Развитие мирового нефтегазового рынка: некоторые тенденции развития рынков СПГ и трубопроводного газа. Последствия для России.

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Выступление на встрече с сотрудниками «Сахалин Энерджи»,
Россия, г.Южно-Сахалинск, 01 октября 2018 г.

Development of international oil and gas markets: some development trends of LNG and pipeline gas markets. Consequences for Russia.

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Presentation at the meeting with the staff of the Sakhalin Energy Investment Company,
Russia, Yuzhno-Sakhalinsk, 01 October 2018

Global Gas Markets of the Future (1)

- Global gas market**s** (plural) ***OR*** global gas market (singular)?
  - From regional (mostly pipeline-based) gas markets to global gas (pipeline + LNG) market(s) => LNG as market(s) integrator
    - LNG as "*second* gas revolution" (IEA) => revolutionary changes + "domino effects" as with "*first* gas (US shale gas) revolution"
- Changing institutional structure of **globalized (global?) LNG market**
  - From historical base-load LNG demand (Japan, Korea, Taiwan – "energy islands") to increasingly flexible demand: semi-peaks (competitive demand), supply diversity (SoS)
  - From investment stability to trade flexibility => from large-scale projects ("economy of scale") with LTC (investment tool) with NBRV pricing (oil indexation) & fixed destination (initial stage LNG development) to:
    - Delivery flexibility (from DES/CIF to FOB) & portfolio purchases (VICs with assets in upstream & downstream) // =>
    - "smaller-scale economy" (technical progress): i.e. floating (FSRU/FSLU) & small–scale LNG => new business areas opened for gas (i.e. mobility)
    - multiple LNG pricing => what future of LNG pricing models? =>

Gas pricing options

- Gas imported NBRV pricing model (1962: to oil) from oil (1950-ies: to coal)
- From NBRV under excessive demand (undersupply) = “oil indexed”:
  - crude-indexation (Asia Pacific)
  - petroleum-products indexation (EU)
- To “gas-to-gas” competition under excessive supply (oversupply) = “gas indexed”:
  - Henry Hub (USA)
  - EU hubs (TTF, NBP)
  - emerging Asia-Pacific hub(s) yet to be developed in JKM: Tokyo? Shanghai? Singapore?
  - Both oil-indexation (Asia Pacific) & PP-indexation (EU) do co-exist now, though with diminished role in gas trade (IGU), & would exist in future LTC
- Today’s dual gas pricing beyond USA:
  - Asia-Pacific: oil-indexed (JCC-based) vs Henry-Hub-based (cost/spot plus) LNG pricing
  - EU: PP-indexed (Russian LTC mostly adjusted to TTF) vs EU hubs (TTF/NBP)
- Multiple pricing models to coexist in different markets

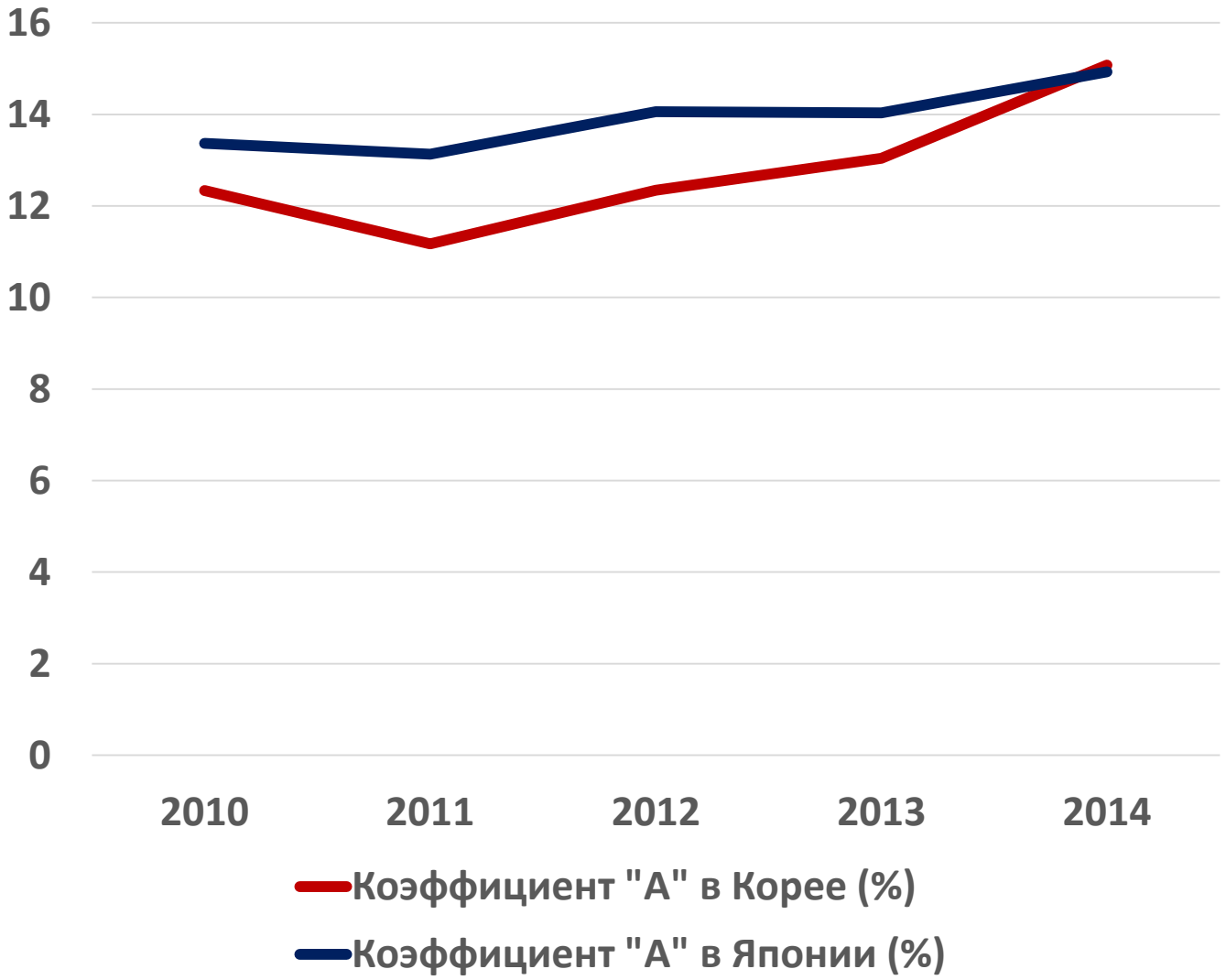
Global Gas Markets of the Future (2)

- LNG making Gas a global commodity
  - Diminishment of (i) contract duration, (ii) unit contract volumes, (iii) company size for entering LNG market, (iv) thus their credit ratings => has increased LNG market volatility & risks => demand for hedging risks => stipulate development of "paper" (financial segment of) LNG market from ***hedger's-side***
  - Due to LNG, regional gas price *differences* become "spreads" (W.Peters/f.RWE) (*differentials*) => price arbitrage deals as driver of trades (LNG as global commodity) => appetite to risk stipulate development of "paper" (financial segment of) LNG market from ***speculator's-side*** =>
    - at which stage of development LNG paper market is now? (no standard LNG contract yet – prerequisite for financial trades, etc.)
- Changing institutional structure of **consolidated global gas market**: whether it will be *same as OR different from* **global oil market** in its institutional structure (contracts? pricing? Etc.)

International LNG & Russian gas

- EU sees LNG as competitor to (Russian) pipeline gas (diversity of supplies), but large-scale LNG producers prefer other (non-EU) markets
  - 25% utilization rate of EU regaz facilities means EU market is less attractive;
  - Not enough connecting pipelines from regaz facilities to inside EU (REKK)
  - Russian pipeline gas in EU won its dominant niche at EU market in global competition (in fair play) with international LNG (S.Dale/BP) since it is cheaper than (US) LNG (now a given fact)
  - How to fulfil US-EU Summit decision (as of 25 July 2018) on US LNG purchases for EU?
    - EU to co-finance (under PCI) & build 9-11 new regaz LNG terminals & connecting North-South pipelines in the “Intermarium” area?
    - US LNG in EU diminishes EU welfare but favoures US business (expanding its market share)
    - “Security premium”? But under “LNG flexibility” producer or LNG off-taker decides (even PIGNiG has recently signed FOB, not DES, US LNG contract)
  - Artificial barriers for Russian pipe gas to EU in favour of US LNG? (2017/2018 CEC Quo Vadis project)
- A new market option: Russian small-scale LNG to the EU (Baltic, Black sea, Danube areas) => options at Russian Far East (SEIC vs Novatek competition?)?

