

“Fair price” of energy resources: whether it does/can exist in international energy?

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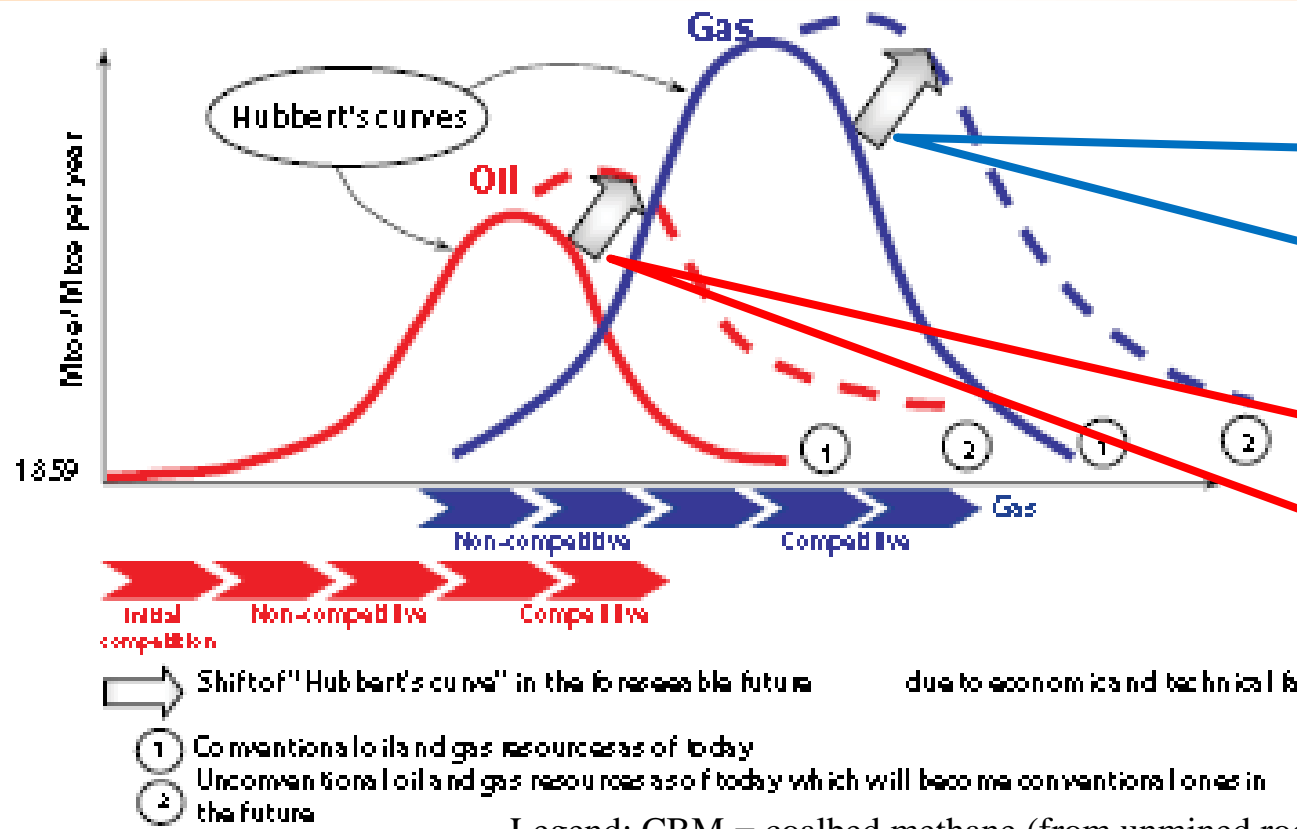
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- 1) **General principles**
- 2) Global oil market
- 3) Gas market – Continental Europe

Price vs pricing

- Price level = f (pricing mechanism)
- No price without pricing mechanism
- Today:
 - global oil market exists,
 - no global gas market exists - yet (but LNG will rather soon unite regional pipeline gas markets into global gas market)
- No universal “fair price” concept:
 - nor for all market players,
 - nor for all market stages,
 - nor for all markets (regional, individual energies, etc.)
- No “fair price” - but justified economic limits of price fluctuations within different markets at different stages of their development

Oil & Gas Hubbert's curves: upward-right supply peaks steady movements



Deep horizons, deep offshore, Arctic, shale gas, CBM, CSM, CMM, tight gas, gas hydrates, etc...

Deep horizons, deep offshore, Arctic, heavy oil, shale oil, tar sands, GTL, CTL, XTL, etc...

Legend: CBM = coalbed methane (from unmined rock), CSM = coalseam methane (from active coal mines), CMM = coalmine methane (from abandoned coal mines), GTL = gas-to-liquids, CTL = coal-to-liquids, XTL = biomass to liquids

