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## Letter from the Editor

Dear Readers,

The times ahead are not very promising. High prices seem like here to stay. But how long the world economy can sustain these high prices? This is something we should all think about...

In our developed world, it may just mean us to switch to public transport, measures for more efficiency. But how about the developing nations and regions? In Africa and in Asia, what will be the effect of high prices?

Today, if we are lucky to find all sorts of goods with competitive prices at stores close to us. If we are talking about high growth rates, if the quality of our lives has increased, this was partially due to low energy prices. Therefore, the expected high price era is a bit discomfoting.

This week, we have two very distinctive writers in addition to our energy expert Haluk Direskeneli. Iskender Gokalp and Emre Iseri are contributing to our journal, which we are very pleased to have them on our pages.

Emre Iseri has also written several articles related to energy and one of the distinctive Turkish researchers of his generation.

And Iskender Gokalp is a very valuable and well-known expert, and he has written a very informative article that can be a road map not only for Afsin-Elbistan but also for other lignite based power plant projects.

Until next week, all the best,

Editor

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## Intelligent Utilization of Afsin Elbistan Lignites

Energy independency is today the main element to qualify a country or a region independent. Energy independency can only be achieved by an intelligent combination and management of natural and socio-economic resources and technology. It is difficult to think that a country can protect his frontiers if his energy policy is fully import oriented.

This is also why some new energy technologies were historically developed pushed by political or strategic orientations or during political crisis periods, such as the development of nuclear energy in France after the second world war by de Gaulle, or the coal gasification and the subsequent liquid fuel production technologies developed in Germany during the WWII or in South Africa during the economic sanctions years imposed by the international community during apartheid.

Turkey has many energy resources but they are not easy to exploit as the mainstream fossil fuels, oil, natural gas or coal, are. The deepening of the hydroelectricity power in Turkey needs careful and intelligent policies taking into account its impact on the environment, the agriculture and the inhabited regions.

Turkey is a heaven of renewable energies but their development needs innovative technologies, large investments and a very intelligent socio-economic incentive policy. The intensive use of bio-resources for energy needs the careful evaluation of the competition between the use of crops for food or for energy and the impact on water resources, soil erosion and other environmental issues. Finally, the solid fossil resources of Turkey are mainly lignite of poor energetic and environmental quality.

The exploitation of the Afsin-Elbistan region lignites is therefore a challenge for the Turkish energy policy and independency. I offer below some notes I believe worth to consider when shaping the legal and techno-economic framework to ease the exploitation of these difficult resources.

1] What is at stake is the future of the Turkish energy policy and independency in the European context and more.

2] It is not possible for Turkey to not to have full control on the future Afsin-Elbistan lignite basin projects and the related technological development, energy policy, etc which are embedded in the outcome of future tenders for Afsin-Elbistan C&D phases. A Turkish consortium should lead such projects.

3] It is not possible to think about future Afsin-Elbistan thermal plant projects as a *bis repetita* of the Afsin-Elbistan A & B projects.

The thermal power plants that will be built within the C & D projects should last about 40 years. This means that the technology for the thermal power plants that will be built during this project should integrate the present cutting edge technology and, furthermore should be so designed to integrate later easily the technology under development today as a response to future technical, socio-economic and environmental constraints and regulations.

4] The envisaged technical capacities are very important: each power plant should have at least an installed capacity of 1200 MW (i.e. equal to the capacity of a nuclear power plant). The total lignite reserves dedicated to feed the plants for about 40 years is about 1,400 million tons.

5] The idea behind any proposal for new thermal plants aiming to use the Afsin-Elbistan lignites should be the IGCC concept.

This means Integrated Gasification Combined Cycle power plant.

In brief, coal is not fully burned but gasified (this is a kind of partial or incomplete combustion).

A mixture of CO+H<sub>2</sub>+CO<sub>2</sub> gases arises from this process. This mixture can be directly burned in a gas turbine to produce power.

The excess heat is used to produce steam for a steam turbine and power again (hence a combined cycle). Both gasification and combined cycle technologies are well mastered today.

There are also several IGCC plants working or under development (see [www.zero-emissionplatform.eu](http://www.zero-emissionplatform.eu)).

