

Pricing mechanisms at the global oil market: defaults of Anglo- Saxon model & possible ways for improvements

**Dr. A.Konoplyanik,
Consultant to the Board, JSC “Gazprombank”,
Professor of Russian State Oil & Gas University**

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Historical evolution of contractual structure of global oil market vs. key organizational forms of market space

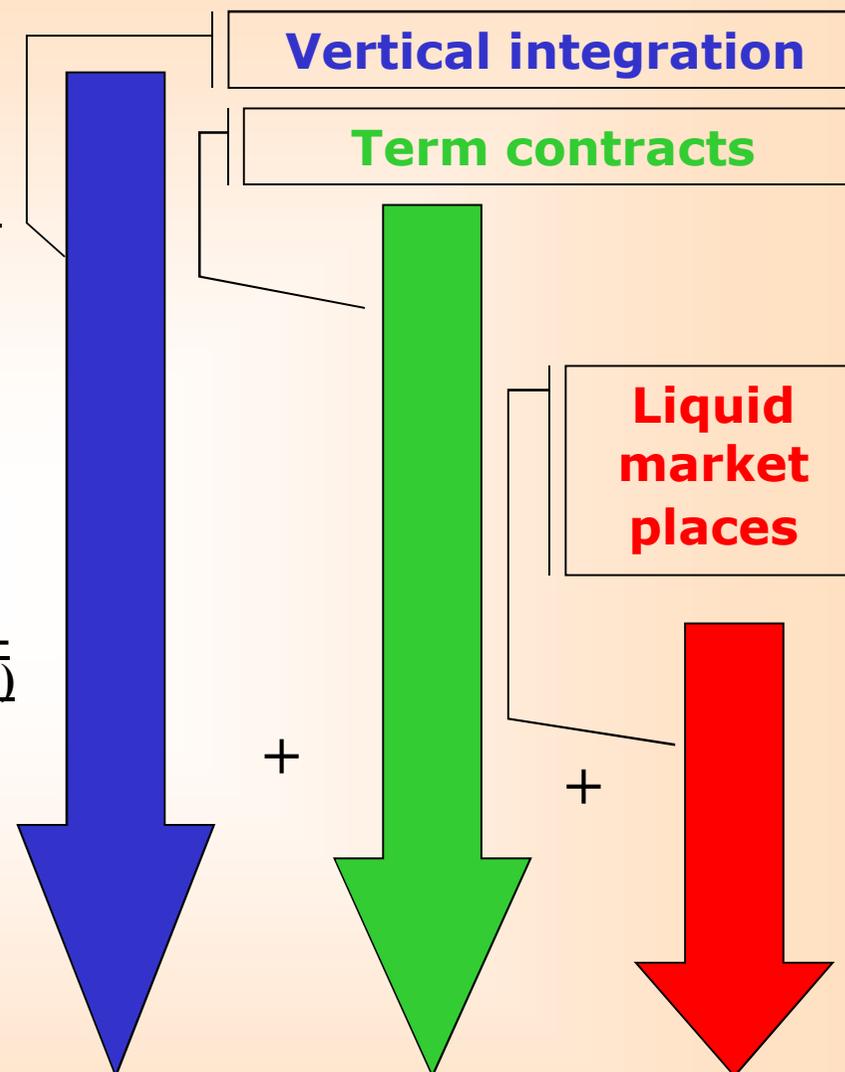
Transfer deals (*dominated prior to 1970-ies*)

+ Markets of physical goods => of “physical” energy & of real deliveries of energy resources (non-liquid energy markets) =

- + Long-term contracts (*since 1970-ies*)
- + Short-term contracts (*since 1970-ies*)
- + Spot deals (*since 1980-ies*)
- + Forward deals (with delayed deliveries of physical goods) (*since 1980-ies*)

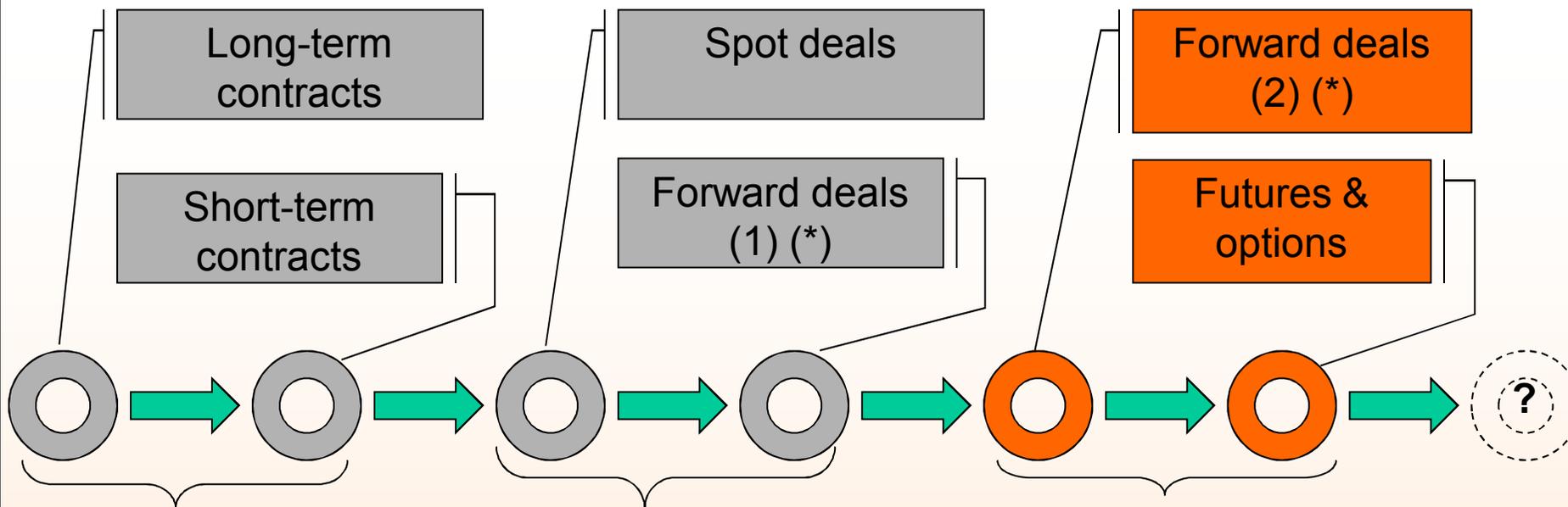
+ Financial markets => of “paper” energy & of energy-based financial instruments (liquid energy markets)

- + Forward deals (without deliveries of physical goods) (*since 1980-ies*)
- + Futures (*since 1990-ies*)
- + Options (*since 1990-ies*)
- + ... ? (*since ... ?*)



Pricing: **cost-plus** => **replacement cost** => **exchange pricing** => ?

