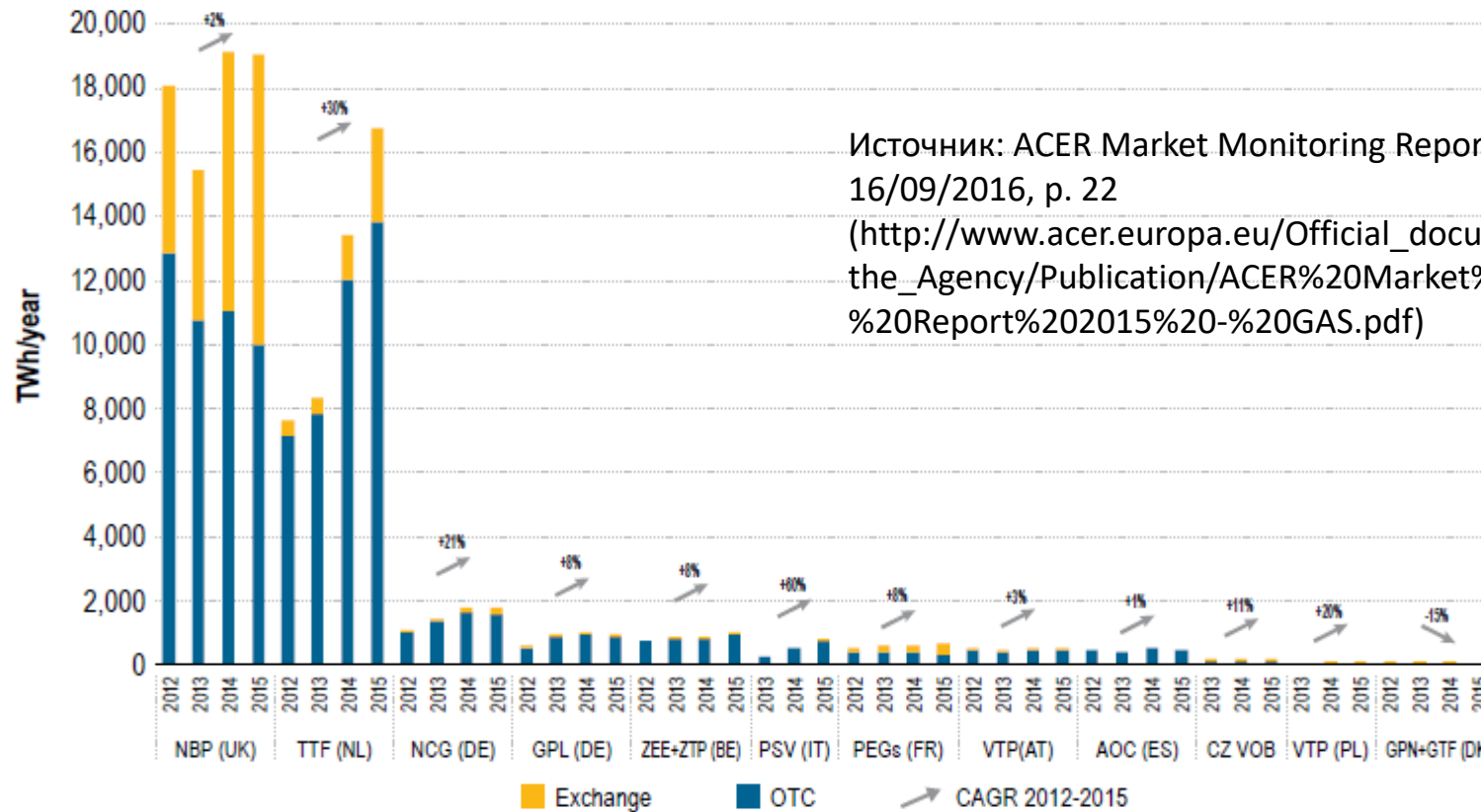
«Чёрн» - параметр, обычно применяемый для оценки уровня ликвидности рыночных площадок; соотношение между объемами, выставленными на торги, и фактически поставленными с данной торговой площадки

Источник: "Gas Matters", IHS-CERA, IEA, M.Kanai (СЭХ) , GasTerra

(*) *Jeff D. Makholm*. There Is But One True Hub, and His Name Is Henry. – "NATURAL GAS & ELECTRICITY", June 2016, p.27-30 (28)

Объемы торговли на хабах ЕС и темпы роста 2012-2015

Figure 13: Traded volumes at EU hubs and CAGR – 2012–2015 (TWh/year and %)



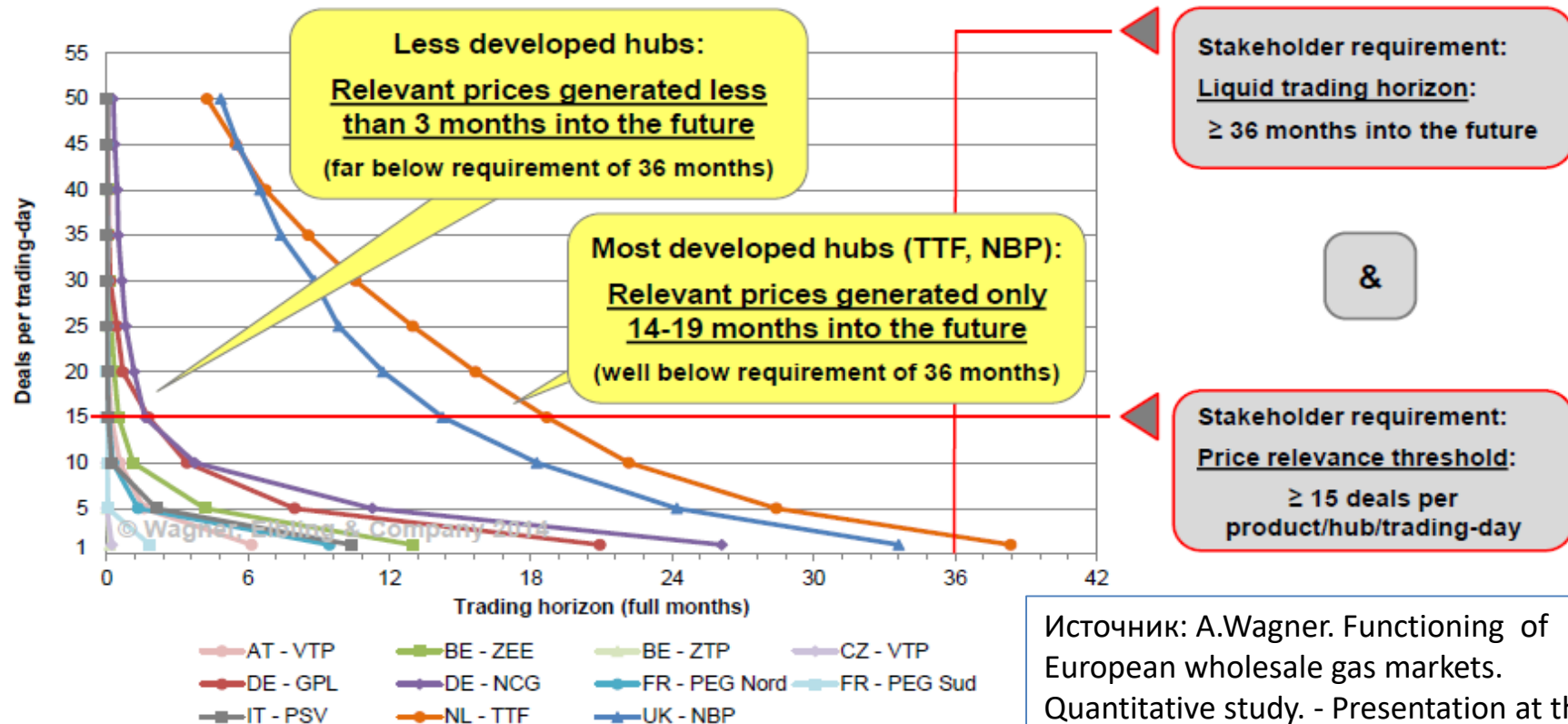
Source: Trayport, Hub operators and NRAs 2015.

Note: Over-the-counter trade (OTC) refers to volumes traded among parties via brokers, with either the parties managing credit risk or trading being cleared by the broker. Exchange execution refers to those volumes supervised and cleared by an organised central market operator. For Spain, data also include physical swaps and bilateral deals.

Насколько сегодняшние хабы в ЕС соответствуют критериям ликвидности оптовой торговли, по мнению участников рынка (результаты опроса) (1)

Wagner, Eibling & Company © Wagner, Eibling & Company 2014
Management Advisors

Price discovery: Deal count per day vs. trading horizon 2013



Источник: А.Вagner. Functioning of European wholesale gas markets. Quantitative study. - Presentation at the 3rd ACER Workshop on Gas Target Model review and update, Brussels, 15.05.2014

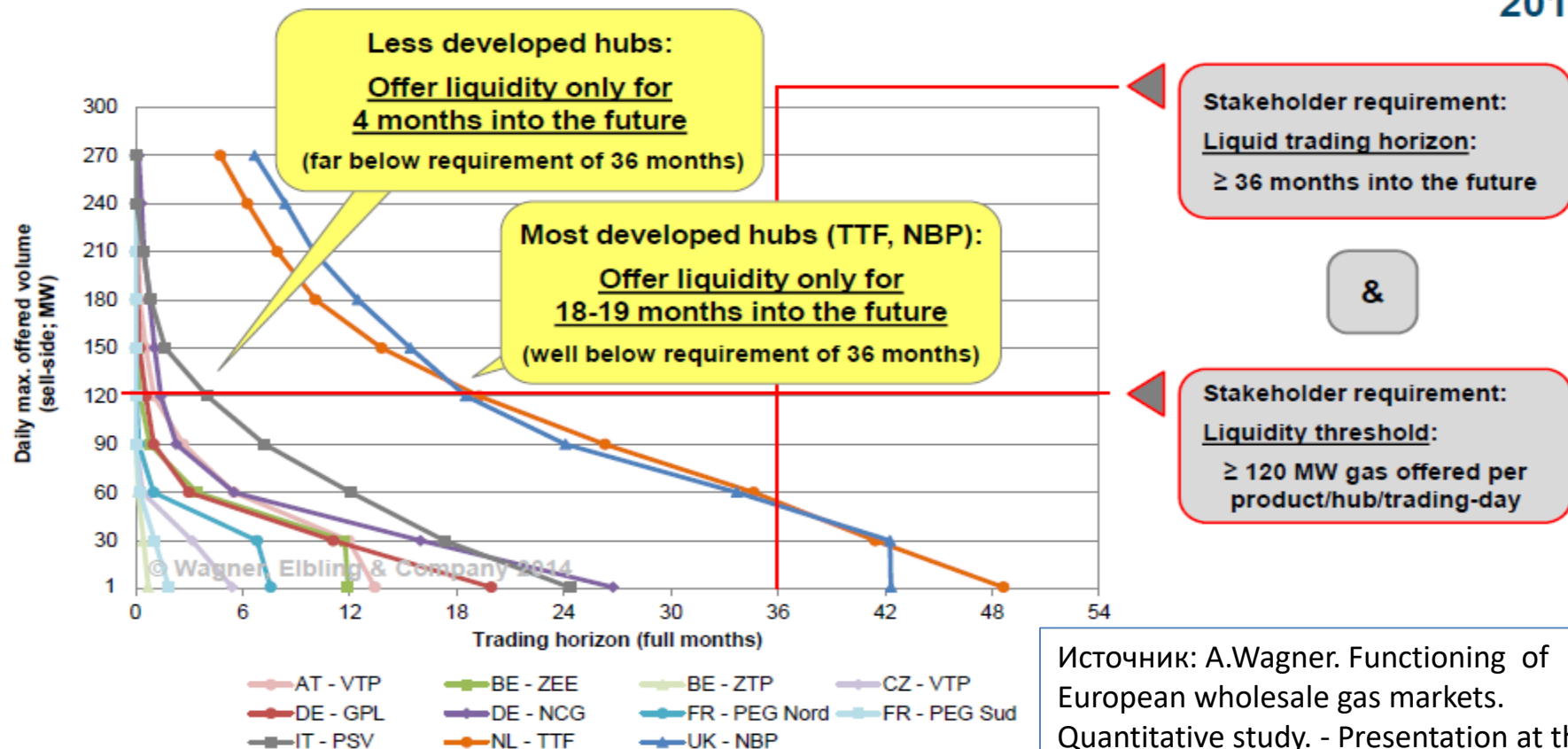
Насколько сегодняшние хабы в ЕС соответствуют критериям ликвидности оптовой торговли, по мнению участников рынка (результаты опроса) (2)

Wagner, Eibling & Company © Wagner, Eibling & Company 2014
Management Advisors

Availability of gas:

Sell-side (offered) volumes vs. trading horizon

2013



Источник: A.Wagner. Functioning of European wholesale gas markets. Quantitative study. - Presentation at the 3rd ACER Workshop on Gas Target Model review and update, Brussels, 15.05.2014

Figure 2. EU acquis' international expansion instruments (energy industry)