There are obviously some technical issues that should be better mastered (such as turbines fuelled by high H<sub>2</sub> content mixtures).

The important issue with IGCC system is its high thermal efficiency and ability to reduce emissions (both SO<sub>2</sub> and CO<sub>2</sub>).

During gasification as the O<sub>2</sub> concentration is low, SO<sub>2</sub> is not formed; instead H<sub>2</sub>S is formed which can be cleaned by known technologies so that pure sulphur can be extracted (which is a by product having commercial value).

6] Reducing CO<sub>2</sub> emissions from thermal power plants is becoming an obligation at the EU level (hence the *EU Zero Emission Plants platform; for 2020 all EU fossil fuel plants should be zero emission plants*).

The best way to capture CO<sub>2</sub> in the IGCC system is to convert the CO to CO<sub>2</sub> before combustion and therefore combust only H<sub>2</sub> as fuel.

The good thing with the IGCC technology is that it allows this possibility which can be included in the plant process at the beginning or added later when the economic conditions (CO<sub>2</sub> taxes, etc) will render the CO<sub>2</sub> abatement fully interesting (and mandatory).

7] CO<sub>2</sub> is not a waste but a commodity.

It is already used in food, chemicals and fertilizers industry, among others. It is also used for EOR (Enhanced Oil Recovery) by pumping it to the oil or gas mines to ease the extraction of additional oil or gas difficult to extract without such a forced extraction. Other uses of CO<sub>2</sub> can also be envisaged.

CO<sub>2</sub> can be easily transported by pipelines. Therefore, for the Afsin-Elbistan project, if CO<sub>2</sub> is captured it could be transported to Iraq or to Iran for EOR as a commodity (as a reverse flow to balance Turkish gas and oil purchases).

8] Another use of CO<sub>2</sub> is the production of methanol by processing it with H<sub>2</sub>.

Therefore, several opportunities can be introduced by the IGCC technology to ease the introduction of a future H<sub>2</sub> economy. First, the H<sub>2</sub> obtained as a result of the gasification process can be used as fuel for power generation or as transport fuel (via fuel cells).

It can also be used to process the captured CO<sub>2</sub> to methanol (which has several advantages compared to H<sub>2</sub> in terms of safety, transportability, usability as fuel in the present heat engines, etc).

Also, in the Afsin-Elbistan region, river waters and solar energy can be used to produce H<sub>2</sub> by electrolyzing water with PV electricity.

9] The IGCC system can be applied to coal/lignite but also to biomass or waste.

Therefore an IGCC plant can be considered as multi-fuel or fuel flexible. As the future Afsin-Elbistan tender conditions will oblige to recultivate the area after mining activities have been completed, such areas can be used to grow energy crops suitable for gasification.

Also, this strategy can be applied to areas surrounding the mining area to increase the energy crop yield and to revitalize the agriculture in the region.

10] Liquid transportation fuels can be produced starting by the gasification process (from the syngas) continued by processes such as Fischer-Tropsch and others. Transportation fuels (including aviation fuels) can therefore be produced from the syngas obtained by lignite gasification or by biomass gasification or by their co-gasification.

11] The Afsin-Elbistan IGCC project may enable Turkey to be a leader at the EU level within the Zero Emission Plants technology platform, by proposing an industrial scale demonstration unit for FP7.

12] Such a project will also have the support of environmentalist groups (NGO's) which favor today clean fossil fuel technologies (IGCC with CO<sub>2</sub> capture).

Courtesy of Iskender GÖKALP, Directeur  
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## Repowering AMBARLI Thermal Power Plant in Istanbul Turkey

Through press releases and internet web site of EUAS tender release, your writer has inspected the new development/ tendering for Repowering project of our old Ambarli Thermal power plant.

There are 5 steam boiler/ steam turbine units in Ambarli, whereby first 3 units are at 110 MWe output capacities,

and the 4th -5th units are in 150 MWe generation capacities

Therefore we shall consider the repowering of 4th and 5th units each with 150 Mwe electricity generation capacities.

The last day for proposal delivery was initially on 4th December 2007, however due to many requests from interested parties, an appropriate period of time extension is expected to be given by the tendering authority shortly.

