

**Whether low oil prices put an  
end to oil indexation in gas?  
What are alternative ways &  
means to obtain Maximum  
Marketable Resource Rent in  
term gas contracts?  
(invitation to discussion)**

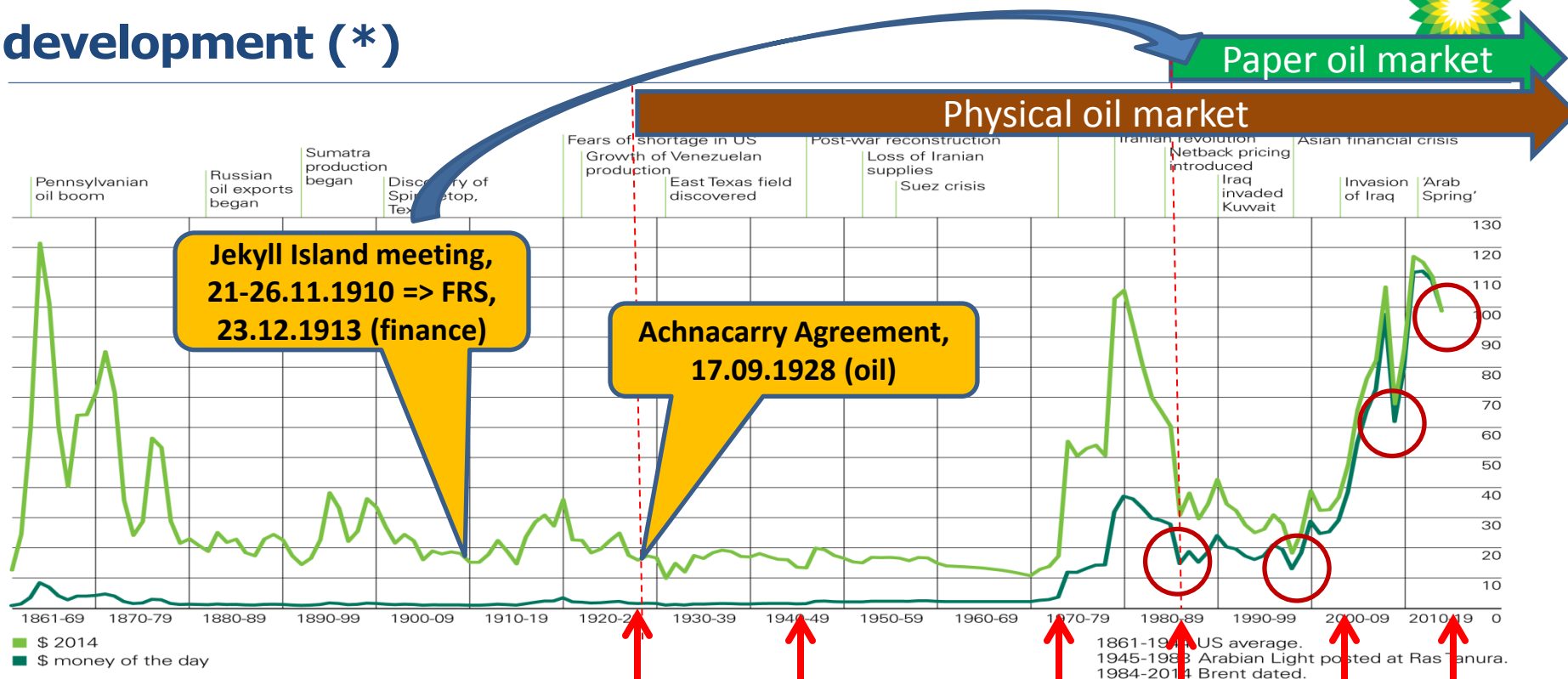
**Dr. Prof. Andrey A.Konoplyanik,  
Adviser to Director General, Gazprom export LLC,  
Professor of International Oil & Gas Business,  
Russian State Gubkin Oil & Gas University**

**Presentation at the Conference “ENERGETIKA-XXI: Economy, Policy, Ecology”,  
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# Oil

# Crude oil prices 1861-2014 (US dollars per barrel, world events)

## Key periods of organized international petroleum market development (\*)



- (1) 1928 – 1947
- (2) 1947 – 1969/1973
- (3) 1973 – 1986
- (4) 1986 – early 2000-ies
- (5) Early 2000-ies – 2014 (?)
- (6) 2014 (?) & further on (?)



(\*) (acc. to A.Konoplyanik)

Source of original chart: BP

## Such different petroleum crises...

Major past oil price falls	Stage of organized oil market development (*)	Which segments oil market consists of (physical oi, paper oil)	Origins of oil price falls (which oil market segment the fall came from)
1985	Third	Only physical oil market	From <b>physical</b> oil market
1998	Fourth	Both physical & paper oil segments	From <b>paper</b> oil market
2008	<b>Fifth</b>	Both physical & paper oil segments	From <b>paper</b> oil market ( <b>financial</b> by nature)
2014	End- <b>fifth</b> (?) or beginning of sixth (?)	Both physical & paper oil segments	From <b>physical</b> oil market

