New metrics of primary energy prices

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PRELIMINARY COMMUNICATION

In terms of sharp drop of international oil prices in the second half of 2008 after heading skyward in the first half of 2008 following continual growth since 2005, while at the same time certain parity among energy prices was disrupted, the author of this article tried to investigate key factors that influenced oil and gas industry and to answer the question what would be a »fair» price of crude oil and what would be the correlation between crude oil and natural gas prices in international market. The economic crises that spread around the world in the second half of 2008, partly as a result of over-consumption, induced many changes in world economy, including changes in price relations.

During the research of key trends in oil industry, the author perceived a number of discrepancies among notions, judgements, even ideas, from peak oil concept - despite growing prices and news about new reserves, to declarative, albeit not confirmed, discordance between crude oil and natural gas prices.

In the conclusion of this paper, based on comparison of different indicators, it is quoted: "Determination of boundaries within which certain phenomenon can move, can be done only through complex analyses of all relevant factors that impact that phenomenon". Preparation of this study was challenged by frequently superfluous and even unprofessional projections of possible future movements of oil and gas prices.

Key words: economic liberalism, prices, primary energy, crude oil, natural gas, oil reserves

1. INTRODUCTION

Collapse of global economic system, the signs of which were made known even beforehand, had significant impact on a number of sectors of economy, it induced various changes and set new relations in overall economy, and logically in individual sectors, causing multiple interactions among the them, but also within one and the same sector of economy.

Energy sector is not immune to these changes, including the changes that affected relations within the sector.

Hence, yesterday's assumptions about global energy and its growth rates became quite unreliable, because general views about steady development, but also in regard to global crises, have changed. Consequently, the assumptions about value of certain commodities and prices of certain goods (and services) have to change as well.

In this paper the author tends to predict in one segment, i.e. in the area of oil and gas price movements, what will be the future trend, by abandoning current extrapolation methods, however without deeper analyses of global socio-economic phenomena (among which is a view about collapse of the so called capitalistic liberalism of the US type, including strengthening of state interventionism – a term that substitutes unpopular term «state capitalism). It is to be noted that price of energy (compared to other prices) is not primary, but consequential category, and is certainly not based on demand and supply movements only, as some may naively believe, but is influenced by far more complex mechanisms.

2. GLOBAL PRICE CHANGES AND RELATIONS AMONG THEM

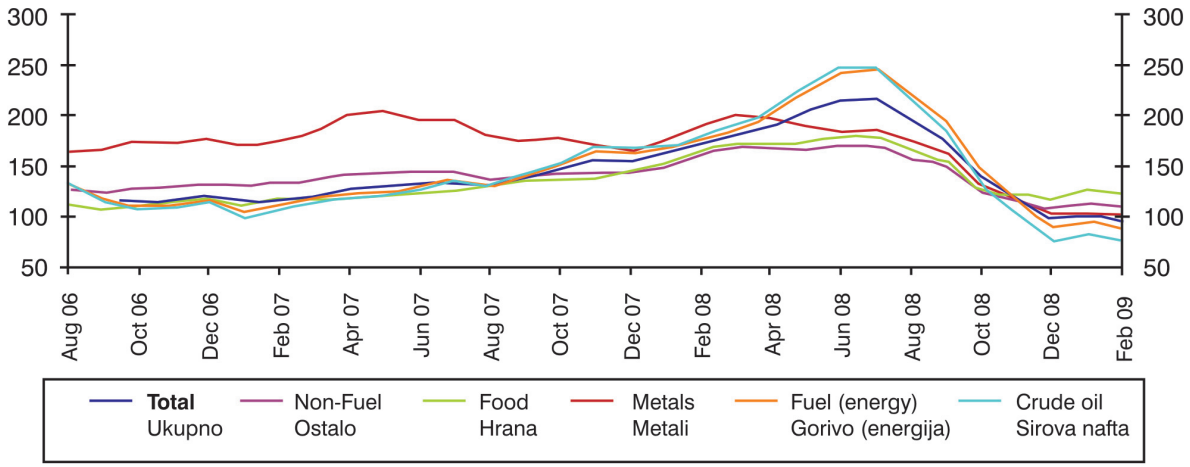
For a long time OPEC has monitored and quoted changes in basic commodity prices in one of its publications15, with reference to IMF and World Bank Index, and recent quotations of these prices (by mid March), which represent key data reflecting the status of world economy, are quoted in this paper in slightly shortened form:

	IX.08 / XI.07	XII.08 / XII.07	II.09 / II.08	II.09 / I.09
Commodity prices	-27.0%	-36.4%	-43.0%	-4.3%
- non-fuel	-19.5	-19.5	-31.6	-2.4
- fuel	-30.8	-42.7	-49.1	-5.6
- crude oil	-40.8	-53.6	-55.5	-4.9
- natural gas	-5.8	-18.1	-47.5[a]	-14.3[a]
- coal	-9.0	13.6	-27.4[b]	-1.1[b]
- food	-11.9	-18.4	-24.6	-2.4
- corn	-4.0	-40.3	-25.8	-5.8
- wheat	-29.5	-23.2	-47.1	-6.1
- sugar	-25.8	-1.7	-26.6	-0.2
- indust. metals	-32.8	-36.4	-46.9	-3.0
- aluminium	-25.9	-36.9	-52.0	-5.8
- copper	-46.4	-53.2	-58.1	-2.1

[a] natural gas USA - [b] South African coal

Main conclusion that can be drawn from the above data is that prices of basic commodities underwent significant changes and that until early March 2009 they have not stabilized.

Figure 1[15] below illustrates changes of commodity prices in the period from August 2006 to February 2008. It is to be noted that the condensed data represented in form of curves in the figure do not reveal high oscillations of prices at first glance, neither provide any indication of



Commodity Price Index, 2005 = 100
Indeks cijena roba, 2005. = 100

Total	**-**	**Includes both fuel and non-fuel**
Ukupno	-	Uključuje gorivo i ostalo
Non-fuel	**-**	**Includes food and beverages and industrial inputs**
Ostalo	-	Uključuje hranu i pića i industrijski input
Food	**-**	**Includes cereal, vegetable oils, meat, seafood, sugar, bananas and oranges**
Hrana	-	Uključuje žitarice, biljna ulja, meso, plodove mora, šećer, banane i naranče
Metals	**-**	**Includes copper, aluminium, iron ore, tin, nickel, zinc, lead and uranium**
Metali	-	Uključuje bakar, aluminij, željeznu rudu, kositar, nikal, cink, olovo i uran
Fuel (energy)	**-**	**Includes both fuel and non-fuel**
Gorivo (energija)	-	Uključuje sirovu naftu (petrolej), prirodni plin i ugljen
Crude oil	**-**	**Is the simple average of three spot prices: Dated Brent, West Texas Intermediate and Dubai Fateh**
Sirova nafta	-	Prosjek tri trenutačne cijene: Dated Brent, West Texas Intermediate and Dubai Fateh

Fig. 1. Changes in prices of basic commodities in the period from August 2006 to February 2008
Sl. 1. Promjene cijena temeljnih proizvoda u razdoblju od kolovoza 2006. do veljače 2008. godine

collapse of global economy, but price movements expressed in numbers provide more clear picture.

However, for many observers, particularly energy sector analysts, the most interesting is the change of primary energy prices.

Former, relatively stable relation among primary energy sources based on equal calorific value, was abandoned some time ago (changes accelerated after 2004). Changed relations between prices of energy sources (value too?) over the last twelve years are presented in Figure 2.[10] We did not have access to more recent issue of the source.

Further in the paper we quote some illustrative data about indirect relations between prices of primary energy sources.

Figure 2 indicates that the correlation between crude oil and natural gas prices observed as calorific equivalent, which was previously expressed by 1 : 0.85 ratio, has been shattered. According to BP's[20] data based on European imports, in 1995 this correlation was 1 : 0.801, in 2000 1 : 0.673, and in 2006 1 : 0.822. It is obvious that this correlation has been quite unstable. The data on actual changes of crude oil prices and prices of natural gas confirm this thesis.