Коэффициент “А” («наклон контрактных кривых») для СПГ контрактов в Японии и Корее (в целом по среднегодовым объемам импорта в 2010 – 2014 гг. , по цене СИФ)



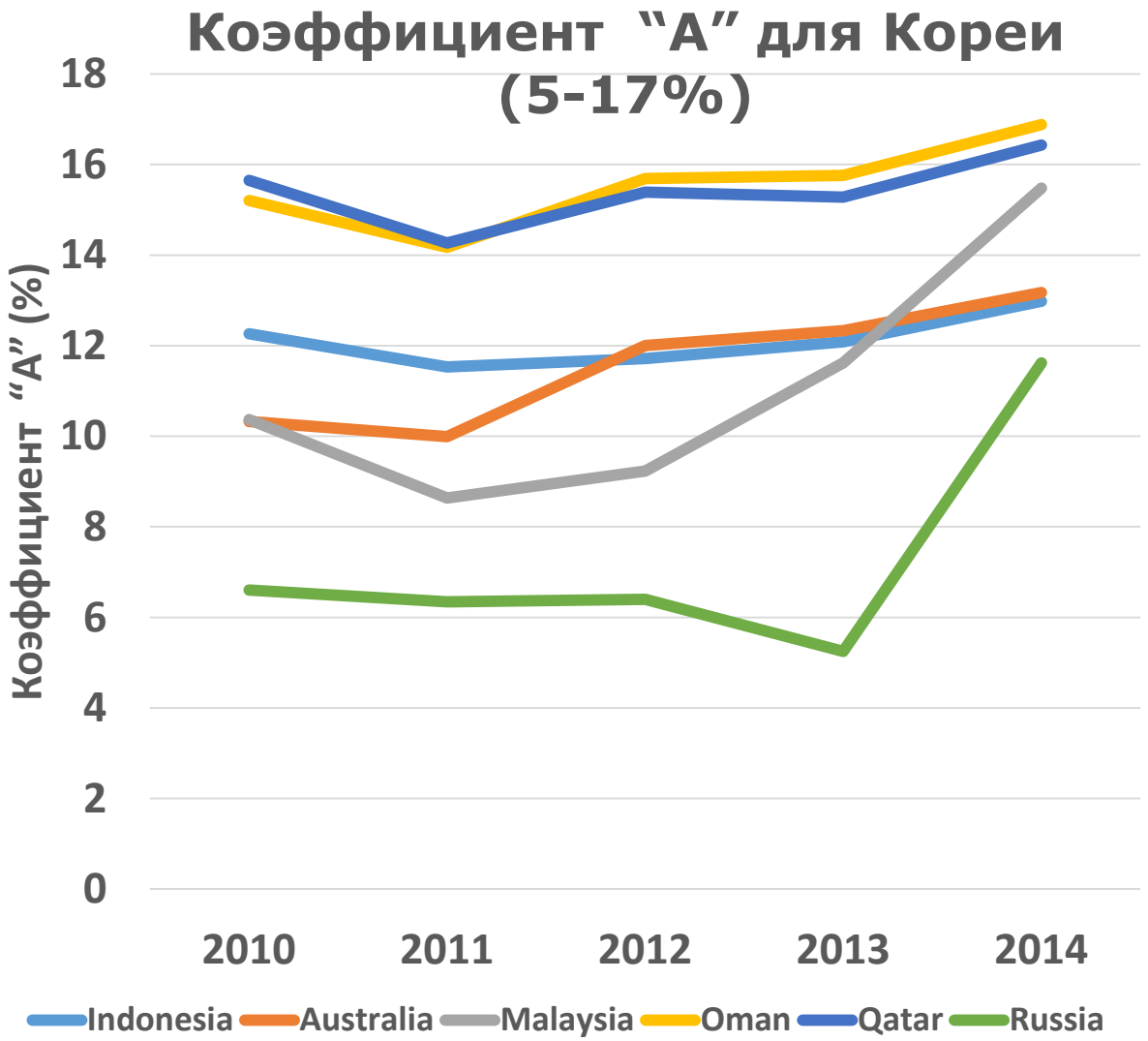
Коэффициент “А” в 2010-2014 гг. колеблется в пределах:

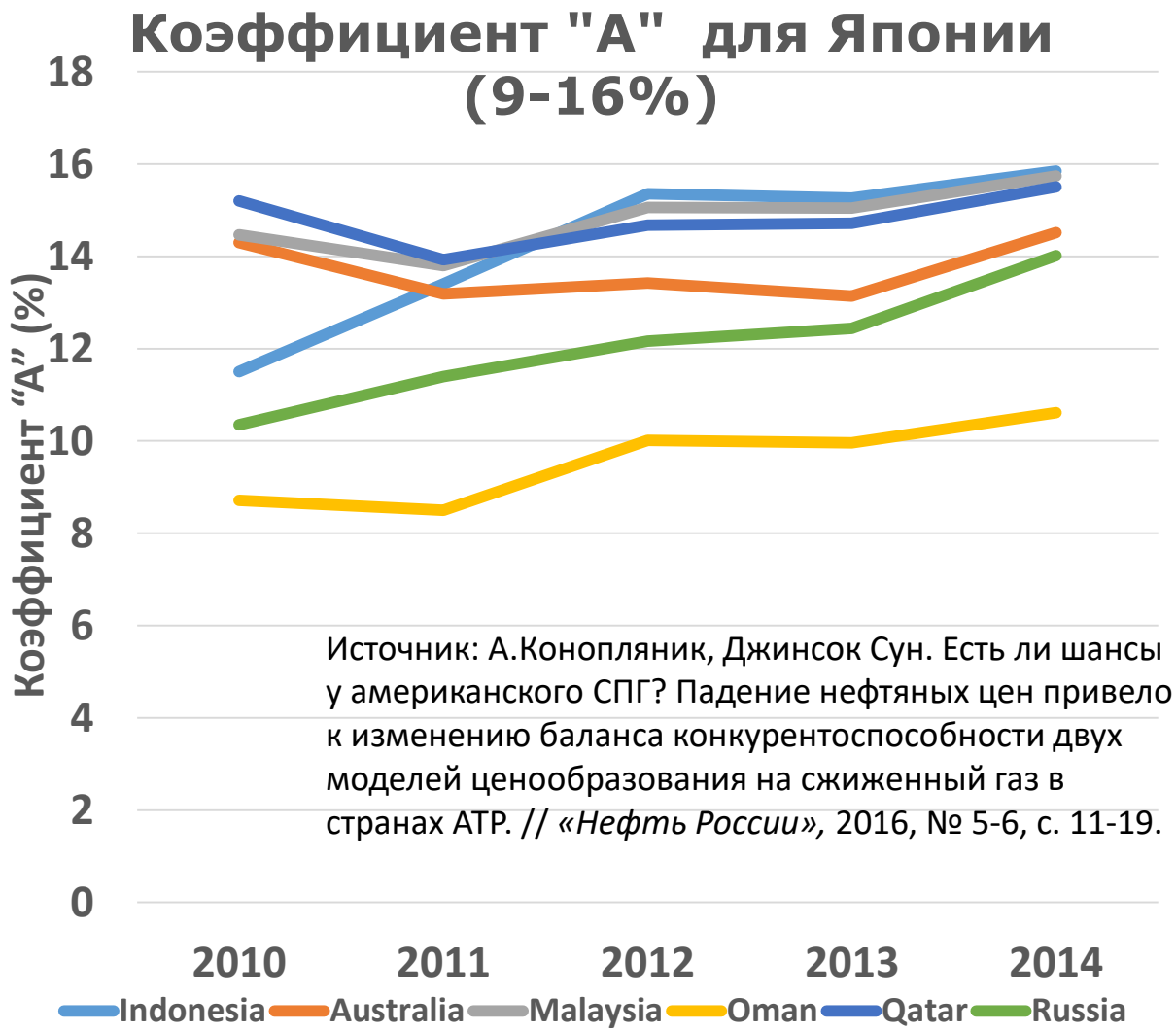
- Япония – **13%-15%**
- Корея – **11%-15%**

Источник: Авторы по данным Таможенной статистики Японии и Кореи

Источник: А.Конопляник, Джинсок Сун. Есть ли шансы у американского СПГ? Падение нефтяных цен привело к изменению баланса конкурентоспособности двух моделей ценообразования на сжиженный газ в странах АТР. // *«Нефть России»,* 2016, № 5-6, с. 11-19.

