

Russia-Ukraine-Central Asia: evolution of international gas pricing within CIS area (from political to market- based pricing and prices)

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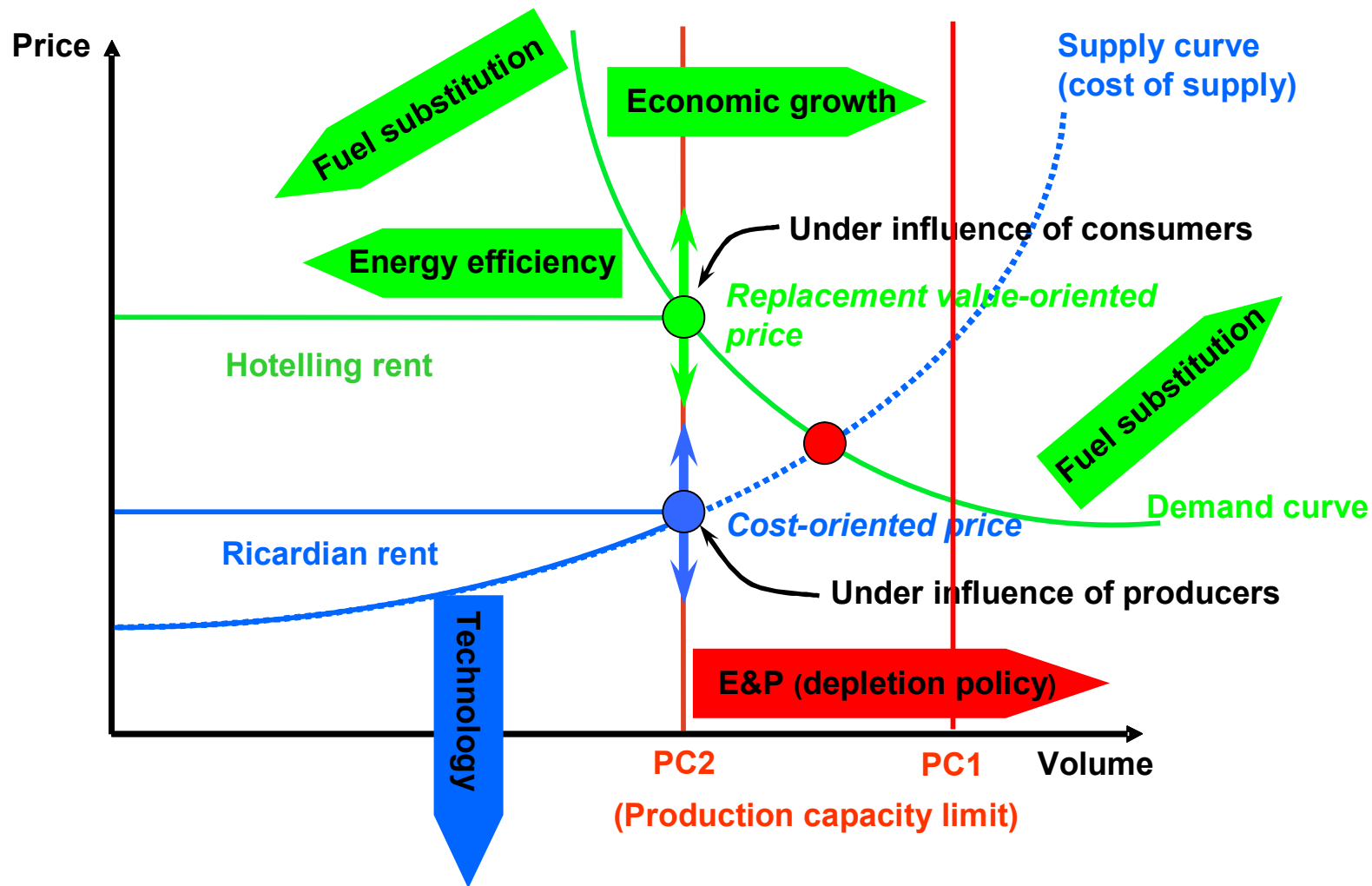
**Presentation at the Adam Smith Conferences'
UKRAINIAN ENERGY FORUM
7 - 9 October 2008, Premier Palace Hotel, Kyiv, Ukraine**

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Pricing of Non-Renewable Energy Resources: RICARDIAN VS. HOTELLING RENT

Ricardian rent + Hotelling rent = Resource rent



Gas Export Pricing & Prices

- Resource price and resource rent for non-renewable energy:
 - **Ricardian rent**: internal demand is *below* domestic production capacity limitations
 - **Hotelling rent**: internal demand is *above* domestic production capacity limitations
- Pricing principles:
 - **Cost-plus (net forward)** => pricing at internal domestic market of producer *or* subsidized export pricing (Hotelling rent is shared with your own nation *or* with foreign nation)
 - **Replacement value** (costs of alternative energies) => in case when domestic production capacities are below internal demand for gas => to receive maximum marketable price/resource rent
 - **Net-back replacement value** = Replacement value netted back to an upstream delivery point in delivery chain => Dutch (Groningen) model of long-term export contract (since 1962)

Key elements of Groningen LTGEC concept

Groningen concept of long-term gas export contract (LTGEC) =

- = long-term contract,
- + gas price linked to its replacement value (to end-use cost of its alternative fuels - at the burner-tip),
- + regular price review within contractual price formula & possibility for regular adaptation of the formula itself,
- + minimum payment obligation (take and/or pay),
- + net-back to delivery point (gas replacement value in end-use less transportation cost from delivery point to end-use point),
- + destination clauses.

Economic & legal background of Groningen LTGEC concept

- *Economic* background: maximisation of Hotelling rent for resource-owning state
- *Legal* background: 1962 UN GA Resolution № 1803
- More than 300 Bcm/y are imported in Continental Europe within contractual structures on the basis of Groningen LTGEC concept.

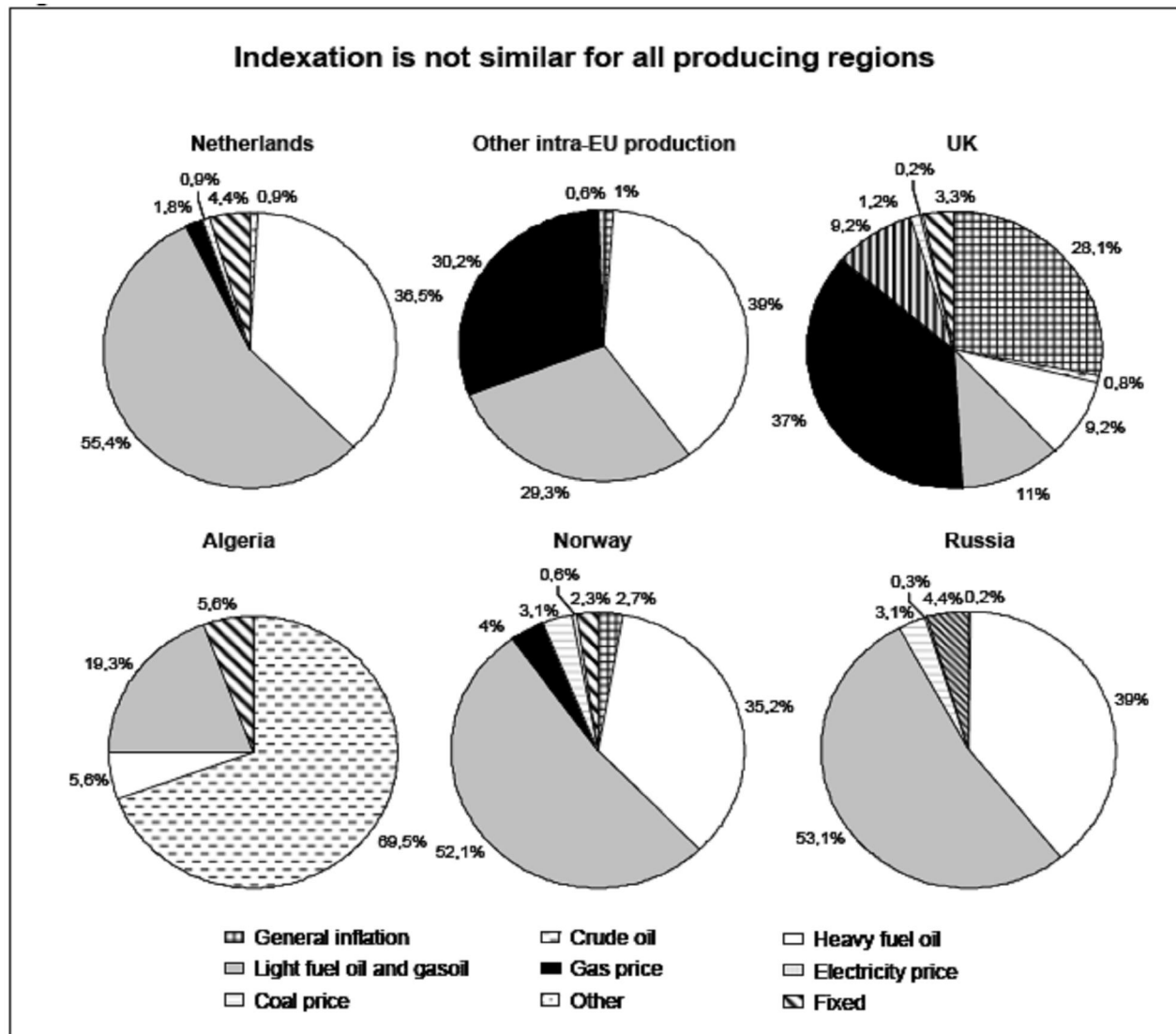
Soviet/Russian LTGEC organized on the basis of Groningen LTGEC concept