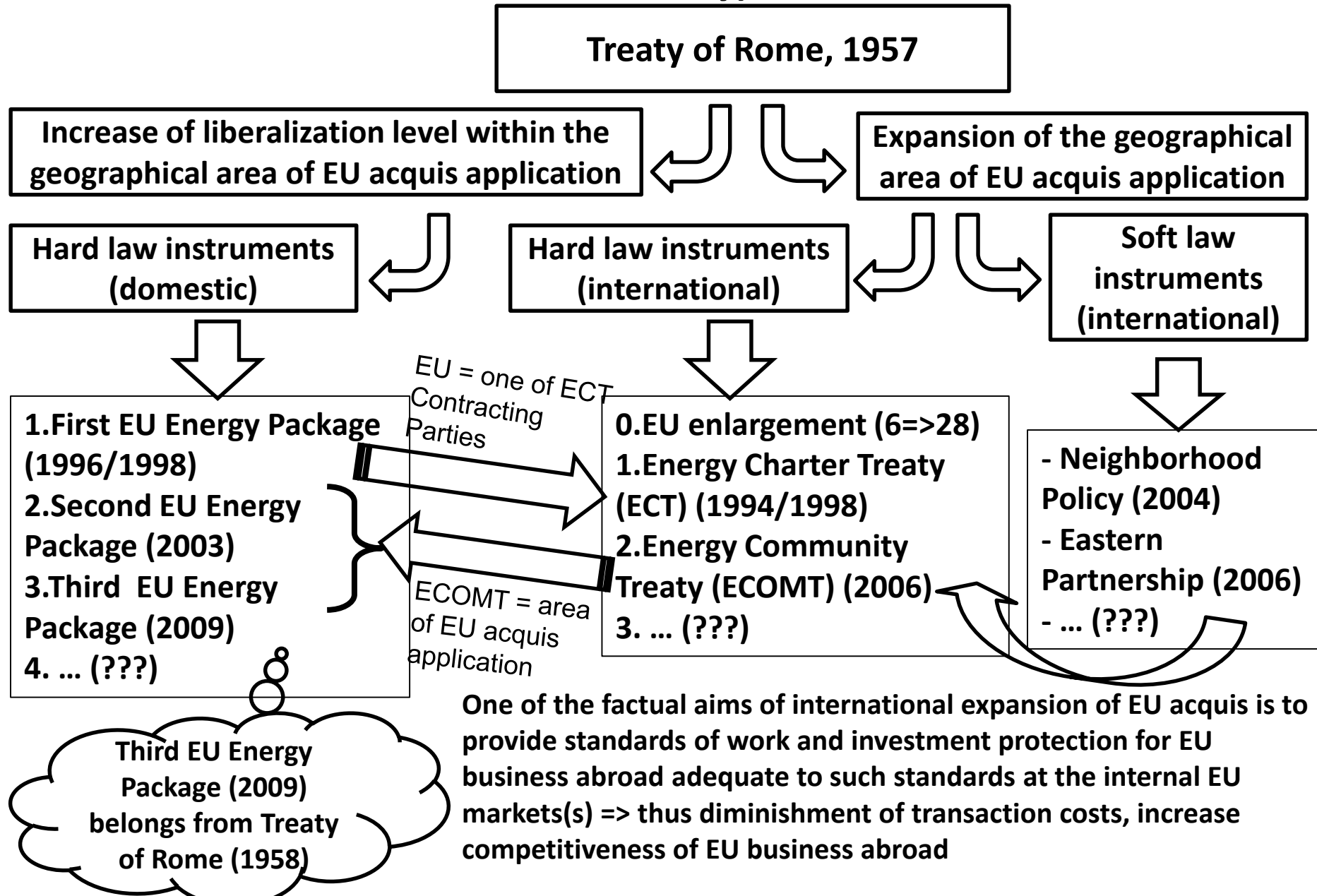


Figure 3. ECT & EU acquis in their comparative development

Legal norms (key examples)	ECT	EU Acquis (1-st Gas Directives)	EU Acquis (2-nd & 3-rd Gas Directives)
Mandatory TPA	No	No	Yes
Unbundling	No	No	Yes

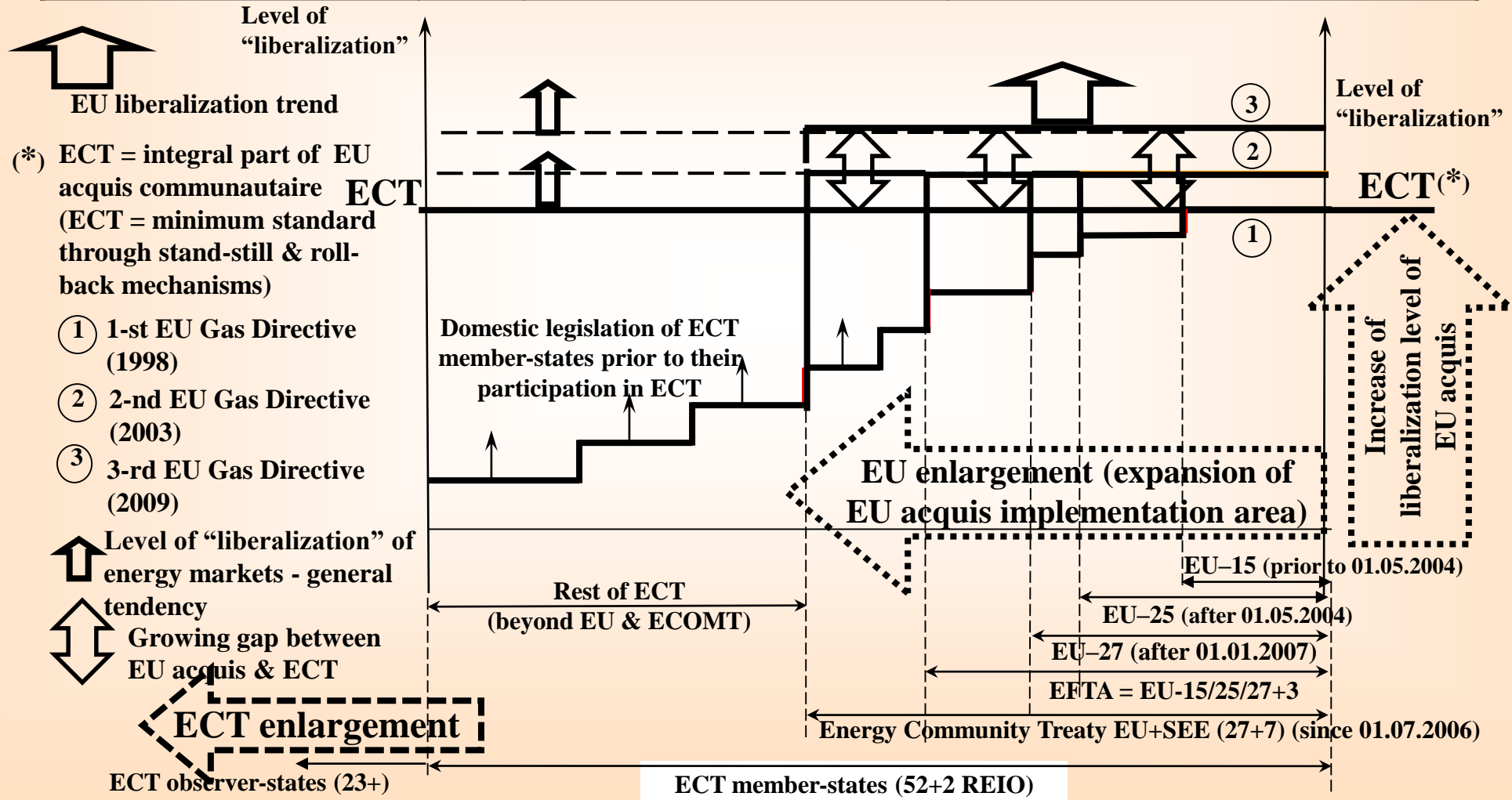
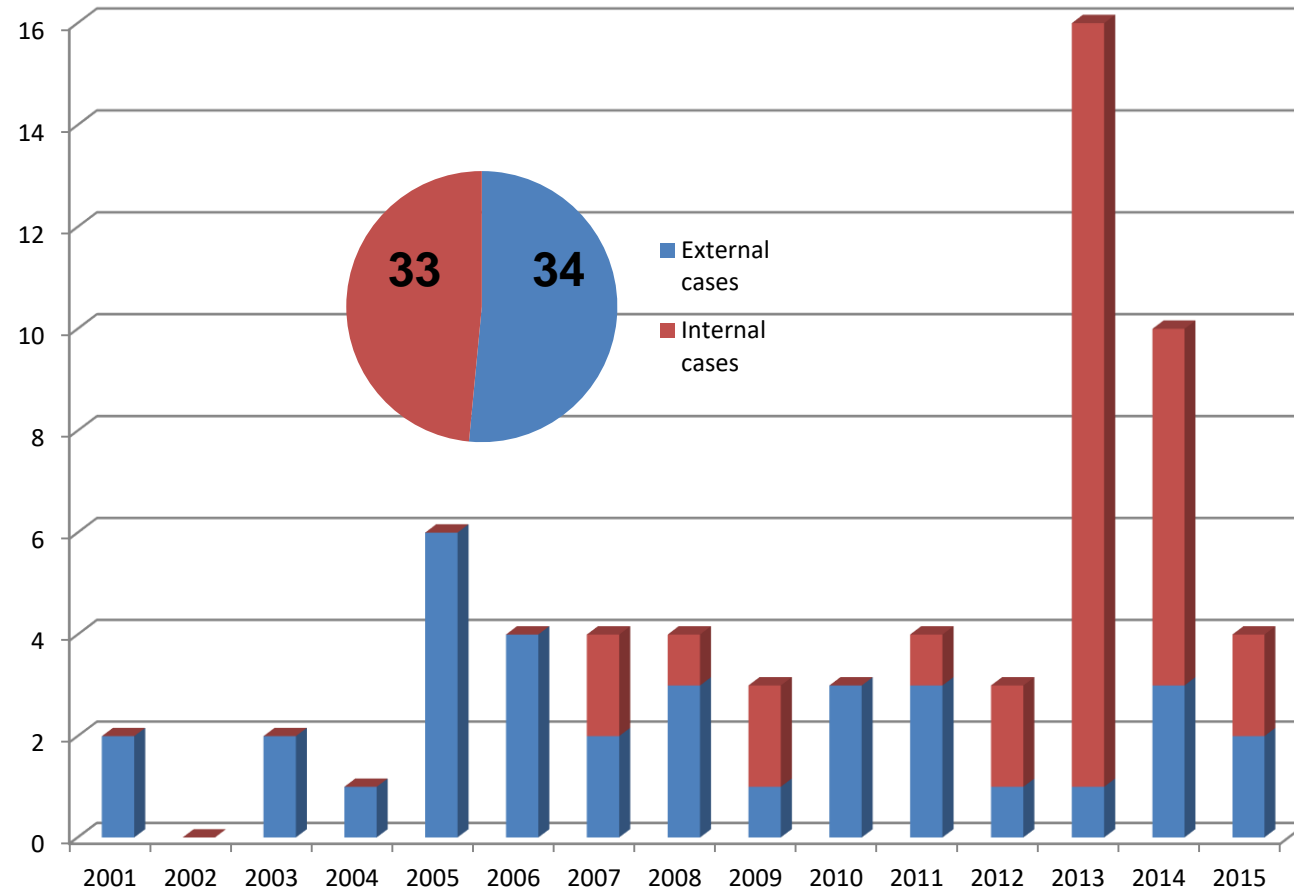


Figure 7. Increasing number of 'investor-state' disputes based on ECT Art.26 from investors of EU Member-States against EU Member-States



For the period since 2001 (since the first 'investor-state' claim based on ECT Art.26) till 21.04.2015 – total of 67 such claims, incl. 33 claims (half of the total) is from investors of the EU Member-States against the EU Member-States, notably, within the EU (internal cases) – de facto against EU "liberalization risks

Source: У.Руснак, А.Конопляник. Эволюция модели энергобезопасности. Россия и ДЭХ: не остаться на обочине. // «Нефтегазовая Вертикаль». 2015, №10, с.4-12 (7).