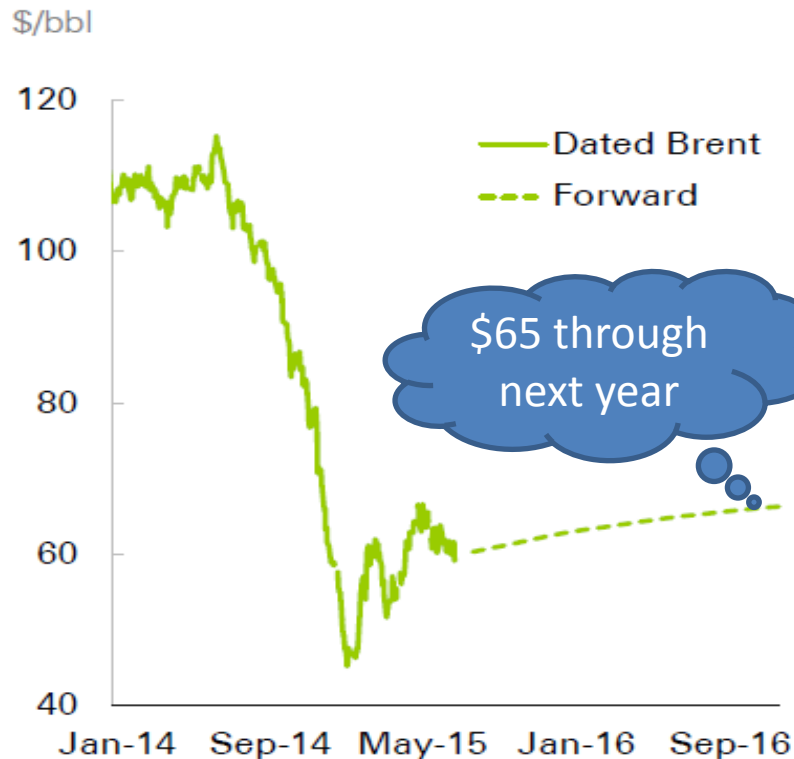
(\*) acc.to A.Konoplyanik classification. See, f.i.: A.Конопляник. Эволюция контрактной структуры на мировом рынке нефти (с.80-190) – глава 2 в кн.: Бушуев В.В., Конопляник А.А., Миркин Я.М. и др. Цены на нефть: анализ, тенденции, прогноз. – М., ИД «Энергия», 2013, 344 стр.