- Soviet/Russian gas export contracts to the:
 - EU (historically – since 1968),
 - Former COMECON (after dissolution of the USSR),
 - CIS (since recently)

are based on/modified towards Groningen (Dutch) concept of long-term gas export contract (LTGEC)

- Pricing = gas replacement value within “old-EU” domestic market + net-back to delivery points at:
 - For “old-EU” members – at Eastern then “EU-15” border,
 - For “new-EU” members and CIS states – at external border of corresponding state

LTGEC: Indexation by Producer



Source: Energy Sector Inquiry 2005/2006

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Soviet/Russian Gas Supplies to COMECON/CIS: ***Prior to* Dissolution of the USSR**

- **Political (friendship) pricing => :**
 - subsidized (notional) export prices
 - transfer of Hotelling rent from producer-state to consumer-state through cost-plus (net forward) pricing
 - portion of resource rent is left to importer in exchange on his political concessions to exporter
 - sharing USSR resources (which today are mostly Russian resources) within USSR and with COMECON countries
 - Legal background: state sovereignty on natural resources (UNGA 1962 Res.1803; ECT Art.18)
- **Barter & quasi-barter deals**
- **Transportation system - but not designed as transit system within USSR/COMECON**
- **No transit within USSR**
- **Export & transit supplies are not contractually separated within COMECON**

Soviet/Russian Gas Supplies to COMECON/CIS: *After* Dissolution of the USSR

- Long & painful transition to :
 - Contractual separation of transit & export supplies
 - Formation of domestic transport vs. transit legislation
 - From barter to cash payments
 - From politically-subsidized - to market-based pricing & prices:
 - Transit tariffs methodologies
 - Market-oriented export pricing & prices

Energy Charter role:

draft Transit Protocol
+ gas/transit-related
activities: e.g.
Transit tariffs study
(Jan'06), Pricing
study (March'07),
etc.

Gas problems in post-Soviet area = result & long-term economic consequences of dissolution of USSR/COMECON political system = objective long-term economic problems of transition period

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Ukraine: Export and Transit of Russian Gas

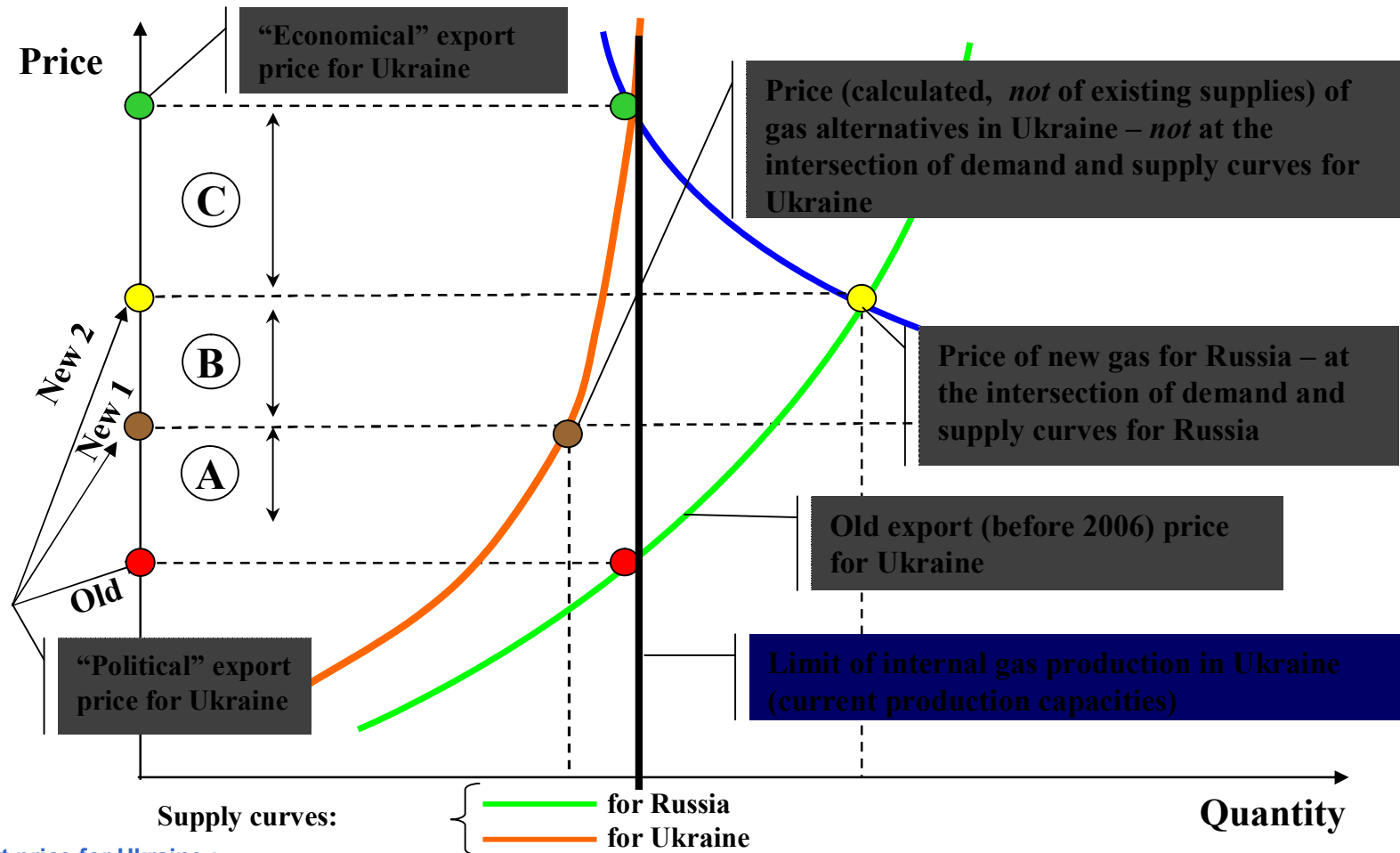
Prior to 4 January 2006

- Export & transit are not contractually separated
- Quasi-barter deals
- Notional export prices & transit tariffs – to balance gas supplies to Ukraine
- Export pricing:
 - “cost-plus (net forward)” – on the basis of the marginal costs (supply curve) for Russia
- Who receive the resource rent (Ricardian & Hotelling rents):
 - Ricardian rent – producer/exporting state (Russia),
 - (at least part of) Hotelling rent – consumer/importing state (Ukraine) => 1962 UN GA Res.1803 + 1994 ECT Art.18

Ukraine: Export and Transit of Gas from Russia *After 4 January 2006 [and prior to 1 Jan. 2009]*