Коэффициент “А” для СПГ контрактов в Японии и Корее по поставщикам в 2010-2014 г. (цена СИФ)





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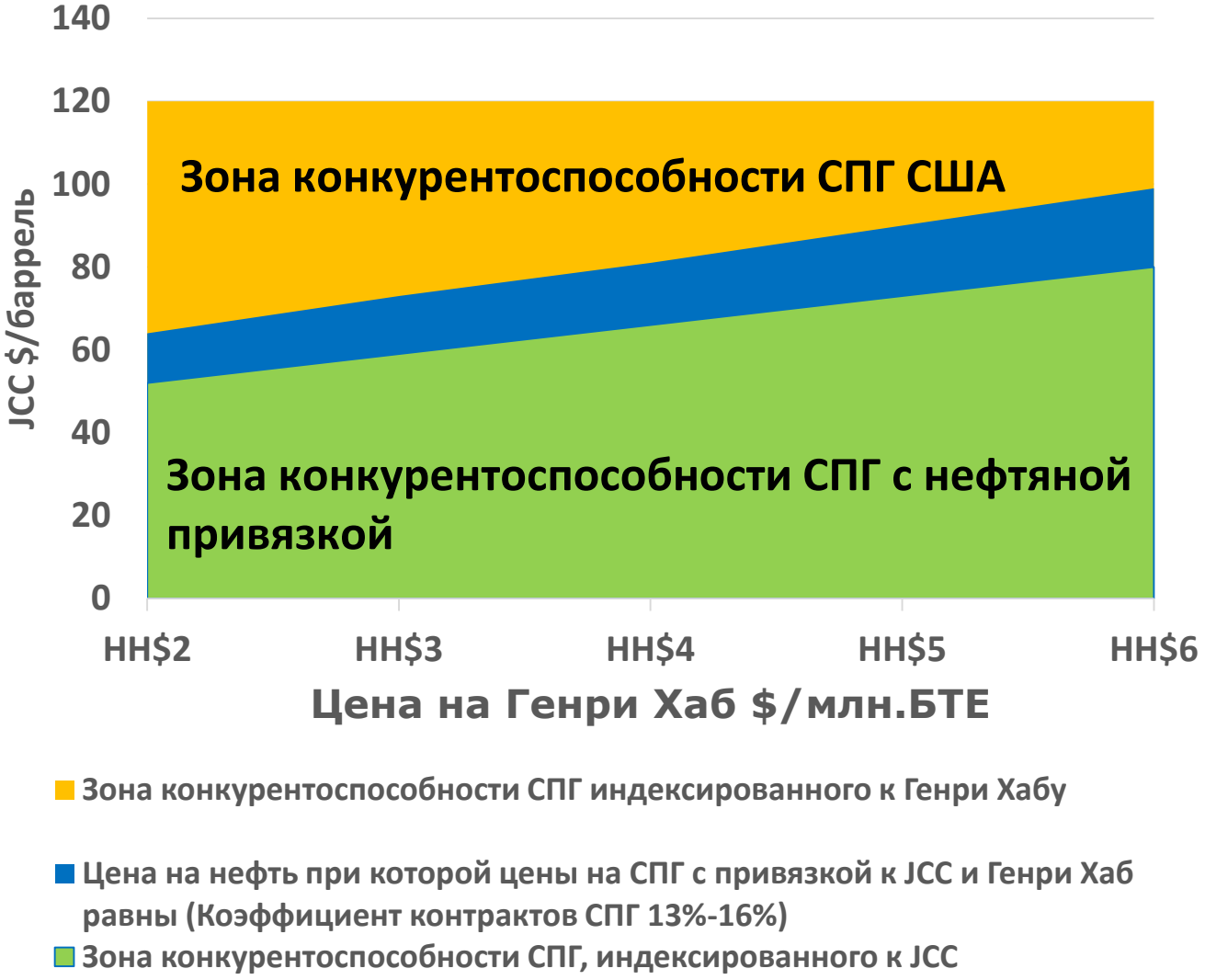
Источник: Авторы по данным таможенной статистики Японии и Кореи

Зоны конкурентоспособности СПГ в Азии с привязкой к JCC и к Генри Хабу



- При цене газа на Генри Хаб $2/млн.БТЕ (*минимальное значение: апрель 2012, начало 2016 г.*), СПГ с нефтяной привязкой конкурентоспособен в Азии при цене JCC < $50/баррель *(сегодня)*
- При цене газа на Генри Хаб $6/млн.БТЕ (*максимальное значение: начало 2014 г.*), СПГ с нефтяной привязкой был бы конкурентоспособен в Азии при цене JCC < $80/баррель *(середина 2010-конец 2014 гг.)*
- При цене JCC выше $100/баррель, СПГ США становится конкурентоспособен, если цена на Генри Хаб превышает $6/млн.БТЕ, но вернутся ли цены на нефть на уровень $100/баррель и выше?

Источник: А.Конопляник, Джинсок Сун. Есть ли шансы у американского СПГ? Падение нефтяных цен привело к изменению баланса конкурентоспособности двух моделей ценообразования на сжиженный газ в странах АТР. // *«Нефть России»,* 2016, № 5-6, с. 11-19.

Gas demand vs import gas demand in Europe & role of decarbonisation

- EU mature gas market => stagnation (decline?) of gas demand, but growth of import gas demand
  - Domestic gas production decline (UK/Norway North Sea, Groningen)
  - Withdrawal coal (environment) & nuclear power stations (radiation safety/load curve - baseload)
- Gas has been long victimized by climate-change-oriented consumers (first & most in EU) as being a fossil fuel (though the cleanest among them all)
  - Past: gas has been considered as “transition fuel” to decarbonized energy future (digital, electrical, renewable => carbon-free RES only) =>
  - Now: whether gas is still a “transition fuel” now or it becomes a “destination fuel” ?
- EU as major promoter of steadily increased environmental targets => now CEC vision (attitude to gas) is changing:
  - from “RES-only-based” to “RES plus decarbonised gas-based” EU energy future (as a stated concept) =>
    - whether this is only a EU phenomenon or a characteristic feature of the “Future Global Gas Market(s)”
- New potential for additional gas supplies: pipeline & LTC cross-border gas supplies are immanently more appropriate for decarbonisation (from economic standpoint) than spot and/or LNG supplies
  - New potential for additional Russian gas supplies to the EU (pipeline + LTC)
    - Topical question: at which particular part of the cross-border gas value chain would be mutually beneficial to decarbonize gas: upstream, midstream or downstream; how to balance costs and rewards
    - Topic for Russia-EU inter-government cooperation in gas since decarbonisation is a cross-border issue (topic in the agenda of WS2 GAC)

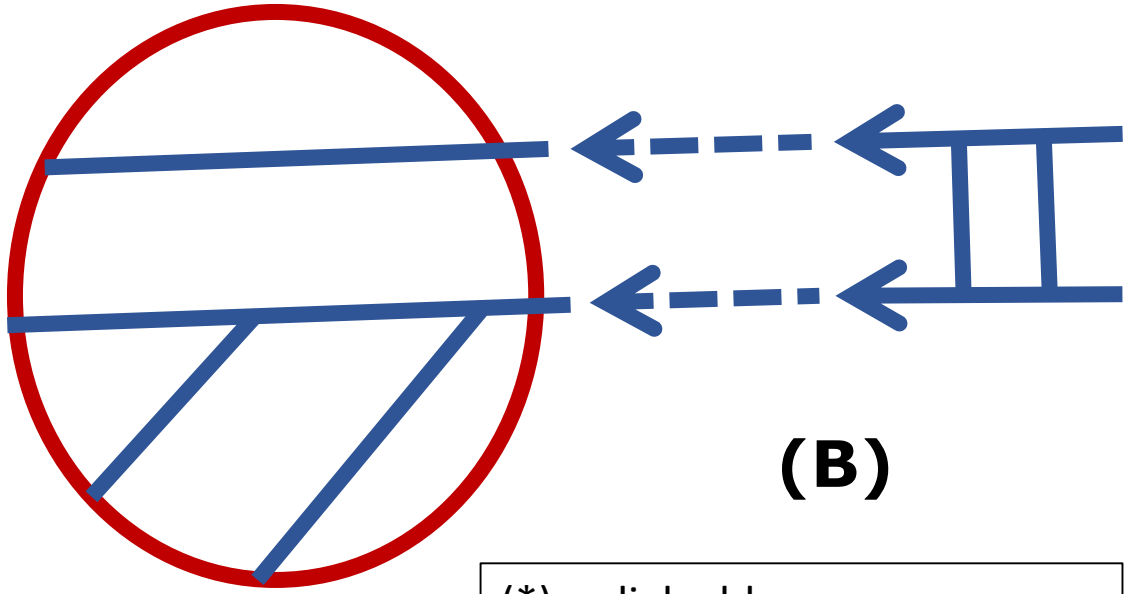
New Russian gas export strategy in European gas supplies (this author's vision)