# No price kick-back foreseen... as it happened in 2009

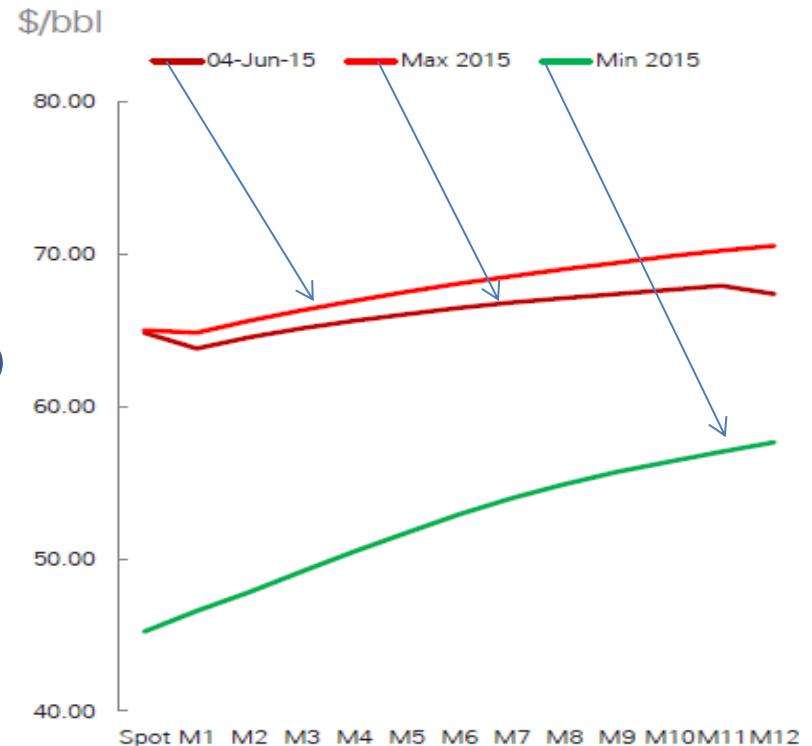


## Market to remain oversupplied for longer in spite of demand growth

### Oil price



### Brent forward curve

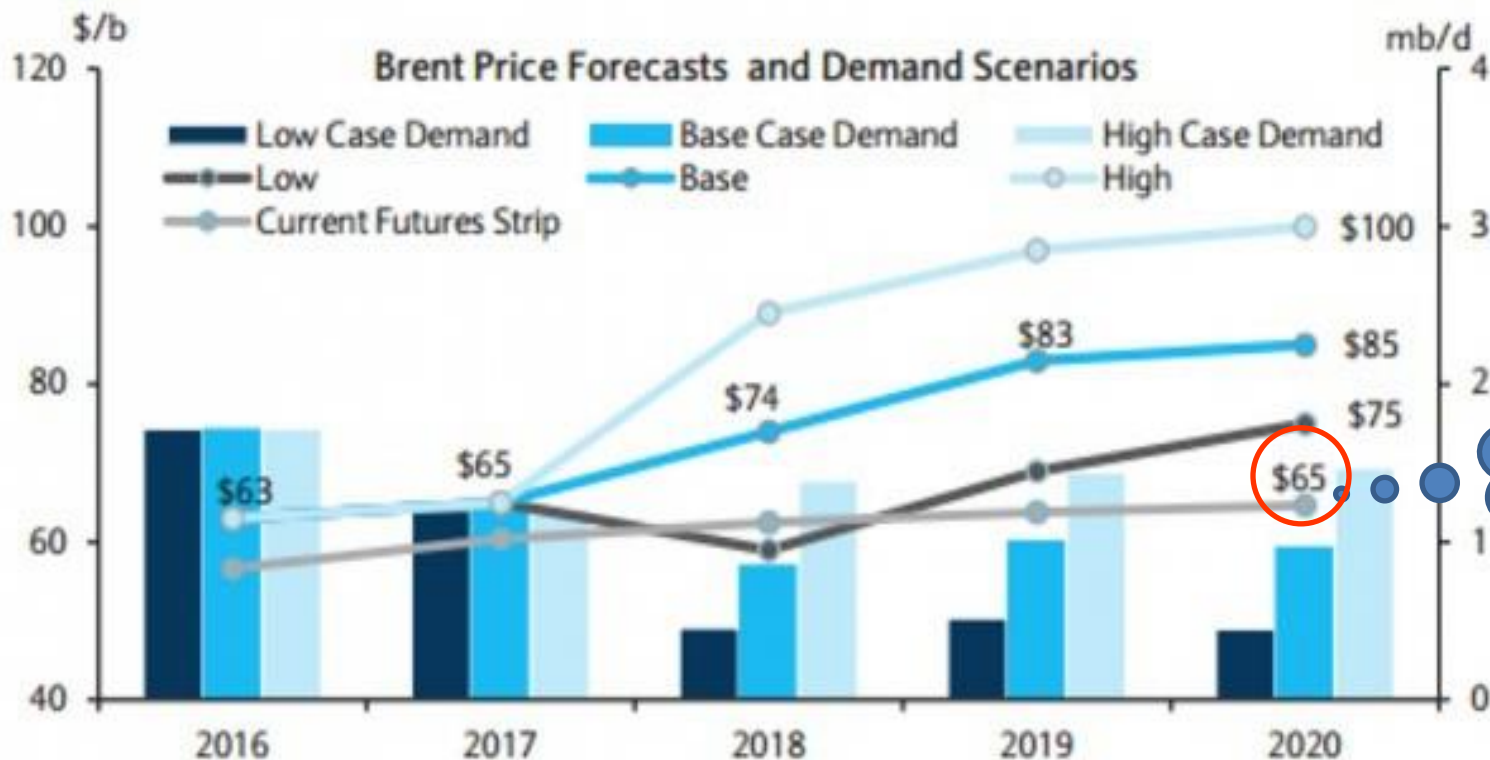


Source (original chart): V.Drebentsov. Oil Market Update, October 2015. IMEMO Workshop. – Выступление на семинаре «Низкие мировые цены на нефть и их последствия для экономики и нефтегазового сектора России» в рамках Форума ИМЭМО-ВР «Нефтегазовый диалог», ИМЭМО РАН, Москва, 21.10.2015

# Barclays analysts on raw materials markets in their "Upward bound" report: price increase is inevitable, but market still thinks differently...

FIGURE 1

We expect prices to average \$85 by 2020 in our base case demand scenario



\$65 through 4 years

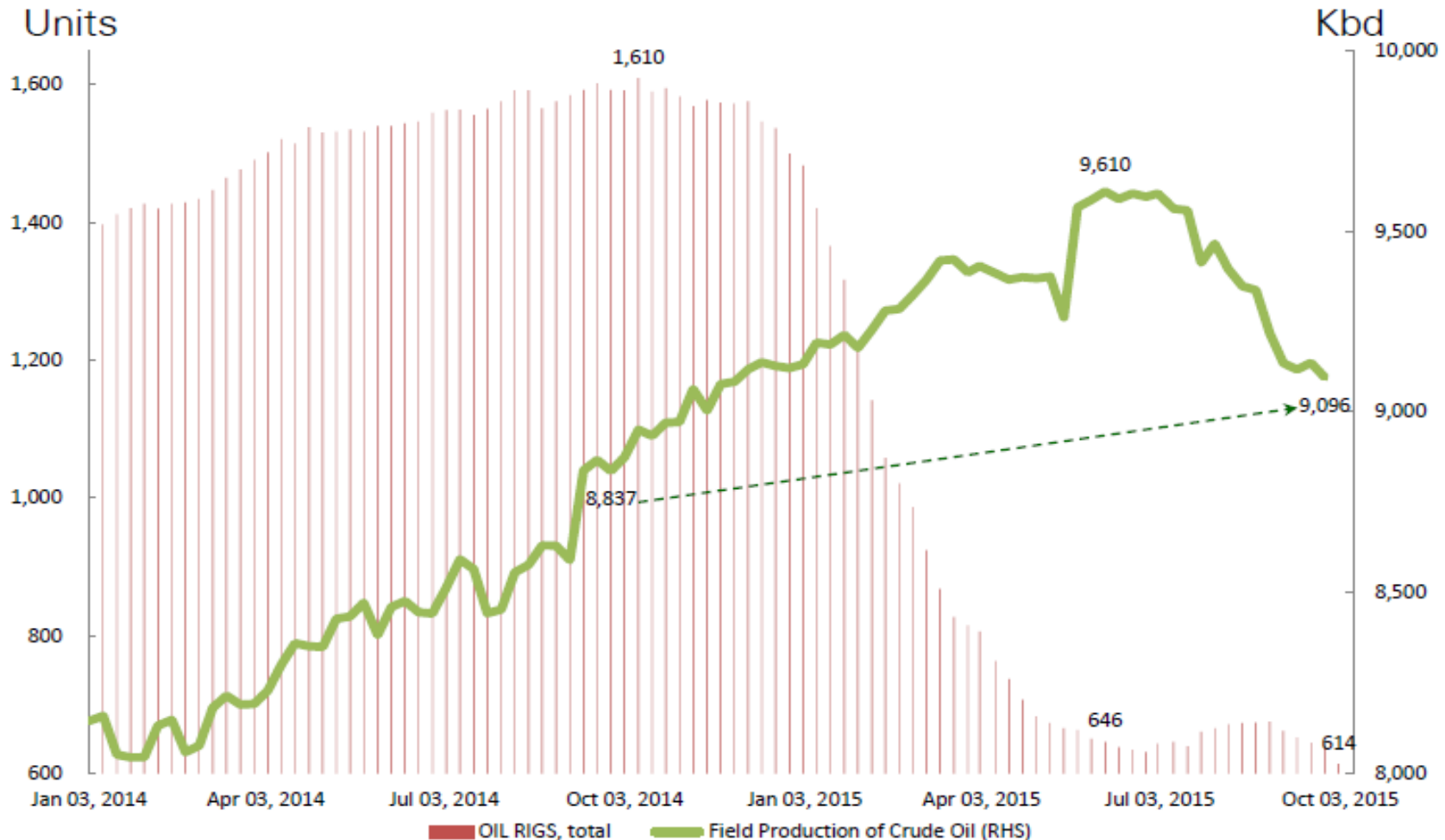
Graphics: Barclays Research

Source: <http://nangs.org/news/industry/barclays-rost-neftyanykh-tsen-neizbezhen-2846>

# The reason of current oil glut = end of primary commodities super-cycle + new type of investment cycle in new marginal/swing oil?