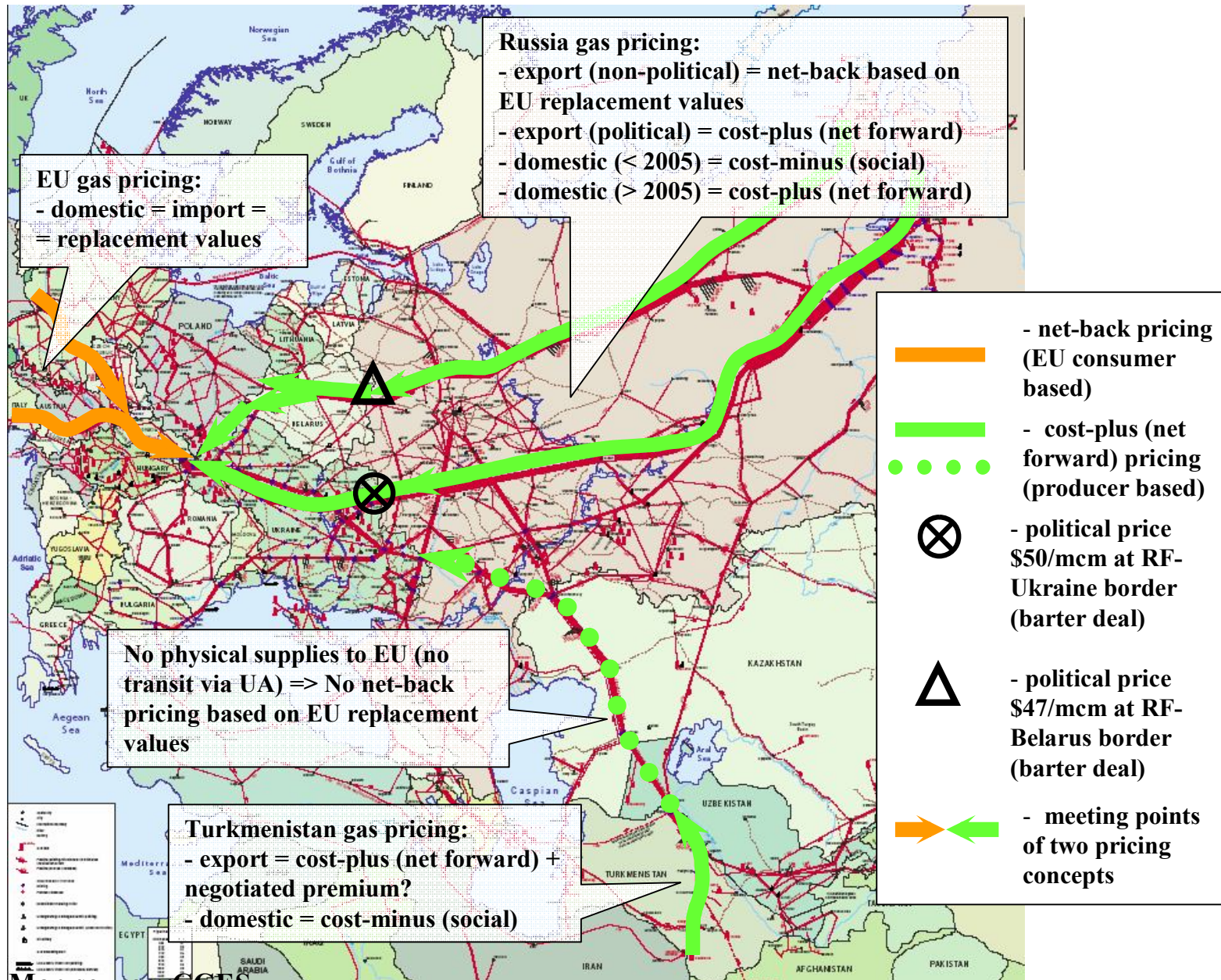
- Transit and export are contractually separated
- Cash payments
- Export price => average based on cocktail from two sources: Russia and Central Asia (CA)
- Export pricing for gas originated from:
 - Russia - by net-back calculation => based on *demand-curve* => replacement value within EU netted-back (less transportation costs) to Russia-Ukraine border
 - Central Asia - by cost-plus (net forward) calculation => based on *supply curve* => negotiated price at external border of exporting CA country (above its cost-plus level ?) plus transportation costs to Russia-Ukraine border
- Who receive resource rent (Ricardian & Hotelling rents) for gas originated from:
 - Russia – both rents go to producing/exporting-state (Russia)
 - Central Asia – *Ricardian* rent goes to CA producing / exporting states; *Hotelling* rent shared between Ukraine & CA producers / exporters => 1962 UN GA Res.1803 + 1994 ECT Art.18

Pricing Options in Russia-Ukraine Gas Trade & Economic Theory



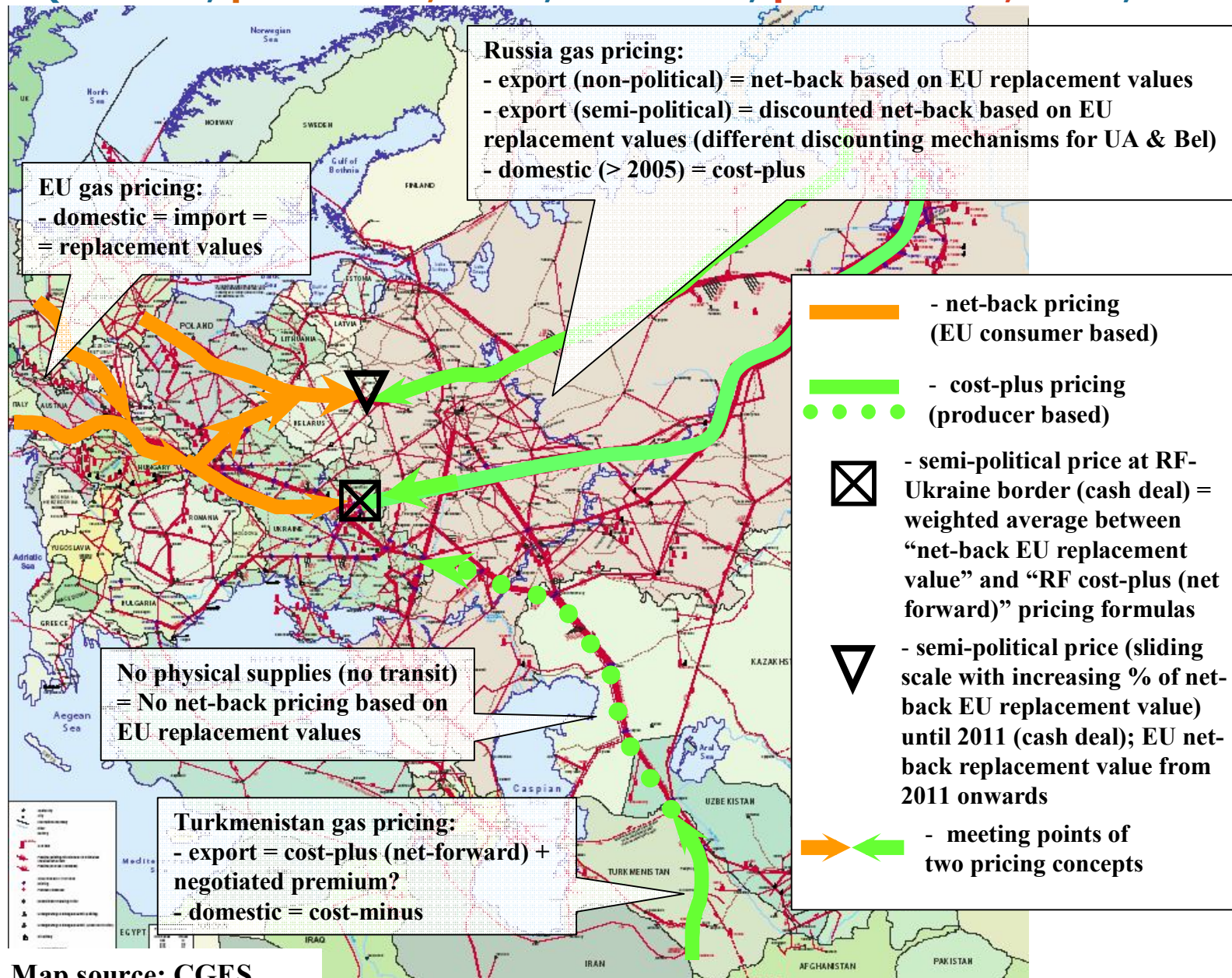
- “Political” export price for Ukraine :**
- **Old** = current internal Russian price plus cost of transportation to Russia-Ukraine border
(Russian export subsidy to Ukraine = $A+B+C$)
 - **[New 1]** = if equated to production costs («cost-plus» in Ukraine) of replacing energies, based purely on the possibility of their production within the internal market of Ukraine (e.g. A.Illarionov)
(Russian export subsidy to Ukraine = $B+C$)
 - **[New 2]** = if equated to internal Russian price (production costs/“cost-plus” in Russia) of new Russian gas
(Russian export subsidy to Ukraine = C)
 - **“Economic” export price for Ukraine** = gas replacement value at the internal EU market (calculated on long-term contracts gas pricing formulas) netted-back to Russia-Ukraine border