- EU - target gas market for Russia => to cover incremental import demand:
  - in line with EU gas market regulatory rules (further contractual adaptation) +
  - to obtain adequate (best effective) supply infrastructure => from linear/radial (pre-2019) to circle-radial (post-2019) Russian gas supplies to the EU
- Changing role of transit routes: from key export corridors - to supporting (back-up) corridors; by-passes are the new key routes
  - By-passing UA pipelines:
    - Not "Putin's pincers" (acc. to some international media), but diversity of supplies to the mutual benefit (transit risk mitigation) of producer/seller & consumer/buyer (Russia & EU)
    - Economic justification of by-passes (comparative economic task)
  - Access to transit capacities post-2019:
    - under Third EU Energy Package (2017 CAM NC INC) rules (UA a party to Energy Community Treaty): demand for capacity (open season); Entry-Exit tariffs => ring-fenced route/capacity & separate EU-certified TSO => EU TSO; financing capacity modernization with IFIs (escrow accounts as political risk mitigation tool); 1st step: 30 BCM (2 UPU lines into one)

(A) Moscow metro network – an illustrative example of the circle-radial system;

(B) pre-2019 (radial*) and post-2019 (circle-radial**) simplified vision of the Russian gas supplies to the EU

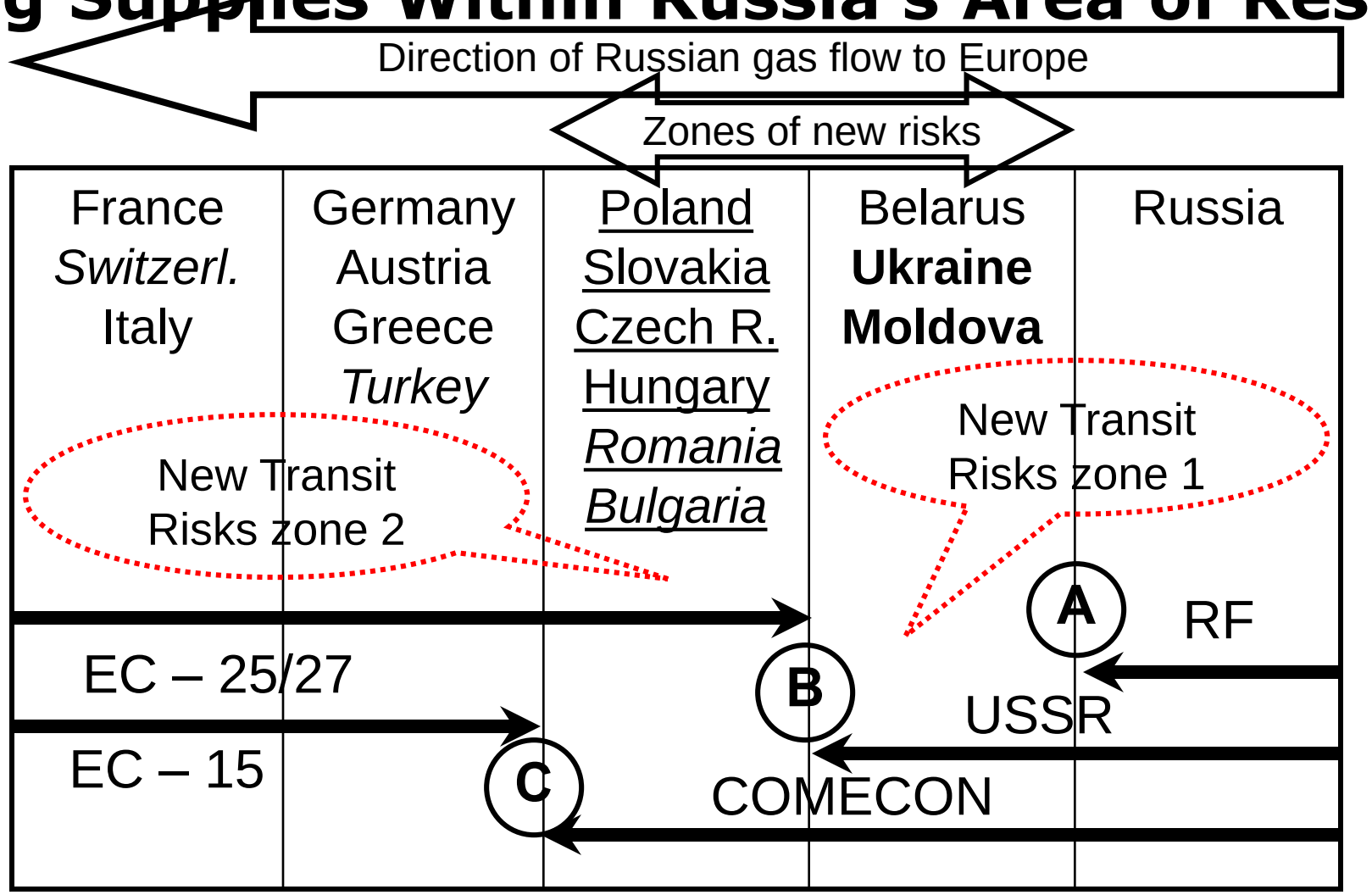
(A)



(B)

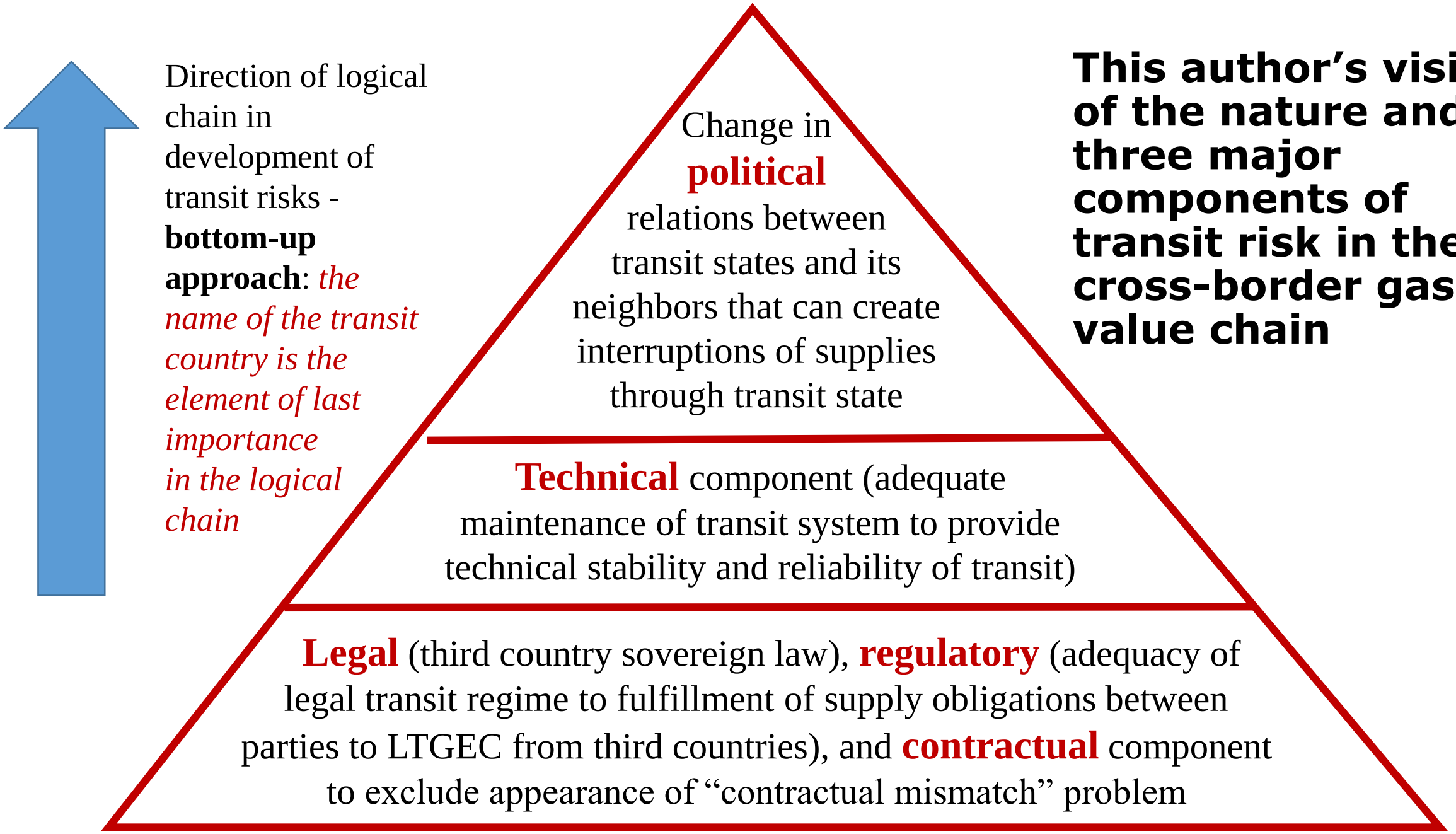
(*) radial = blue
(**) circle-radial = blue + red