- 1) End of primary commodities super-cycle: e.g. referred to by:
  - *E.Nabiulina* (continuation of low oil price, Central Bank pessimistic oil price forecast much below 40USD),
  - *M.Zadornov* (all commodities, not only oil, will not grow next 4-5Y)
- 2) US shale revolution = new type of investment cycle in shale oil (new marginal/new second swing producer) compared to traditional oil (ME/SA):
  - shorter duration => quicker introduction of innovations => more radical decline of “learning curve”/cost decrease supports competitiveness under falling oil prices
  - New indicators to consider (f.i. “number of rigs” now less illustrative for production forecast)

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



Source: EIA, PIRA

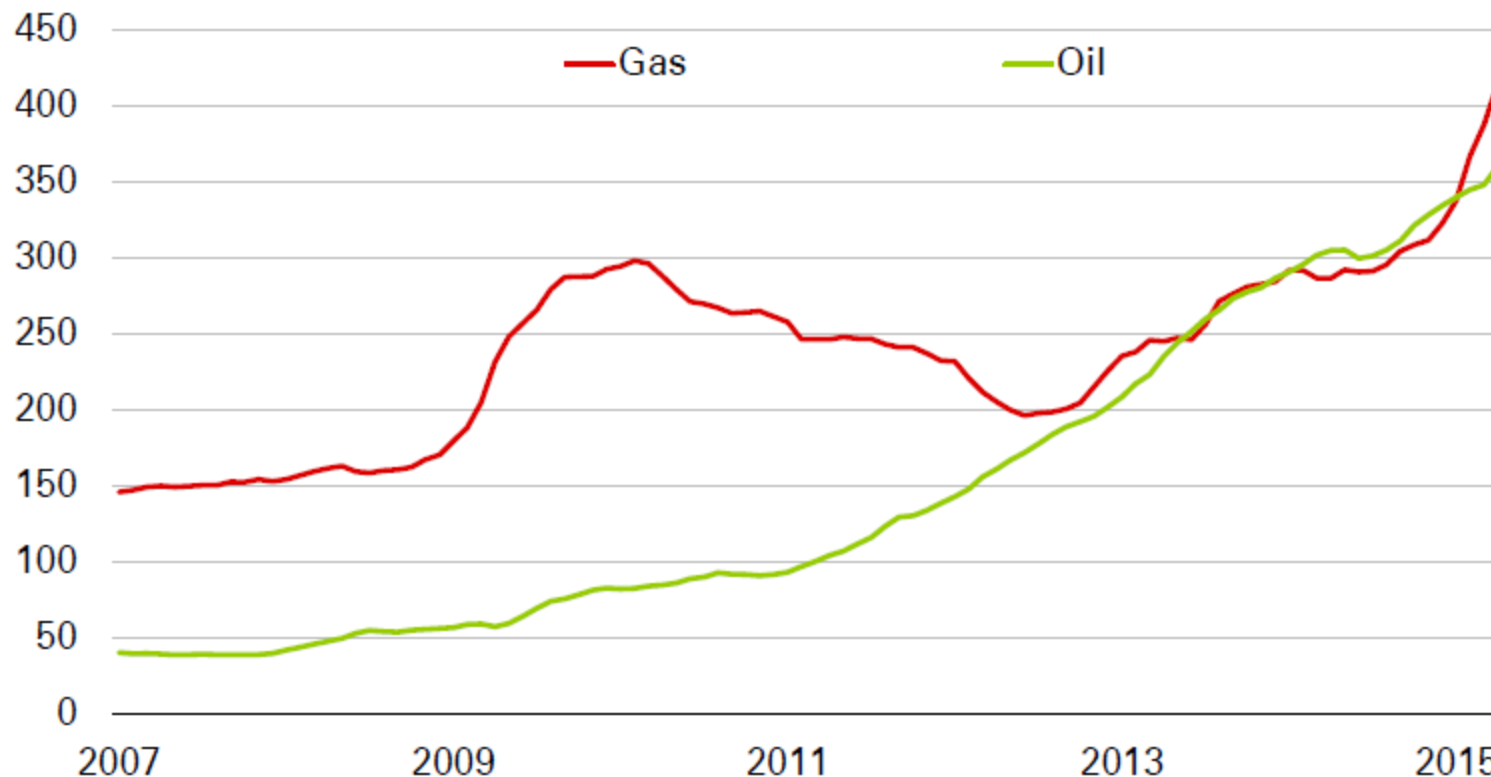
Source: V.Drebentsov. Oil Market Update, October 2015. IMEMO Workshop. – Выступление на семинаре «Низкие мировые цены на нефть и их последствия для экономики и нефтегазового сектора России» в рамках Форума ИМЭМО-ВР «Нефтегазовый диалог», ИМЭМО РАН, Москва, 21.10.2015





# US new-well production per rig

Boe/d per rig



Source: US EIA

BP Statistical Review of World Energy

8

Source: V.Drebentsov. Oil Market Update, October 2015. IMEMO Workshop. – Выступление на семинаре «Низкие мировые цены на нефть и их последствия для экономики и нефтегазового сектора России» в рамках Форума ИМЭМО-ВР «Нефтегазовый диалог», ИМЭМО РАН, Москва, 21.10.2015

# 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 <sup>st</sup> 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

Based , inter alia, on: Spencer 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