Russian Gas Export to Europe: "Political" and "Non-Political" Pricing Zones pre-January 4, 2006



Map source: CGES

Russian Gas Export to Europe: "Political" and "Non-Political" Pricing Zones (Ukraine, post-Jan.4, 2006, & Belarus, post-Dec.30, 2006, cases)

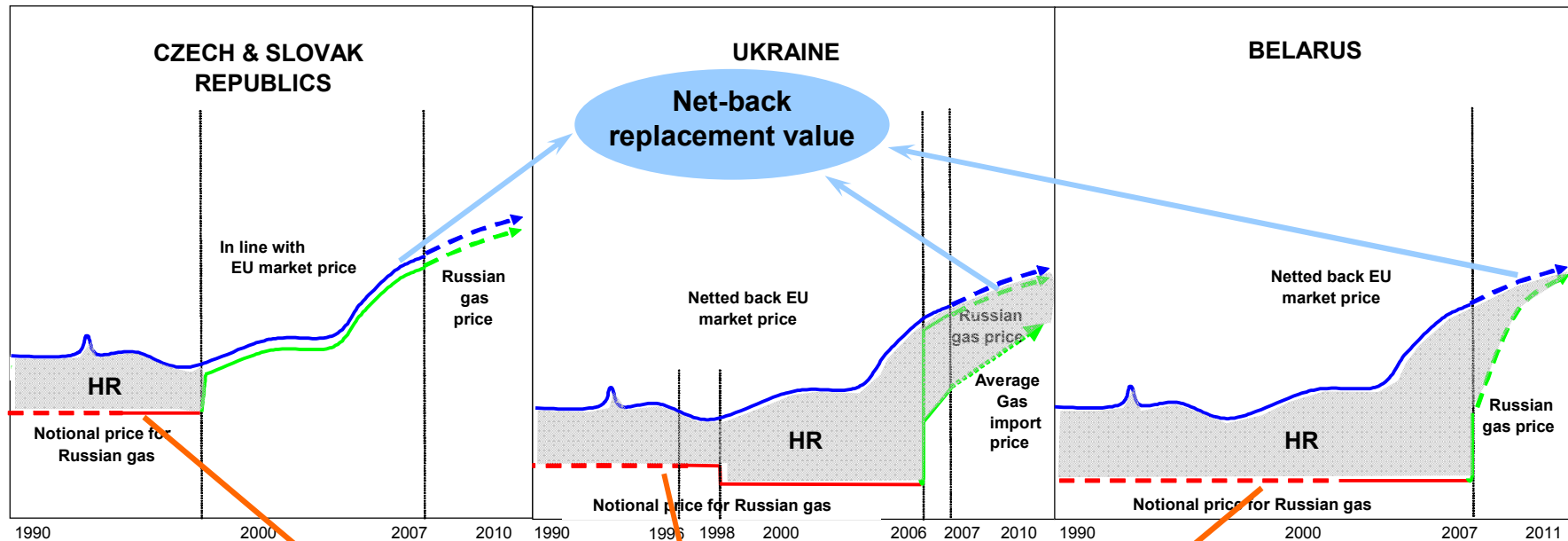


Map source: CGES

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Russian Gas Prices to the EU and Countries along the Pipe



- Remarks:**
- 1- The figures are entirely for illustration purposes and, therefore, may not fully reflect the actual price levels and movements
 - 2- The illustration for "Netted back EU market prices" are based on the IEA's World Energy Outlook, 2006
 - 3- Estimates for future gas price movements beyond 2007 are entirely illustrative.
 - 4- Recent actual price figures for Ukraine and Belarus, based on information from public sources, are as follows:
 For Ukraine - Russian gas price: 230 \$/mcm (2006) ; Average gas price (for a mixture of Russian / Central Asian gas): 65 and 135 \$/mcm (2006 and 2007, respectively)
 For Belarus - Russian gas price: 100 \$/mcm (2007) It will reach market price level by 2011 in agreed upon steps (67, 80, 90 and 100% from 2008 to 2011)
 - 5- Notinal prices for Russian gas were used to determine volumes of gas as compensation for transit services.
 For Ukraine: 80 \$/mcm until 1998; 50 \$/mcm from 1998 to 2006
 For Belarus: 47 \$/mcm most recently until 2007

■ Hotelling Rent

○ Cost-plus?
(Net forward)

Based on: "Putting a Price on Energy: International Pricing Mechanisms for Oil and Gas". Energy Charter Secretariat, 2007.

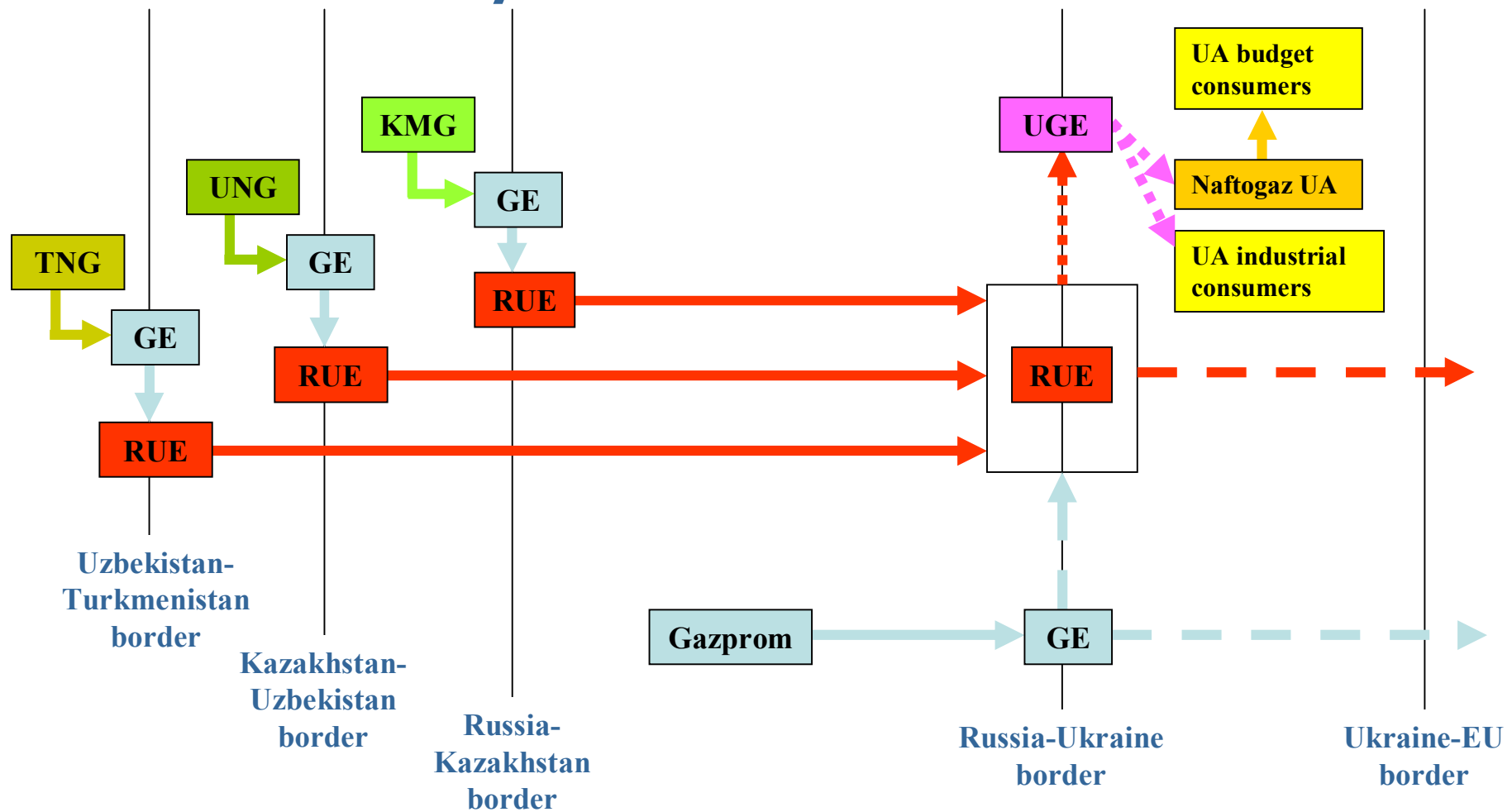
Russia & Former COMECON/USSR states: Different Sensitivity of Transition to Market-based Gas Pricing/Prices