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

Direction of logical chain in development of transit risks - **bottom-up approach**: *the name of the transit country is the element of last importance in the logical chain*



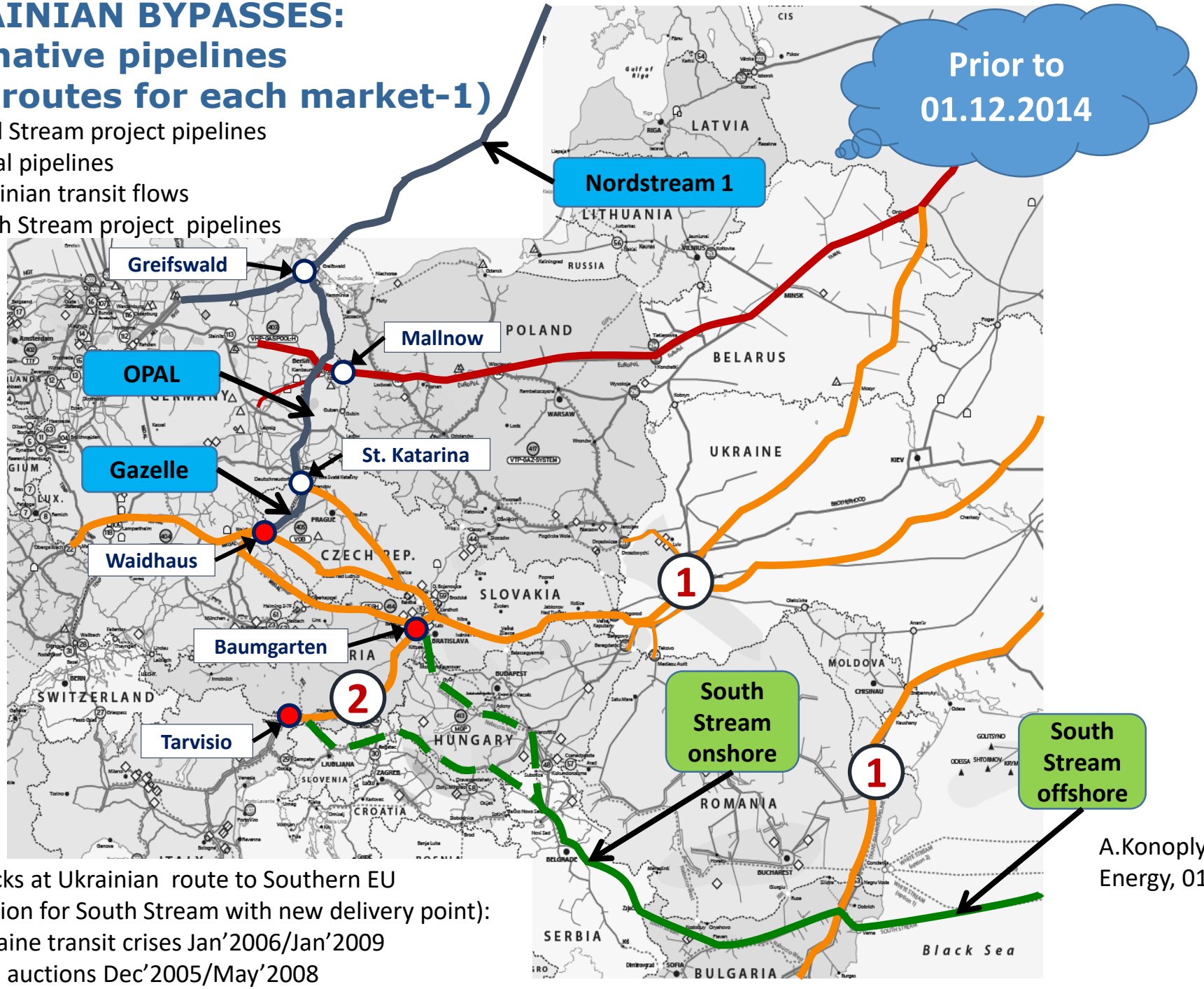
This author's vision of the nature and three major components of transit risk in the cross-border gas value chain

Russia-EU common interest & mechanisms for minimizing transit risks

- Prior to dissolution of COMECON/USSR:
  - Delivery points at COMECON-EU border, de facto no transit via COMECON, producer/exporter had full operational control on gas value chain from wellhead to delivery point
- After dissolution of COMECON/USSR:
  - New sovereign independent states between producer/exporter (Russia) and EU => producer has lost control on transit part of gas value chain => transit risks
  - To minimize transit risks for importer & exporter = to diversify:
    - For importer: multiple sources of supply, **routes** (+ suppliers)
    - For exporter: multiple markets, **routes** (+ importers)
  - => diversification of routes = common interest for producer/exporter & importer => to exclude transit totally or alternative pipelines (by-passes)

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

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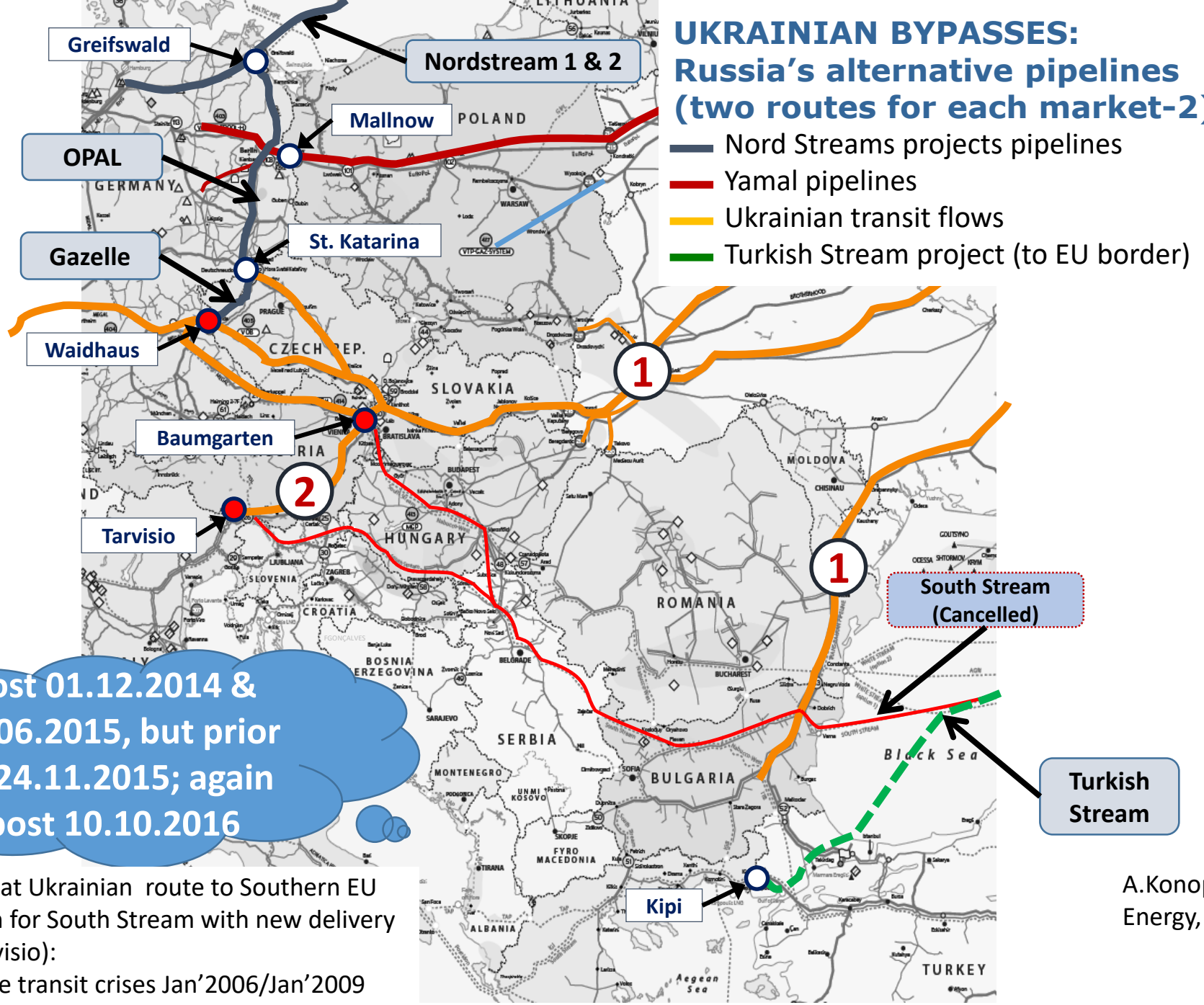
UKRAINIAN BYPASSES: Russia's alternative pipelines (two routes for each market-2)