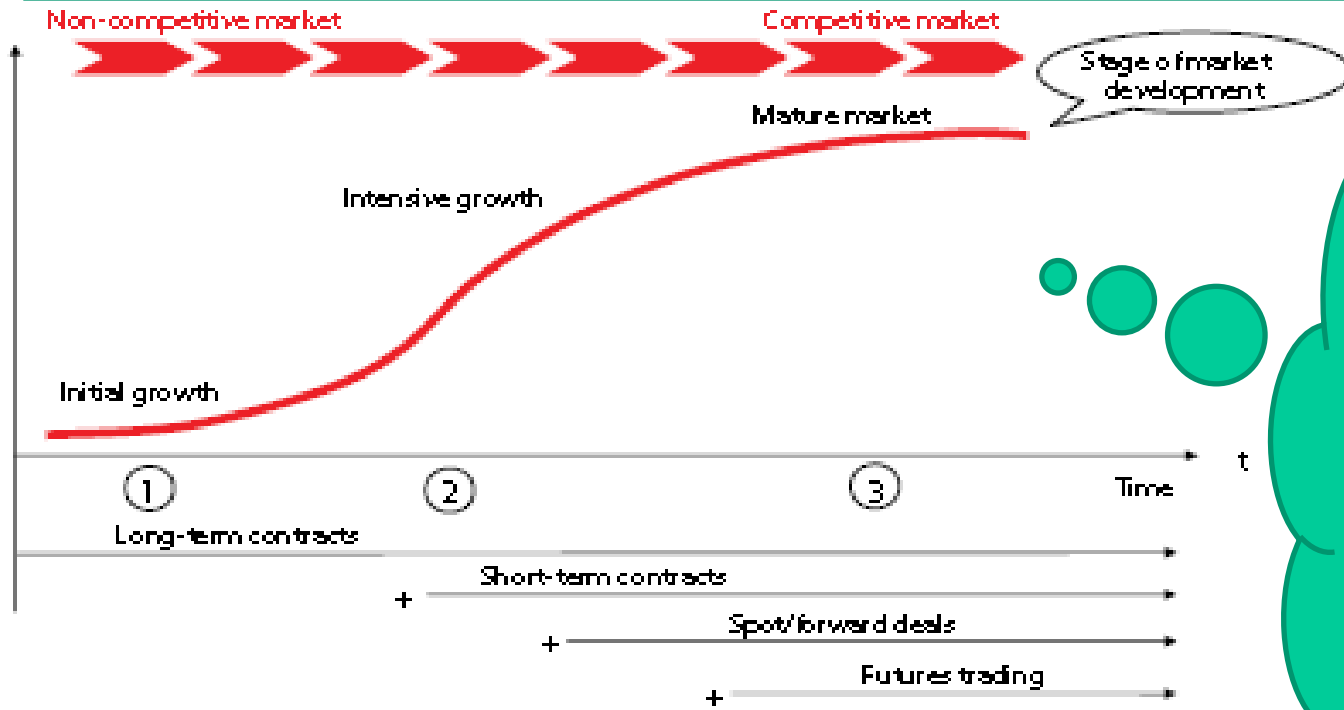
Source: based on Andrei Konoplyanik

We will not reach Hubbert's peaks in O&G at least within two investment cycles (first - based on currently commercialized technologies, second – based on those yet not commercialized technologies that are currently at R&D stage)

Evolution of oil & gas markets: correlation of development stages, contractual structures, pricing mechanisms on the left (upward-growing) wing of Hubbert's curve

Paper energy (oil, gas) market(s)

Physical energy (oil, gas) market(s)



- ① Pricing mechanism's development stages:
 - cost-plus
 - escalation formulas (based on alternative fuels prices)
 - based on futures prices (commodities markets)

Through two investment cycles we will leave within left (upward-growing) wing of Hubbert's O&G curves

Source: Based on Andrei Konoplyanik

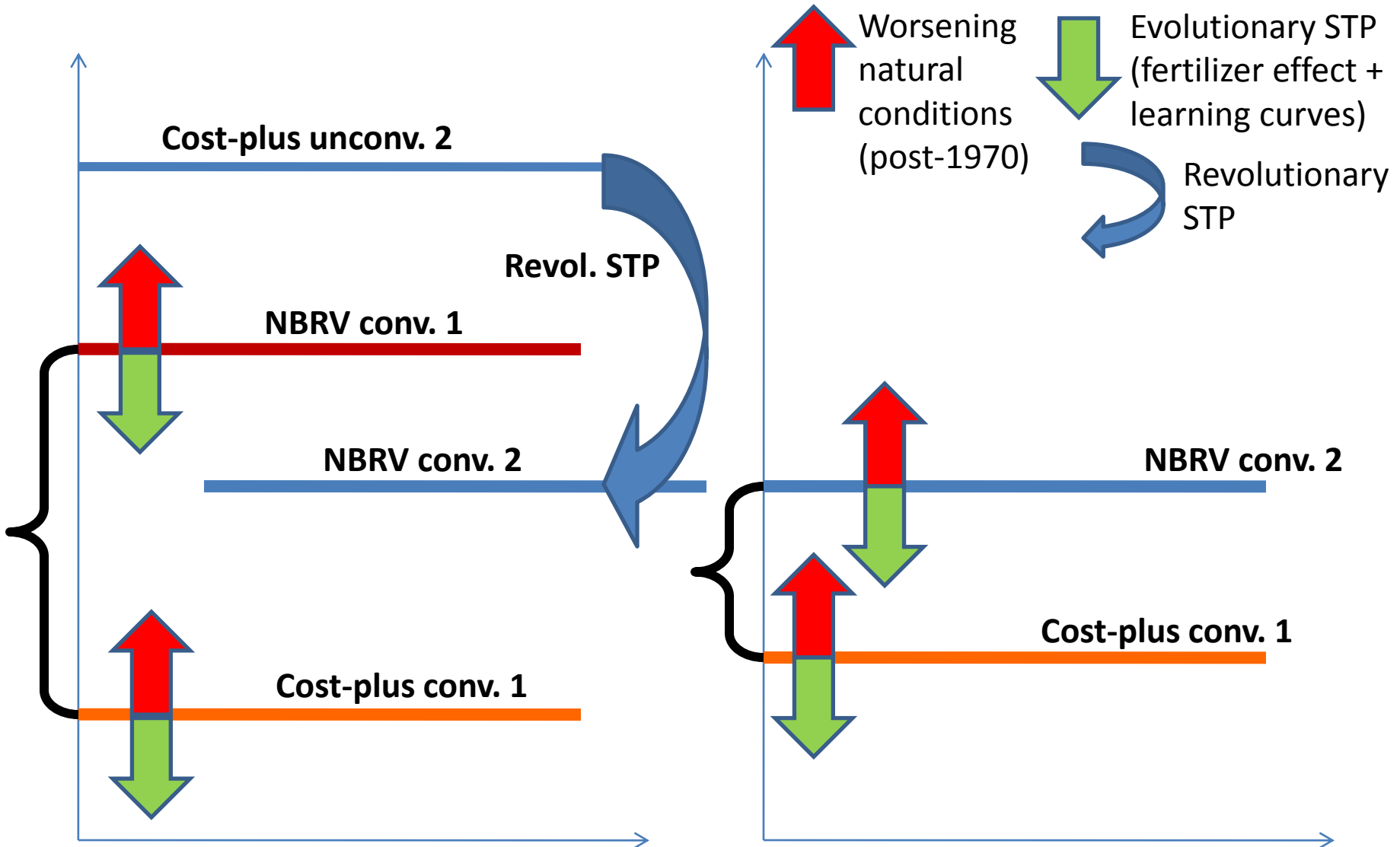
Three major pricing mechanisms in international energy