Evolution of oil market: volumes of trade vs. volumes of physical supplies



Volume of trade **corresponds** to volume of supplies

Volume of trade **exceeds** volume of supplies => OTC market (subsequent re-sales of non-unified commercial batches – “daisy chains”)

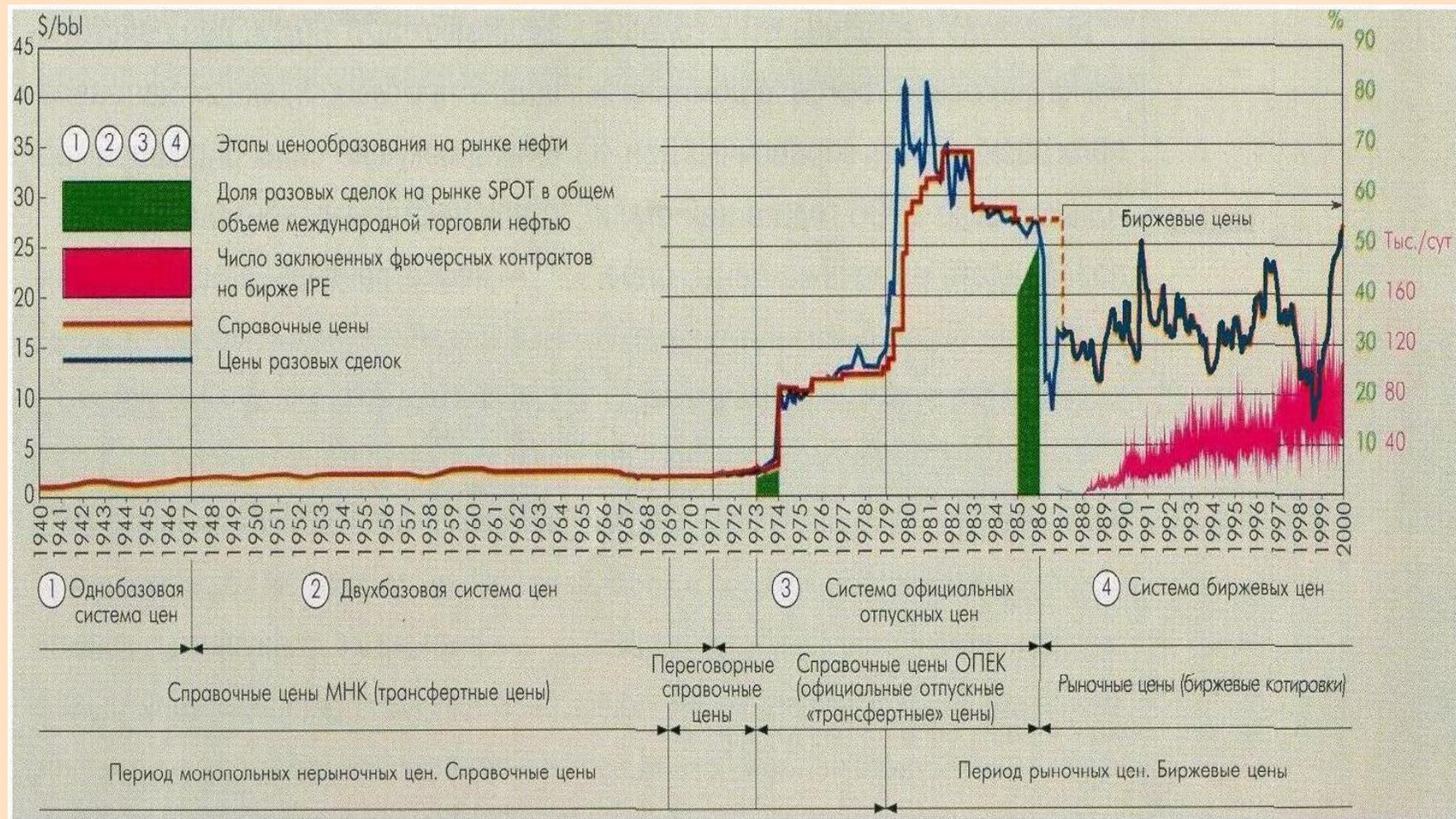
Volume of trade **multiply exceeds** volume of supplies => liquid marketplaces/exchanges (multidirectional re-sales of unified supply liabilities)

Increasing liquidity, **but also** growing market/price instability => good for traders/speculators, but is short-term & deprives project financing

- Markets of physical goods (of “physical” oil)
- Financial markets (of “paper” oil)

(*) (1) within the limits of coverage by accumulated volumes of stocks, (2) beyond such limits