## Energy companies have been borrowing to fuel growth ...

US high-yield capital expenditure as a % of ebitda

Energy capital expenditure as a % of ebitda



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

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



Source: Deutsche Bank

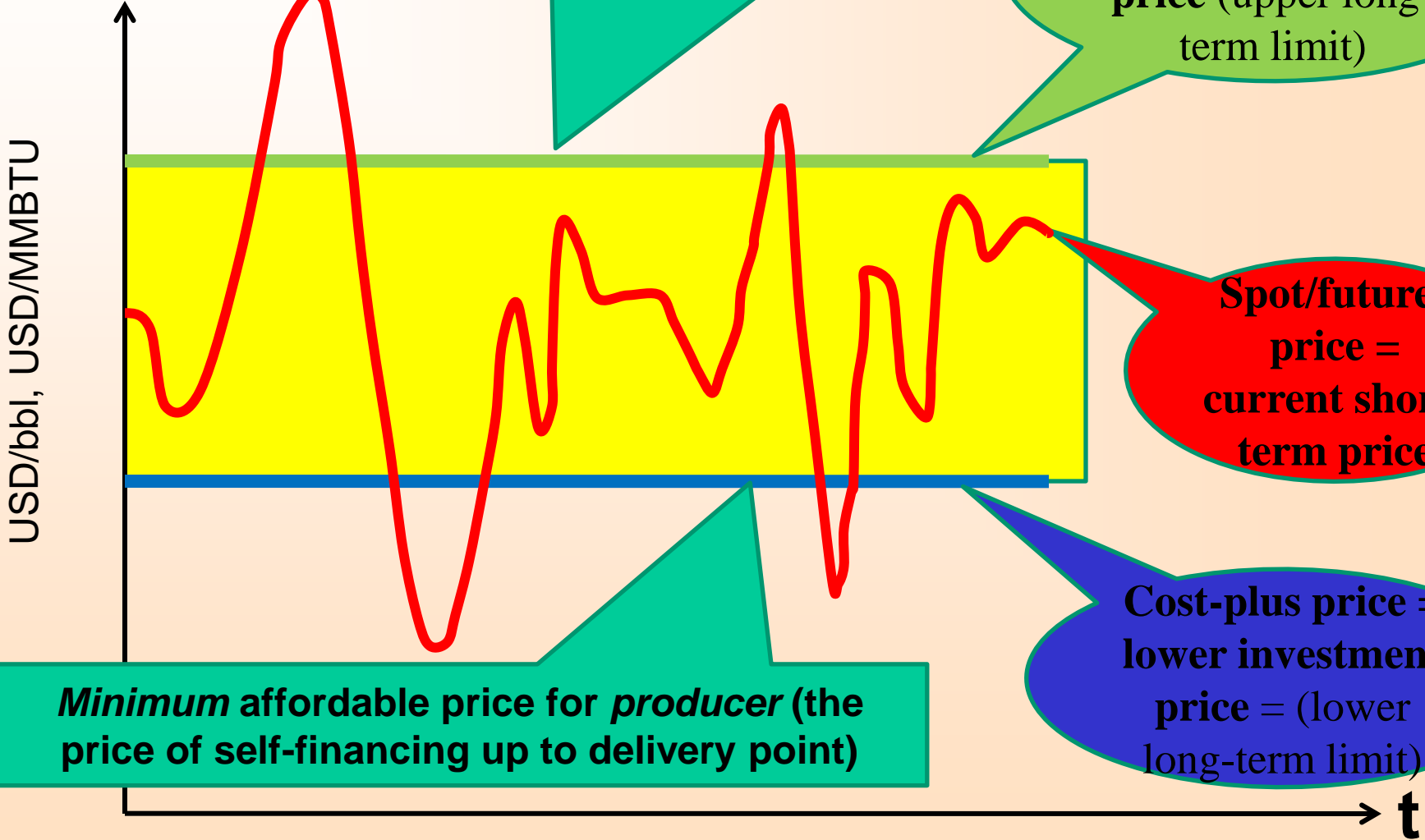
Source: Trace Alloway. Crude slide sparks oil-related debt fears. – “Financial Times”, 22/23.11.2014, p.15

# Gas

# Corridor of cut-off prices for producer & consumer

*Maximum* affordable price for *consumer* (lowest among available alternative options in end-use)

NBRV price = upper investment price (upper long-term limit)