Proposal evaluation period is given as 120 calendar days;

Project execution is to be completed within next 1000 days upon effective date of contract.

It is our humble estimation that the contract value would be around 400+ Million US Dollars, and with that ball-park budget number, the tender project scope will cover;

Rehabilitation/ renovation of existing 2 each 150 Mwe Escher Steam turbines (vintage early 1970s)

Dismantling/ demolition of two each existing Sulzer steam boilers

Supply/ purchase/ site installation of two new gas turbines each with approximate electricity output of 250- 300 Mwe

Whereby only GE Energy, Siemens Westinghouse, Mitsubishi and Alstom can fabricate that big size gas turbines. We may also add Ansaldo Energia with their repowering past references,

However their production lines may not be available to meet our time schedule

Then design/ fabrication/ site installation of two each new heat recovery steam generators, fired/ unfired type, preferably forced circulation/ vertical gas pass,



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These 2 each new gas turbines/ 2 each new heat recovery steam generators and 2 each existing steam turbines will be coupled,

New Instrumentation & Controls will be installed, and in the end, we shall have a new combined cycle power plant with output capacity of 800-900 Mwe, firing natural gas only in Ambarli, on the European side of Turkey, on the north coast of Sea of Marmara, and west of Istanbul

Project financing would be a real challenge both for supplier and purchaser,

We have only a few reputable / reliable local contracting companies with references and engineering/ software/ hardware/ qualified human resource capability, with financial credibility to purchase such big size gas turbines, with qualified fabrication facilities to fabricate the heat recovery steam generators.

Your humble writer does not believe in any other party, who would declare to participate and execute such a big project properly,

Eastern cheap equipment suppliers do not have any capacity to fabricate such gas turbines nor have any license to export these equipment beyond their authorized national borders

Your writer does not believe that any Eastern company can get prequalification, nor any local bureaucrat/ technocrat can accept their prequalification application.

That article is for your early information and further comments,

Your comments are always welcome. Thank you & best regards

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## Global Peak Oil and Dollar

Lately, we have been witnessing fluctuations of dollar and oil. This has led us to question the link between the dollar and oil and also whether this link still serves to the interests of the United States (US).

In the 1960s, the emergence of Western European countries and Japan as economic rivals caused the US to start operating a trade deficit, which reached its most critical levels in the late 1960s and early 1970s due to the military costs of the Vietnam War. Clearly, this has led a decline of confidence to American economy and its currency among core capitalist countries. When other national central banks joined the French, an international currency crisis soon became inevitable. As a response, the US unilaterally took the decision to abolish the gold standard and adapt a floating exchange rate system in 1971. This relieved the US from the burden of maintaining a fixed par value of the dollar against gold, or any other currency.

An oil agreement in 1975 that was signed between the US and Saudi Arabia, OPEC's most powerful member has played viable for the brand new financial system under construction. According to this agreement, OPEC committed to price its oil exports in US dollars, ensuring that oil importing countries throughout the world would be required to have sufficient amount of dollars to pay for oil imported from OPEC members. Hence, this would create a dependable demand for US currency regardless of other economic factors. To put simply, oil replaced gold as the backer of the US dollar by creating an artificial demand, sustaining, and reinforcing its central role in the global economy.

For the sustainability of this dollar-oil link, oil prices should be reasonable and stable. Otherwise, this link will cut down and be shattered. In that regard, one should acknowledge arguments that propose we are coming to the age of 'global peak oil'. The term 'peak oil' denotes the date after which the rate of oil production is predicted to enter terminal decline. This simply means that the world is running out of cheap oil. The world economic system has been based on the supposition that oil would always be available cheaply. However, industry estimates indicate that a global economic crisis will soon occur precipitated by dramatically rising oil prices. Moreover, it is estimated that continued price increases will become a structural problem. Therefore, IEA's warning regarding tightening of supply in oil markets is meaningful.

Even though it is not possible to detect the exact time of global peak oil, it is possible to determine its possible disastrous implications



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for dollar. Actors in the financial markets determine the value of a given currency. In the case of dollar, oil's supply-demand balance plays a viable role. Rising oil prices will create inflationary pressures in the US and force the value of the dollar to decrease. This will slow down American economy and unveil structural problems as we have witnessed in the case of recent mortgage crisis. Eventually, this will shake the global confidence in American economy and its currency.