Based on: <http://www.energycharter.org/what-we-do/dispute-settlement/all-investment-dispute-settlement-cases/>

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US LNG export pre-history

- US shale gas revolution domino effects on US gas:
 - Rocket-style increase of domestic shale gas production post-2007 has led to oversupply within US gas market =>
 - US domestic gas market has almost closed for import LNG post-2007
 - Till Feb'2016 US - "energy island" => HH price went down/stayed low => price gap with Europe & Asia Pacific => both foreign non-US areas -premium markets for US gas
 - Debt financing of US shale gas development => growing indebtedness of US shale producers within US "energy island" domestic environment
- To pay-back CAPEX in US shale gas production within low domestic gas (HH) prices => reorientation/economic stimuli for export
 - Conversion of regas import LNG terminals to liquefaction export LNG terminals
 - Key target market – Asia Pacific with oil-indexed LNG price premium (esp. after Fukushima accident)
 - Third line of Panama channel expansion (Summer 2016) for US LNG to Pacific (unit size of LNG cargos increased 3 times)
- **BUT:** New export US LNG strategy was developed in end-2000-ies/first-half-2010-ies when oil price stood high (above 100 USD/bbl)

Buyers seem to become cautious on the competitiveness of Henry Hub based LNG

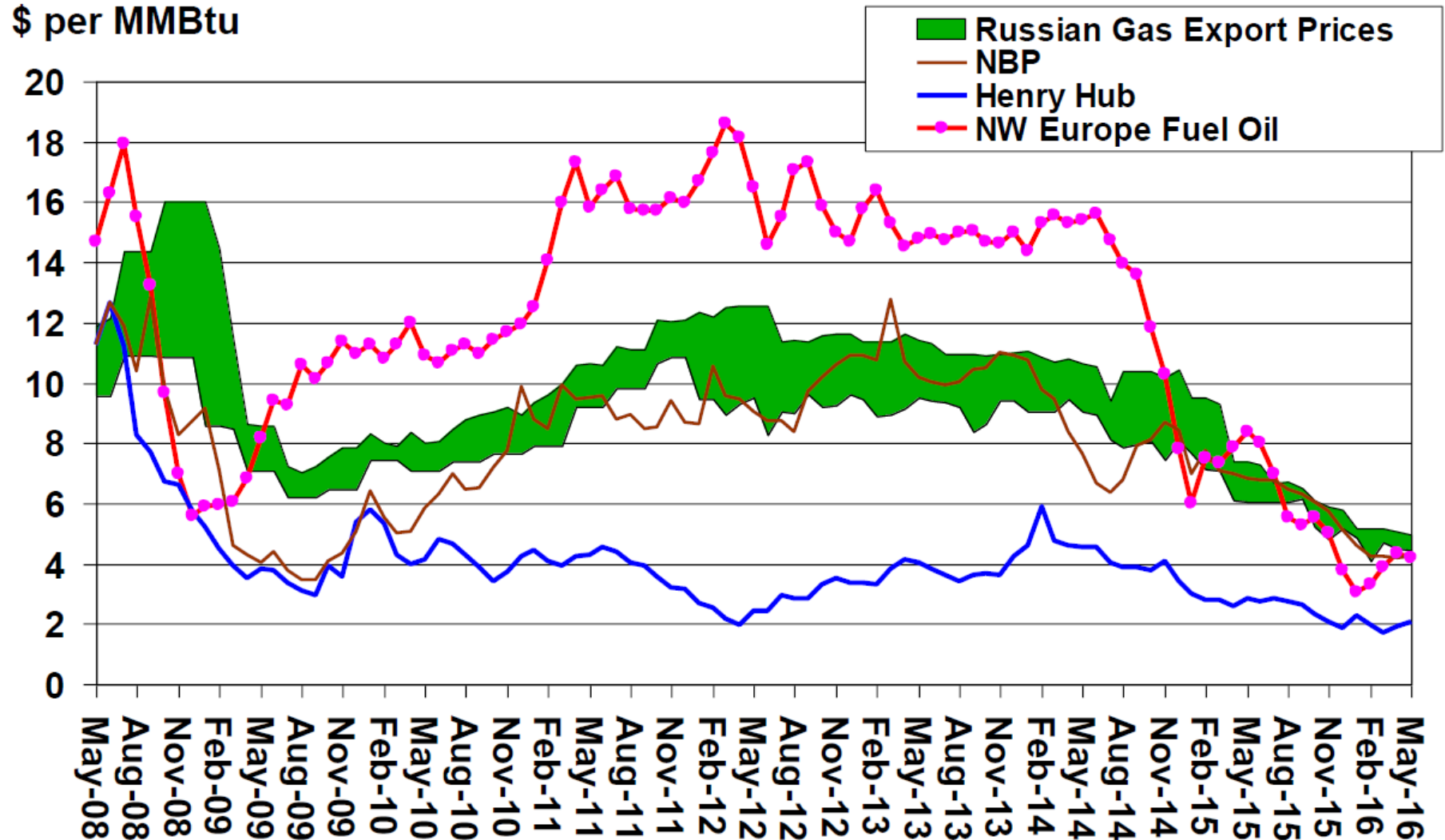
Medium-Term
Market Report
2015



- *Financing of projects with previously signed contracts is unproblematic*
- *Only one small contract (0.75 Mt/Y) was signed since oil peaked*

Source: Costanza Jacazio, Senior gas analyst, International Energy Agency. Gas: medium-Term Market Report 2015. Market Analysis and Forecast to 2020. – Presentation at The Center on Global Energy Policy, Columbia University, New York, NY, USA, 20.06.2016, <https://energywatch-inc.com/wp-content/uploads/2015/07/IEA-Medium-Term-Gas-Market-Report-Presentation.pdf>

Convergence of Gas Prices

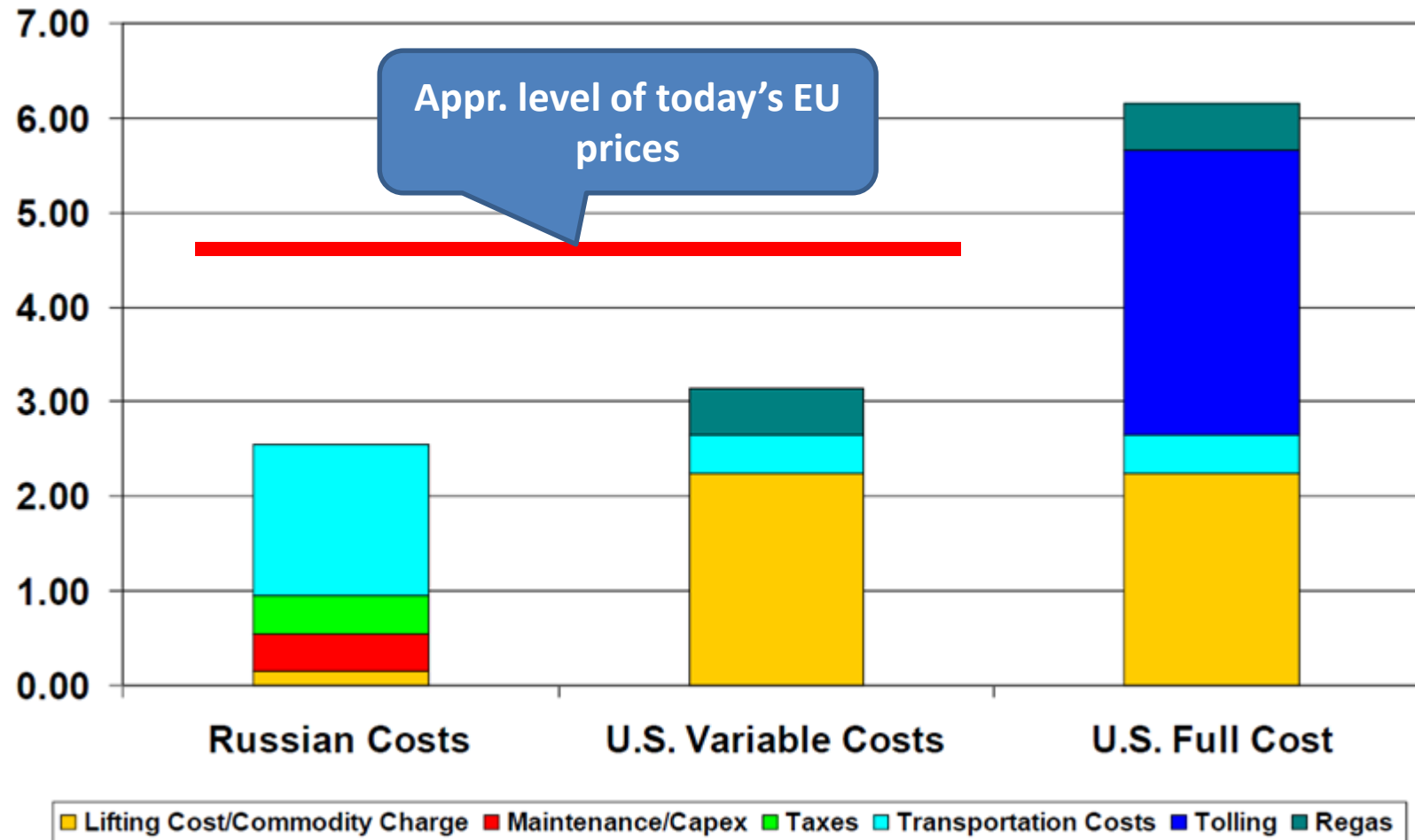


Source: PIRA

Source: S.Komlev. Gazprom on the European Market Problems and Solutions . ETCSEE2016, 15-16 June, 2016, Bucharest, Romania

Gazprom Sees No Threat from US LNG to European Pipeline Gas

\$/MMBtu, assumes 115% of Henry Hub at current prices

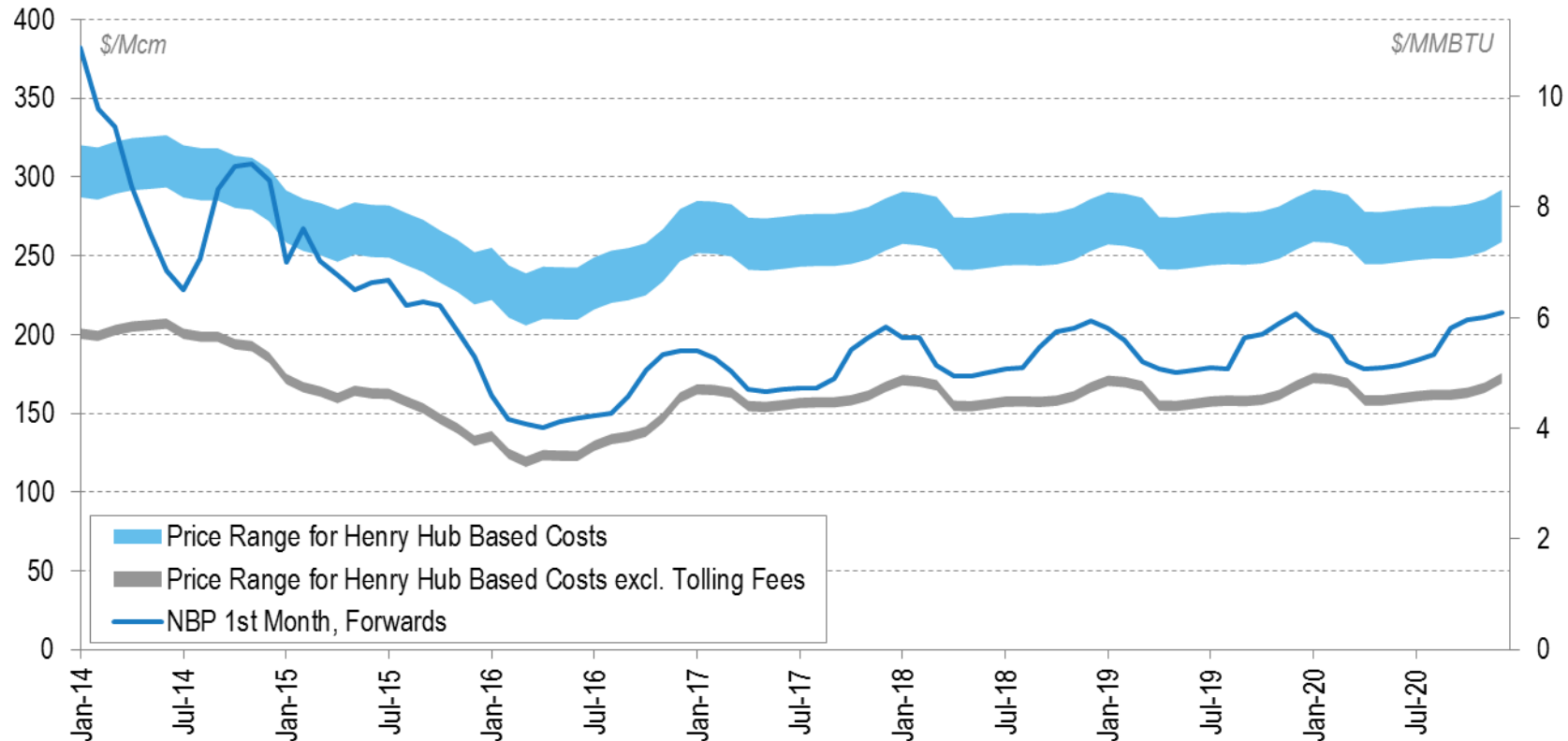


Source: PIRA

Source: S.Komlev. Gazprom on the European Market Problems and Solutions . ETCSEE2016, 15-16 June, 2016, Bucharest, Romania

US Benchmark Prices are Poised to Rise Within a Year, Meaning Export Costs to Europe Will Also Gain

Estimated Costs* of US LNG Deliveries to Europe in comparison with European Traded Forwards**



* Based on Henry Hub Forward Curve, $P = HH * 115\% + X$, where X – costs of liquefaction, shipping, regasification

** NBP Forward Curve

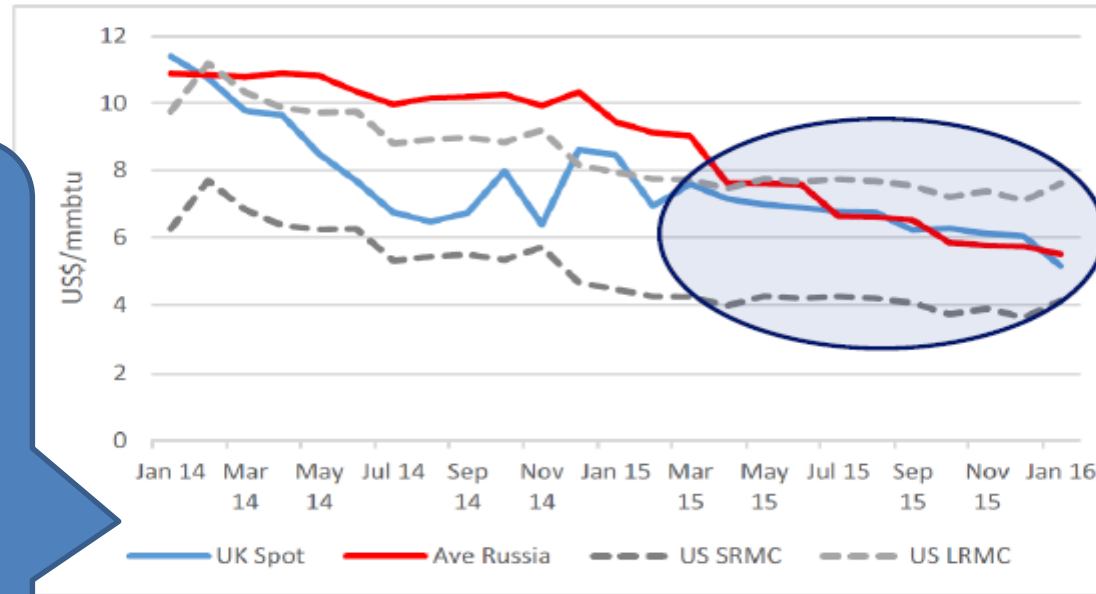
Source: Bloomberg, Wood McKenzie

Source: S.Komlev. Gazprom on the European Market Problems and Solutions .
ETCSEE2016, 15-16 June, 2016, Bucharest, Romania



European Gas Prices vs. Marginal Cost of US LNG

Source: The Oxford Institute for Energy Studies



J.Henderson's conclusions on US LNG competitiveness in EU are trusted in other parts of Europe...