Evolution of pricing systems in international oil trade

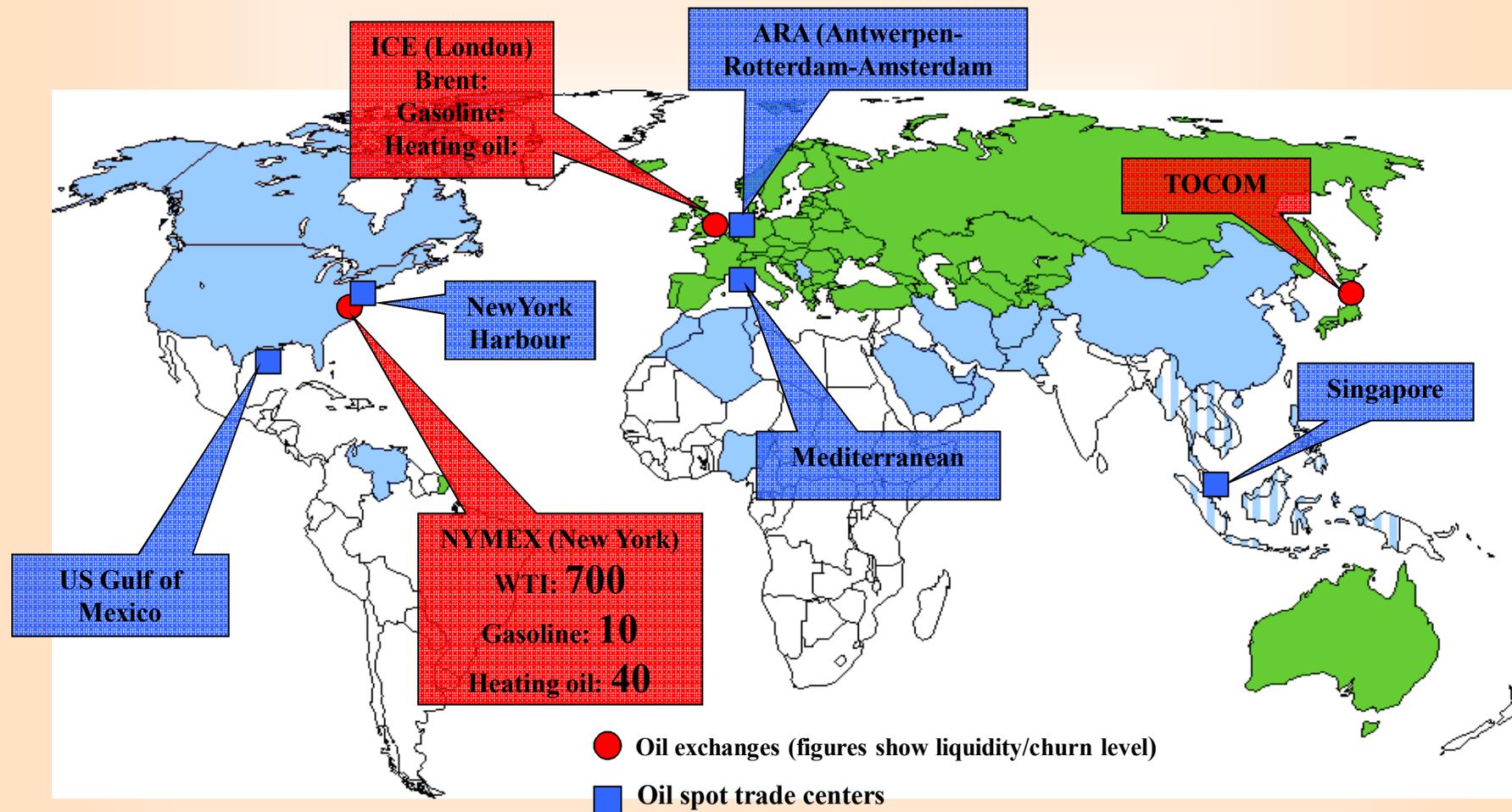


Futures prices dominate oil market, but NOT used by oil companies as benchmarks for project financing any more => 'oil price' is NOT a signal for long-term oil development

Modern oil market: major players

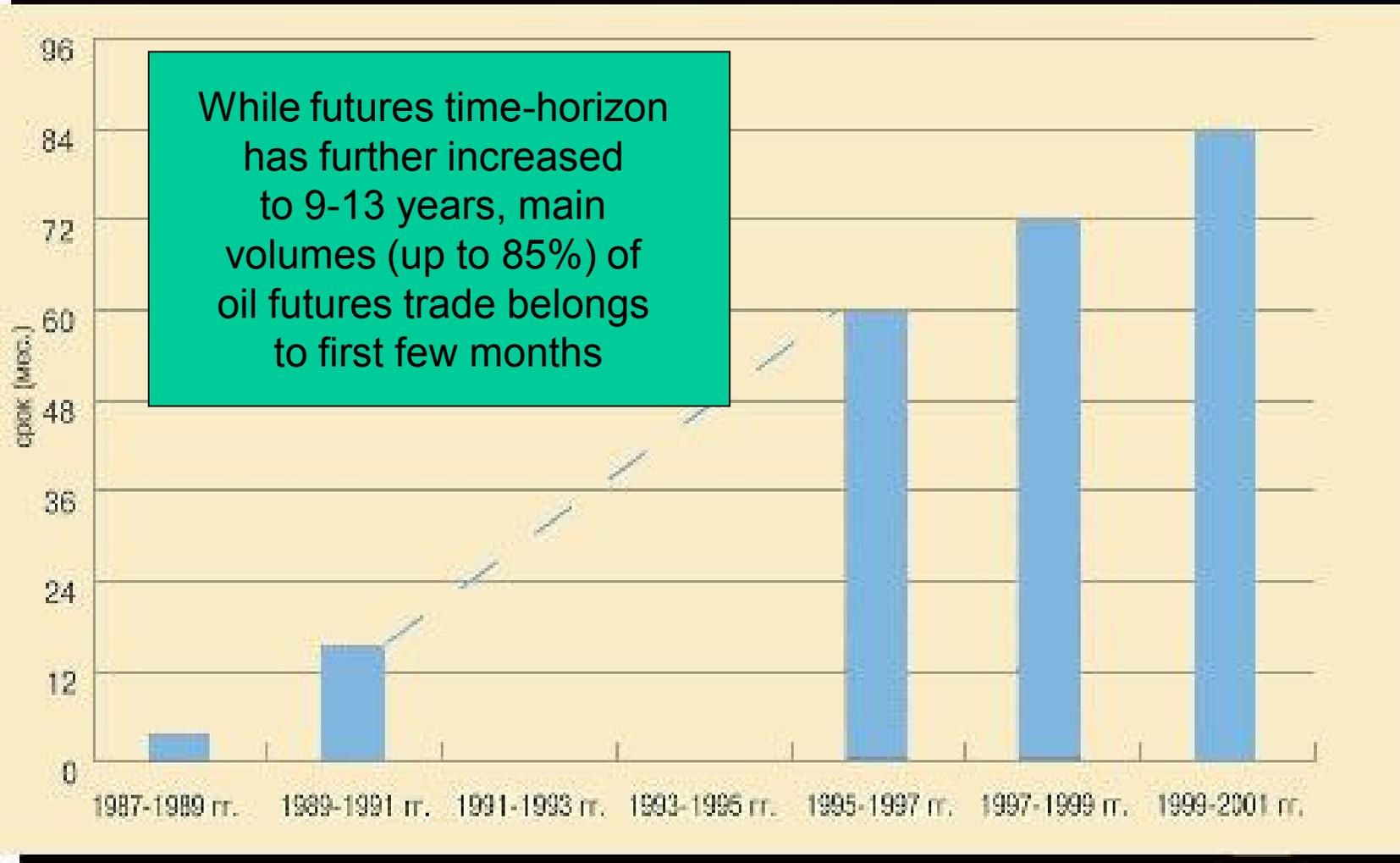
- Hedgers
(since 1980-s)
- Oil speculators
(since 1990-s)
- Non-oil speculators
(since 2003)