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



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

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

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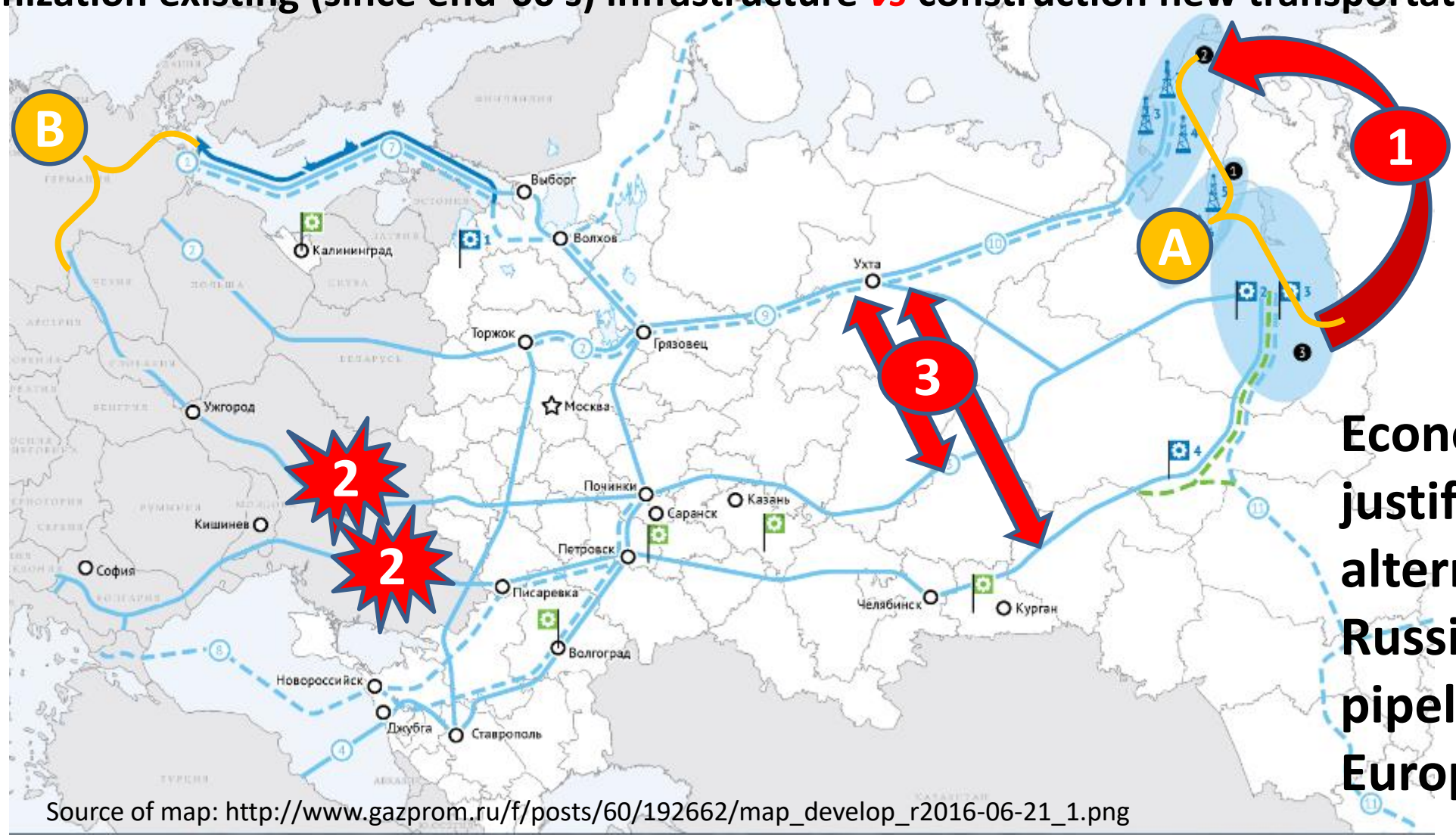
01.10.2018

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* construction new transportation route



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

Economic justification of alternative Russian gas pipelines to Europe

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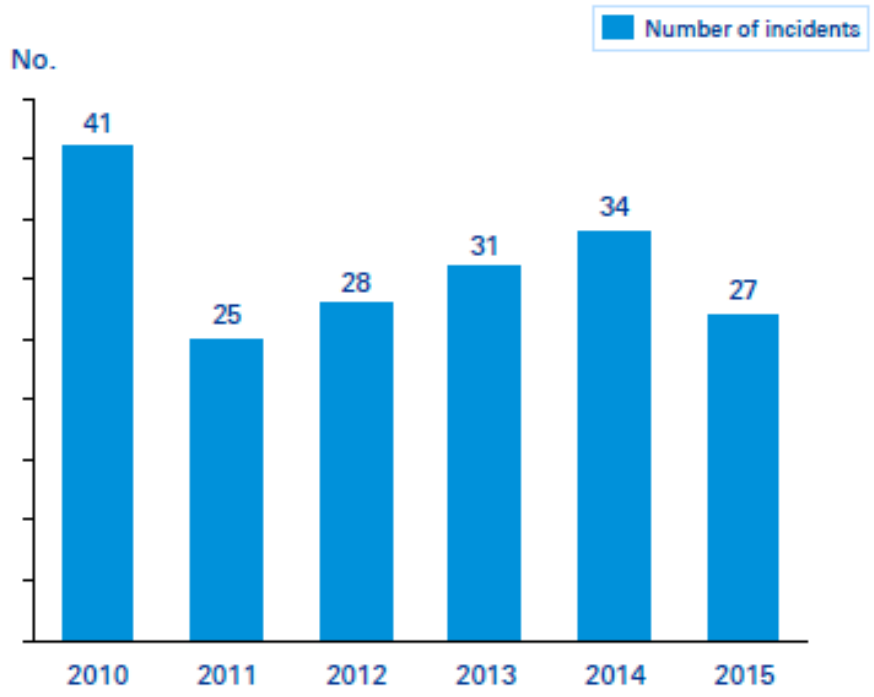
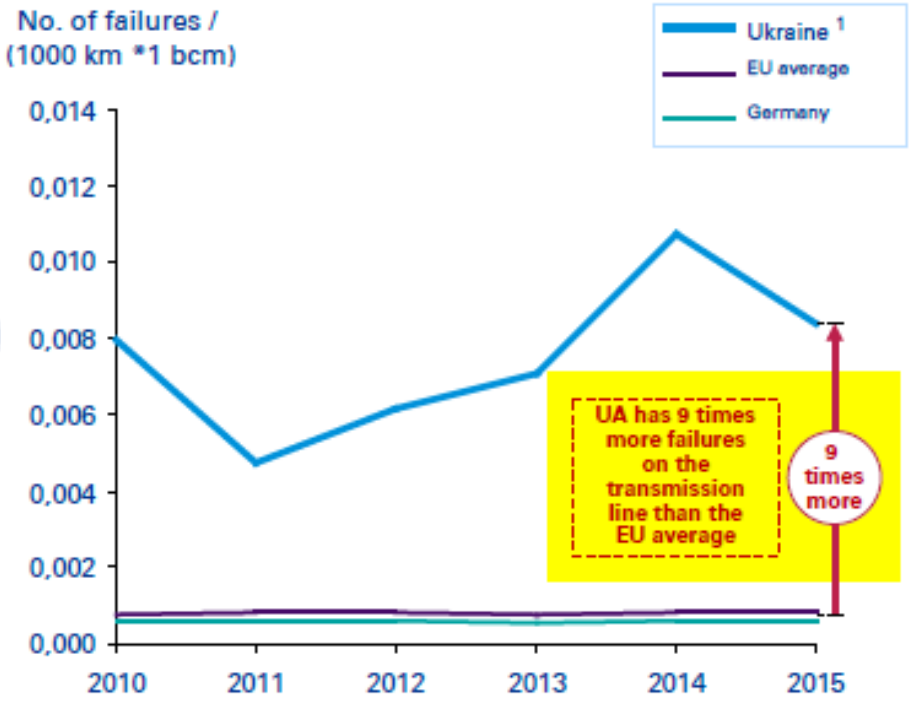
Technical conditions of Ukrainian GTS (acc. to KPMG)