- **Cost-plus (net-forward):** price linked to cost of energy production & delivery/transportation (incl. ROR) to the consumer/delivery point => utilized at non-competitive markets of physical energy => low benchmark price level acceptable for producer (producer's "fair price") => investment price
- **(Net-back) replacement value:** price linked (with discount) to price of competing energies at the end-user => utilized at competitive markets of physical energy => upper benchmark price level acceptable for consumer (consumer's "fair price") => investment price
- **Spot/exchange:** equilibrium supply/demand price at competitive markets of physical (spot/forward) and/or paper (financial derivatives linked to futures contracts) energy => trade price => trader's/speculator's "fair price"

Conventional vs unconventional energies & cost-plus vs NBRV (1)

- Usually cost-plus of conventional energies is *below* NBRV of conventional energies
- Cost-plus of unconventional energies usually *exceeds* NBRV of conventional energies
- Revolutionary STP:
 - Converts unconventional energies into conventional ones,
 - downgrades cost-plus of former unconventional energies (now conventional ones) below NBRV1 to new NBRV2 (see next slide)

Conventional vs unconventional energies & cost-plus vs NBRV (2)



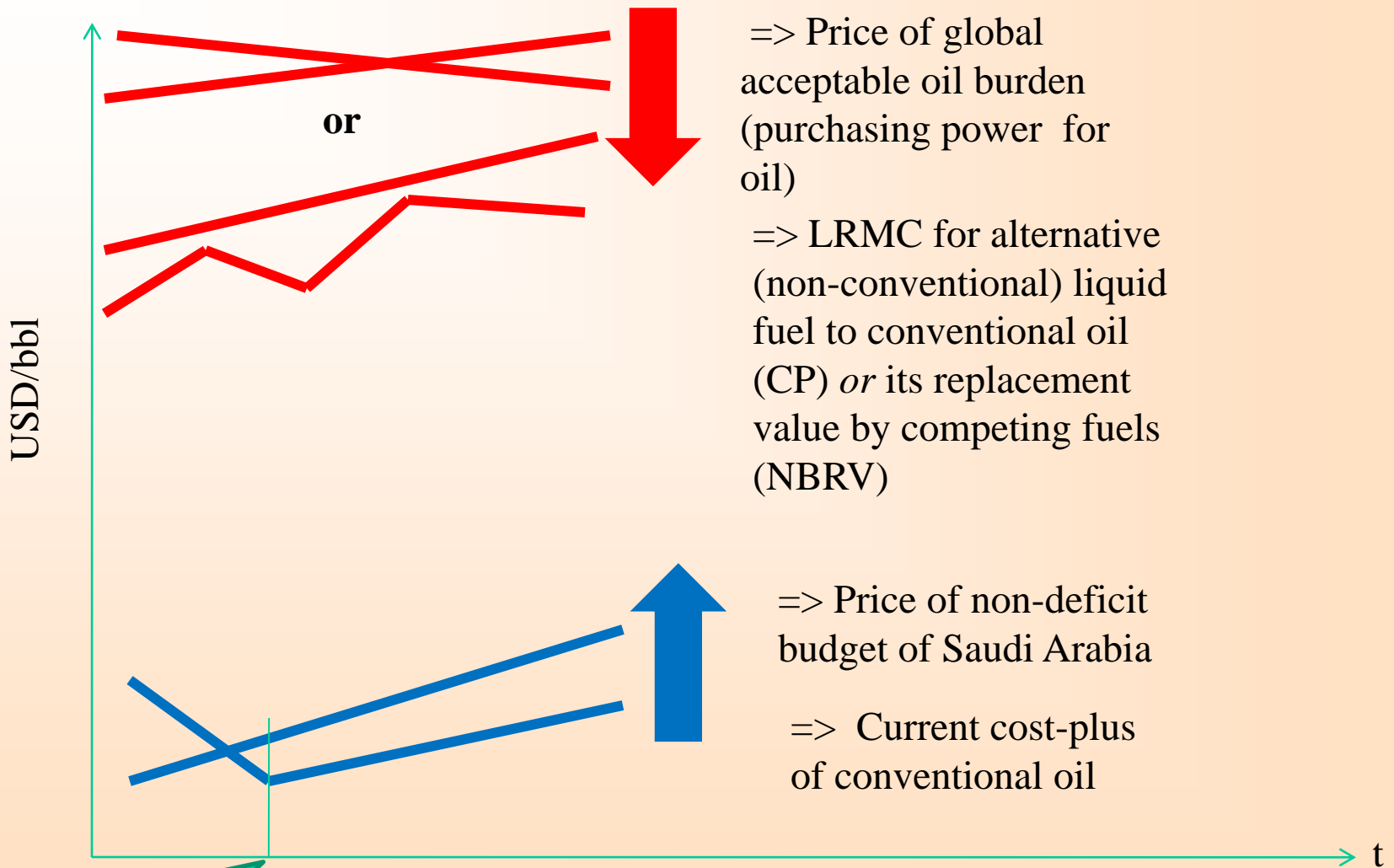
Market stages, pricing mechanisms & contractual structures