Key international petroleum exchanges and spot trade centers

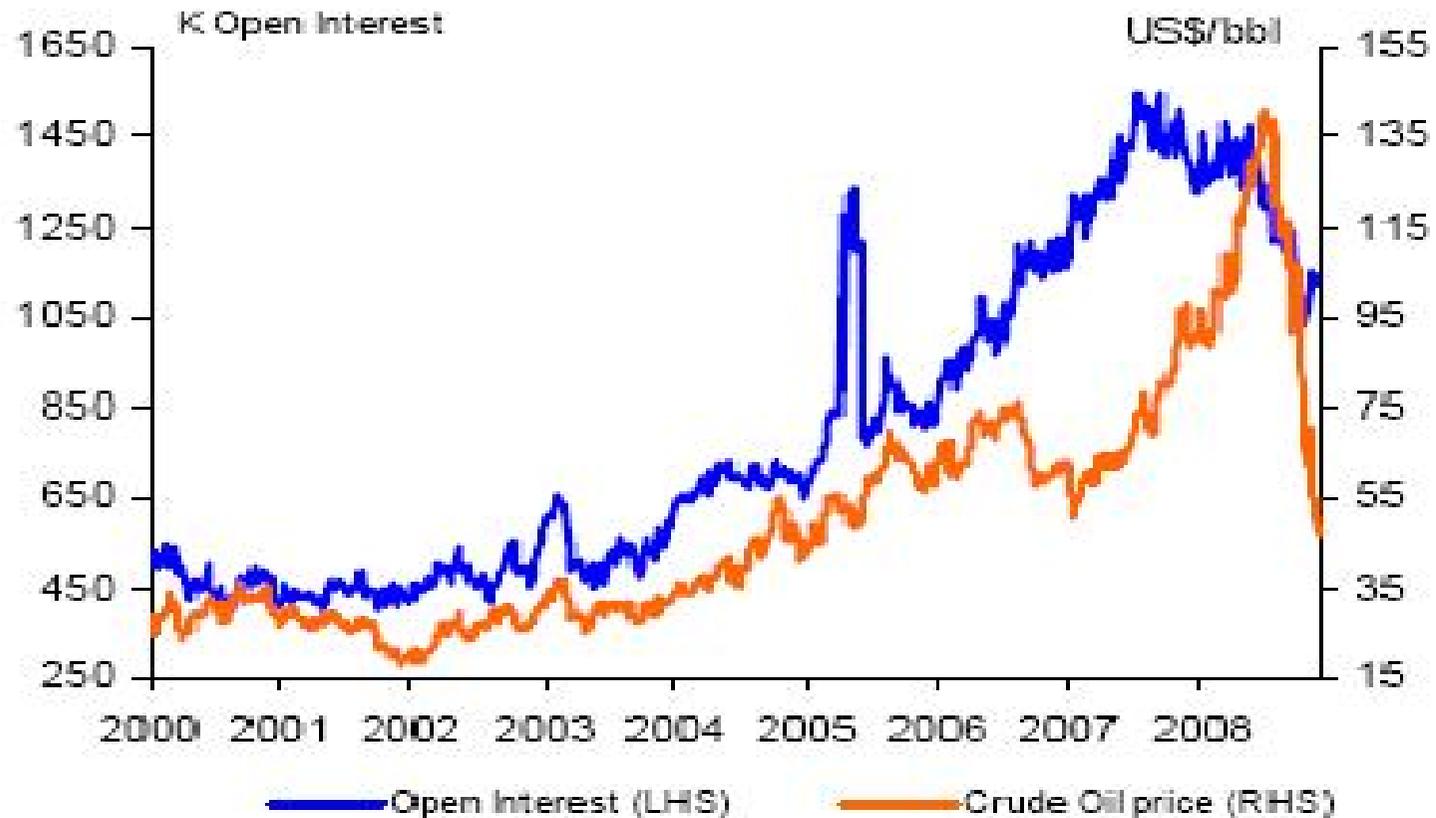


Evolution of NYMEX oil futures time-horizon

Рис. 3. Временной горизонт торговли фьючерсными контрактами на рынке нефти



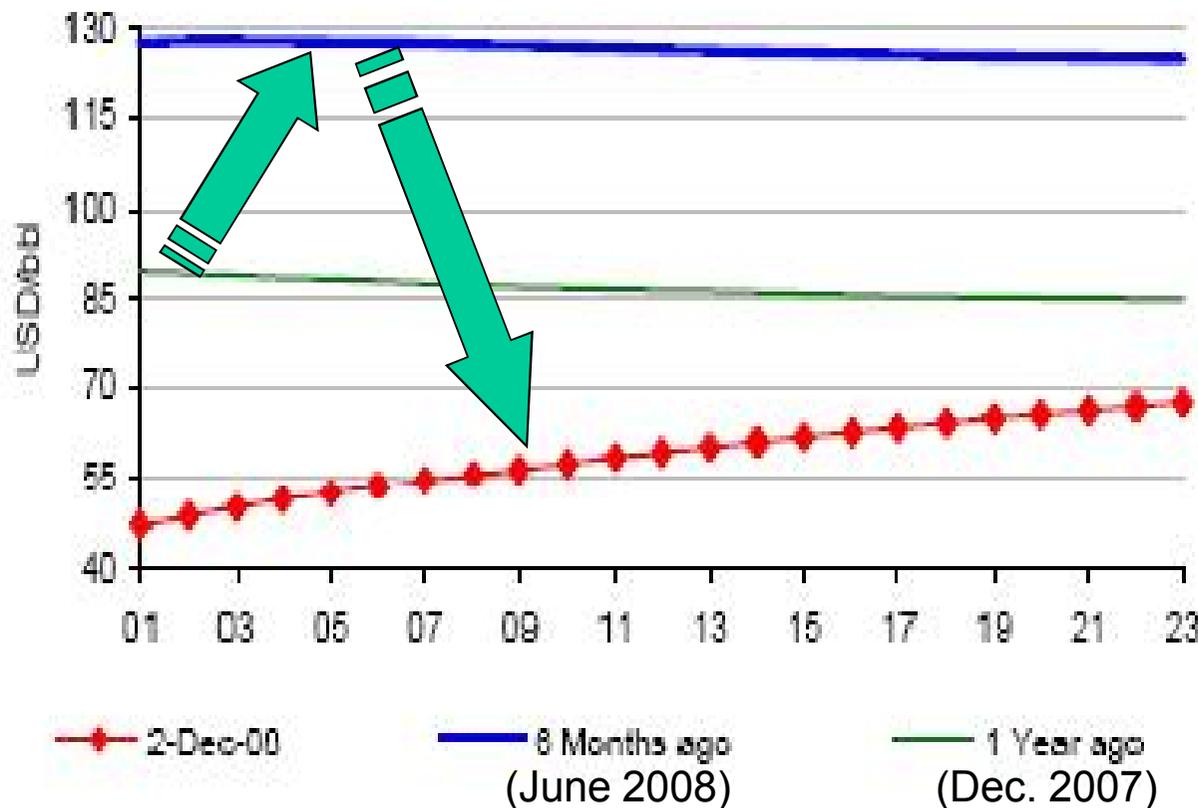
Nymex Crude Oil prices vs open interest



Source: Deutsche Bank, CFTC Commissions of Traders report for w/e 02-Dec-08, p.1 (based on CFTC, NYMEX data)

NYMEX WTI 2-year forward curves (December 2007, June and December 2008)