# Maximum Marketable Resource Rent (MMRR) & oil indexation: evolution of instruments

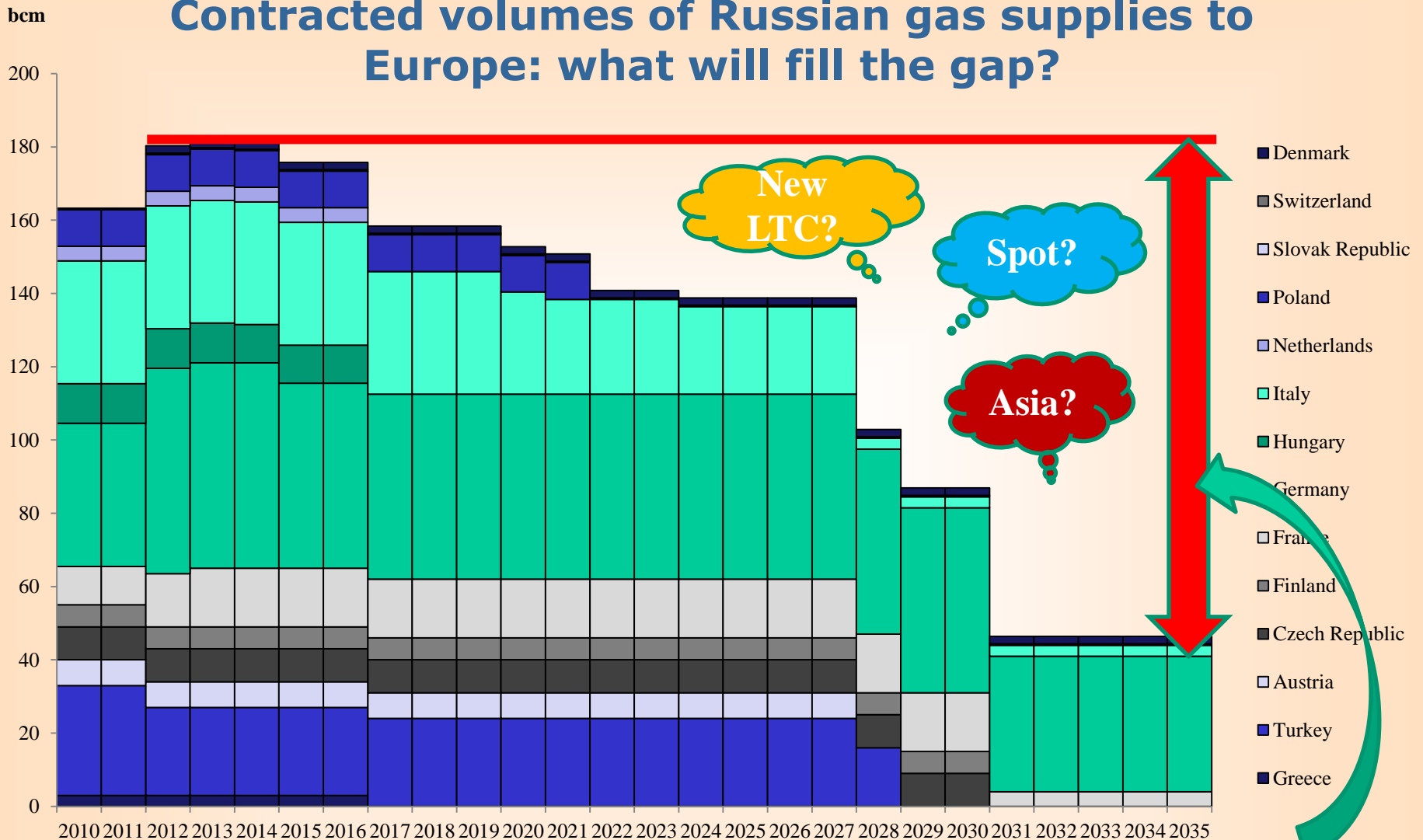
- Sovereign State & non-renewable energy resource:
  - International law (UNGA Res.1803/Dec'1962; Art.18 ECT/1994-1998; etc)
  - “*Principal vs Agent*” theory => Russian Federation (*Principal*) vs. Gazprom (its export *Agent*) => Gazprom to obtain MMRR for its *Principal*
  - Groningen-type LTGEC (1962+) = economic & legal background for MMRR in gas => historical tool for Gazprom to obtain MMRR
- Implementation then (situation differs from now):
  - Historical precedent of NBRV in W.Europe in 1950/60-ies in oil (RFO substituted coal in competitive areas)
  - Gas enters energy market in 1960-ies => No gas-to-gas competition => gas competed only with other energies => oil (petroleum products/PP)
  - NBRV for new investment decisions => oil/PP-indexation as a mean to compete & obtain MMRR (PP dominated energy balance) => clear straightforward contractual structure for long-term in growing market
- Since then situation in EU gas changed radically:
  - Not growing but mature & oversupplied market
  - Ecologically, economically & politically motivated diversification
  - New institutional structure of emerging internal EU gas market
  - Increased multi-facet competition, demand for flexibility to be competitive
- Whether former oil-indexed LTCs suit best for obtaining MMRR to RF by Gazprom in these conditions?

## Key factors of MMRR formation for Russia (as for sovereign state - owner of non-renewable natural resource - gas) by its export agent (Gazprom state company - sole pipeline gas exporter by law) in gas deliveries to Europe by oil-indexed LTGEC

Periods (EU gas market character)	Factors providing for MMRR for exporting state		Key factor providing for MMRR
	Physical substitutability of PP & gas in main areas of consumption	Oil price level	
<b>Early 1960-ies to early 1970-ies (seller's market)</b>	Gas enters EU market & competes with PP which dominates in fuel balance	Low	Physical substitutability of energies in end-use
<b>1970-ies – mid-1980-ies (seller's market)</b>	Gas continues to compete with PP at EU market & drives them out from fuel balance	Violent growth, high, then short-term deep fall (1985)	High oil price, LTGEC structure (duration, TOP)
<b>2H/1980-ies – early 2000-ies (seller's market)</b>	PP are mostly driven out of fuel balance but are left as reserve fuel	Medium low, unstable, then short-term fall (1998)	LTGEC structure (duration, TOP)
<b>2000-ies till 2009 (seller's market)</b>	PP are mostly driven out of fuel balance but are left as reserve fuel	Violent growth, then short-term fall (2008)	High oil price, LTGEC structure (duration, TOP) but counteraction of the buyers
<b>2009-2014 (buyer's market)</b>	PP are mostly driven out of fuel balance but are left as reserve fuel	High, then fall (2014)	LTGEC structure (duration, TOP) but increased counteraction of the buyers (*)
<b>2014 &amp; further on (how long?) (buyer's (?) market)</b>	PP are mostly driven out of fuel balance but are left as reserve fuel; gas enters transport sector where it directly competes with PP	Preservation of relatively medium-low price in mid-term perspective (?)	Denial from domination of PP-indexation (?) in favour of more flexible mechanisms of MMRR collection to protect gas competitiveness

(\*) incl. arbitration; gradual softening of PP-indexation by, inter alia, addition of spot component into gas price formula, retroactive pay-backs to buyers to support gas competitiveness