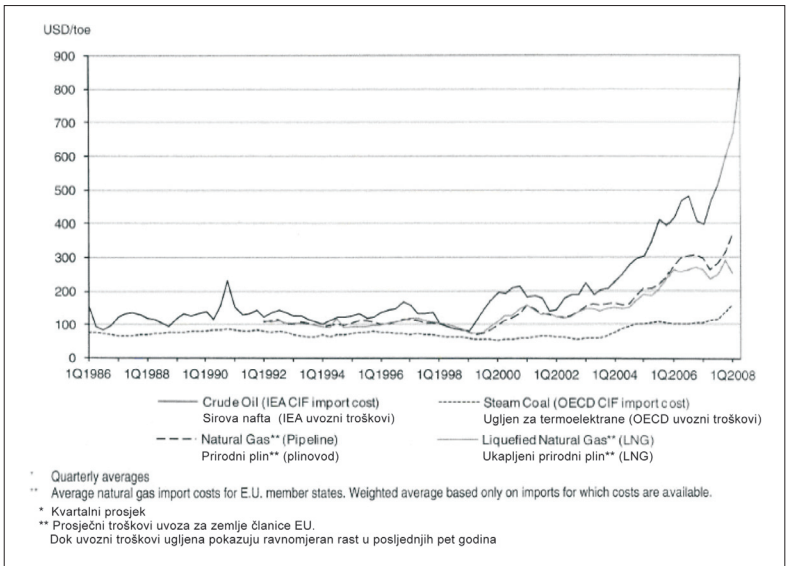


Fig. 2. Changed relations between prices of primary energy sources over the last 12 years
Sl. 2. Promjena odnosa cijena primarnih energenata u proteklih 12 godina

According to general forms of natural gas supply contracts (mainly based on quarterly change of prices) it can be concluded that natural gas prices are marked by inertia, which does not, however, exclude existence of short term correlation with crude oil prices. But it is necessary to recognize causes of this changing pattern. In the past, growing demand for natural gas was supported by lower consumption of heating oil – the process almost completed now. Currently, transportation sector is the largest consumer of oil products. This area of consumption will remain dependant predominantly on oil (for at least ten years) and not natural gas. Therefore the author is cautious in statements about the correlation between these two energy sources.

As for the price of coal, the data from specialised publications are incomplete, but according to available data partly presented here, it is obvious that prices of this energy source are not exposed to dramatic oscillations and when translated into calorific equivalent, coal prices will continue to lag behind crude oil and natural gas prices.

3. GLOBAL CHANGES IN WORLD ECONOMY

The data on changes in commodity prices quoted on the above pages, are quite indicative for a more careful observer and point to significant global changes. Value relations (as a result of unequal changes in prices) have changed dramatically, for example, decrease of metal prices was higher than in case of other commodities which points to decline of investments. Of course, other specialised sources of information, (as for example Nelson-Farrar Index[14] for oil industry) provide more analytical data.

In an effort to depict a realistic picture of the current situation, and to explain the difference between current and former assumptions, we shall take into consideration some macro-indicators.

GDP is one of the most important indices which denotes upward or downward trend in economy and it has significant impact on energy consumption, particularly on oil consumption. In the quoted source[6] (more relevant for the past period than for the future – as will be additionally substantiated by respective data) the base case scenario predicted improved energy intensity, but without concrete numerical data, only with illustrations in figures and in the manner that makes impossible methodological comparison with other data (comparison of GDP growth and energy demand growth).

Nevertheless, the basic data, both in Reference Case and in other scenarios, like High Economic Growth Case, and the other more modest scenario - Low Economic Growth Case, projections indicate lower energy demand than recorded in the former periods. Further data refer exclusively to the Reference Case.

The table below shows relevant data about movement of overall energy consumption in the world over the past, including specific data for oil and natural gas, and a comparison with former projection 2003 - 2030 according to previously quoted source. Already at first glance it can be seen that energy consumption growth rate in the latest observed period (2007 : 2006) did not support former projections about future energy consumption.

Table 2. Average growth rate of overall energy consumption and separately for oil and natural gas consumption (%)

PERIOD	WORLD	OECD	OECD EUROPE
OVERALL ENERGY			
2003 : 2002[6]	2.5	1.0	1.3
2006 : 2005[20]	2.0	-0.1	0.2
2007 : 2006[20]	2.4	0.3	-2.2 b
PROJECTION 2003 - 2030[6]	2.0	1.0	1.7
OIL			
2003 : 2002[6]	2.1	1.7	1.3
2006 : 2005[20] a	0.7	-0.9	0.3 b
2007 : 2006[20] a	1.1	-0.9	0.2 b
PROJECTION 2003 - 2030[6]	1.4	0.8	0.2
NATURAL GAS			
2003 : 2002[6]	3.2	1.2	3.5
2006 : 2005[20]	2.5	0.3	-1.4 b
2007 : 2006[20] a	3.1	3.3	-1.6 b
PROJECTION 2003 – 2030[6]	2.4	1.5	2.0

a) Only „commercial" energy
b) Europe 25

Table 1. Average annual change of GDP in selected countries in the world (%)