	Czech & Slovak Republics	Ukraine	Belarus
Internal motivation vs. external political obligations to move to market pricing / prices	(No?) / Yes (accession to EU)	No / No	No / No
Price gap (market vs. political price): value (USD/mcm) & trend prior to transition	10- (1998); diminishing	15 (1998), 160 (2005); growing	25 (1998), 170+ (2006); growing
Relative economic value / political sensitivity	Low	High	Highest (Union state)

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Organisation of Russia-Ukraine Gas Trade After 4 January 2006: the Role of Intermediaries

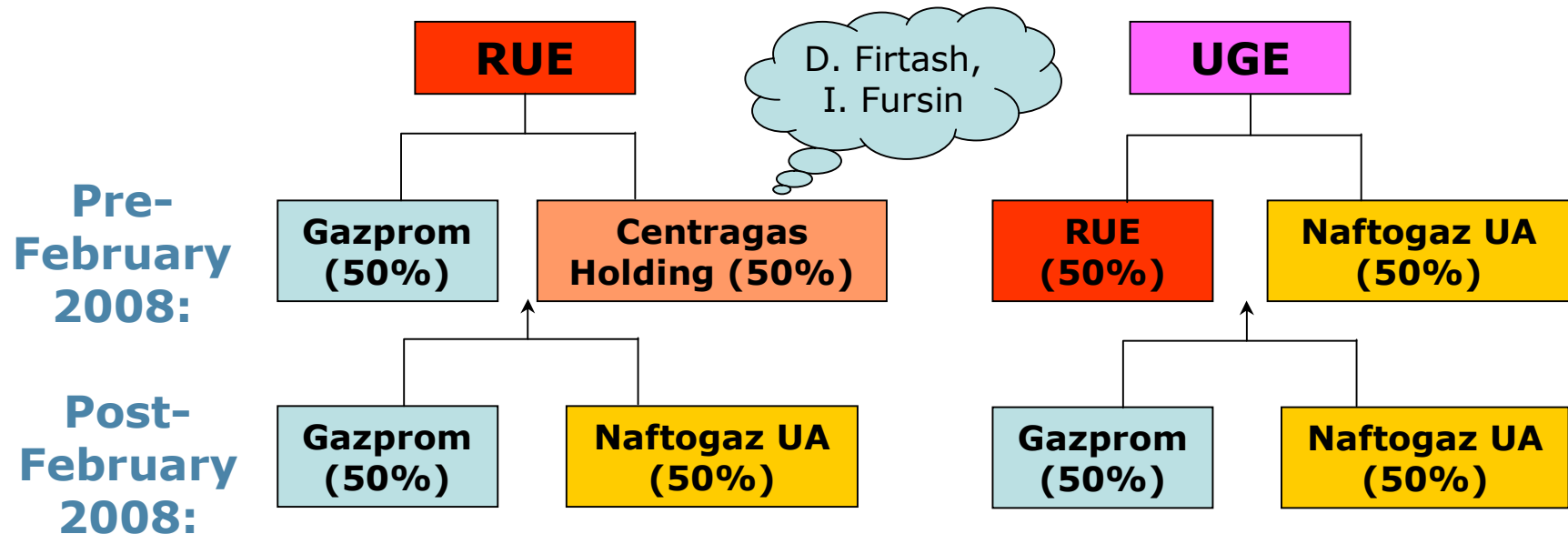


- ▶ Cost-plus (net forward) pricing
- - - - -▶ Net-back replacement value pricing
-▶ Weighted average price based on two formulas' calculations

Economic rationale for appearance of RUE & GUE in gas supply chain to Ukraine

- To exclude price competition in Europe of gas originated from Russia and from Central Asia
- To exclude threat of re-export by Ukraine (if Naftogas is importer) of cheap Central Asian gas (cost-plus import pricing) to Europe at high re-export prices (net-back replacement value)
- To exclude transit (in legal/contractual meaning of the term) of Central Asian gas to Europe via Russia (strong continuous Russia-EU debate on transit within Energy Charter)
- But also: to provide soft transition for UA to EU-based gas pricing & prices (inevitable future result of UA intention to enter the EU) by providing supplies to UA of gas received from GE & Gazprom & originated from Russia & Central Asia based on mixing the gas flows & weighting pricing principles

February 2008: How/Which/Whether Intermediaries in Russia-Ukraine Gas Trade Were Abolished



RUE =

(a) gas supply to UA of Russian and Central Asian gas received from GE & Gasprom based on mixing the gas & pricing principles in order to provide soft transition for UA to EU-based pricing (inevitable future result of UA intention to enter the EU)
 [+ (b) limited export]

UGE =

marketing of gas received from RUE within the domestic UA market (UGE = institutional form of "destination clause"; prevents UA from re-export of cheaper imported gas)

Current organisation of gas supplies to Ukraine – and its further change since 1st January 2009