| Energy market development stage | Physical energy market | Paper energy market |
|---|------------------------------------|------------------------------------|
| Initial growth => non-competitive market of physical energy, no paper energy market possible | Cost-plus (LTC) | - |
| Intensive growth => competitive market of physical energy, no paper energy market available | + Net-back replacement value (LTC) | - |
| Mature market => competitive markets of both physical & paper energy | + Spot (OTC) | + Futures-options (exchange & OTC) |

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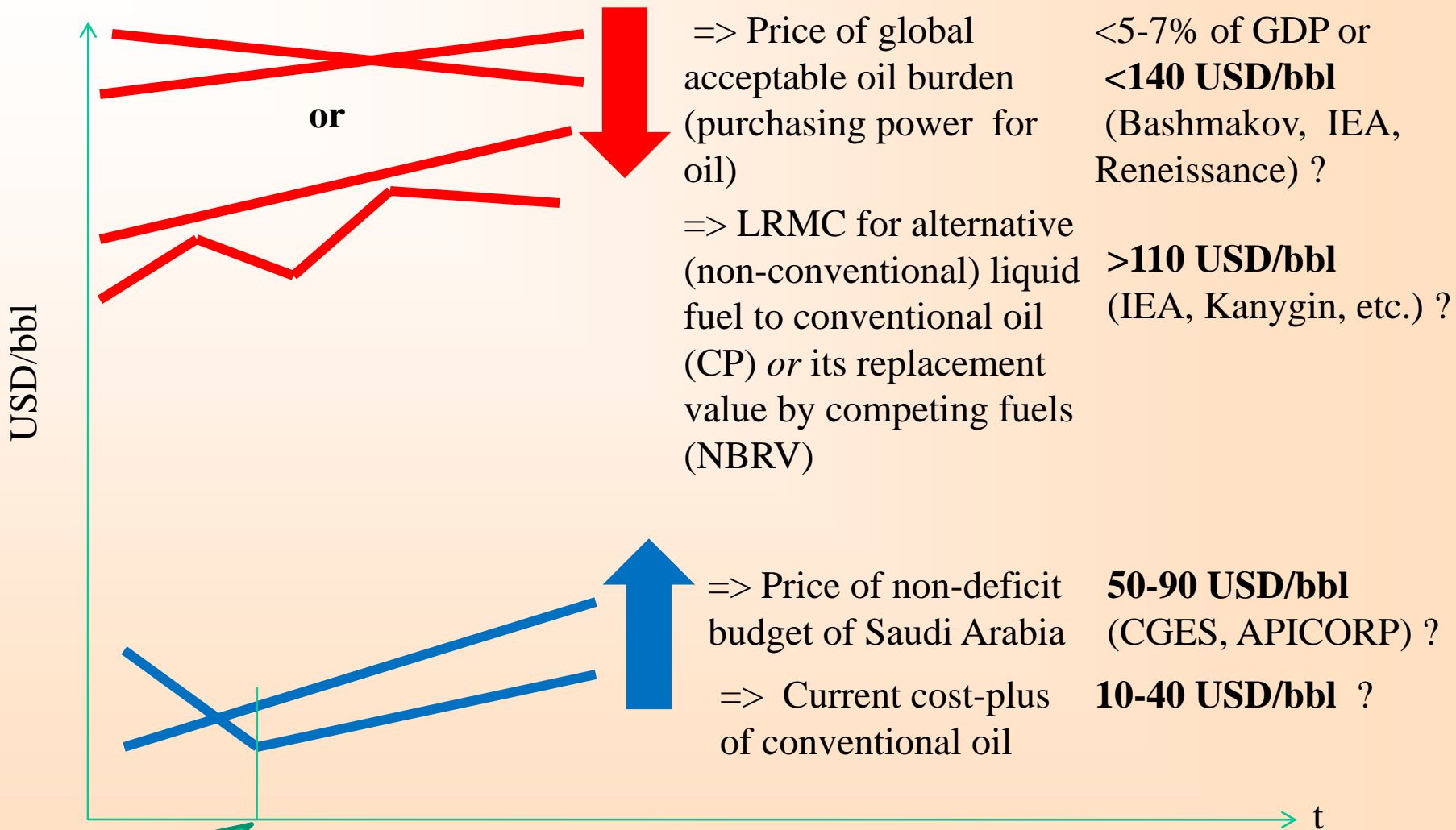
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Upper & lower economic limits for oil price fluctuations: then & now. The gap is diminishing?