European gas prices below long run marginal cost of US LNG, limiting appetite for new investments into LNG projects.

Taken from:

Andreas Rau, CEO NET4GAS, s.r.o. The Current Environment for Gas Infrastructure Investment. // Central European Gas Congress, Bratislava, April 27, 2016

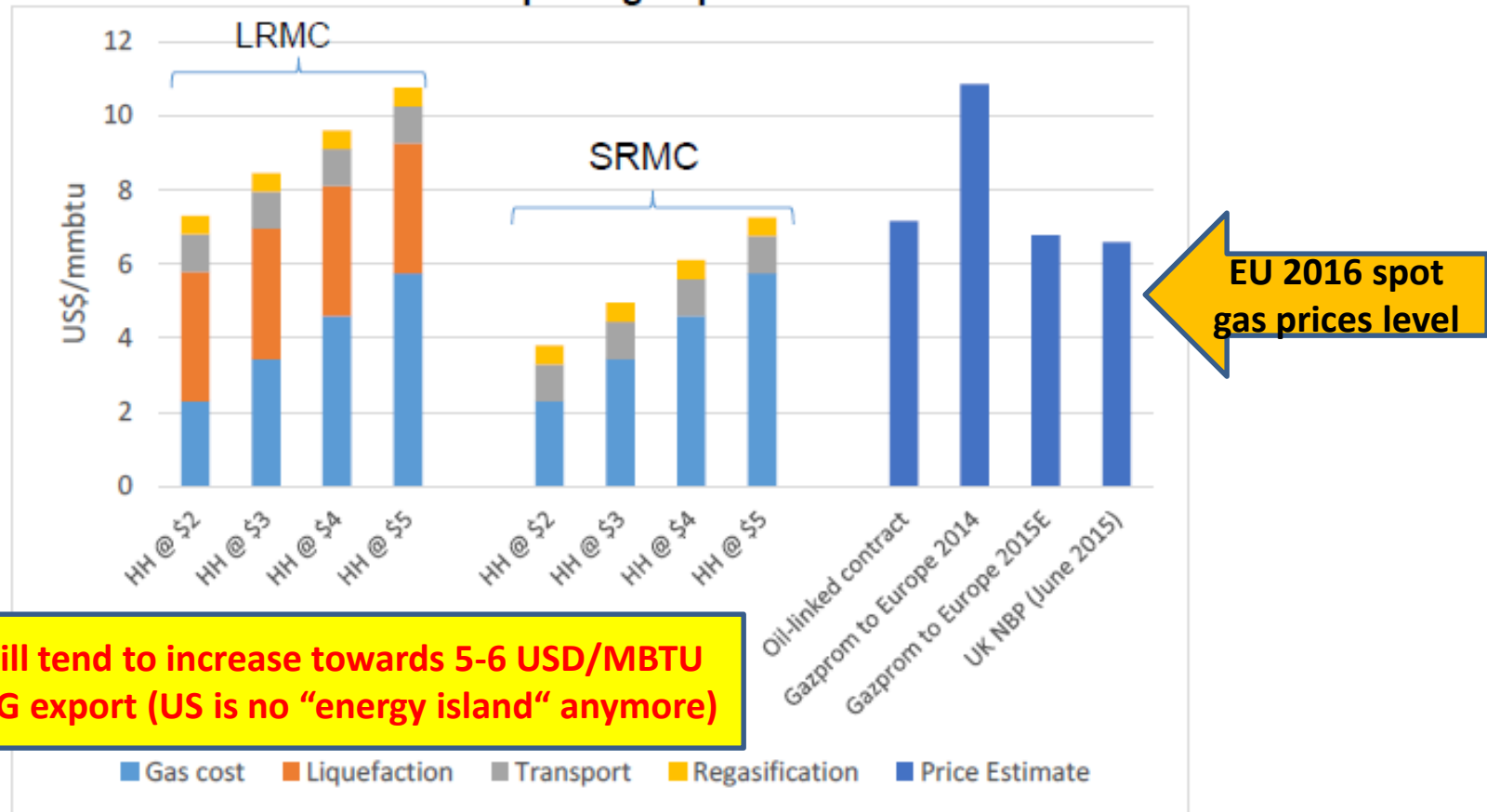
Original source:

James Henderson. Gazprom – Is 2016 the Year for a Change of Pricing Strategy in Europe? – OIES, OXFORD ENERGY COMMENT, January 2016, p. 7 (fig. 3).

US LNG is less competitive to Russian pipeline gas in the EU by LRMC (CAPEX + OPEX) & is competitive there only by SRMC (OPEX) (Henderson) =>

this does not diminish the increasing “debt bubble” of US shale gas producers – the resource base for US LNG export => *short-term “window of opportunities” for US LNG in the EU?*

The cost of US LNG versus European Gas prices (acc. to J.Henderson & T.Mitrova)



US HH prices will tend to increase towards 5-6 USD/MBTU with growing LNG export (US is no "energy island" anymore)

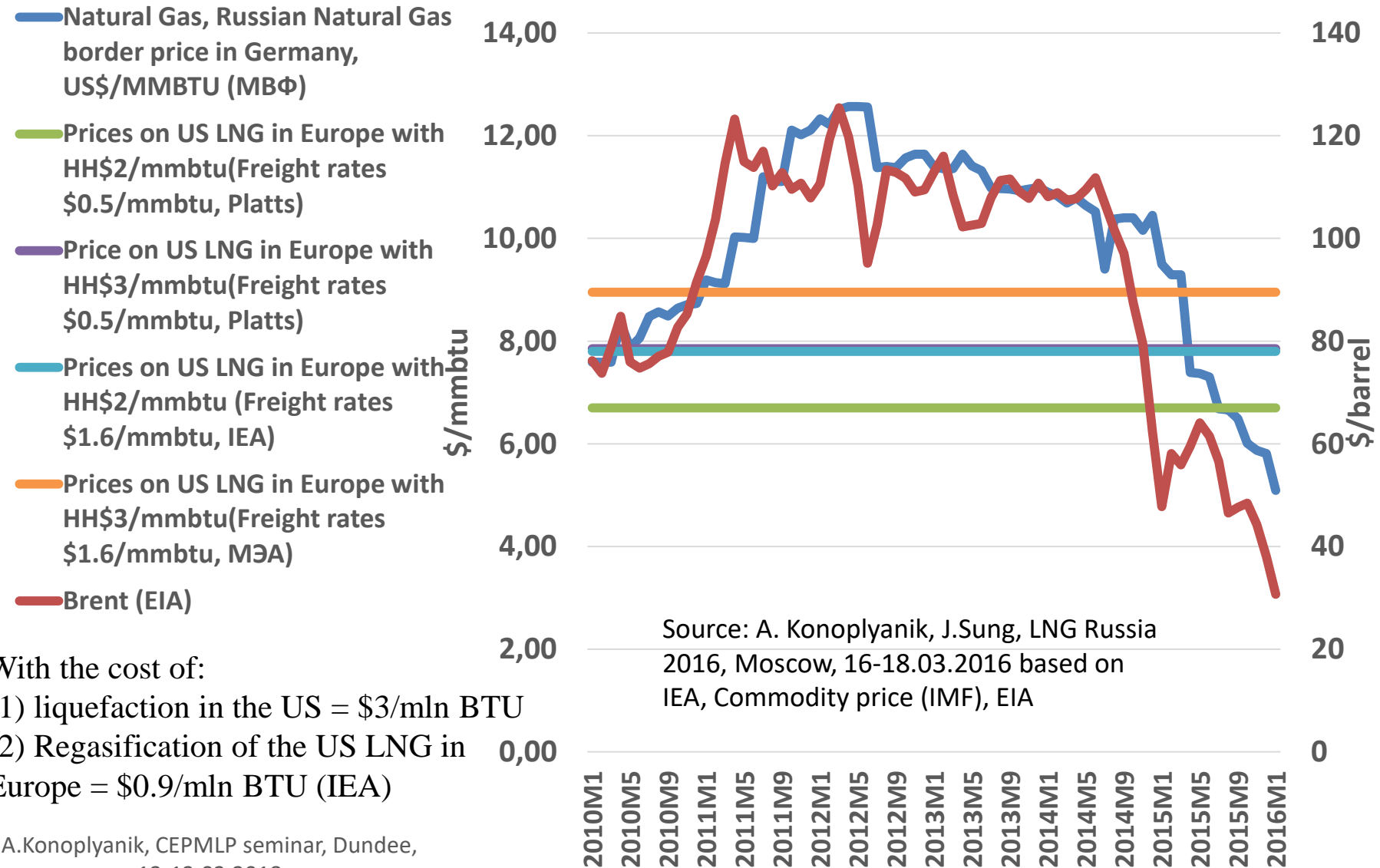
Sources: Cheniere Energy, Energy Intelligence, Gazprom (n.b. oil-linked contract calculated at an oil price of \$65/barrel)

Source of original chart: James Henderson & Tatiana Mitrova. The Political and Commercial Dynamics of Russia's Gas Export Strategy. - OIES PAPER: NG 102, September 2015, p. 44

Thierry Bros on US LNG competitiveness vs Russian gas in the EU

- Thierry Bros: “HH price will guarantee Gazprom European rent in 2020e! ... Even if Europe market moves to near full spot indexation, if it is inked to the US via the costs of LNG exports, Europe price could remain 6 USD/MBTU (cost of liquefaction, shipping & regasification) above HH. ... In short, the liquid US market will guarantee minimum profit for Gazprom and revenues for the Russian state”
 - (T.Bros. After the US Shale Gas Revolution. // Editions TECHNIP, Paris, 2012, p.149)

US LNG prices compared against Russian pipeline gas in Europe

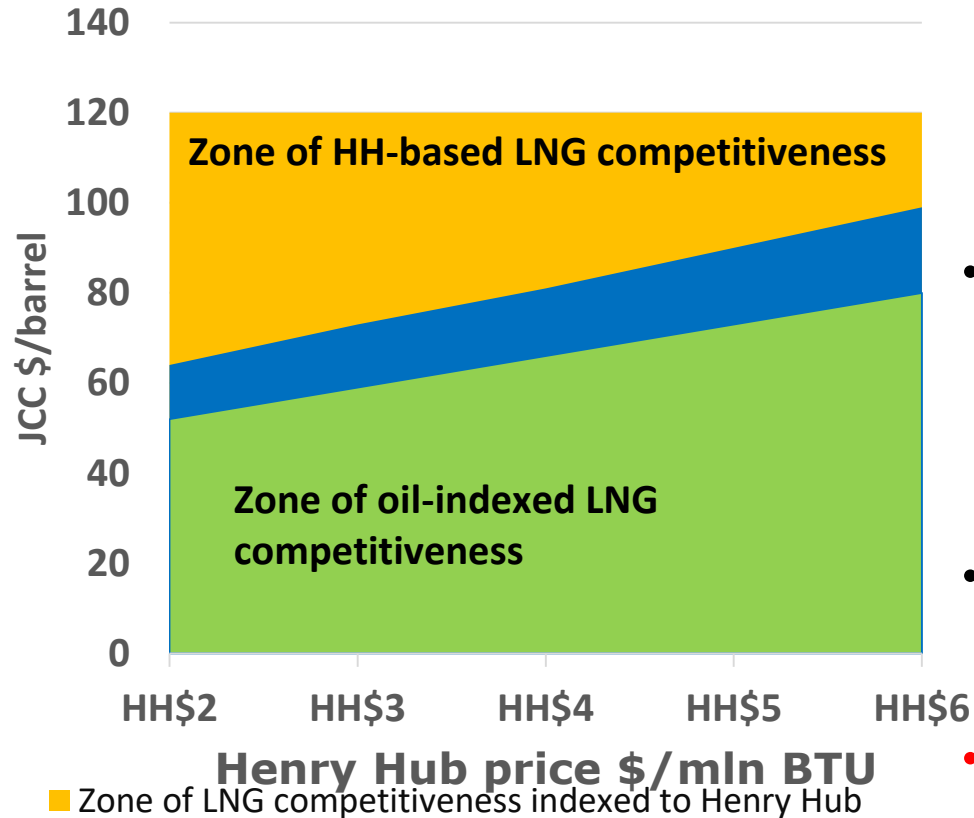


With the cost of:

(1) liquefaction in the US = \$3/mln BTU

(2) Regasification of the US LNG in Europe = \$0.9/mln BTU (IEA)

Zones of LNG competitiveness in Asia indexed to JCC (NBRV pricing) and Henry Hub (cost-plus pricing)

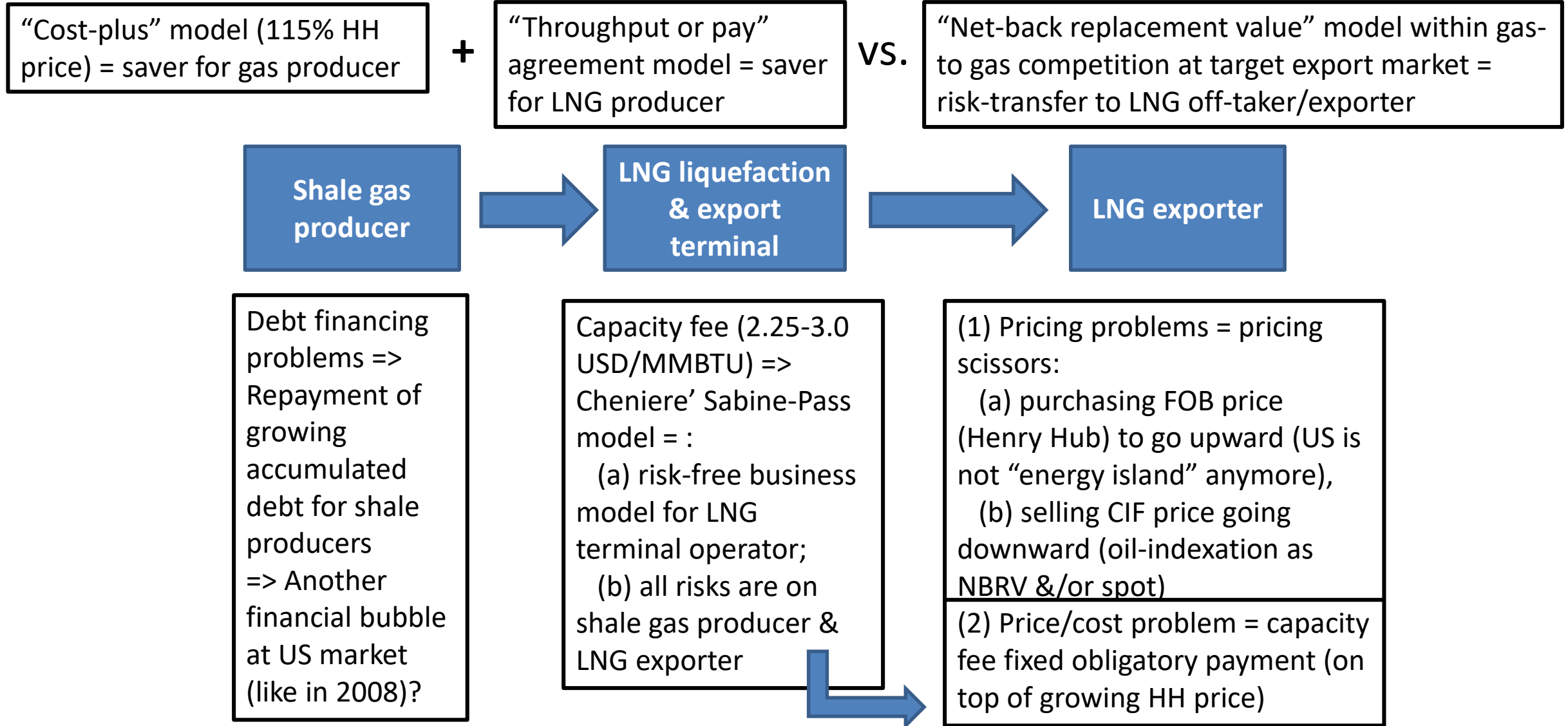


- Zone of LNG competitiveness indexed to Henry Hub
- Oil price that sets LNG prices equal if indexed to JCC and Henry Hub (LNG contracts coefficient 13%-16%)
- Zone of LNG competitiveness linked to JCC indexation

- With the oil price of **\$2/MMBTU** at Henry Hub (*minimum value: April 2012, beginning of 2016*), oil-indexed LNG will be competitive in Asia if JCC price **< \$50/barrel** (*at present*)
- With the oil price of **\$6/MMBTU** (*maximum value: beginning of 2014*), oil-indexed LNG will be competitive in Asia if JCC price **< \$80/barrel** (*mid 2010 – end of 2014*)
- With JCC price **above \$100/barrel**, US LNG becomes competitive if Henry Hub price **exceeds \$6/MMBTU**,
- **BUT WHETHER OIL PRICES LIKELY TO RETURN TO \$100/BBL AND ABOVE?** => *My answer is “NO”, at least in the foreseeable future, due to “domino effects” of US shale revolution*

Source: A. Konoplyanik, J.Sung, LNG Russia 2016, Moscow, 16-18.03.2016

US LNG export model



=> Prior to 2014/2016:

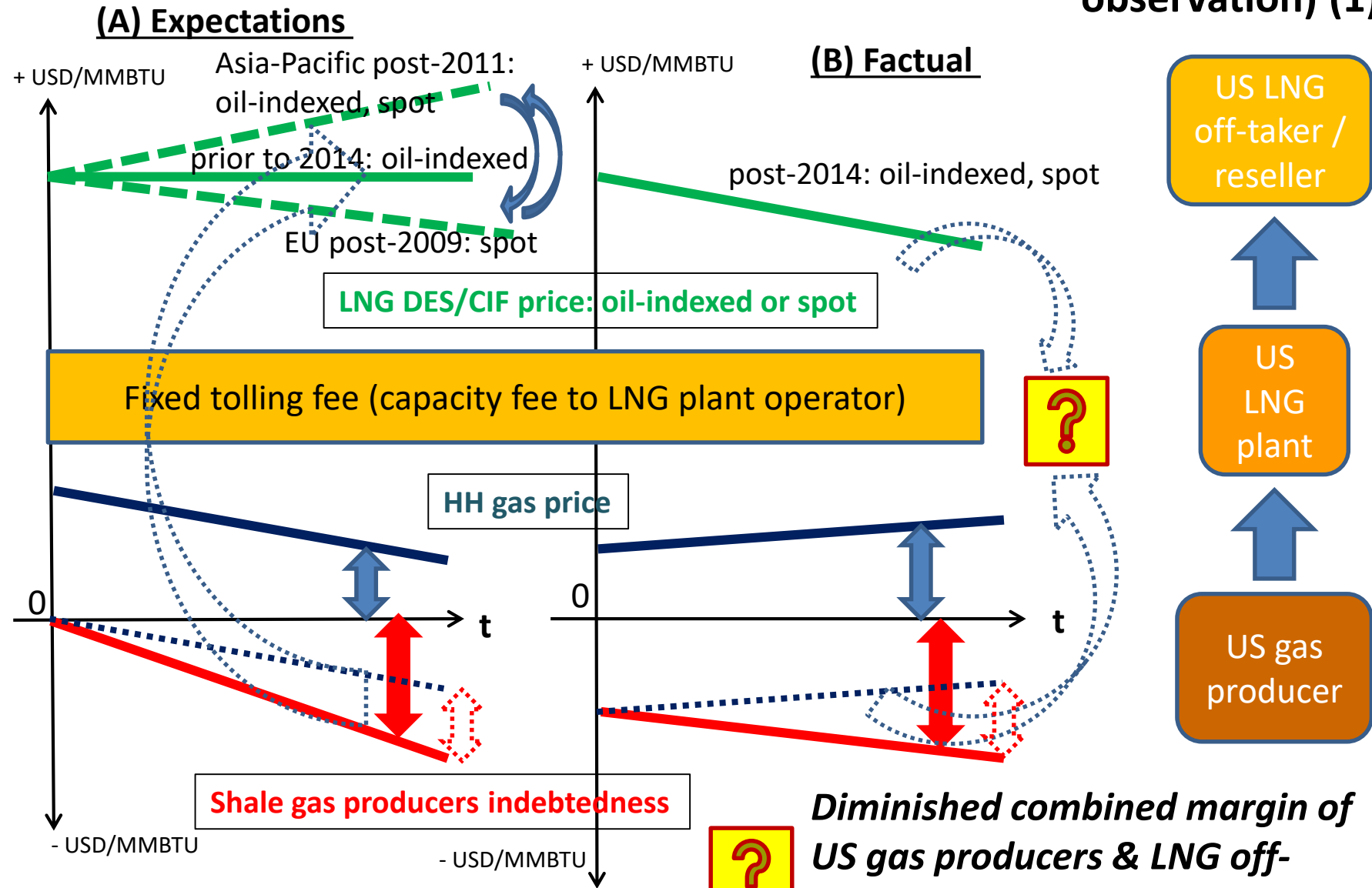
- (1) US gas price decrease (US = “energy island”) plus (2) accelerated growth of shale gas producers indebtedness (debt financing) => perception to compensate (in plenty) current losses at domestic US market by future LNG export at high Asian price (oil-indexation plus post-Fukushima Asian price premium);
- EU market not attractive for US LNG post-2011 (EU oversupply post 2009) despite excessive/free regaz EU capacities.

=> Post 2014/2016:

- USA not “energy island” anymore (2016 onwards) => HH-price to grow? => shale gas producers revenue to grow, but their indebtedness grow as well and converted in “junk debt”; LNG prices (oil-indexed, spot) fell (2014 onwards) => margins of LNG off-takers/wholesale resellers diminished, price risks grew (=> portfolio sales growth); indebtedness of shale gas producers continues => to sell LNG at any price (above SRMC) to diminish losses (sunk costs approach)?

=> Higher LNG prices needed for “US Energy Dominance”/“America First”!

Expected & factual profitability zone for US LNG prior to & after export begins (2016) and oil prices falls (2014) (principal scheme; no scale observation) (1)



Diminished combined margin of US gas producers & LNG off-takers. How it will be shared? Who will take most of losses?

Expected & factual profitability zone for US LNG prior to & after export begins (2016) and oil prices falls (2014) (2)

=> Prior to 2014/2016:

- (1) US gas price decrease (US = “energy island”) plus (2) accelerated growth of shale gas producers indebtedness (debt financing) => perception to compensate (in plenty) current losses at domestic US market by future LNG export at high Asian price (oil-indexation plus post-Fukushima Asian price premium);
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US LNG & campaign against Russian gas: to get rid of the rival?

- Different recent Western “studies” present **RUSSIAN GAS AS IF MORE DIRTY** than other gases (both pipeline & LNG) &/or other fossil fuels &/or RES, like (*):
 - US Dep’t of Energy on long-term GHG perspective on exporting LNG from the US as of May, 29 2014 (long-term GHG perspectives for NG)
 - Karlsruhe Institute of Technology (KIT) Study as of March 2016 (argues the results of the above & official estimates of the US Environment Protection Agency)
 - PÖYRY Study as of June 2016 (coal vs NG)
 - EXERGIA/COWI for DG ENER, “Study on Actual GHG Data for Diesel, Petrol, Kerosene, and Natural Gas”, July 2015 (to provide information about the lifecycle GHG emissions of fossil fuels used in transport)
- **NB1:** *Current thesis of as if “more dirty” Russian gas is additive to post-2009 thesis of Russia as if “non-reliable” source of gas (supplier)*
 - *substitution of notions: “non-reliable **source**” (Russia) vs “non-reliable **transit route from the source**” to the market (Ukraine)*
- **NB2:** *The Trans-Atlantic fight against NordStream-2 - of the same origin?*
 - *To “softly” force Russia to continue gas supplies to EU post-2019 through more risky & costly transit route (to diminish its competitiveness?)*
- **NB3:** *Parallel with different other (non-energy) spheres, like f.i. WADA treatment of Russian (vs US &/or other) Olympic & Paralympic athletes in Rio & following Olympics?*
 - *substitution of notions: fact of allowed doping vs source of information (hackers)*

(*) Source: D. Leonov, N. Sudarev. COP-21 – role of NG in Decarbonization and Sustainability of EU economy.; K. Romanov. The Role of Natural Gas In Decarbonization and Sustainability.// Russia-EU Gas Advisory Council, Work Stream 2 “Internal Markets” meeting, Vienna, E-Control, 01 July 2016

Conclusion (*)