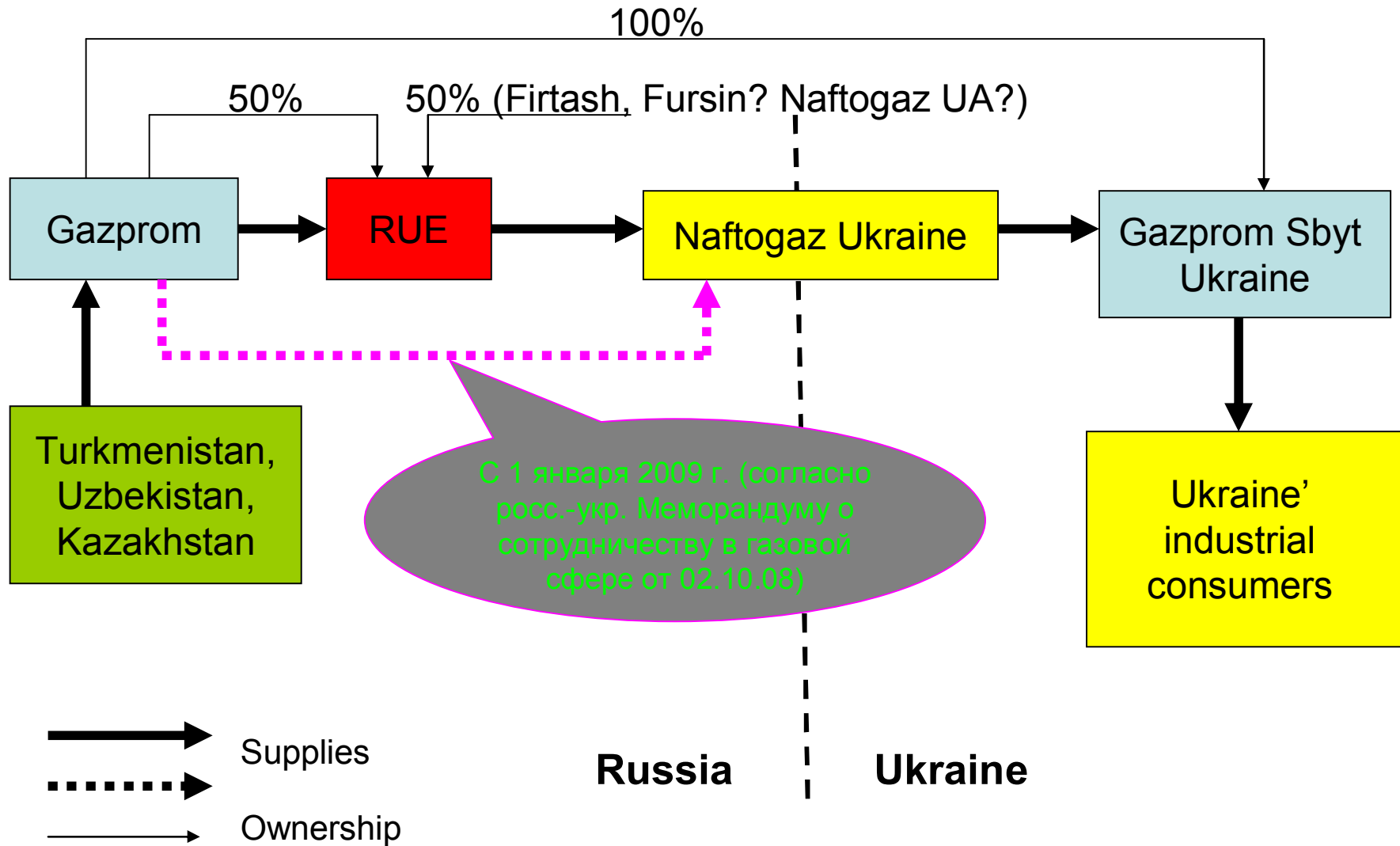


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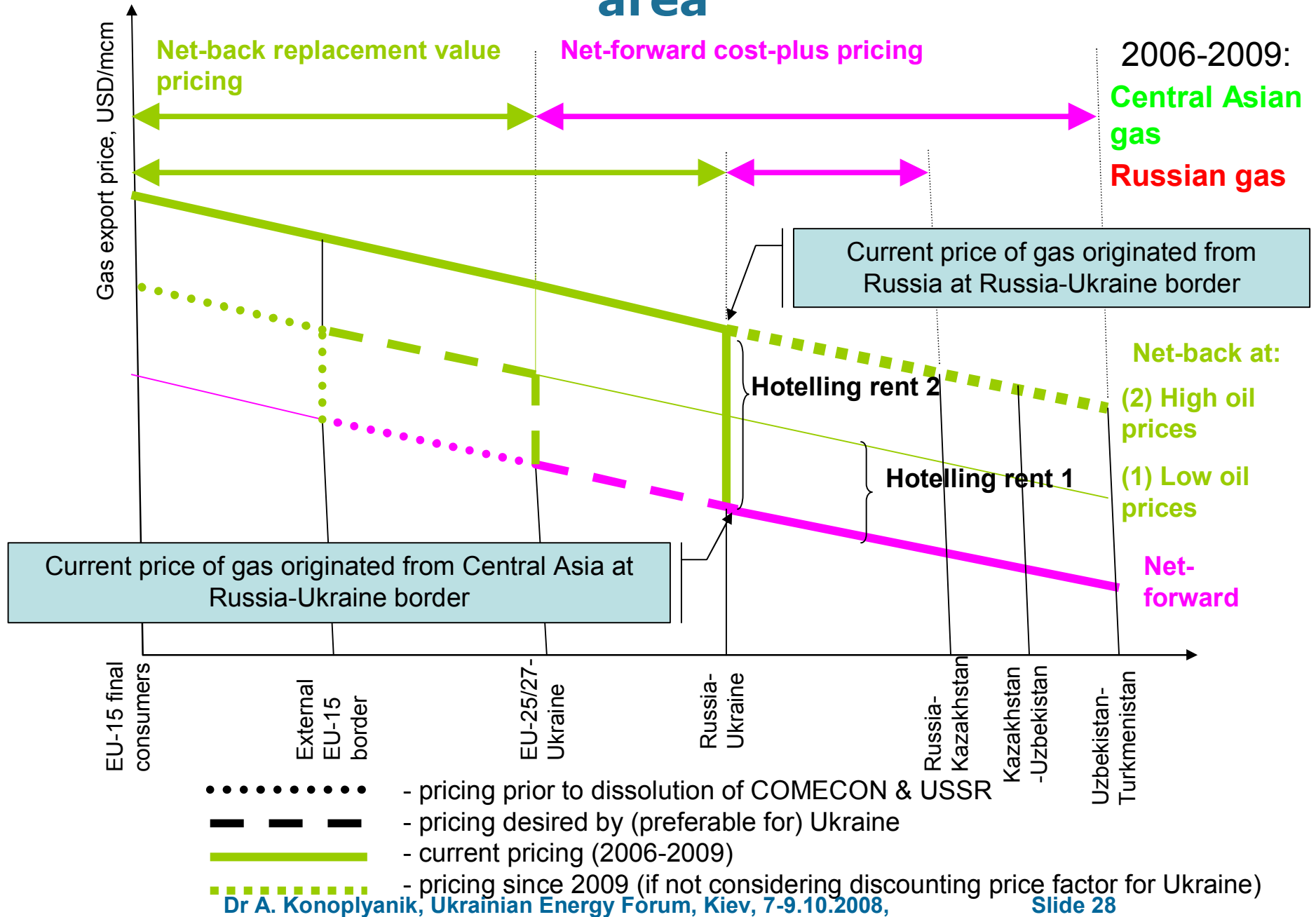
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Ukraine: Export and Transit of Gas from Russia

After 1 January 2009 (incl. Russia-Ukraine Memorandum on cooperation in gas sphere as of 2 October 2008)

- Transit and export are contractually separated
- Cash payments
- Export **pricing**: same pricing mechanisms for gas originating from Russia and Central Asia - by net-back calculation based on *demand*-curve => replacement value within EU netted-back (less transportation costs) to:
 - Russia-Ukraine border – for gas originating from Russia,
 - Turkmen-Uzbek (Kazakh-Uzbek, Russia-Kazakh) border – for gas originating from Central Asia
- Export **price** at Russia-Ukraine border: transition to “market price” for Ukraine within 3 years (2009-2011) =>
 - Diminishing discounting factor from market price (similar to Russia-Belarus gas agreement as of 30.12.2006)? If so, then
 - Ratio & implementation mechanism of discounting factor for 2009-2011?
- Who receive **resource rent** (Ricardian & Hotelling rents):
 - **Ricardian rent**: to producing/exporting-state – for gas originating both from Russia and from Central Asia,
 - **Hotelling rent**:
 - for gas originating from Central Asia - to producing/exporting state,
 - *For gas originating from Russia - shared between producing/exporting state (Russia) and importing state (Ukraine) in proportions to provide discounted import price on ALL Ukrainian import gas volumes => 1962 UN GA Res.1803 + 1994 ECT Art.18*

Evolution of gas export pricing within post-Soviet area



Central Asian alternative (1)

- To sell its gas directly to Ukraine:
 - ▶ During 2005-2006 Russia-Ukraine gas dispute Ukraine was arguing for gas import price calculation on the basis of gas replacement value within Ukrainian domestic market, which is much lower than within EU market =>
 - ▶ If Ukraine to follow consistent policy regarding import gas pricing, it is to present the same pricing principles to Central Asian gas exporting states as well,
 - ▶ Export gas price at external border of Central Asian exporter, if calculated as net-back replacement value at the domestic Ukrainian market, will be relatively low

Central Asian alternative (2)

- To sell its gas to Ukraine via Russia:
 - Russia agreed to buy Central Asian gas at their external borders at the price calculated as net-back replacement value at the EU market =>
 - Export price at external border of Central Asian exporter would be relatively high – higher than according to Ukrainian scenario (previous slide)
+
 - Russia contracted (booked) all export volumes of Central Asian gas and took all costs and risks of its transportation to the end-use markets

Central Asian alternative (3)

- Central Asian gas exporting states are willing to receive maximum Hotelling rent & to minimize export costs & risks
=>
- It is profitable for them to sell their gas to Russia at their external borders at the price, linked to gas replacement value at the EU market (maximization of Hotelling rent), with further Westward transportation of their gas by Gasprom (exclusion of risks & costs of transit)