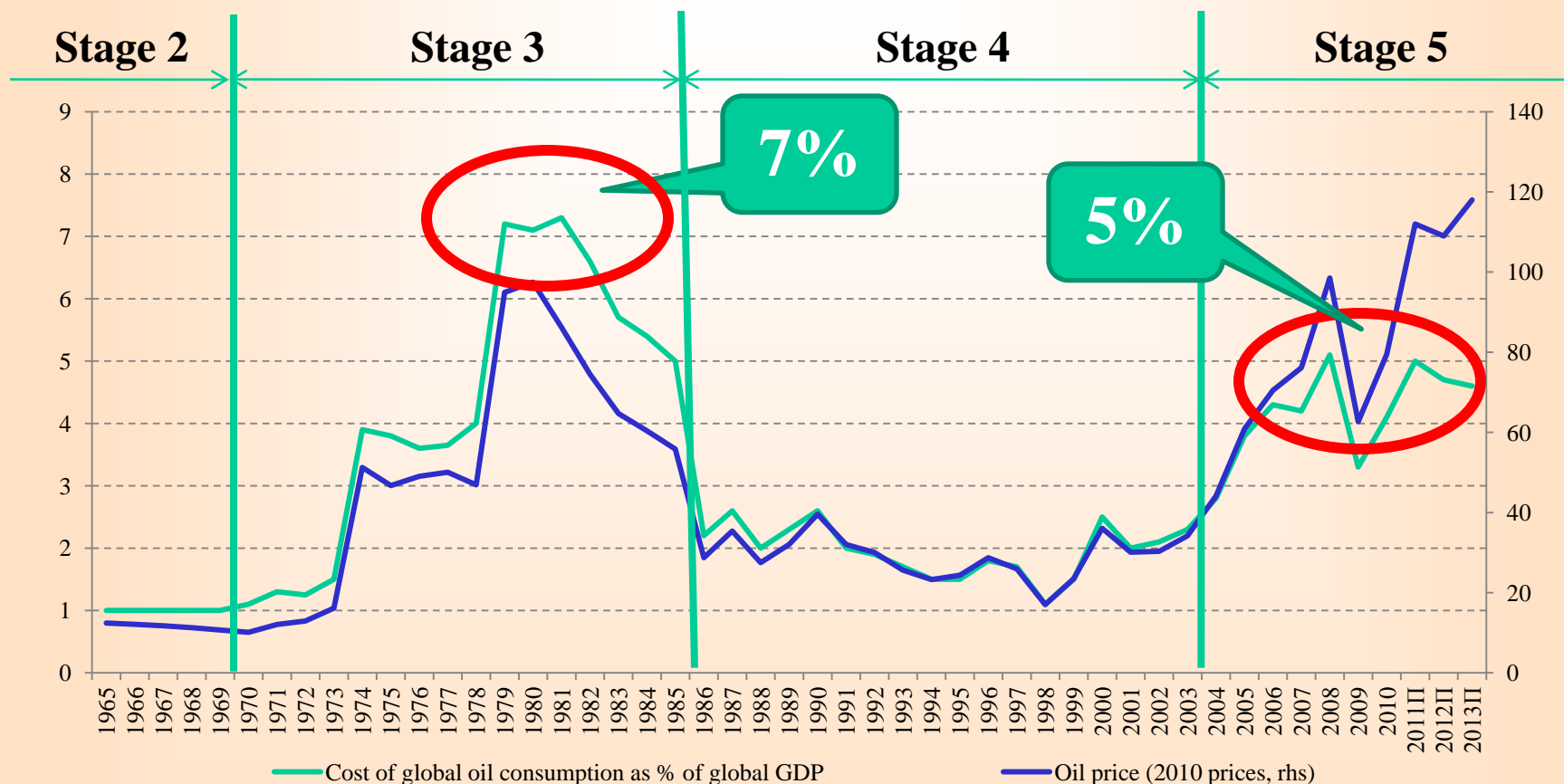
Edge of 1960's/1970's
(Chevalier)

Upper & lower economic limits for oil price fluctuations: then & now. The gap is diminishing?



Edge of 1960's/1970's
(Chevalier)