	ACC. TO FORMER SOURCE[6]			NEW PROJECTION[6]	
	ACTUAL		PROJECTION		
	1978 - 2003	2005	2005 – 2015	2008	2009
WORLD	3.1	4.6	4.0	3.1	-0.2
OECD	2.7	2.7	2.7	0.9	-2.52
USA	2.9	3.6	3.1	1.1	-2.3
JAPAN	2.5	2.4	1.7	-0.7	-5.5
EURO ZONE (OECD)	2.4	1.9	2.3	0.8	-2.4
CHINA	9.4	9.2	6.6	9.0	6.5
INDIA	5.3	6.8	5.5	6.6	5.0

NOTE: „New projection" is a compilation of the data published in other publications
a) According to real purchasing power
b) More recent available source was published in 2008 but it did not include full year data.

In case of oil (and partly natural gas), already in the second half of 2008 the forecasts announced slowdown in short-term consumption growth, occasionally predicting even fall of consumption. The author did not have access to complete data on overall energy consumption projections, although he came across some forecasts. The projections of oil consumption provided by institutions such as IEA are certainly most reliable and indicative for overall energy consumption.

The data on world and OECD countries demand are presented in the table below:

Table 3[11]. Overall oil demand in the period 2005 – 2008 and forecast for 2009

(mln bbl/d, weighted index)

	2005	2006	2007	2008	2009
WORLD	84.0/100	85.1/101.3	86.0/101.06	85.7/99.8	84.7/98.8
OECD	49.8/100	49.8/100	49.2/ 98.8	47.5/96.5	46.0/96.8

The above overview of demand movement contains a correction for 2009 demand forecast which was lowered by 0.6 mln bbl/d for the world and 0.3 mln bbl/d for OECD countries.

As projections of energy consumption go down from month to month, it is likely that demand (consumption) will continue to fall, particularly as economic recovery is not so fast as expected.

Consequently, we cannot expect increase of energy demand in the near future, because we cannot expect fast economic recovery. Among other things, economic recovery depends on implementation of various measures for curbing excessive consumption generally, and for more efficient use of energy.

As mentioned above, there is a close correlation between GDP growth or decline and energy consumption. Figure 3[9] below is of earlier date and a kind of compilation of data, but it clearly illustrates the link between global real GDP growth and growth of oil demand.

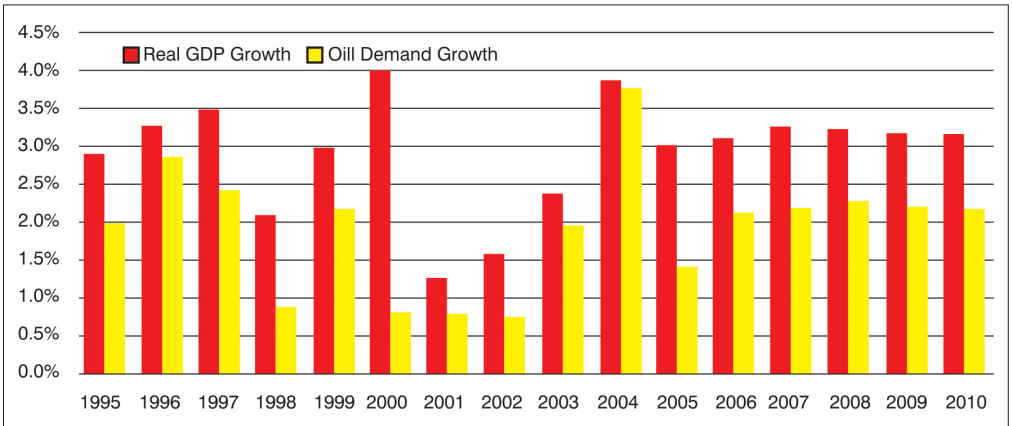


Fig. 3. Global real GDP growth versus preliminary oil demand growth
Sl. 3. Globalan realni rast BDP-a u odnosu prema porastu potražnje nafte

4. OTHER RELEVANT FACTORS THAT IMPACT DEMAND AND PRICES OF ENERGY (PARTICULARLY OIL AND NATURAL GAS)

With the remainder that growth in energy consumption is only possible if economy rebounds and GDP goes up, the author analyzes other factors that impact energy sector and which will have significant influence on oil and gas industry in the near future.