Responds by Ukraine

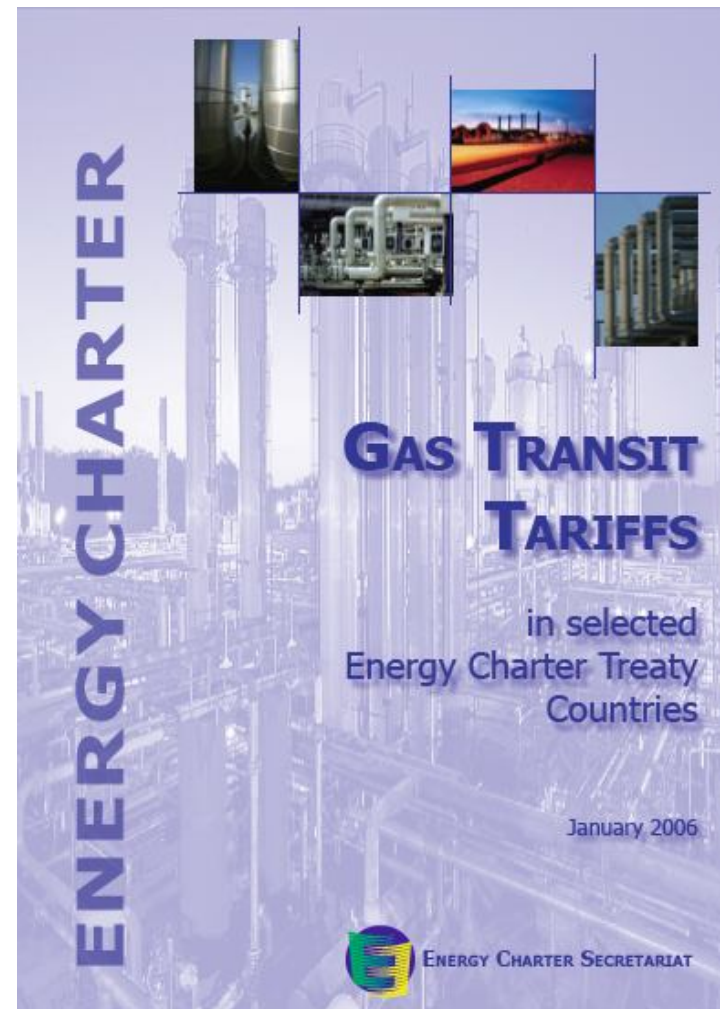
- Compensatory increase of transit tariffs? NO, since it is NOT a market-based and NOT an economically proved, but just a politically motivated respond:
 - Development of export gas prices (if based on replacement values and/or on exchange quotations) and of transit tariffs is NOT correlated (after contractual separation of gas supply and transit),
 - Export prices within LTGEC = replacement values; gas-to-gas competition (exchange quotations) will rather long not become (if will become at all) a dominant pricing mechanism within gas market(s) of Continental Europe,
 - Transit tariffs = “cost-based” (cost-plus) (draft Energy Charter Protocol on Transit, mutually agreed Art.10.3) => fair & competent accounting of investment & operational costs & reasonable rate of return (9.32 USD/mcm/100km = “triple-count” of investment costs?)
- Increase of energy efficiency within all segments of energy value chain & within all sectors of Ukrainian energy economy => YES !!!

Russia-Ukraine Memorandum on cooperation in gas sphere as of 02.10.08: some questions to be further clarified

- Russia & Ukraine will switch to market gas price levels within 3 years, but:
- Ukraine imports gas originated both from Central Asia & from Russia, and
- Russia & Central Asian exporters switch to gas market pricing (replacement value at EU market netted-back to external border of Central Asian exporter) since 1 January 2009
- If so, and if market prices ("normal market prices" – acc. to Y.Timoshenko) = contractual prices defined within Groningen-type LTGEC at escalation formulas (so-called "European formulas"), then:
 - ▶ Russia again (as prior to 4 January 2006) agreed to transfer to Ukraine part of Hotelling rent from export of gas originating from Russia – within volumes that will provide for discounted import gas priced for **ALL** imported gas to Ukraine =>
 - ▶ Russia again places on itself cost of softening financial burden for Ukrainian consumers, related to transition to "normal market prices" on gas in Ukraine; Russia provides gradation of this transition,
 - ▶ It is Russia who will compensate since 2009 to Central Asian gas exporters their "lost revenues" from gas export to Ukraine in 2006-2009 (due to transfer at that time portion of Central Asian's Hotelling rent to Ukraine)
 - ▶ Russia again act like "donor" for Central Asian gas exporters and for Ukraine as gas-importer in supplies of gas originated both from Russia & Central Asia to Ukraine
 - ▶ Question 1: Whether this is understood in Ukraine?
 - ▶ Question 2: What benefits Russia receives from Ukraine in return?

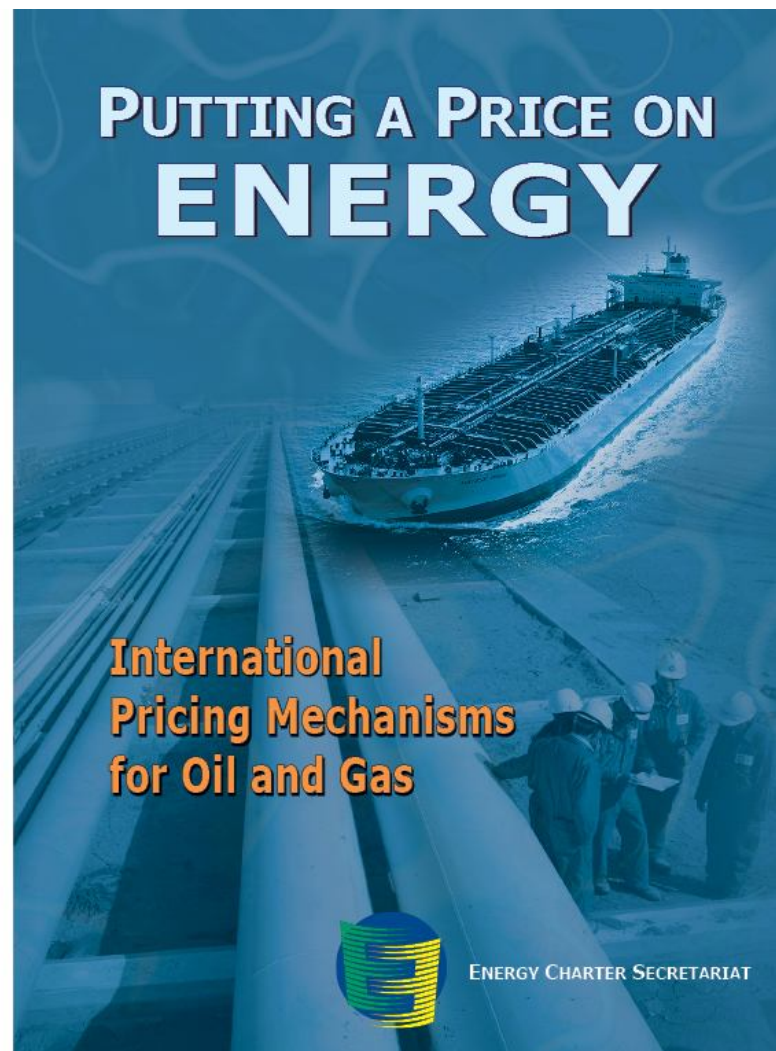
Back-up slides

Report on Tariffs by the Energy Charter



The Report can be downloaded free of charge at: www.encharter.org

Report on Pricing by the Energy Charter



The Report can be downloaded free of charge at: www.encharter.org

A Typical Net Back Gas Price Formula & its Review

$$P_m = \left\{ \begin{array}{l} [Po] \\ + [0.60] \times [0.80] \times 0.0078 \times (LFO_m - LFO_o) \quad \{up/down\} \\ + [0.40] \times [0.90] \times 0.0076 \times (HFO_m - HFO_o) \quad \{up/down\} \\ + [...] \quad (\text{coal}) \quad \{up/down\} \\ + [...] \quad (\text{electricity}) \quad \{up/down\} \\ + [...] \quad (\text{gas-to-gas competition}) \quad \{up/down\} \end{array} \right.$$

NB: [...] – parameters in brackets usually subject of renegotiation

Long-term evolution of price review mechanism:

- reflect its adaptation to the new state of development of energy markets,
- changing shares of existing competing fuels (LFO/HFO ratio in favour of LFO) *and* incorporation of new competing fuels *and* gas to gas competition,