Oil price (2010 prices) vs cost of global oil consumption as % of global GDP

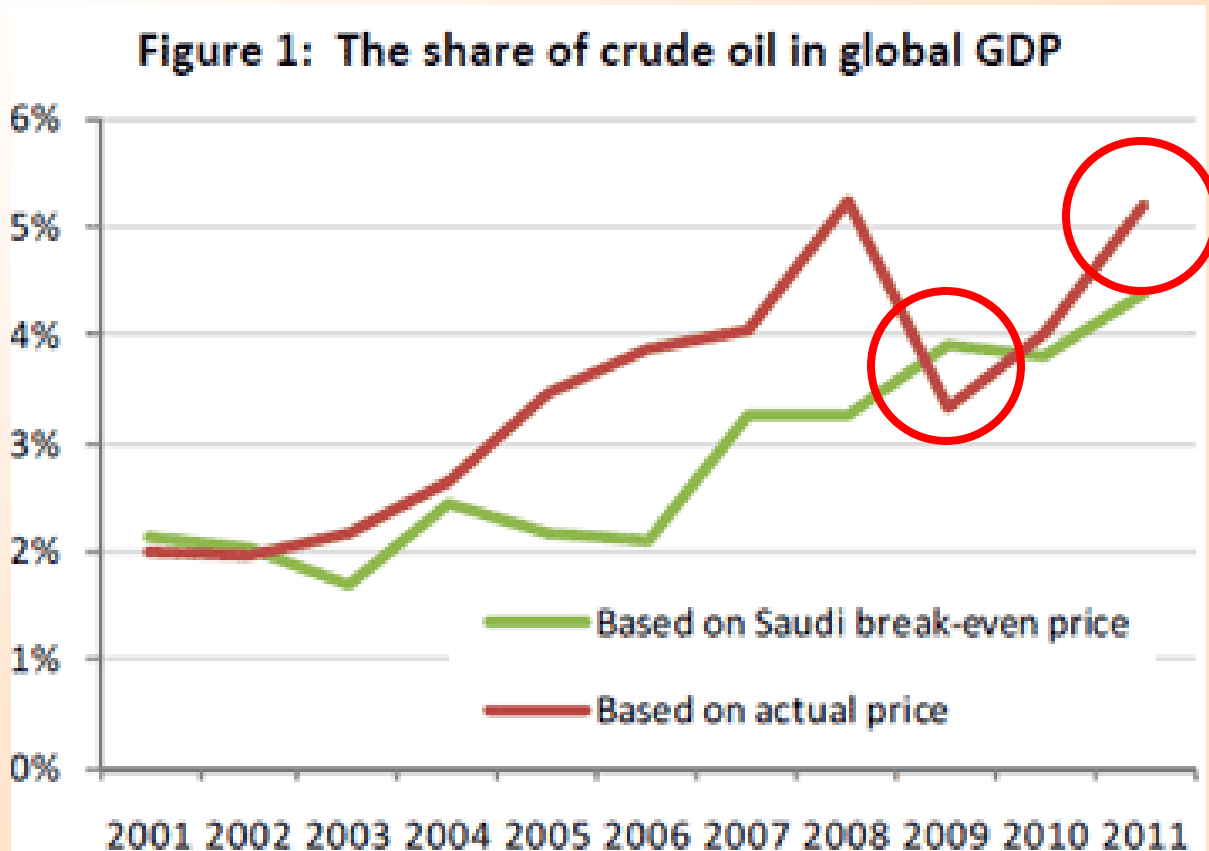


(1) Stages 2-5 – pricing stages in international oil markets development

Source of graph: BP, Deutsche Bank

Source: А.Конопляник. В поисках «справедливости». Существует ли обоснованная цена на «черное золото» и каков может быть ее уровень? – «Нефть России», 2011, № 10, с. 42-45; № 11, с. 11-16.

Share of crude oil in global GDP based on actual price & break-even price of Saudi Arabia non-deficit budget (acc. to CGES calculations)



Source: *Arab Spring will impact oil prices in the long term*. Center for Global Energy Studies (CGES), Monthly Oil Report, August 2011.

CGES estimate of OPEC basket oil price needed to cover Saudi Arabia non-deficit budget, USD/bbl

| | 2010 | 2011 |
|---|------|----------|
| ... to cover expected general expenditure and debt interest (2010 – 141 bln USD, 2011 - ...) | 61 | 53 |
| ... as above plus capital expenditures (2010 - 20 bln USD; 2011 - 70 bln USD) | 71 | 79 |
| ... all of the above plus contingency reserve (2010 - 5 bln USD; 2011 - 10 bln USD) | 74 | 83 (90*) |
| Oil production level, mbd | 8.3 | 9.1 |



(*) Effect of Arab Spring, (**) excluding non-oil & investment income (appr. 15 bln USD/2010)