There was a slight improvement in 2011. but since then the number of incidents has been increasing



Compared to the international benchmark, Ukraine has the most failures per 1000 km times natural gas throughput



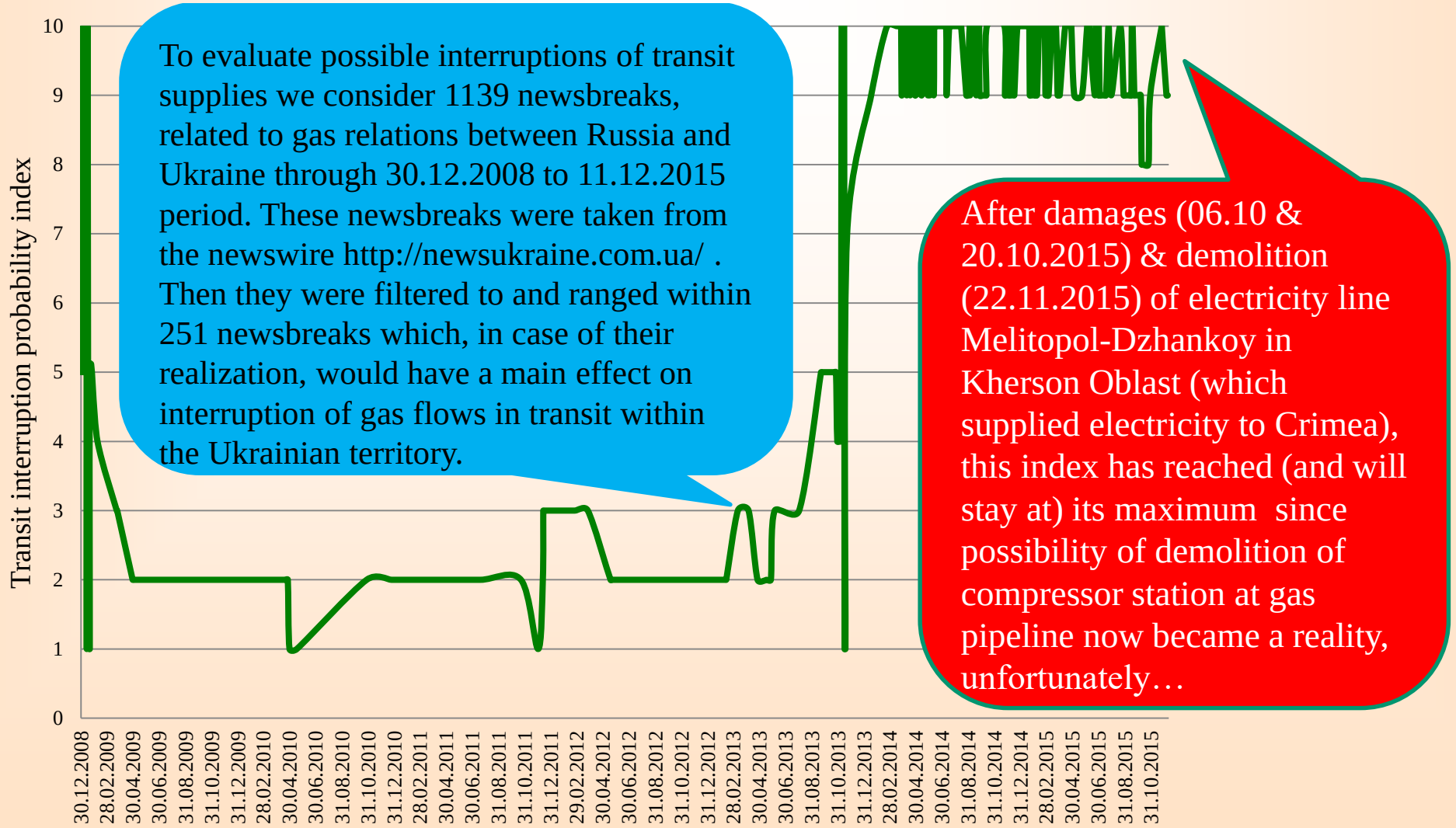
KPMG calculation methodology for failure index (No. of failures/(1000 km *1 bcm)):

(1) Ukraine: Calculated on the basis of number of failures (published by Ukrtransgaz, 2015) and 38.5 th km long transmission system and sum of transit and net imports from Russia were taken into account.
(2) EU average: Number of incidents per 1000 km from EGIG 2015 report and quantity of imports from Eurostat Statistical Dashboard.
(3) Germany: Number of incidents per 1000 km from DVGW 2011-2015 statement and quantity of imports from Eurostat Statistical Dashboard.

Source: Ukrtransgaz Publication on Incidents on the transmission system („У 2015 році кількість відмов на магістральних газогонах України зменшилась на 21%" Published on 2016.06.15), 8th Report of the European Gas Pipeline Incident Data Group on period 1970 – 2013 (2015); Sicherheit von Gasfernleitungen – das Technische Regelwerk im Licht der aktuellen Rechtsprechung (2011; 2013; 2015)

Source: Situation of the Ukrainian natural gas market and transit system. Market Study. // KPMG, 10.04.2017, p.37-38

Ukraine: “transit interruption probability” index (2009–2015)

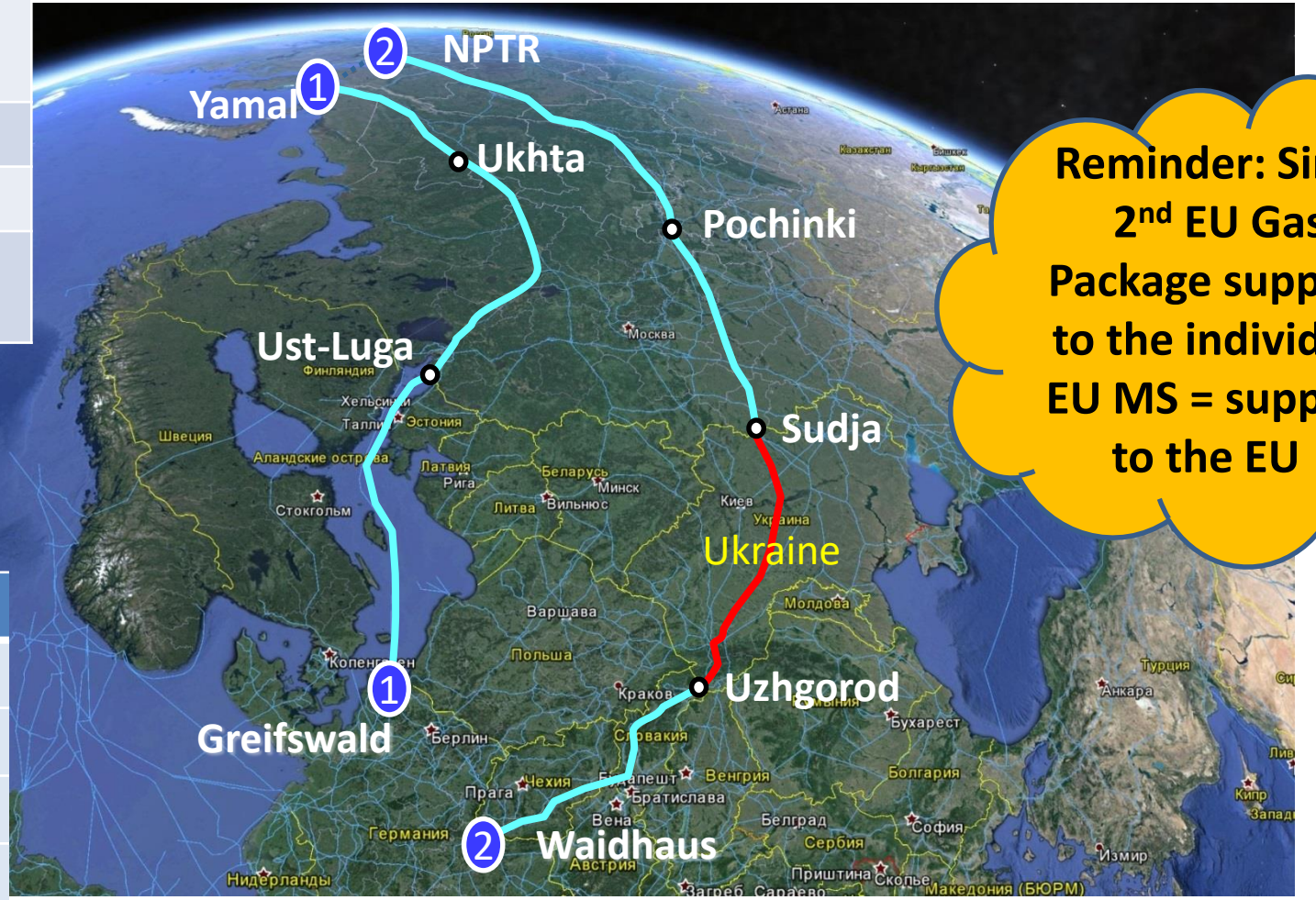


Calculated by M.Larionova, Russian Gubkin State Oil & Gas University, Chair “International Oil & Gas Business”, Master’s programme 2013-2015, on methodology, jointly developed with A.Konoplyanik, based on principles of credit ratings evaluation by major international credit agencies