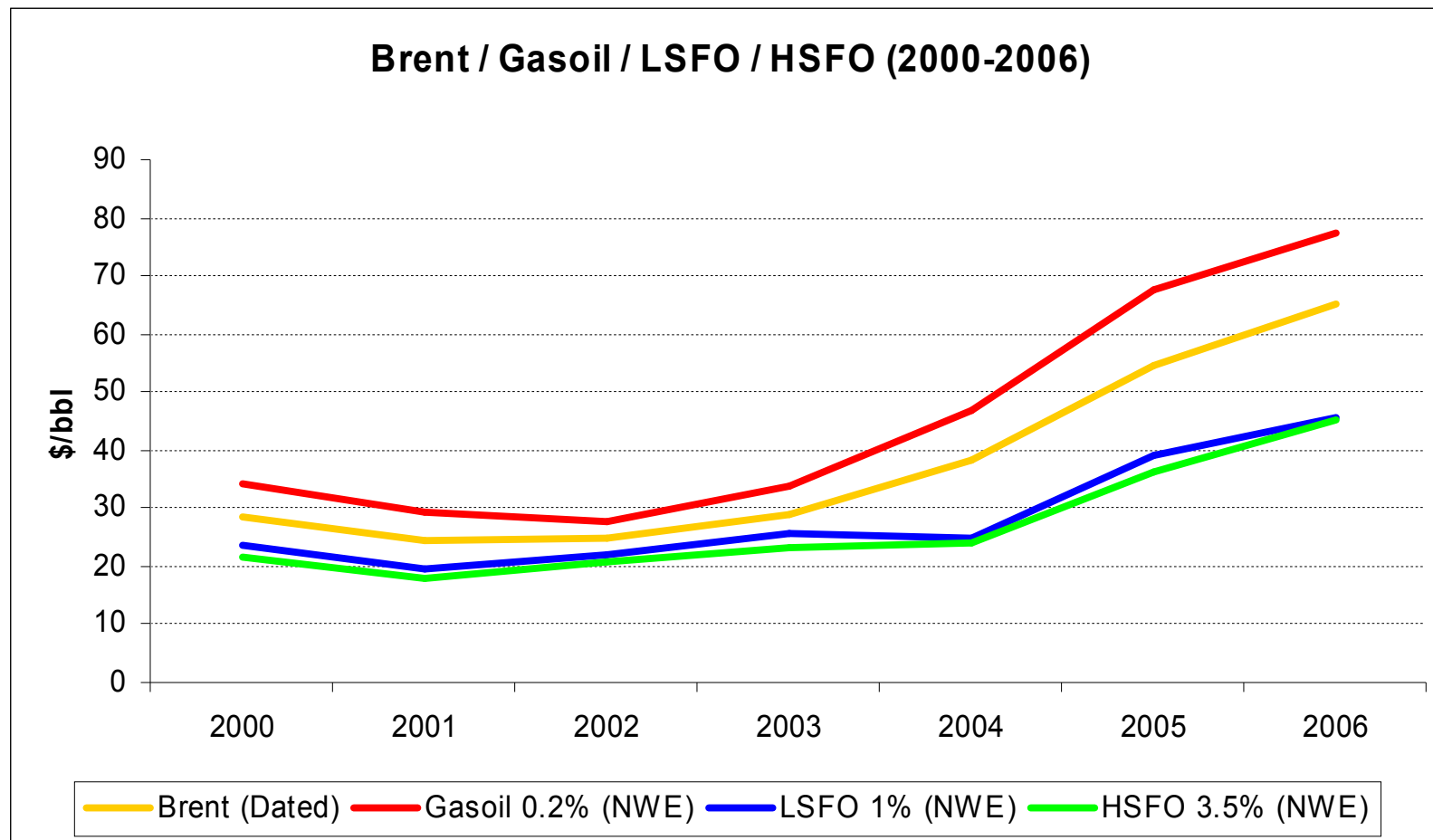
but

LFO & HFO are still dominant replacement fuels in gas pricing within long-term gas export contracts

Беларусь: экспорт и транзит российского газа *после* 30 декабря 2006 г.

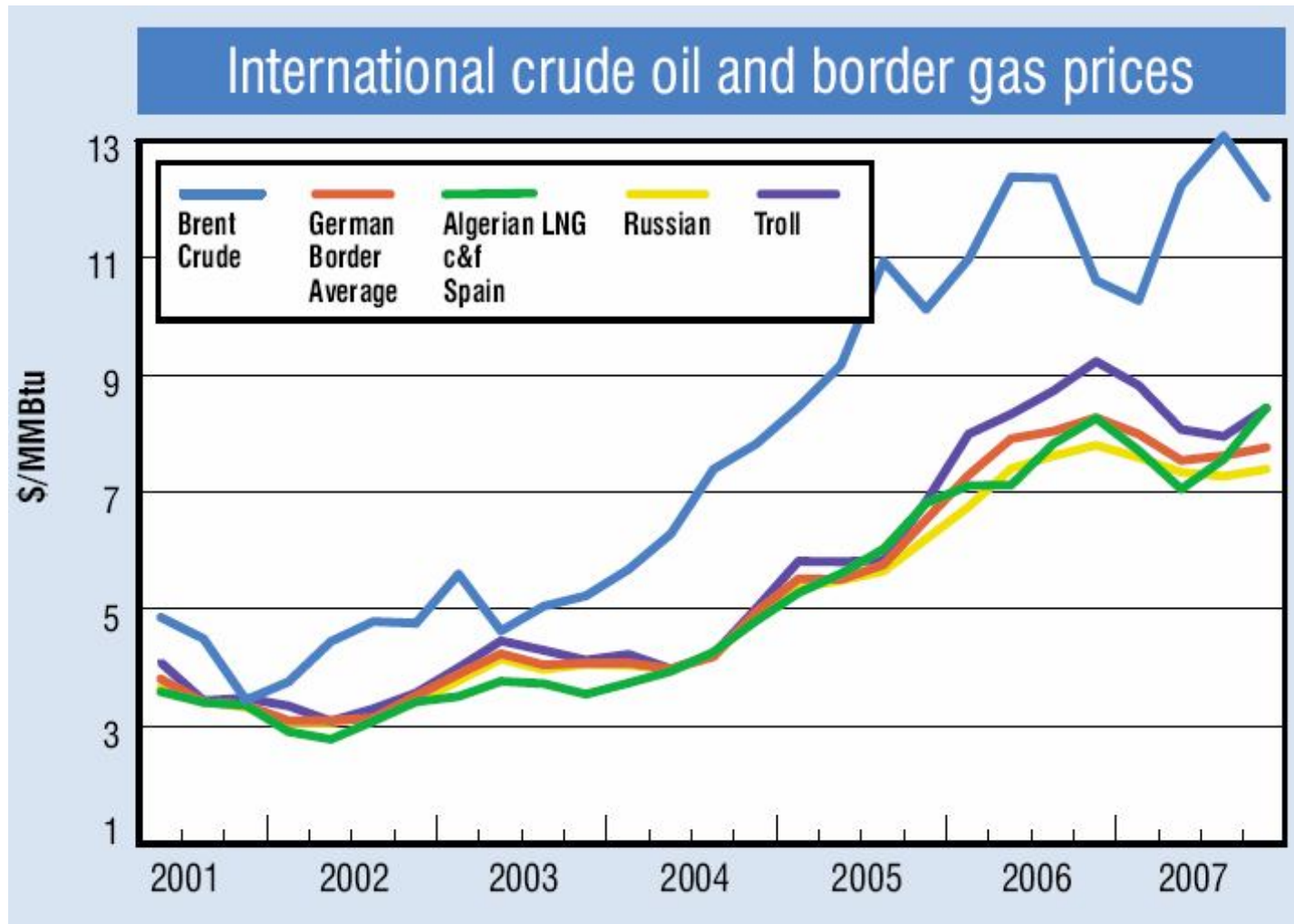
- Транзит и экспорт контрактно разделены
- Оплата денежными средствами
- Экспортное ценообразование: **обратным** счетом (методом «**нет-бэк**») от кривой **спроса** => стоимость замещения газа на рынке ЕС минус стоимость транспортировки до российско-белорусской границы (рыночная цена)
- Экспортная цена: рассчитывается как увеличивающаяся (от сегодняшнего уровня) процентная доля от рыночной цены с целью достижения уровня рыночной цены в 2011 г., рост параллельно динамике внутренних российских цен на газ для промышленных потребителей
- Кому достается ресурсная рента:
 - Рента Рикардо – стране-производителю (России)
 - Рента Хотеллинга – до 2011 г. распределяется между страной-производителем/экспортером (Россией) и импортером (Беларусью); после 2011 г. – стране-производителю/экспортеру (Россия) => Рез. 1803 Ген.Асс. ООН 1962 г. + ст. 18 ДЭХ 1994 г.

ЦЕНЫ НА НЕФТЕПРОДУКТЫ НА РЫНКЕ РОТТЕРДАМА



Source: IEA

ЗАПАДНО-ЕВРОПЕЙСКИЕ ЦЕНЫ НА НЕФТЬ И ГАЗ



GAS MATTERS – SEPTEMBER 2007