4.1 AVAILABILITY OF CRUDE OIL AND NATURAL GAS

1. According to well known publication, BP Statistical Review of World Energy for 2008[20], there was almost no change in proved oil reserves year-on-year for 2006/2007 (2007 : 2006 = 1 237.9 : 1 239.5 billion bbl of oil and 2007 : 2006 = 177.36 : 176.22 trillion m^3 of natural gas). Considering the fact that BP Statistical Review quotes that the reserves are calculated «under existing economic and operating conditions», there is a discrepancy between «existing economic and operating conditions» and reserves data as reserves remained on the same level, but prices of oil and gas went up all the same. The same source quoted that after sharp increase in 2006, the price of natural gas (European gas import) went up again in 2007 (from 8.69 to 8.93 $/MM Btu), while crude oil prices rose from previous 8.74 to 10.6 $/MM Btu in 2005 to 10.66 and 11.95 $/MMBtu, or to put it mildly, existing reserves were not revaluated, and the reserve category plays an important role in «existing and operating conditions» and they changed dramatically.

2. The magazine Nafta[12] in the article entitled «The largest discoveries in 2008» among other things it is quoted: «the year 2008 will be recorded for big discoveries of oil and gas in different parts of the world ….» and lists ten largest discoveries with more specific data, size of reserves, type and quality of hydrocarbons. These new discoveries will be mentioned again in the text that follows.

4.2 ALTERNATIVE ENERGY SOURCES

The assessment of availability of alternative energy sources and their contribution in total energy supply – as for example oil extraction from tar sands or shales, including substitutes with prefix "bio" (bioethanol, biodiesel) frequently neglect information about energy needed for production of biofuels, which has significant impact on overall costs. Namely, as price of crude goes up, it seems that alternative fuels become more competitive, but when we take into account primary energy needed for their production, the economics of such orientation may be totally negative.

4.2.1 Unconventional oil resources

Cost of oil production from tar sands is very high, regardless the mode of exploitation (in situ, surface). The same applies for shales. This certainly impacts overall production costs from unconventional resources.

According to an article published in Petroleum Economist in 1997[22] previous price of synthetic oil extracted from oil sands was 24.50 Can.$/bbl, while in 1997 it was written: «today the cost of oil extracted from oil sands is up to 13.50 Can.$/bbl. In 2005[7] it was quoted that «oil sand production and refining range between 22 and 28 $/bbl of synthetic oil, while in 2006[1] Oil and Gas Journal quoted the price of $25/bbl. At the time when international oil prices skyrocketed in May 2008, the other[2] quoted that oil sands break-even price was 33 $/bbl.

Cost of oil production from oil sands is one of key factors that will impact international crude oil prices in the near future, because oil sands reserves are huge and could become one of dominant oil resource in the future. In 2006 Canada's share in world production was 4.4%.[20]

Shale oil gains on importance, although few years ago production volumes were rather low. Consequently it was quite difficult to find reliable data in literature. However, in recent years shale oil attracts more and more attention, particularly in the USA. One of available publications quotes world reserves of shale oil estimated at 2.6 trillion in more than twenty countries.[5]

Shale oil production costs in the USA are indicated in a wide range[3], depending primarily on manner of extraction as presented in Figure 4. However, the study provides a number of uncertainties which make prices more variable (depending on cost of financing, shale quality and selected extraction technology), so that the costs from the study can be taken only as preliminary.

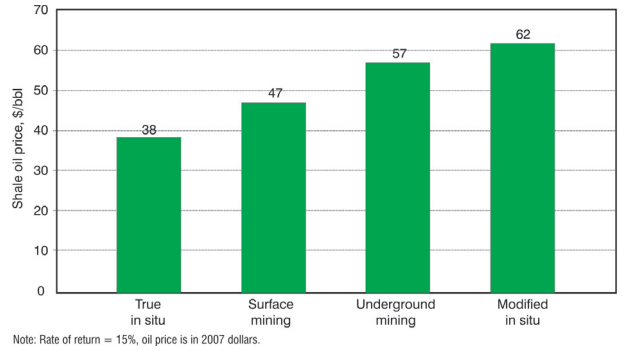


Fig. 4. Shale oil production costs in US
Sl. 4. Troškovi proizvodnje nafte iz škriljaca u SAD-u

Available studies mention that it is unlikely that any larger scale shale oil production could start before 2015.