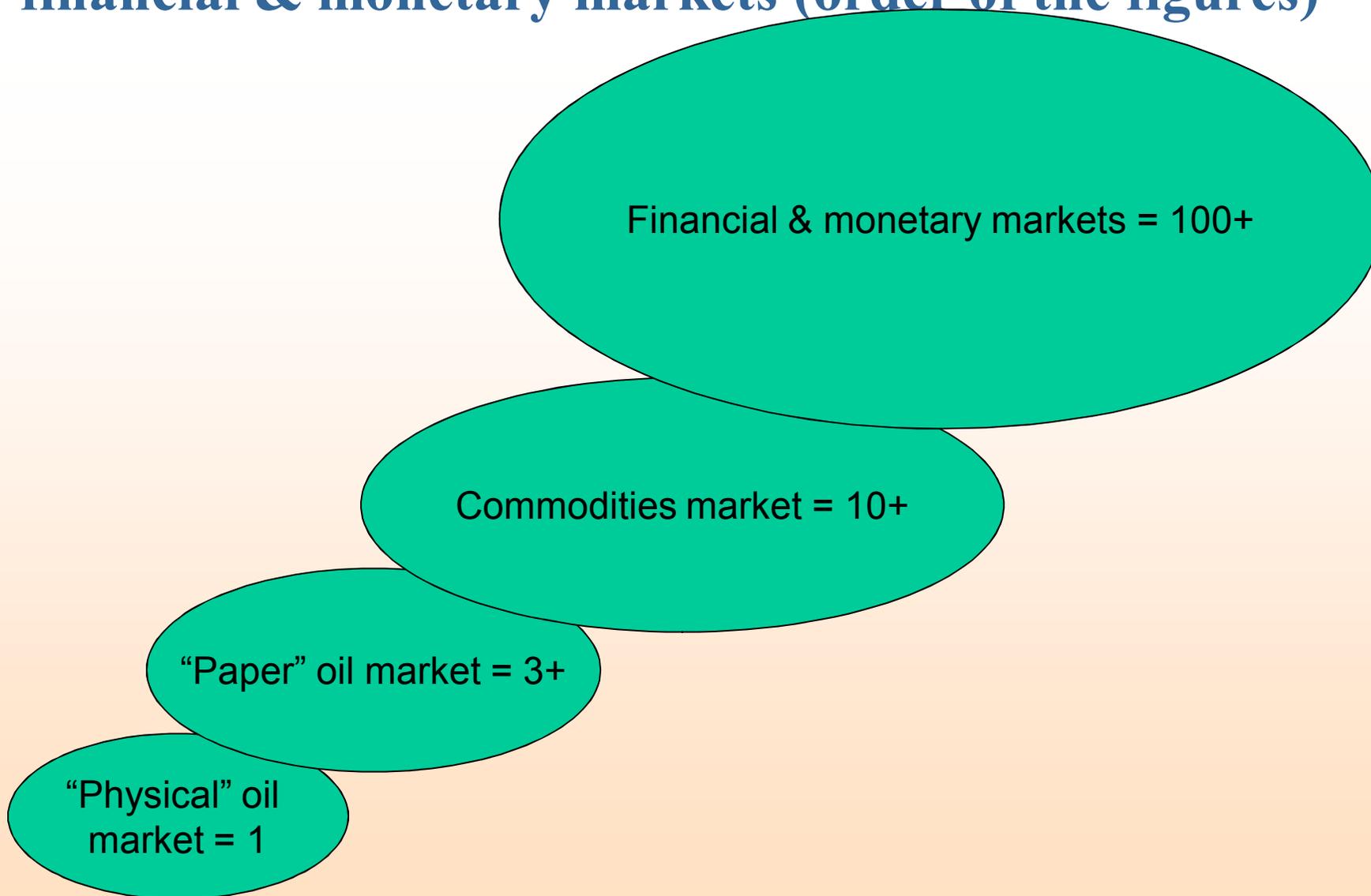
Nymex WTI forward curves



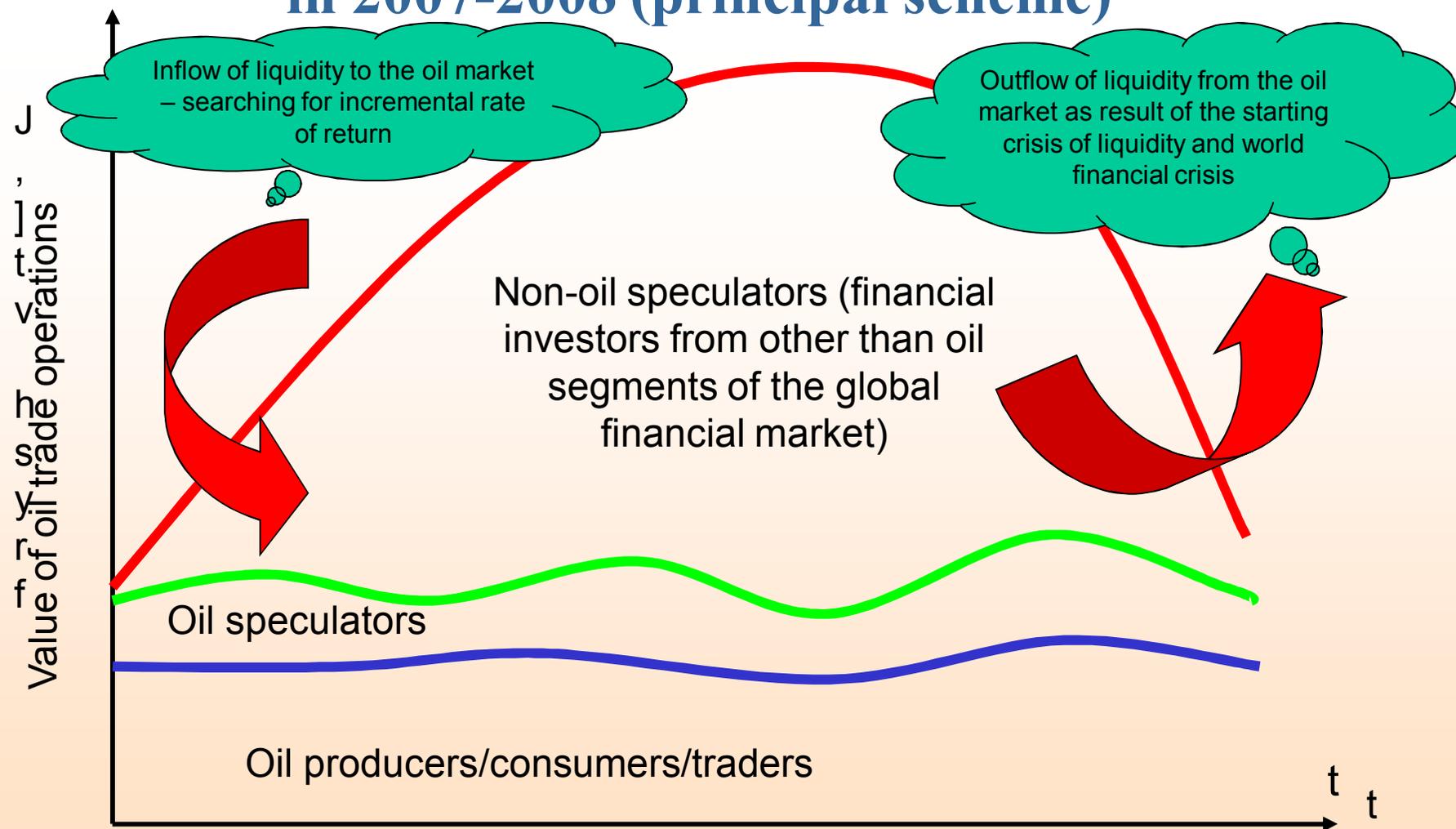
Range of fluctuations = +/- 50% within one year => example of quick opposite-directed radical fluctuations in price expectations for coming 2 year-period => inappropriate for long-term capital-intensive investment decision-taking in oil industry

Source: Deutsche Bank, Global Commodities Daily, 4 December 2008, p.1

Correlation of the scales of oil, commodities and financial & monetary markets (order of the figures)



Role of non-oil speculators (global “financial investors”) in forming “price bubble” at the global oil market in 2007-2008 (principal scheme)



UNCTAD: 2009 – return of speculators

- Price increase at commodities' & stock exchanges is due to return of speculators
- Price increase at commodities marketplaces can be an element of the game: trade in commodities is oversupplied with financial products and “index traders”, who prefer long positions, dictate long-term price increase
- Average size of positions of such traders is so big that it can influence significantly on prices (price levels) and create speculative bubbles
- Large proportion of liquidity is invested in financial instruments, which results in that bubbles are inflated at financial and commodities' markets
- Real sector can not absorb such huge amount of money