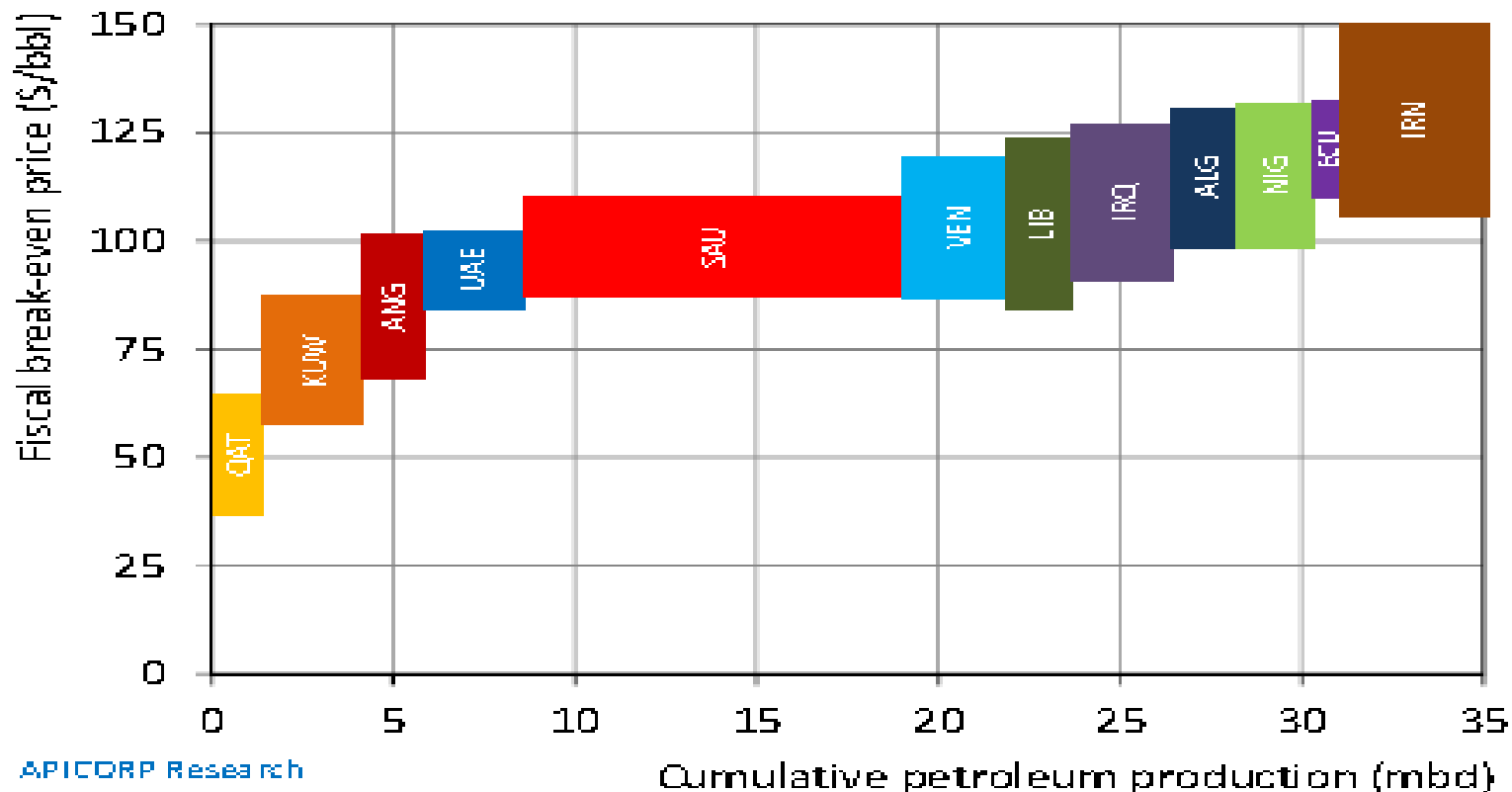
Based on: Lee Julian (CGES). Changes in Oil Prices and the Impact on Gas. Argus European Natural Gas/LNG Trading Conference, London, 6-7th October 2010; Drollas, Leo. 2011.

Saudi Arabia's target oil price in 2011. Center for Global Energy Studies (CGES), Global Oil Insight, March 2011.

Ali Aissaoui (APICORP) fiscal cost curve for OPEC member states, 2012

Figure 2: Fiscal Cost Curve for 2012

[Bar width: country's production; bar heights: price estimate ranges]