Comparison of length & some other parameters for different gas routes from Yamal to Germany/EU

	Yamal-Greifswald	NPTR-UA-Waidhaus
Pressure, bars	120/90	75/55
Distance between CS, km	240	120
Inner coating	Yes	No
Efficiency GCU	Twice high	18-25%
Gas-compressor units capacity, MWt	32, 25	12, 16 (new/UA)

Compiled from public sources, incl.: С.Правосудов. Почему Газпром не доверяет украинской трубопроводной системе. // «НГ-Энергия», 16.01.2018



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

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	Yamal – Germany routes	km
1	**Yamal – Greifswald:**	**4166**
	Yamal – Ust-Luga (within RF)	2977
	Ust-Luga – Greifswald	1189
2	**Yamal – NPTR – UA - Waidhaus:**	**6051**
	Yamal – Sudja (within RF)	3987
	Sudja – Waidhaus	2064

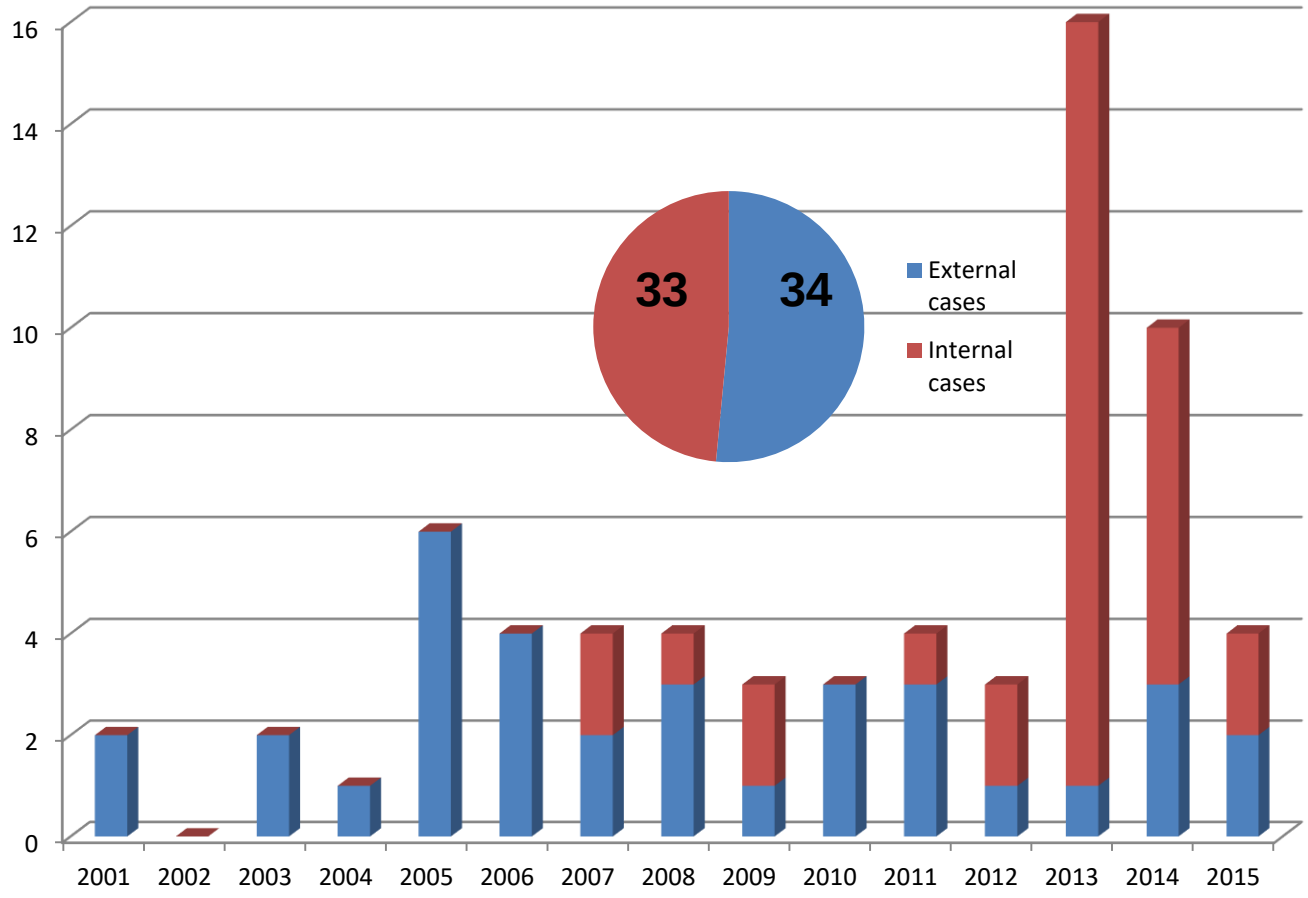
Source: PJSC "Gazprom"

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 large-scale gas transit to EU via UA post-2019 => Russia's transit fees to UA vs financial support of UA from EU/US public finance
- Special Third Gas Directive amendments against NS2 (retroactive to investment already made): to slow down (if not to prevent) NS2 construction/start-up + to "export" EU acquis into Russia (MTPA => competition between Russian companies)
  - Export EU acquis upstream cross-border gas value chains = regular long-standing EU task in favour of EU business = mainstream of EU external economic policy
    - Most recent: new concept "upstream-downstream partnership" in Quo Vadis final report (16.02.2018) = proposal for implementation of 3rd EU Energy Package within Russia
  - 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 resource rent) => to escape Russian gas vs Russian gas 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: creation of [open] conflict between two Russian major state energy companies as a blow on prestige of "Putin's regime"?
- *Possible legal solution*: Russia has withdrawn from ECT provisional application (2009) and has withdrawn its signature under ECT (2018), but ECT can help Russia/Gazprom/NS-2 sponsors (investors from EU MSs) to sustain anti-NS2 legal initiatives of the Commission:
  - ECT Art.13 => Art.26: Investors of EU MSs against the EU (30+ precedents in EU => reverse to "Yukos Case")

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/

Global macroeconomic competition & changing role of key players

- Three historic world economic centers (US/NA, WE/EU, Asia-Pacific/SEA)
- But: Growing role of emerging economies (BRICS et al) as additional world economic centers => tightening global economic competition both between “old” and “new”, & within “old” economic centers => threat for US dominance
  - Two ways (policies) to protect one’s competitive niche (to become more competitive yourself, to make another one less competitive)
  - USA (under “America First” & “US Global Energy Dominance” doctrines) is to improve its global competitive niche for the account of the “partners” => of the EU (!)
- EU as a “weakest player” among “old” economic centers:
  - Non-homogenous EU post-2014: expectations (pre-2014) & realities (post-2014) for new EU MSs - a deathblow to hopes on equality & same economic prosperity
  - Two EUs – “old” and “new” EU MSs: “old” EU MSs are EU-oriented, “new” EU MSs are US-oriented;
    - demand for “external threat” for “new” EU MSs in respond to their non-equal (secondary) role in the EU & thus for closer ties with US over the head of Brussels
  - On top of this: refugees, BREXIT, US & EU anti-Russia (means: anti-EU) sanctions, etc., which weakens EU global competitiveness
- Increasing energy costs for EU (proposed US LNG instead of Russian pipeline gas) will further decrease EU global competitiveness & welfare (*Nothing personal. America First. Only business*.) => Russian gas to improve EU global competitive positions

Thank you for your attention!

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