# Contracted volumes of Russian gas supplies to Europe: what will fill the gap?



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

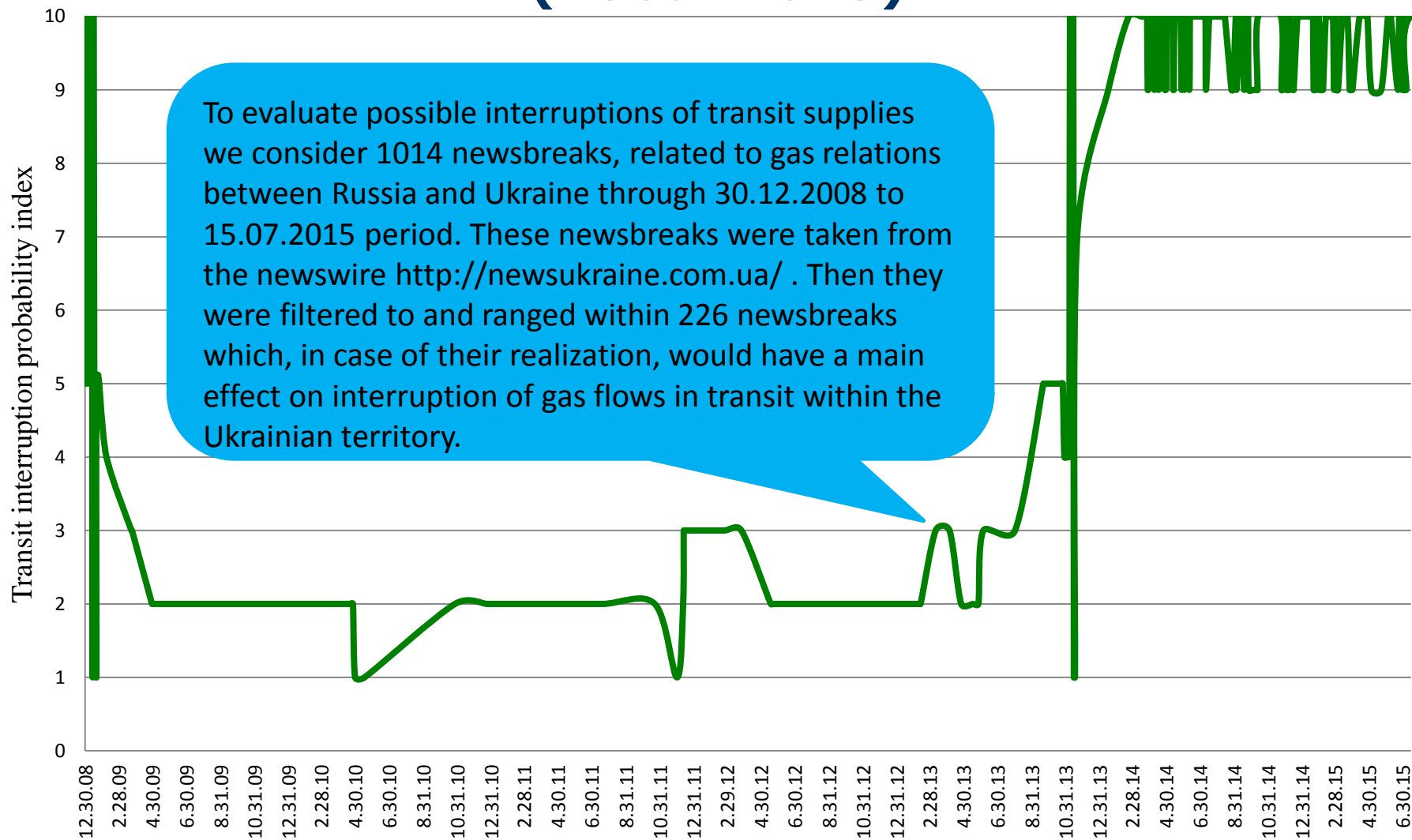
Source of primary chart): ERI RAS (T.Mitrova), reproduced in & taken from «The Russian Gas Matrix: How Markets Are Driving Change», Ed. by J.Henderson & S.Pirani, Oxford University Press, 2014, Fig.3.1/p.53.



# What are the options for adaptation?

- No ways to renew expiring contracts at their previous structure (Third Energy Package) => low oil price + expiration of current LTC = adaptation is inevitable => what are the options?
- To sell at the external Russian border? No?
  - Informal/indirect proposal from EU/CEC to continue transit through UA either by Gazprom, or EU companies, or (assumed) by new EU Single Purchasing Agency?
    - Motivation: to finance Ukraine by transit of Rus gas. Whether EU companies would agree to take transit risks? EU SPA = new EU Gosplan/MinVneshTorg?
- To stay with current LTC but to trade at the hubs at hub-indexed price? No?
  - Downgrading price spiral (S.Komlev)
- To sell at auctions in SPB? Yes, one of partial solutions (testing new options)
- To use hybrid forms of indexation? Too sophisticated?
  - Net-back Replacement value (NBRV) = inter-fuel competition (gas to other energies), instrument of growing/seller's market; instrument for new CAPEX
  - In oversupplied mature/buyer's market NBRV converted to competitive value (+ gas-to-gas competition), instrument for new OPEX
  - How to index to increasing number of competing energies with increasingly volatile price behavior ?
- To implement portfolio approach (integrated supply, trading and marketing model)? To be present both in term & spot segments, to minimize losses under bad market & maximize benefits under good market non-dependent oil price fluctuations? "Domino effects" possible benefits ...
- Internal debates continues....

# 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

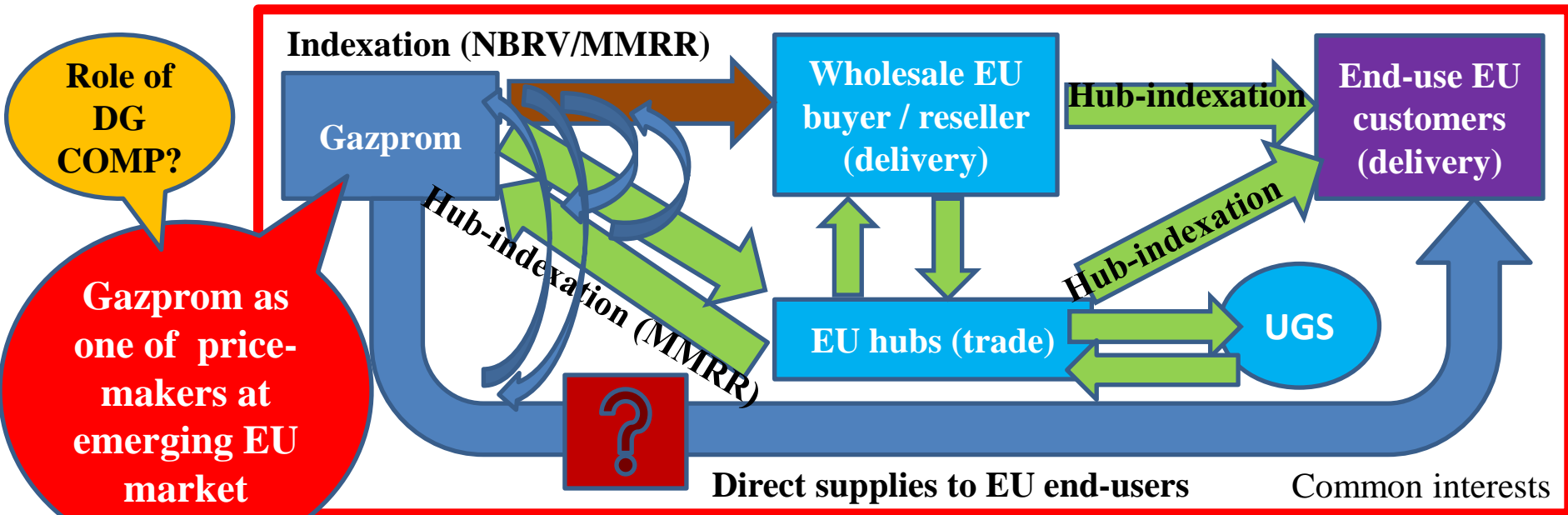
# New model for EU: Evolution of gas value chain & pricing mechanism of Russian gas to EU (2)