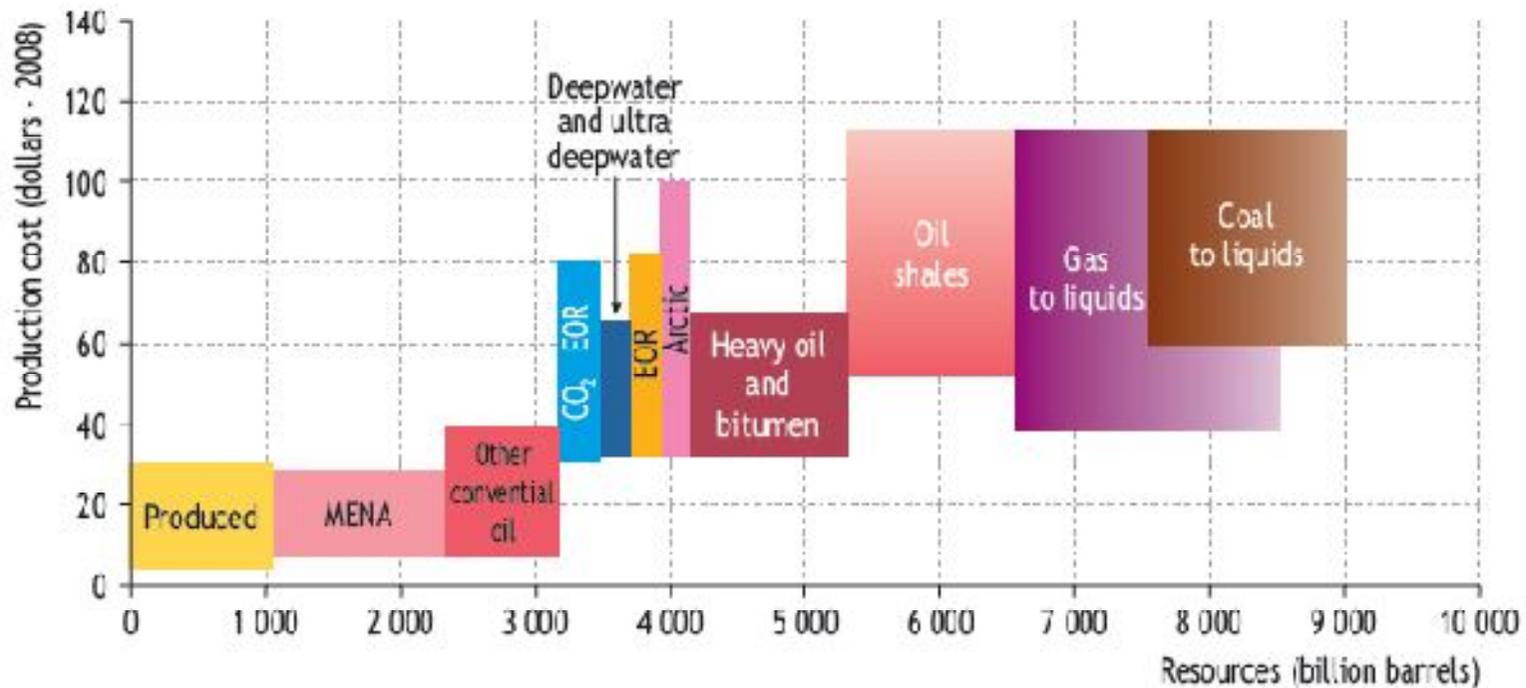
Source: UNCTAD Trade & Development Report 2009 (translated from: «Ведомости», 11.09.2009)

Oil pricing systems: what instead of exchange?

- Exchange quotations:
 - Breaking-off price from (production) cost
 - Transparent result, but “black box” of decision taking, possibility to manipulate prices (exchange quotations) since they based on perceptions/expectations of players in marketplace
- Cost-plus:
 - Evaluation (methodology) of marginal costs of energies that can be consumed within one type/category of end-use
- Replacement costs (alternative energies):
 - System evaluation (methodology) of marginal costs within whole spectrum of competing energies mutually replaceable in end-use
- => substitute to exchange = adequate evaluation of marginal costs of alternative energies (liquid fuels) => how to calculate them?

Long-term oil-supply cost curve from conventional & unconventional resources (IEA assessment based on 580 major fields)

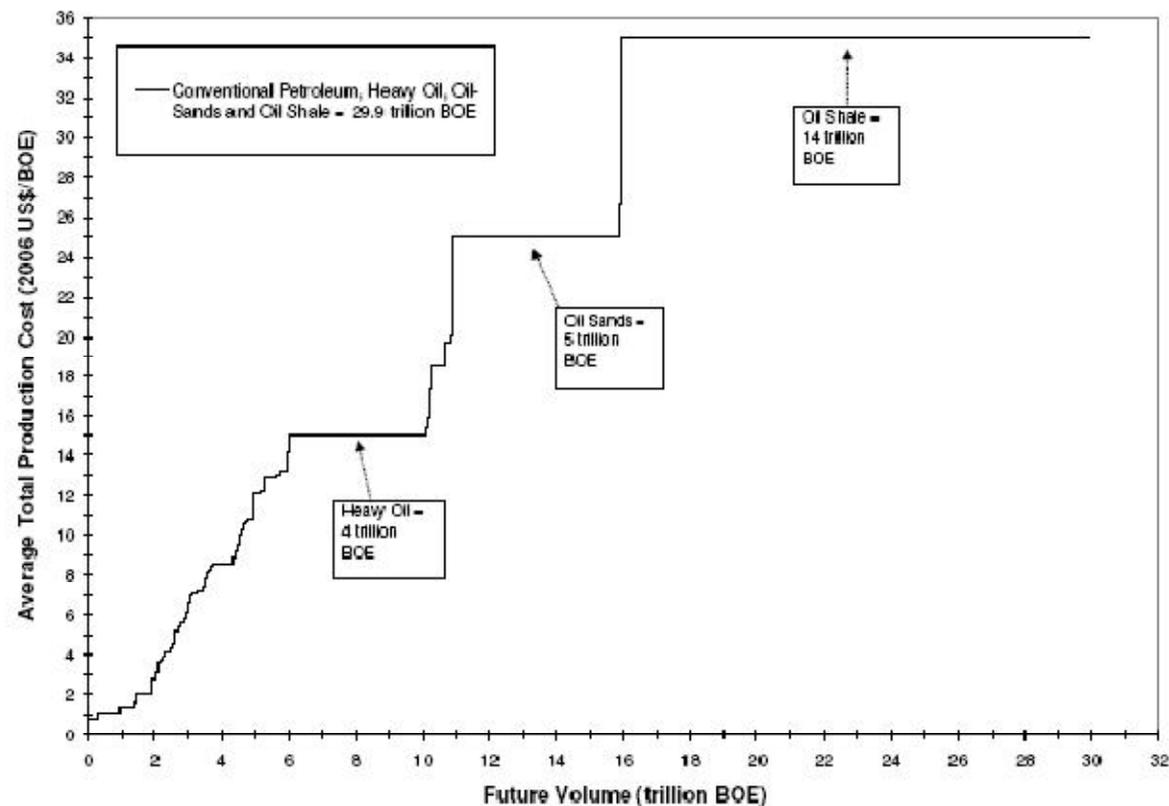
Figure 9.10 • Long-term oil-supply cost curve



Source: International Energy Agency. World Energy Outlook 2008, p.218

Global cumulative long-run availability curve for conventional petroleum and unconventional sources of liquids including heavy oil, oil sands and oil shale (CSM/PUCC/IASA assessment based on 937 petroleum provinces)