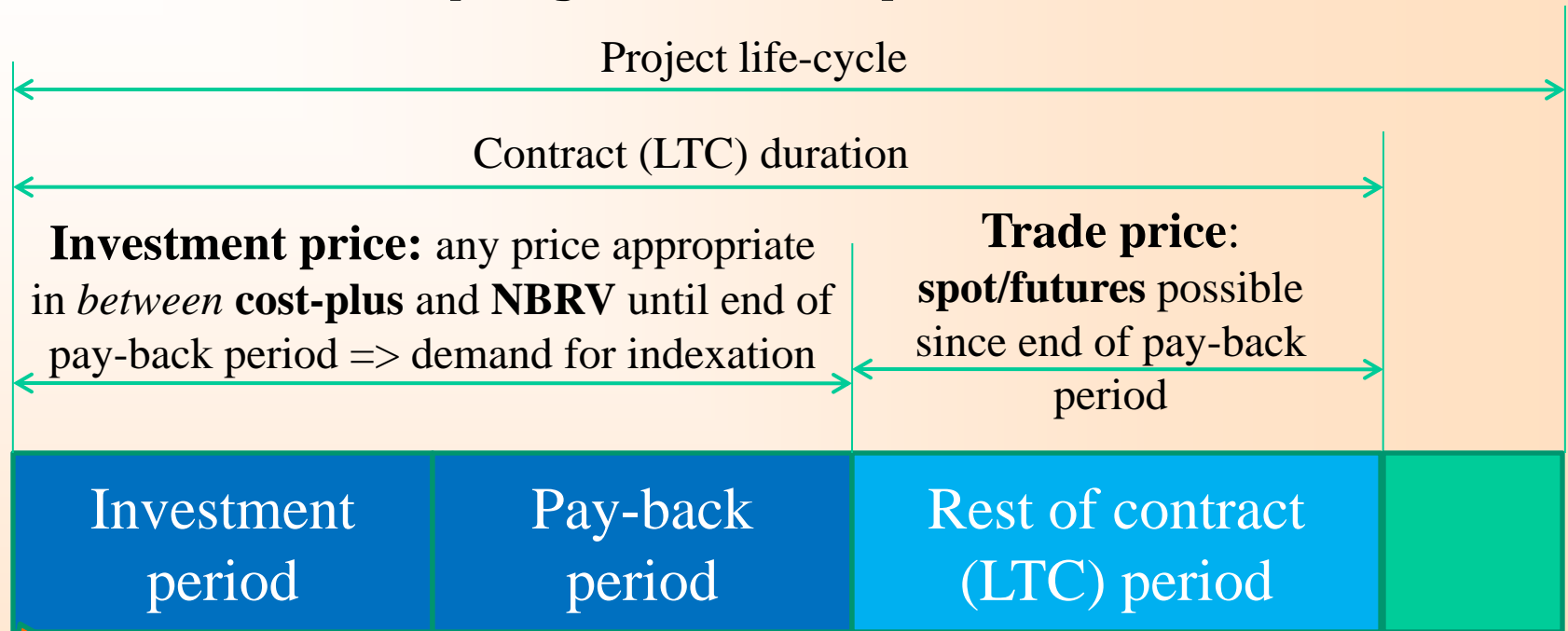


Source: Ali Aissaoui. "Fiscal Break-Even Price Revisited: What More Could They Tell Us About OPEC Policy Intent". APICORP Research, Economic Commentary, vol. 7, N 8-9, August-September 2012

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Economic preconditions for different pricing mechanisms at different stages of investment project life-cycle

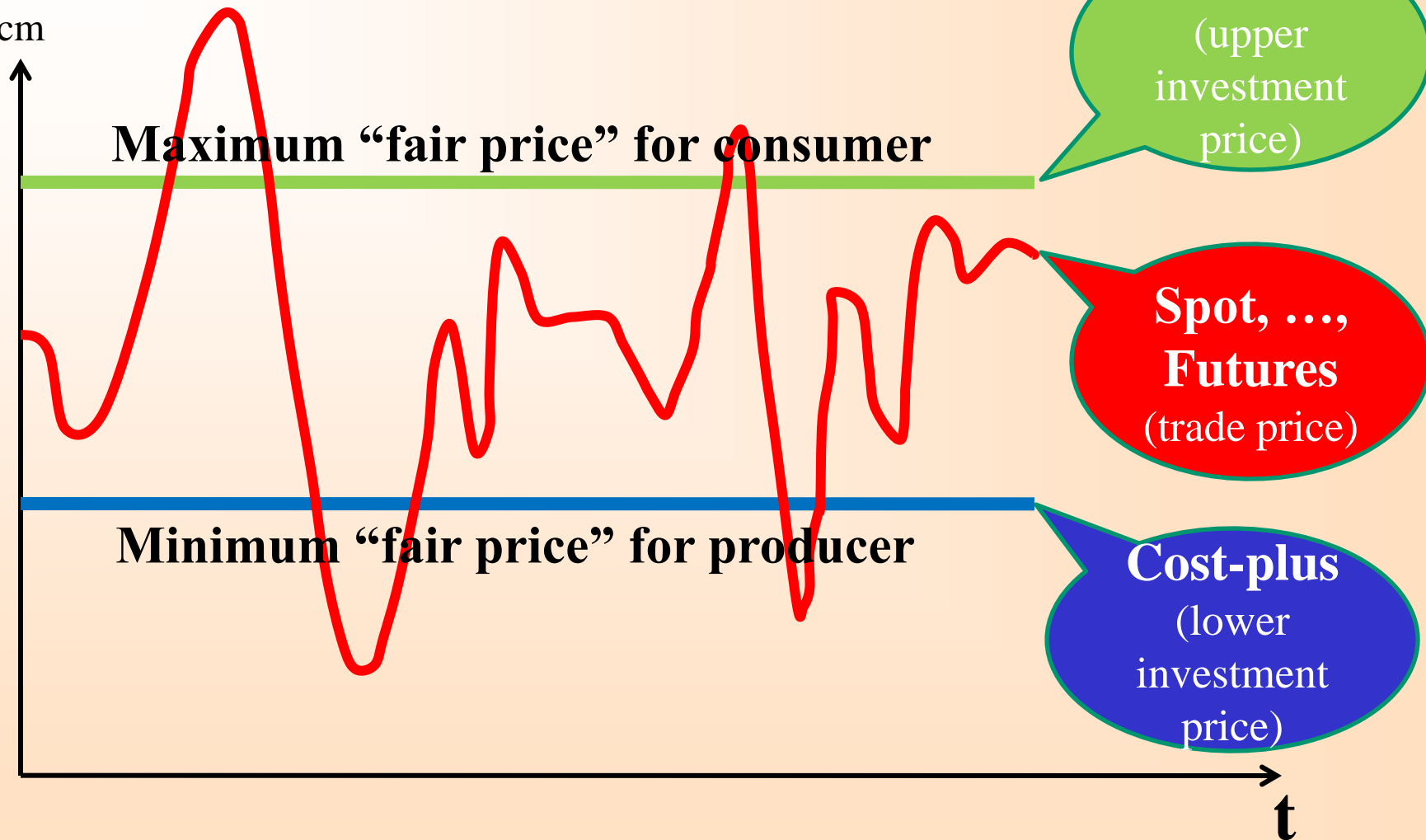


Energy resource enters the market; upfront CAPEX & OPEX assessment for acceptable ROR; higher price needed

Energy resource is already at the market; CAPEX recouped; technological possibilities to switch between competing energies in end-use; OPEX determines benchmark price level; lower price needed to stay with acceptable ROR

S-curve approach for indexation in Continental Europe/Eurasia within contractual pricing (author's vision/proposal)

USD/bbl,
USD/mcm



**Thank you for your
attention!**

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