4.2.2. "Bio – fuels" - alternative to oil fuels

Bringing of biofuels to the market was accompanied by huge expectations and praises about replacement for fuels produced from crude oil (as if crude oil was not of organic origin). However, the euphoria subsided rather soon, although it should not exclude possibility that certain products could be good substitute for traditional fuels. The main shortfall in use of biofuels is their energy inefficiency. As quoted in an article published in OGJ[23], «DOE (Department of Energy) provided an estimate according to which biofules require 3.2 units of energy more compared to energy contained in fossil fuels needed for production of unit of useful energy.

Without entering into detailed analyses of advantages and disadvantages, or even harmful effects of biofuels, the author points out that political obsession with energy independence contributed to biofuels euphoria.

Use of ethanol in Brazil became widely spread because production of ethanol from sugar cane represents higher valuation of sugar cane (and sugar obtained from it), but production of ethanol from corn or production of biodiesel from oil crops in the USA contribute to lower food production and more famine in world. This comment regarding biofuels is very important, including the discussions about future (useful) ethanol production from wood waste[23], as such discussions could contribute to better evaluation of natural resources, without unwanted side effects.

In all statistical publications the use of biofuels is described under title «other biofuels – outside Brazil and USA» and according to available data volumes are still very small: in 2005 – 0.1 million bbl/day ; 2006 – 0.2 million bbl/day; 2007 – 0.3 million bbl/day ; 2008 – 0.5 million bbl/day and according to forecast in 2009 it should be 0.6 million bbl/day, which means that in 2009 a share of biofuels in total fuel consumption would be only 0.07%.[11]

4.3 COSTS OF PRODUCTION, (FUTURE) INVESTMENTS, BREAK EVEN POINT

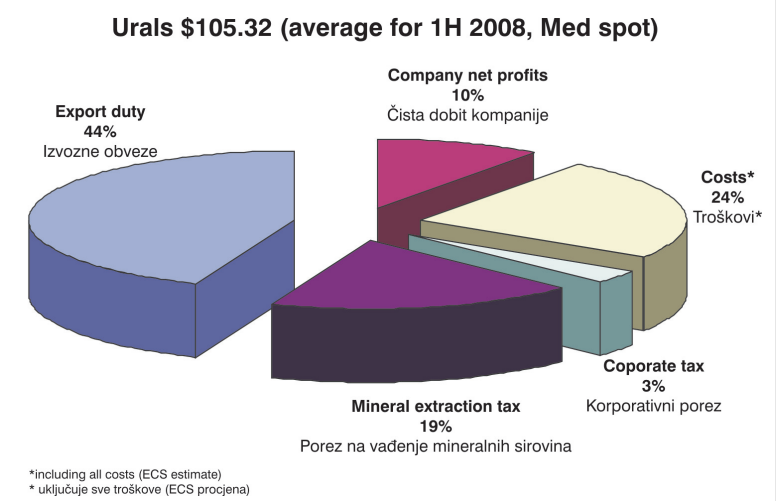
While few years ago specialised publications presented a number of news on cost of production of oil and gas with additional information about reserve replacement cost, finding and development costs, acquisition costs, not only specialised editions but other publications as well (for example[8]), such data are rather scarce lately, even in publications that deal with such topics.

For example in the Final Report for 2000, a specialised edition Herold quoted that in 1999 average reserve replacement was only 3.36 $/boe, finding and development costs were 3.52 $/boe, whole production cost was 3.80 $/boe – and all these at average revenues from producing activities of 13.74 $/boe.

A more recent publication quoted 2005 reserve replacement cost of 10.27 $/boe, and finding and development cost of 11.26 $/boe, and profits of 11.15 $/boe.

Lack of reliable data is typical also for investment costs, including costs related to new exploration ventures and development of existing reserves. Even when such data are found, they are of general nature and do not enable drawing of precise conclusions. Nevertheless, further in the text the author used available data for substantiating his thesis.