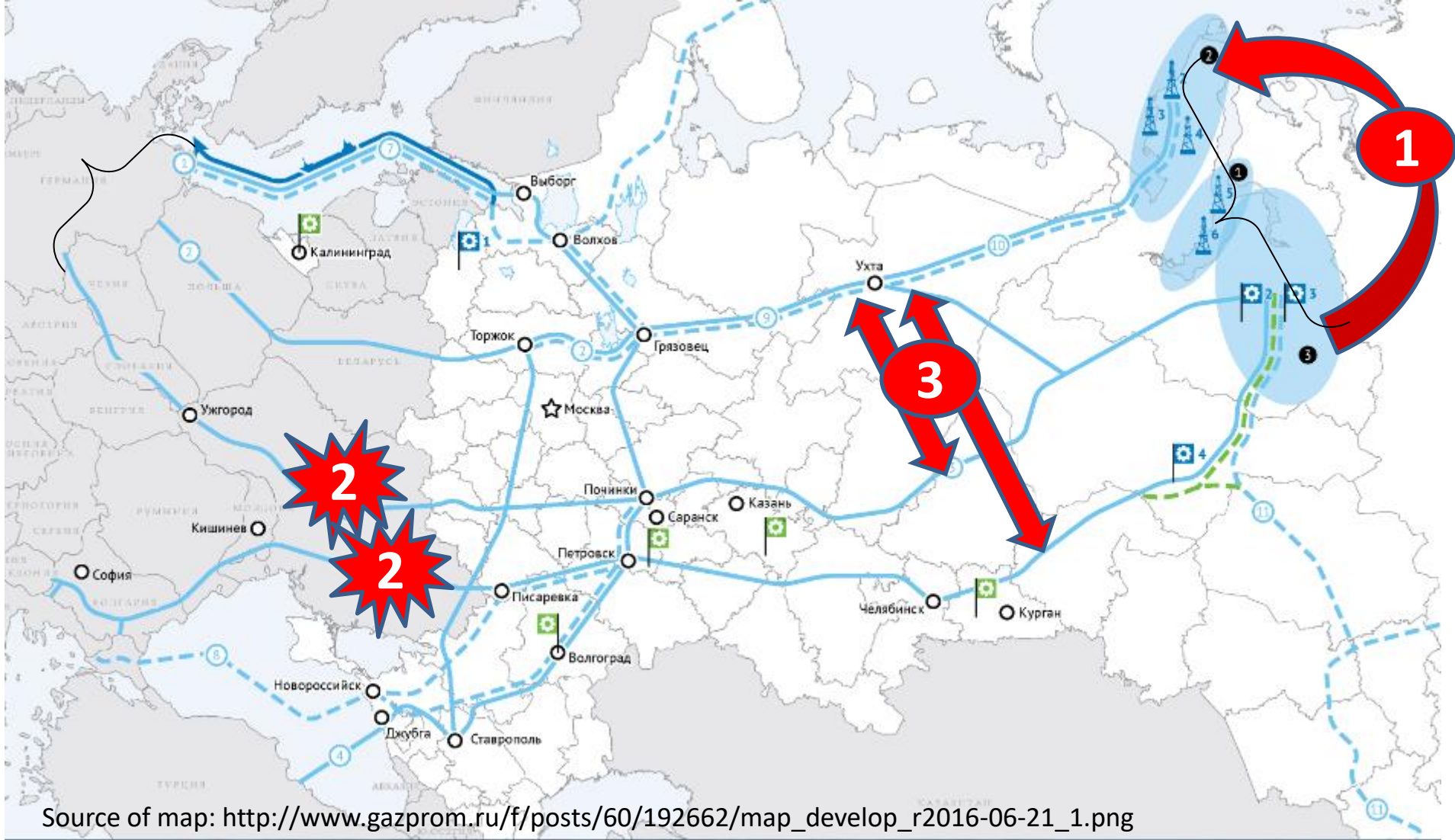
- J.Henderson: “The potential of North American LNG is huge...”, but (*different authors*) economics is poor when it is to be delivered to the EU
- A.Konoplyanik: ...so whether US LNG can be competitive in Europe based on free market forces without administrative support to US LNG from the opponents of Russian gas in the EU? Maybe (one of) the real reason(s) of current campaign against Russian gas in the EU is to create administratively competitive advantages for US LNG aimed at getting rid of Russian gas as its rival in the EU?

() from: A.Konoplyanik. Vostock Capital webinar, 26.10.2016*

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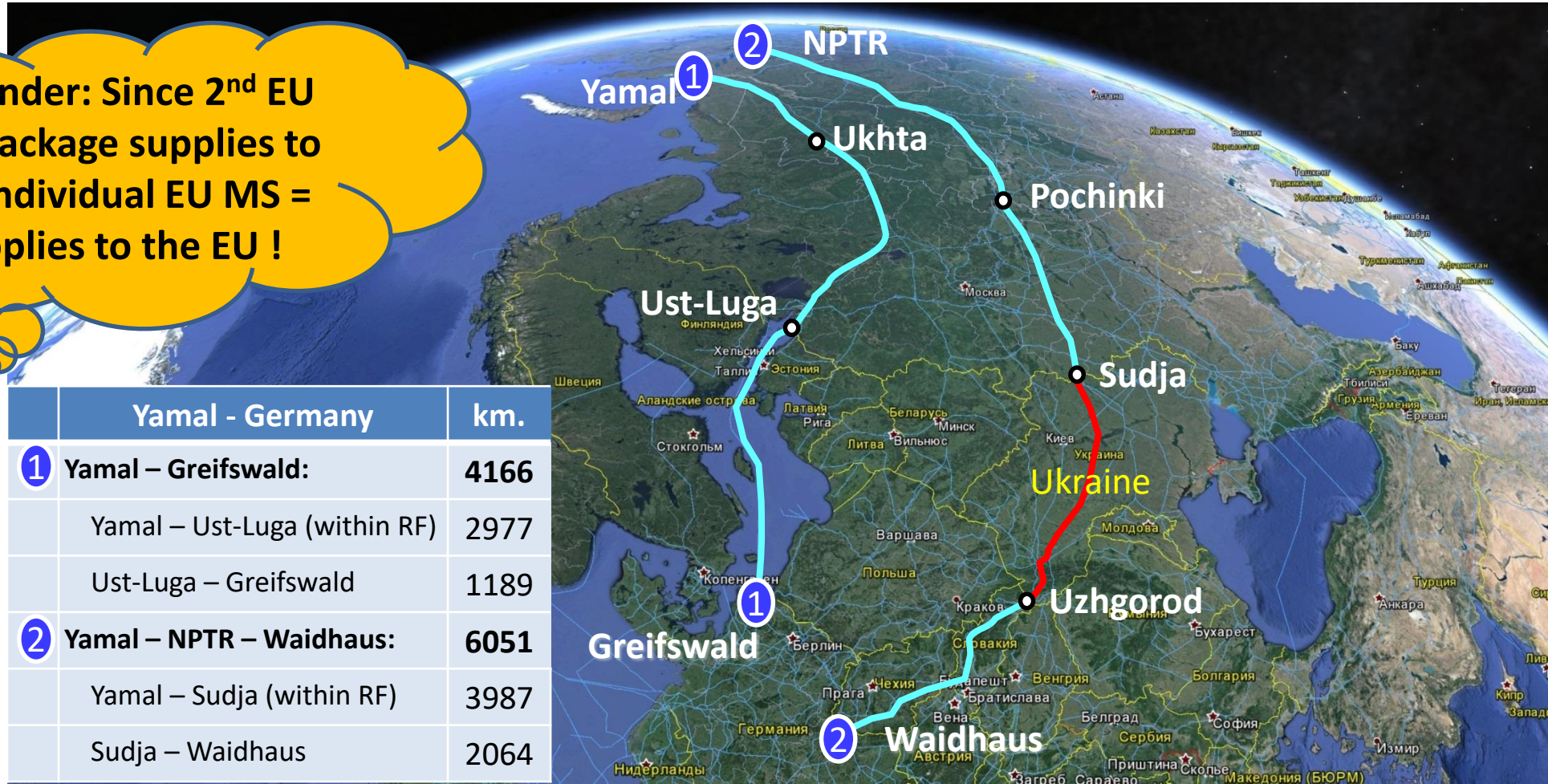
Russia's existing/new supplies to Europe (to the unbundled EU gas market): (1) resource base moves from Nadym-Pur-Taz to Yamal, (2) Ukrainian transit risks & costs increases, => (3) modernization existing (since end-60's) infrastructure vs new construction transportation route



Source of map: http://www.gazprom.ru/f/posts/60/192662/map_develop_r2016-06-21_1.png

Length comparison of different gas routes from Yamal to Germany

Reminder: Since 2nd EU Gas Package supplies to the individual EU MS = supplies to the EU !



Length of the route via Nord Stream is **1885 km** shorter than through UA GTS, incl. that within Russian territory the distance is shorter by **1010 km**.

Route via Ukraine is **45%** longer than via Nord Stream.

Fight against NS2: multilayer task for EU (& other players)

- To force Russia continue gas transit to EU via UA post-2019 & to pay transit fees (instead of supporting UA from EU/US public finance)
- Special Third Gas Directive amendments for NS2: to slow down (if not to prevent) construction/start-up + export EU acquis (MTPA/ competition between Russian companies)
 - Export EU acquis upstream cross-border gas value chains = regular long-standing EU task in favour of EU business
 - Most recent: new concept “upstream-downstream partnership” in Quo Vadis 2nd preliminary report (13.12.2017)
- Additional (hidden?) aim (?): to provoke further conflict between Gazprom & Rosneft (on Russian gas market “liberalization” issue):
 - Gazprom: state agent (sole pipeline exporter by law) on monetizing Russian pipeline gas (maximize marketable rent) => to escape Rusgas-to-Rusgas competition
 - Rosneft: would like to monetize its large gas resources (preferably internationally), agent agreements on gas marketing at external markets: with GPE vs with BP
 - Political consequences: open conflict between two Russian state companies = a blow on prestige of “Putin’s regime”?

COP-21, low prices, US LNG & fight against Russian gas

Aim of fight: to get rid of rival within the narrowing demand niche for gas?
(if COP-21-based demand restrictions + low oil price effects for gas) =>

- to present in different Western “studies” **AS IF RUSSIAN GAS IS MORE DIRTY** than other gases (both pipeline & LNG) &/or other fossil fuels &/or RES, like (*):
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- *NB3: Parallel with different spheres, like f.i. WADA treatment of US & Russian Olympic & Paralympic athletes in Rio?*
 - *substitution of notions: fact of allowed doping vs source of information (hackers)*

(*) Source: D. Leonov, N. Sudarev. COP-21 – role of NG in Decarbonization and Sustainability of EU economy.; K. Romanov. The Role of Natural Gas In Decarbonization and Sustainability.// Russia-EU Gas Advisory Council, Work Stream 2 “Internal Markets” meeting, Vienna, E-Control, 01 July 2016

From “Peak supply” to “Peak demand”, US LNG & fight against Russian gas in EU (1)

- **IEA:** Current PRR of non-renewable energies 3 times higher (if produced & utilized) than CO2 emissions to stay within 2 degree Centigrade global temperature increase => “unburnable energy”
- **Q:** If 2/3 of future CO2 emissions refer to coal, 22% to oil, and only 15% to gas (IEA), why major aim/victim in the fight (incl. for climate change) in EU is (Russian) gas?
- **A:** many studies have shown that US LNG is not competitive with Russian pipeline gas in EU on LRMC basis => “to kill a competitor” policy within the narrowing competitive niche for gas in EU (“zero-sum-game” approach)
 - To create artificial administrative & other barriers for more competitive Russian gas (*f.i. Quo Vadis scenarios, Third Gas Directive amendment proposal*) + to develop its negative image (*f.i. EXERGIA*) & consequences (*f.i. REKK on NS2*) => to make it non-competitive against US LNG within new energy environment: lower oil prices post-2014, and expected demand limitations induced by “peak demand” paradigm & COP-21 targets

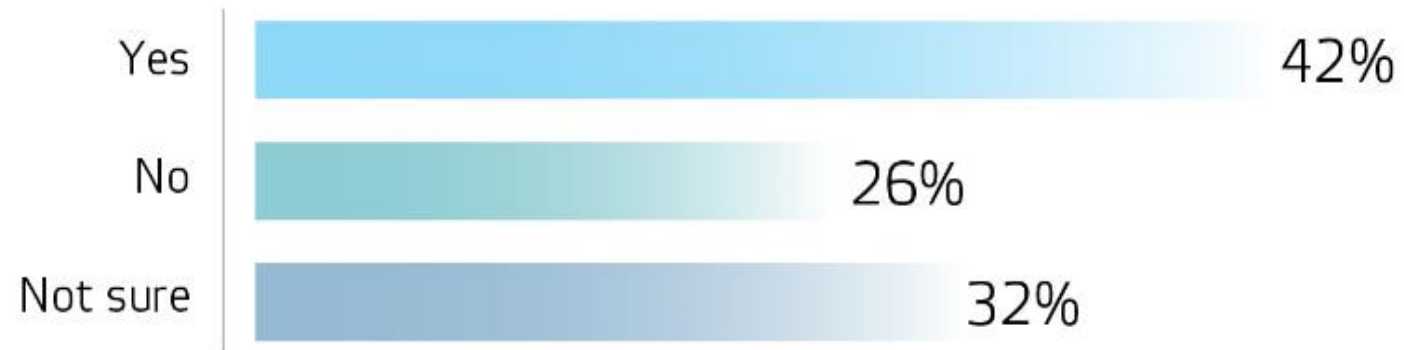
Results of the poll for the audience of the Webinar «US LNG and European gas market» 26.10.2016 (1)

LNG 2017
congress RUSSIA



www.lngrussiacongress.com

? Do you think that US LNG will undermine Russia's gas monopoly in Europe?