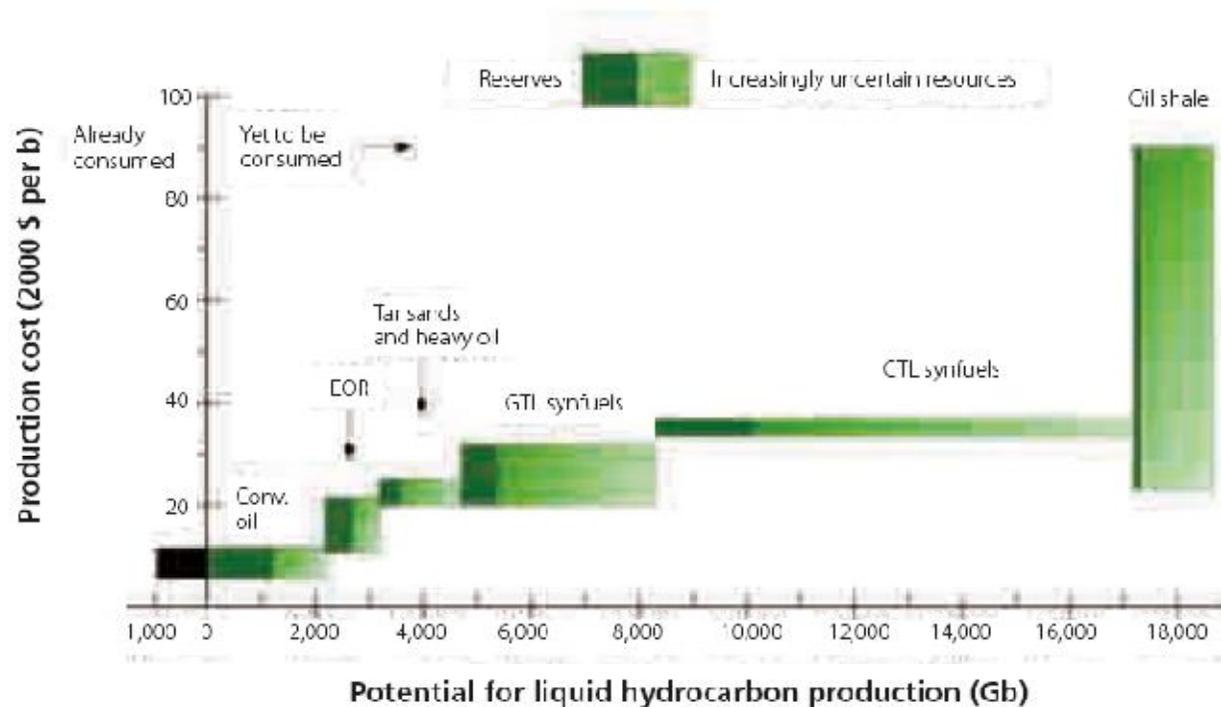
Figure 6. Global Cumulative Long Run Availability Curve for Conventional Petroleum and Unconventional Sources of Liquids Including Heavy Oil, Oil Sands and Oil Shale



Source: R.F.Aguilera, R.G.Eggert, G.Lagos C.C., J.E.Tilton. Depletion and the Future Availability of Petroleum Resources. Colorado School of Mines/Pontificia Universidad Catolica de Chile. Version 20 May, 2008, p.20.

Global supply-cost curve of potential liquid hydrocarbon fuels

Figure 1.2 The global resource base of potential liquid hydrocarbon fuels



Source: Farrell and Brandt (2006).

Note: Global resources of fossil hydrocarbons that could be converted to liquid fuels. EOR is enhanced oil recovery, GTL and CTL are gas- and coal-derived synthetic liquid fuels. The CTL and GTL quantities are theoretical maxima because they assume all gas and coal are used as feedstock for liquid fuels and none for other purposes. The lightly shaded portions of the graph represent less certain resources. Results are based on conversion efficiencies of current technologies available in the open literature. Gas hydrates are ignored due to a lack of reliable data.

Источник: S.Sorrell, J.Speirs, R.Bentley, A.Brandt, R.Miller. Global Oil Depletion: An Assessment of the Evidence for a Near-Term Peak in Global Oil Production, UK Energy Research Center, August 2009, p.3

Where is the bottom of oil price fall?

“Fair (justified)” bottom of oil price fall (mean for the pay-back period of upstream projects) – nor less than long-term (marginal) production costs for current and future reserves

**IEA forecast
(2008):**

- **110 \$/bbl.
(\$2008)**
- through 580 major fields
- **10 trln. bbl**

**CSM/PUCC/IIASA
forecast (2008):**

- **35 \$/bbl. (\$2006)**
- through 937 discovered & undiscovered oil & gas provinces
- **32 trln. bbl**

**Farrel &
Brandt**

**forecast
(2006):**

- **90 \$/bbl
(\$2000)**
- **19 trln. bbl**

Mutually exclusive results ?

Factors influencing level of future marginal costs

- Volumes of current and prospective reserves (not resources!) – to overflow the future demand levels =>
 - Demand forecast
 - + “safety pillow”
 - => not all known current marginal reserves need to be taken into consideration
- Post-1970s general trend = growing marginal reserves worldwide => more reserves developed – higher marginal costs
- Effect of “learning curve” for marginal costs + correlation between “evolutionary” and “revolutionary” scientific & technical progress (STP)
=> correlation between STP & “natural” factors of marginal costs trend
=> slowing of growth or decline of marginal costs
- Economic evaluation of reserves => cost of (project) financing
- Access to resources of different cost categories at supply curve
- Marginal costs vs “fair (justified)” price (i.e. incl. taxes + royalties + effect of “replacement costs”)

Marginal costs evaluation: consequences

Lack of valid marginal costs evaluation => :

- Absence of justified price & investment benchmarks =>
- Depression of investment activity =>
- Diminishment of supply / increased gap between supply & demand =>
- Price increase =>
- Instrument of influence on energy policy of states

**Thank you for your
attention !**

www.konoplyanik.ru

andrey.konoplyanik@gpb-ngs.ru

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