In an issue published in 2008[21], published the data on structure of Russian crude export price, which are very



Sl. 5. Structure of Ural crude sales price
Sl. 5. Struktura prodajne cijene nafte Ural

important and can serve as a benchmark for assessment of reliability of other data which seem dubious. According to the information (with the remark that it was published by Energy Charter Secretariat) total production cost of Ural type crude at the price of 105.43 $/bbl was 24% or 25.30 $/bbl (Figure 5)

In this context the data on oil breakeven prices[2] – for several large oil producing countries as quoted below, with breakeven point price denoting a point at which revenues equal total production costs (excluding Canadian oil sands – 33 $/bbl) seem quite unconvincing:

Bahrain	40 $/bbl
Kuwait	17 $/bbl
Saudi Arabia	30 $/bbl
UAE	25 $/bbl
Oman	40 $/bbl
Qatar	30 $/bbl

However, for determination of realistic, lower level price of crude oil, it is necessary to take into account realistic production cost from existing reserves and from new prospects that have not been put into production yet. As mentioned before, not many data are available, but already from previously quoted reference12 it can be concluded that development costs from new deep sea or other challenging reservoirs can be very high and we can find information about new discoveries: «deep sea well reached total depth of 5 773 m at water depth of 2 187 m», or ...«well is located at sea depth 1 417 m», or...»well is located at sea depth of 1 500 m, and total depth is 9 494 m»,.....

Among different articles dealing with prognosis about future price of crude, some of which are totally unreliable and not even worth mentioning, I selected the article entitled »Measuring «cheap» oil»[17] which quotes a number of forecasts about future crude prices, some linked with GDP projection, some quoted estimates of individual country producers, and then gave an estimate what they think would be a fair price: Saudi Arabia wants 55 $/bbl for its oil, while Russia balances around 70 $/bbl. The article ends with a conclusion that a «price of around 60 $/bbl could represent an arresting point for crude».

However, there are no such considerations about future prices of natural gas, although these two sources are technologically connected, frequently produced together, and economically closely linked, consequently price of natural gas must be in correlation with crude prices and the relation between the value of these two energy sources should remain at parity as it used to be, with a small possibility of higher and longer disruption in this relation – a topic to be considered in the next chapter.

5. POSSIBLE PLATEAU OF CRUDE OIL AND NATURAL GAS PRICES

For an objective observer aware of the depth of economic crises, current crude prices fluctuating slightly above 40 $/bbl may seem the «lowest possible» in the context of complex economic circumstances.

According to my estimates, the price of crude will go up, but following the pace of economic recovery, it will grow to about 60 $/bbl, and the plateau in normal circumstances (without situations of «force majeure» or extraordinary events described in the following chapter). In the next ten to fifteen years it could increase to 80 $/bbl, I repeat again, in normal circumstances (assuming minor fluctuations in economic growth, relatively stable forex relations between international currencies, and of course without conflicts between countries with important energy transit systems like Russia and Ukraine).

As for the prognosis about natural gas industry, particularly prices, the problem is far more complex, primarily because of non-existence of integrated international market for natural gas, and because three large regions – North America, Europe and Far East have completely different market features. I will illustrate this difference by quoting concrete data, without investigating the causes (for example: use of pipeline transport, LNG, long distance transport etc.): in Europe in mid January 2009 average price of natural gas was slightly above 5 $ /MMBtu, in continental North America it was as low as 3.26 to 4.05 $/MMBtu, (with exception of New York - NY City Gate 5.23 $/MMBtu) and Japan with 12.70 $/MMBtu and South Korea 15.10 $/MMBt).[13]

To make this overview of natural gas prices even more complex, we quote export price of Russian gas for Europe which was 14.70 $/MMBtu.

For an assessment of «normal» price of natural gas in relation to crude price, I will take a calculation that takes into account quite a lot of «average» amounts that in one way or another, directly or indirectly influence factors in oil and gas industry.

As one metric tonne of oil contains 10 million of kilo calories or 40 million BTU, and a tonne has in average 7.33 barrels (according to BP Statistical Review[20]) it co-

mes out that the average energy value of one barrel of oil is 1 364 256 kilo calories or 5 457 026 BTU.

Hence, it can be concluded that on the basis of quoted natural gas prices, equivalent energy value of oil would be for example:

from (5.14 $/MMBtu - Zeebrugge)	28.05 $/bbl
to (14.70 $/MMBtu - (Russia)	80.22 $/bbl.