Future (“NO GO” contractual scheme under any (?) supply-demand scenario)

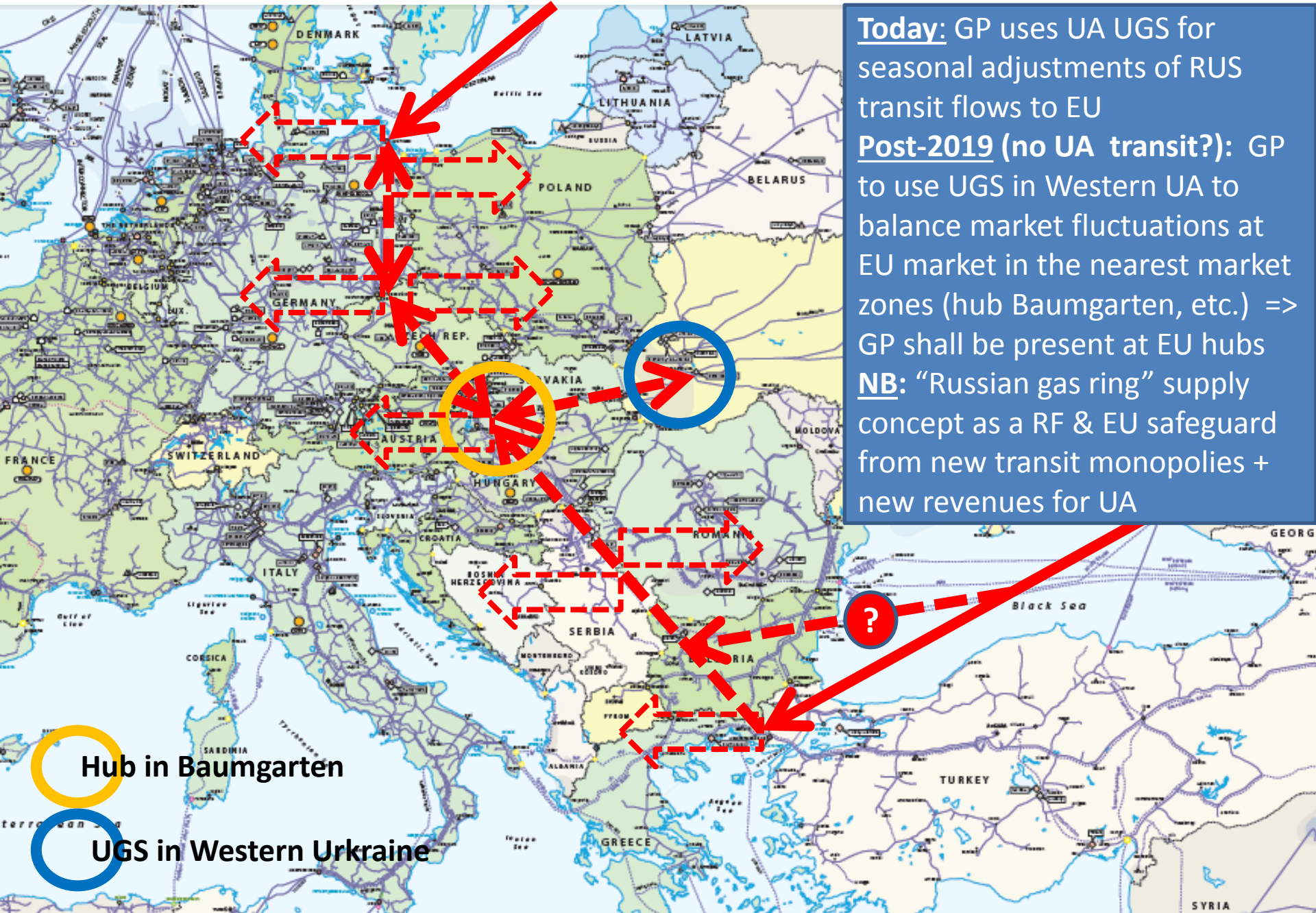


Gazprom as price-taker from GAS BUYER'S market (with no participation on it)? => NO GO

Future (what competitive niche for oil-indexed LTC & spot deliveries & trade to/within EU?)



# Russian gas ring diminishes UA transit risk & presents a non-transit way for UA to raise gas revenues (thus covers issue of major EU concern)



Today: GP uses UA UGS for seasonal adjustments of RUS transit flows to EU  
Post-2019 (no UA transit?): GP to use UGS in Western UA to balance market fluctuations at EU market in the nearest market zones (hub Baumgarten, etc.) => GP shall be present at EU hubs  
NB: "Russian gas ring" supply concept as a RF & EU safeguard from new transit monopolies + new revenues for UA

Hub in Baumgarten  
UGS in Western Ukraine

# Thank you for your attention!

[www.konoplyanik.ru](http://www.konoplyanik.ru)  
[andrey@konoplyanik.ru](mailto:andrey@konoplyanik.ru)  
[a.konoplyanik@gazpromexport.com](mailto:a.konoplyanik@gazpromexport.com)

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