Results of the poll for the audience of the Webinar «US LNG and European gas market» 26.10.2016 (2)



? How can you comment on the currently increasing inflow in public domain of negative information about Russian gas (too risky to rely upon, it is more dirty than other gases, etc.), Russian gas policy in the EU (political weapon of Kremlin), and new projects on its delivery to the EU (not commercially, but politically motivated)?

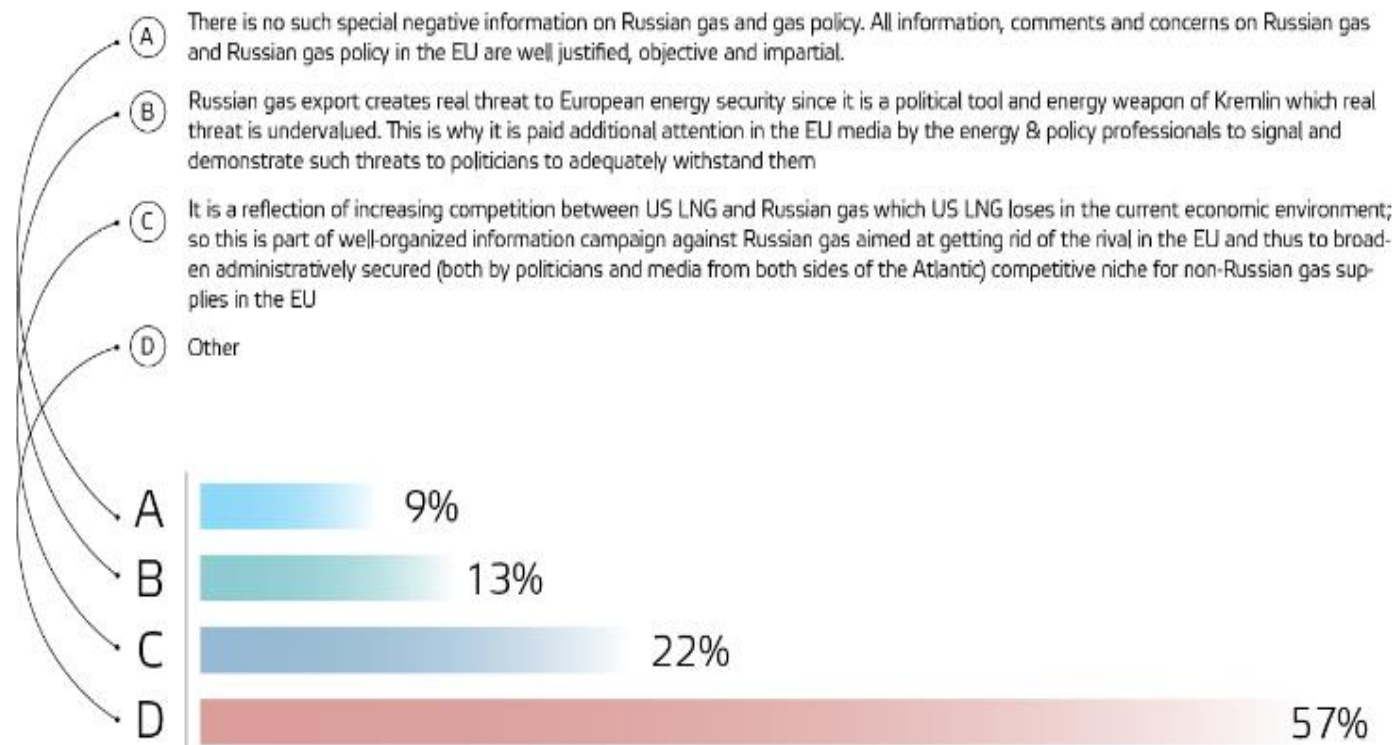


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From **competition** between individual new pipeline proposals, based on the “old” EU rules, to **cooperation** of shippers, TSOs, NRAs under “new” EU rules (1)

- ❖ Three types of perceived competition in SEE – e.g. between:
 - Russia/producer/exporter-“sponsored” & EU/consumer/importer-“sponsored” pipeline projects (incl. from alternative to Russian supplies),
 - Different EU-“sponsored” pipeline & LNG regas projects,
 - Three different EU regulatory models/procedures of initiation, financing, development of new capacity:
 - “Old”: **(a)** PCI and/or **(b)** Exemptions under Art.21-22 (2nd Gas Directive)/Art.35-36 (3rd Gas Directive),
 - “New”: **(c)** CAM NC INC (originated from Art.13.2 Third Gas Directive)
- ❖ “Russia-sponsored” projects:
 - South/Turkish Streams (offshore & onshore parts) e.g. their continuation/prolongation onshore EU, incl. Poseidon project proposal, - to the existing delivery points (destination markets) under existing LTC (supply)
- ❖ “EU-sponsored” projects:
 - TANAP-TAP (EU Southern Gas Corridor), incl. its potential capacity expansion
 - Vertical Gas Corridor (CESEC)
 - IGB/IBR & other interconnectors with reverse flows
 - Integration into these pipeline systems of LNG regas facilities & LNG/ storages (both existing onshore & proposed FSRUs)

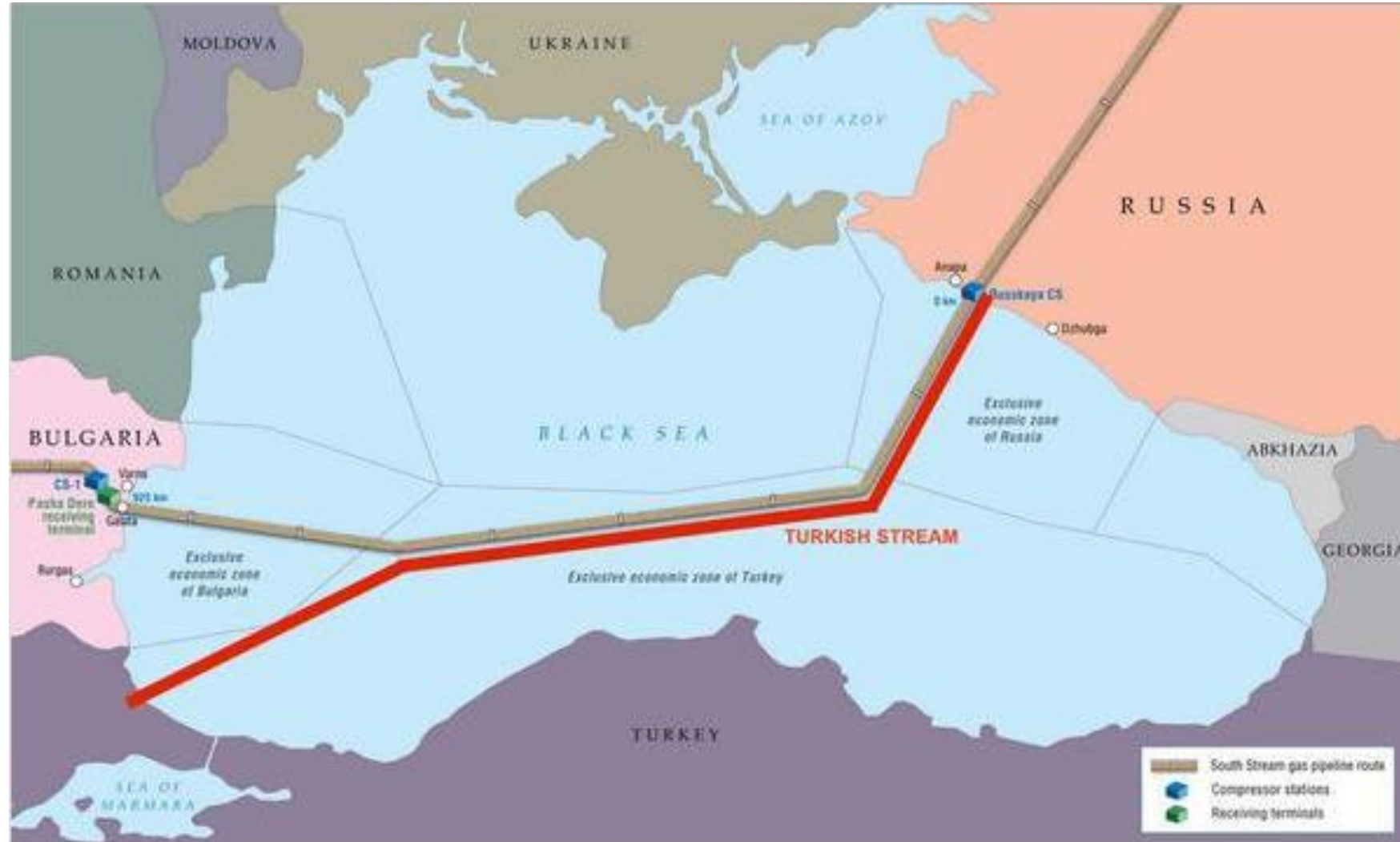
From **competition** between individual new pipeline proposals, based on the “old” EU rules, to **cooperation** of shippers, TSOs, NRAs under “new” EU rules (2)

- ❖ Evolution of pipeline development concept in SEE: From “*offer of capacity*” based on *old* EU PCI/Exemptions rules (NABUCCO) - to “*demand for capacity*” based on bilateral IGAs (South Stream: “no go” if contradicts Third Energy Package) or on *new* EU rules (CAM NC INC)
 - Failure of NABUCCO: lack of shippers’ readiness to book transportation capacity
 - Failure of South Stream (onshore): opposition of EU to allow unilateral deviation from EU Third Energy Package rules (unbundling, mandatory TPA) in post-2009 period
 - Contradiction between (non-compliance of) bilateral IGAs & EU rules for unbundled internal market = prerequisite for development of new EU rules for development of new capacity within unbundled EU gas market based on “demand for capacity” approach
- ❖ Difference in the major purpose of development of new capacity:
 - Russia (producer/exporter initiative): firstly, to reroute to the new transportation routes with the same delivery point capacity (transportation) contracts within existing valid long-term supply contracts after expiration of the above-mentioned transportation contract which is part of this supply LTC
 - Originates from the Russian GTS which incorporates existing and new resource bases (multiple fields).
 - EU (consumer/importer initiative): firstly, to develop new transportation routes from the new supply source(s) to diversify from dominant Russia supplies
 - Southern Gas Corridor originates from Azeri Shah-Deniz II (from new single field)

From **competition** between individual new pipeline proposals, based on the “old” EU rules, to **cooperation** of shippers, TSOs, NRAs under “new” EU rules (3)

- ❖ Financeability/bankability:
 - former EU rules: competition between the projects for access to EU public finance to make project (new capacity) financeable;
 - new EU rules: demand for capacity = shipper’s readiness to book capacity long-term = security for project (debt) financing = no need for public finance (except “up to 20%” quota for short-term shippers)
- ❖ Conclusion: from competition between individual “distance” pipelines to “entry-exit” approach with multiple entry capacities (pipeline and LNG regas) based on “demand for capacity” approach (covering all shippers’ requests) based on new EU regulatory rules (adopted by comitology procedure in end-2016)
 - Southern Gas Corridor to become an integral part of such integrated system: to convert it from isolated East-West pipeline endeavored as alternative to Russian gas supplies into well-integrated in all four geographical dimensions system with reverse flows at ICs
 - Similar approach was proposed in IENE’s June 2016 Publication “TAP is Not Enough”

Turkish Stream: why such complicated route? To by-pass (former) Ukrainian EEZ... but...