As calorific value of oil based on current price relation is significantly higher as mentioned before (1 : 0.801, 1 : 0.673, 1 : 0.822), it comes out that in case of equivalent values of oil and gas as a result of equal energy content, actual, usable value (depending on type of use) of oil could be in $/bbl as follows:

	1:0.700	1:0.750	1:0.800	1:0.850
according to Zeebrugge price	40.07	37.40	35.06	33.00
Russian export price	114.60	106.96	100.28	94.38

The main conclusion is that current price of Russian gas, in relation to current price of crude oil, is excessive and overvalued, and not only in respect to the current moment, but also in regard to expected future increase of oil price. In such a paradoxical situation it is difficult to make other conclusions.

Instead of prognosis on natural gas prices, which would be based on extrapolation of current prices, the author is of opinion that based on existing correlation between calorific values and forecast prices of crude, future natural gas prices could range as follows:

At crude price	40$/bbl	60$/bbl	80$/bbl
and ratio: 1:1 $/MMBtu	7.330	10.994	14.653
1 : 0.65 $/MMBtu	4.76	7.15	9.52
1 : 0.700 $/MMBtu	5.13	7.70	10.26
1 : 0.750 $/MMBtu	5.50	8.24	10.99
1 : 0.800 $/MMBtu	15.86	8.80	11.72

The correlation between prices will depend on structure of demand for oil products. If the trend of higher derivatives consumption (gasoline, diesel) for transport continues, the demand for such products will push up crude prices, regardless comparison with calorific value of other energy sources, less suitable for transportation. The author considers that the ratio 1 : 0.70 between crude and natural gas prices (reduced to calorific value) would be appropriate in the future.

6. DEVIATIONS

How to call futures trading with non-existent commodity, when prices are pushed up or down fed by stories about wars, crises, assassinations, shipwrecks and other disasters, when paper trading value exceeds several times actual value of one of the same commodity which is subject of future contracts?

In the so called liberal capitalism of American type (not in all types of capitalism) such deals are called futures trading. In Croatian language there is a clumsy translation version «budućnosnica». The role of futures in modern trading proves in a way that the term «liberalism» is close to «anarchism». Such behaviour is sometimes called «catch-as-catch-can». Namely, each well organized state, and the USA are organized and they can introduce mechanisms for better monitoring of futures trading and stock and commodity exchanges in order to prevent anarchy. By the way, the 1929 stock market crash and the great depression resulted also from euphoria and stock value bubble without actual value of assets. Similarly, various bubbles created current economic downturn.

The 1929 stock market crash was the biggest financial crises of the 20th century. It was overcome by New Deal, state interventionism, something that is done even today on much wider scale than in 1929.

As a support for argument about unsustainability of futures trading and unrealistic bubbles, we provide some examples:

a) In a publication issued by Energy Charter Secretariat[16] in early 2007, it was written that futures contracts for WTI trading on NYMEX exceeded three times actual production volumes.

b) The article with interesting title: «Futures trading: What is excessive»[18] quotes data about futures trading and estimates according to different criteria that futures trading deals were 12 (even up to 30) times higher than physical gas trading in the USA, while in 2006 crude oil futures trading on NYMEX exceeded three times actual, physical trading. According to one of methodologies, futures trading was even 27 times higher for crude and 19 times higher for natural gas in 2007 (although different sources provide different data).

Actually, the author is not against «pro-futuro» trading, but without dangerous bubbles. However, with the recent economic downturn crude oil prices tumbled, oscillations are small, and finally, the system of false values, over-consumption and overspending collapsed (see very good article written by Ante Čičin Šain[4]), and if it is to judge recent events according to effects created by them, it is quite easy to conclude where the truth is.

7. CONCLUSION

Determination of boundaries within which certain phenomenon can move, can be done only through complex analysis of all relevant factors that impact that phenomenon. It is more difficult to determine the size of impact, because there is a number of feedback relations and seemingly insignificant effects (Heisenberg's uncertainty principle), similarly as it is difficult to predict future behaviour of various groups of people in real life.

This study was challenged by frequently superfluous and even unprofessional projections of possible future movements of oil and gas prices, and I hope that this short study of relevant factors that impact these movements and their interactions will contribute to clarification of these relations.

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