Source: <http://middleeastnewsservice.com/tag/turkish-stream/>

Black Sea delimitation prior to and after reunification of Crimea with Russia



The new reality:
Turkish &
Ukrainian EEZs
do *not* interlock
anymore

Map source:

http://img1.liveinternet.ru/images/attach/c/0/113/415/113415843_large_16012_102020_54593033675_5644072863940384821_n.jpg

Black Sea delimitation prior to and after reunification of Crimea with Russia: consequences for risk-avoidance offshore pipelines



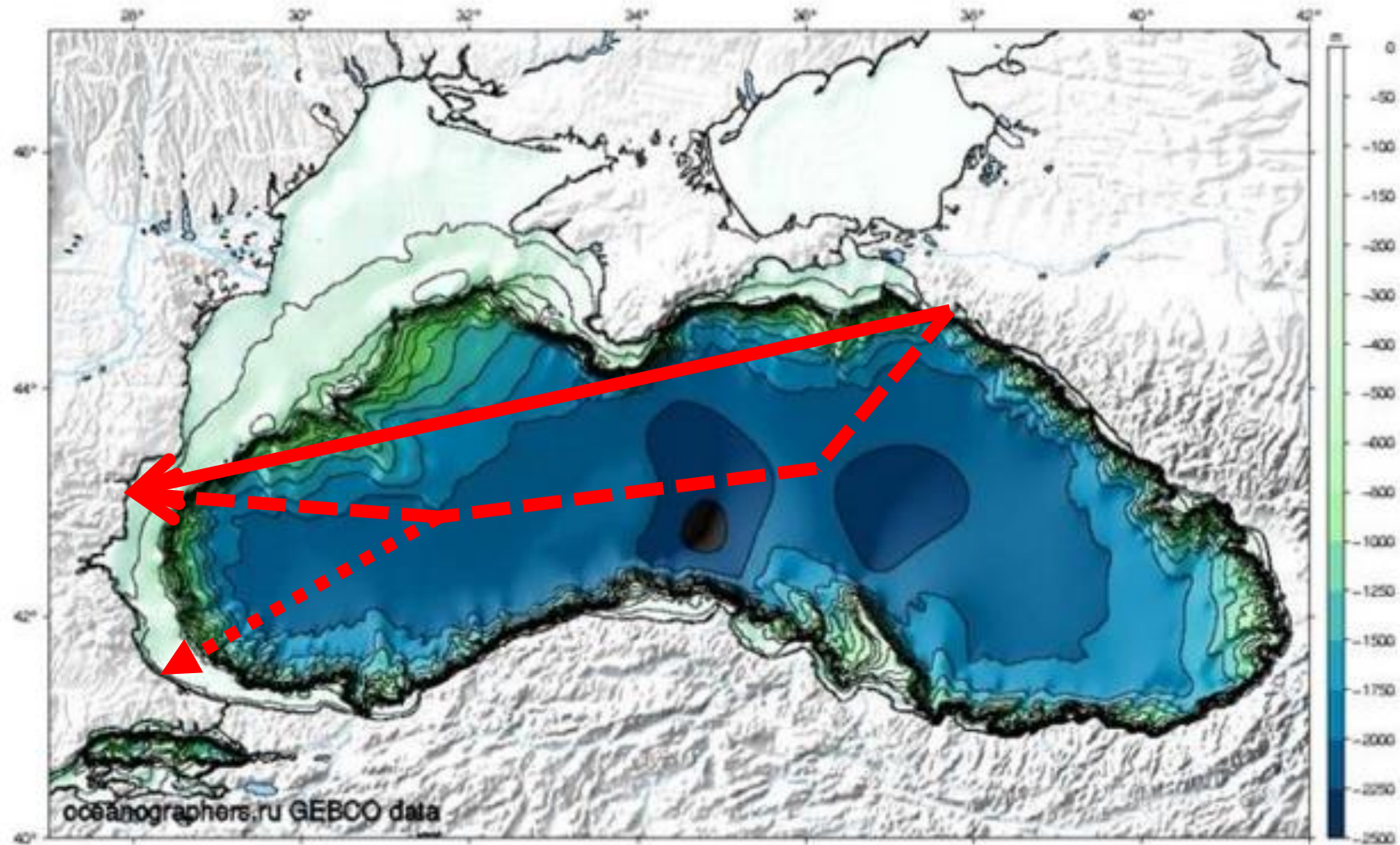
- South Stream (via Turkish EEZ)
- Turkish Stream
- Possible “New” Stream (?) (via new / expanded Russian EEZ)

Reunification of Crimea with RF opens opportunity (& 24.11.2015 incident & event afterwards votes for its use) to avoid Turkish transit => My proposal: offshore pipeline route to Bulgaria/Varna directly via new (expanded) RF EEZ in Black Sea, now by-passing both Ukrainian & Turkish EEZs, with all its positives: shorter line via shallower waters => benefits to both RF & EU

Map source:

http://img1.liveinternet.ru/images/attach/c/0/113/415/113415843_large_16012_102020_54593033675_5644072863940384821_n.jpg

Black Sea: map of water depths & offshore routes



Map source:
<http://www.perekop.info/black-sea-history/>




-  South Stream (via Turkish EEZ)
-  Turkish Stream
-  Possible "New" Stream (?) (via new/expanded Russian EEZ)

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Five selected Quo Vadis scenarios

1) Tariff reform

- nullification of intra-zone E-E tariffs, compensatory increase of entry (to EU wholesale market) and/or exit (to EU retail market) tariffs, centralized redistribution of compensatory revenues (via newly established TCF)

2) Real merger of market zones

3) Virtual merger of market zones

- paving the way for virtual reverse flows to UA

4) Shift of delivery points to the external border of EU (area of EU acquis => EU + Energy Community area)

- Russian gas to be delivered to RF-UA border

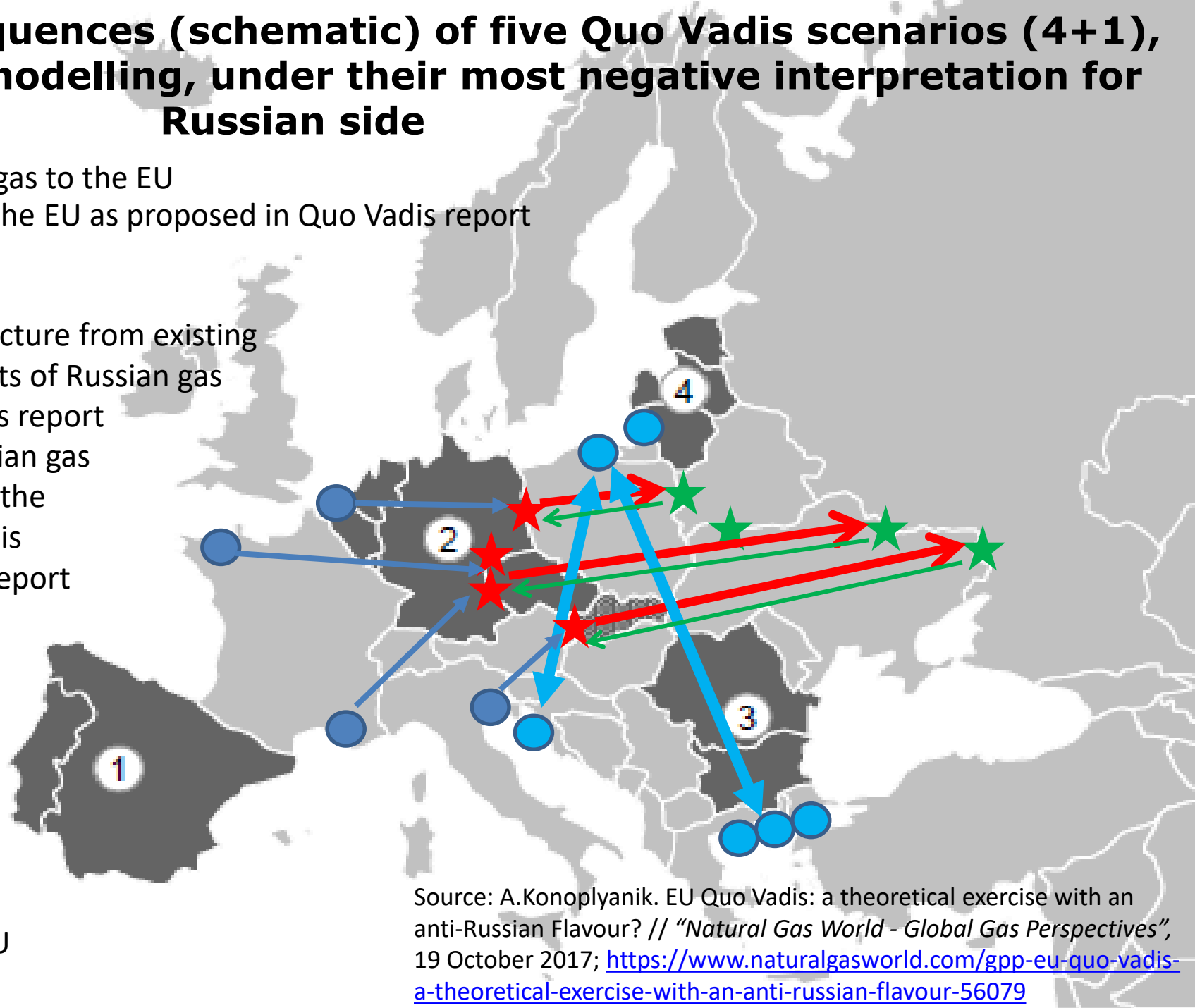
5) Expansion of pipeline infrastructure to deliver regasified LNG from coastal import terminals to inside EU (the main/Rus delivery points)

- To substitute their Rus gas shifted to RF-UA border? who will finance? Via TCF?

My final conclusion (devil's advocate/worst-case interpretation): Quo Vadis in its current structure presents an integral programme of pushing out the (more cheap) Russian pipeline gas supplies to the periphery of the EU/Energy Community area (RF-UA border) and its substitution in the (Eastern EU) area of its historical presence by (more costly) US LNG

Possible application consequences (schematic) of five Quo Vadis scenarios (4+1), selected for quantitative modelling, under their most negative interpretation for Russian side

- ★ Existing key delivery points of Russian gas to the EU
- ★ New delivery points of Russian gas to the EU as proposed in Quo Vadis report
- Existing LNG terminals
- New LNG terminals
- Development of new pipeline infrastructure from existing LNG terminals to existing delivery points of Russian gas within the EU as proposed in Quo Vadis report
- Shift of existing delivery points of Russian gas inside the EU to their new locations at the external border of the zone of EU acquis application as proposed in Quo Vadis report
- Transfer of existing transit business of Russian gas to existing delivery point within the EU to the mid-stream companies of the EU as proposed in Quo Vadis report
- ① New merged regional gas market zones as proposed in Quo Vadis report
- ↔ New North-South EU gas pipeline corridor in the Eastern part of the EU to connect new LNG terminals



Source: A.Konoplyanik. EU Quo Vadis: a theoretical exercise with an anti-Russian Flavour? // "Natural Gas World - Global Gas Perspectives", 19 October 2017; <https://www.naturalgasworld.com/gpp-eu-quo-vadis-a-theoretical-exercise-with-an-anti-russian-flavour-56079>

New (incremental) European gas infrastructure (PCI) (see legend)



A.Konoplyanik, CEPMLP
seminar, Dundee, 12-
13.02.2018

Источник: http://ec.europa.eu/energy/infrastructure/transparency_platform/map-viewer/main.html

Legend to figure with new (incremental) European gas infrastructure (PCI)

Natural Gas

Terminal for liquefied natural gas (LNG)

 before 2017

 between 2017 and 2020

 after 2020

Storage facility

 before 2017

 between 2017 and 2020

 after 2020

Reverse flow

 before 2017

 between 2017 and 2020

 after 2020

Compressor station

 before 2017

 between 2017 and 2020

 after 2020

Node

Pipeline

 before 2017

 between 2017 and 2020

 after 2020

Existing terminal for liquefied natural

Existing storage facility

Existing pipeline network

Источник: http://ec.europa.eu/energy/infrastructure/transparency_platform/map-viewer/main.html

Quo Vadis, Russian pipeline gas & US LNG in EU : attempt of unfair competition? At the cost of EU? What the Presidents are saying...

- In its current structure Quo Vadis seems to be factually aimed at justification of substitution in EU **by more expensive** US LNG **of more cheap** Russian pipeline gas; on the routes of the latter to EU (both on existing and on prospective ones) it is modelled to create incremental barriers. => Quo Vadis scenarios well correlate with new anti-Russian US sanctions against existing and new Russian export pipelines and might lead not to increase but **to decrease of EU welfare**. It seems that Quo Vadis scenarios are constructed not in favour of EU, but **in favour of US**:
 - US President **D.Trump** (Warsaw, 04.07.2017): “Maybe, the price will come slightly higher – but that’s OK...” (“US Energy Dominance” & “America First” strategies)
 - Russian Prime-Minister **D.Medvedev** (St.Petersburg, 21.09.2017): “...American Administration - and Congress... - try to promote its own suppliers and to substitute Russian Federation at this market”
 - Russian President **V.Putin** (Sochi, 19.10.2017): “... recent sanctions’ package adopted by US Congress openly aimed at pushing Russia away from European energy markets, to force Europe to turn to more expensive US LNG ...”

How homogenous is EU (what about internal EU solidarity)? What about Transatlantic solidarity?



- EU = “old” EU + “new” EU or “old” EU vs “new” EU?
- A lot of EU-Russia energy politicization comes either from “new” EU or from abroad
- “New” EU vs “old EU” (still dividing lines?):
 - Expectations (pre-2004/2007) vs realities (post-2004/2007) =>
 - Brussels vs Washington
 - EU vs NATO (funding etc)
 - Russian pipeline gas vs US LNG (& EU welfare)
 - NWE vs CEE/SEE gas prices/pricing

EU vs USA: allies or competitors?

- Joint sanctions against Russia
- Joint support of Ukraine

BUT: to jointly oppose Russia, to depart from Russian energy = more costly energy for EU => less competitive EU manufacturing globally => who wins in global competition from anti-Russian sanctions undertaken within Trans-Atlantic solidarity? => Anti-Russian sanctions as an instrument of weakening EU global competitiveness ??? (“America First. Nothing personal. Only business.”)

Dividing line from Baltic to Black sea (Project "Intermarium") – major aim of USA in Europe (acc. to G.Friedman, "Stratfor")



“...final aim of the US consists in creation of “*Intermarium*” – territory between Baltic and Black Seas, which concept was developed as far back as by Pilsudski. First aim for US is not to allow that German capital and German technologies were united with Russian natural resources and labour resources in the invincible combination. ... Trump card of US which defeat such combination - dividing line between Baltic states and Black Sea.”

(<https://www.thechicagocouncil.org/event/europe-destined-conflict>)

Source: Presentation of George Friedman, Founder and President of private intelligence agency “Stratfor” at the conference of “The Chicago Council on Global Affairs”, 4 февраля 2015 г., <https://www.youtube.com/watch?v=iOY1dDqa7F0>; https://www.youtube.com/watch?v=xewzbMYmC_I

Thank you for your attention!

www.konoplyanik.ru
andrey@konoplyanik.ru
a.konoplyanik@gazpromexport.com

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