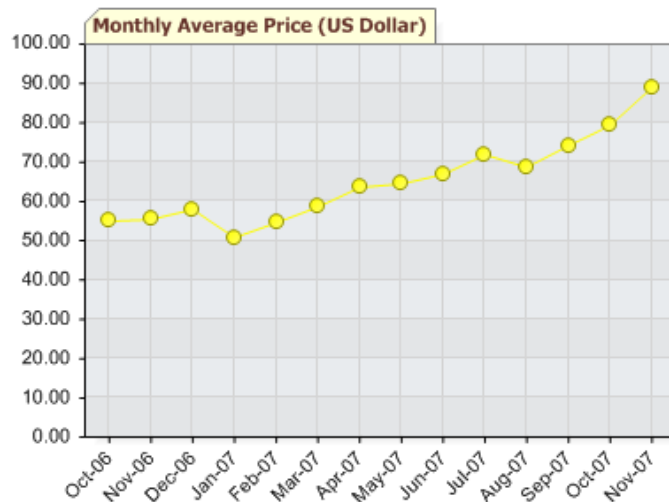
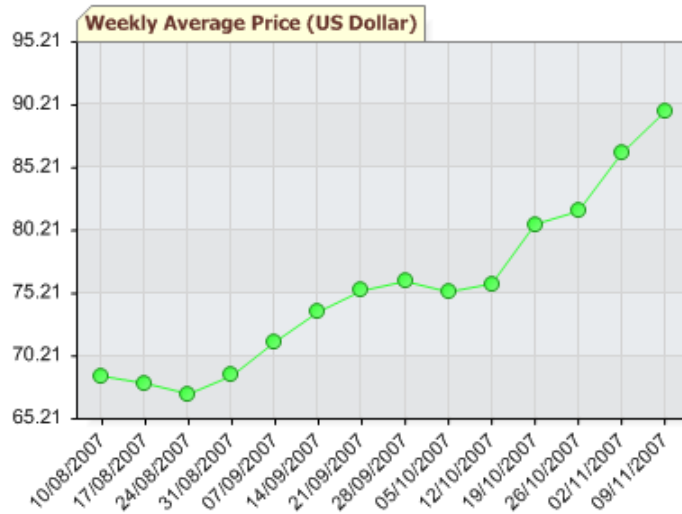
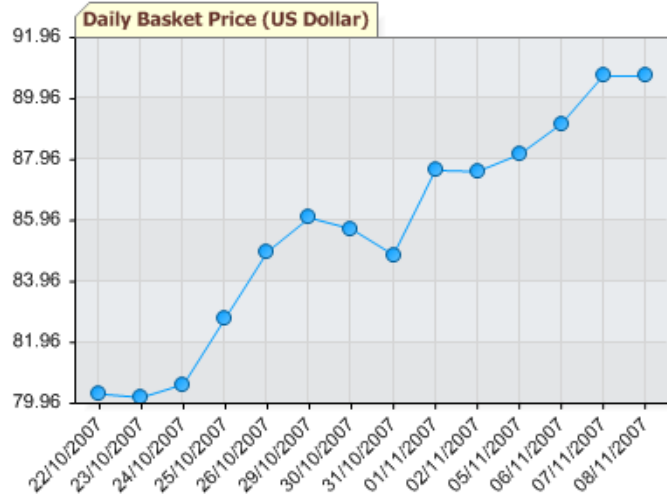
As classical economists indicate 'bad money drives out good'. In this case, good money is the currency that has potential to threat US dollar's key reserve status, the Euro. Ever since its emergence, the euro has steadily increased its value against the dollar. This reveals that arguments that propose Saddam Hussein's conversion to the euro rather than the dollars for Iraq's oil exports in 2000 as the main reason behind the US's unilateral invasion of Iraq in 2003 are not simply conspiracies. Consequentially, China's intention to balance weakening US dollar in its foreign currency reserves has led us to question the sustainability of the current financial crisis.

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## Indicators

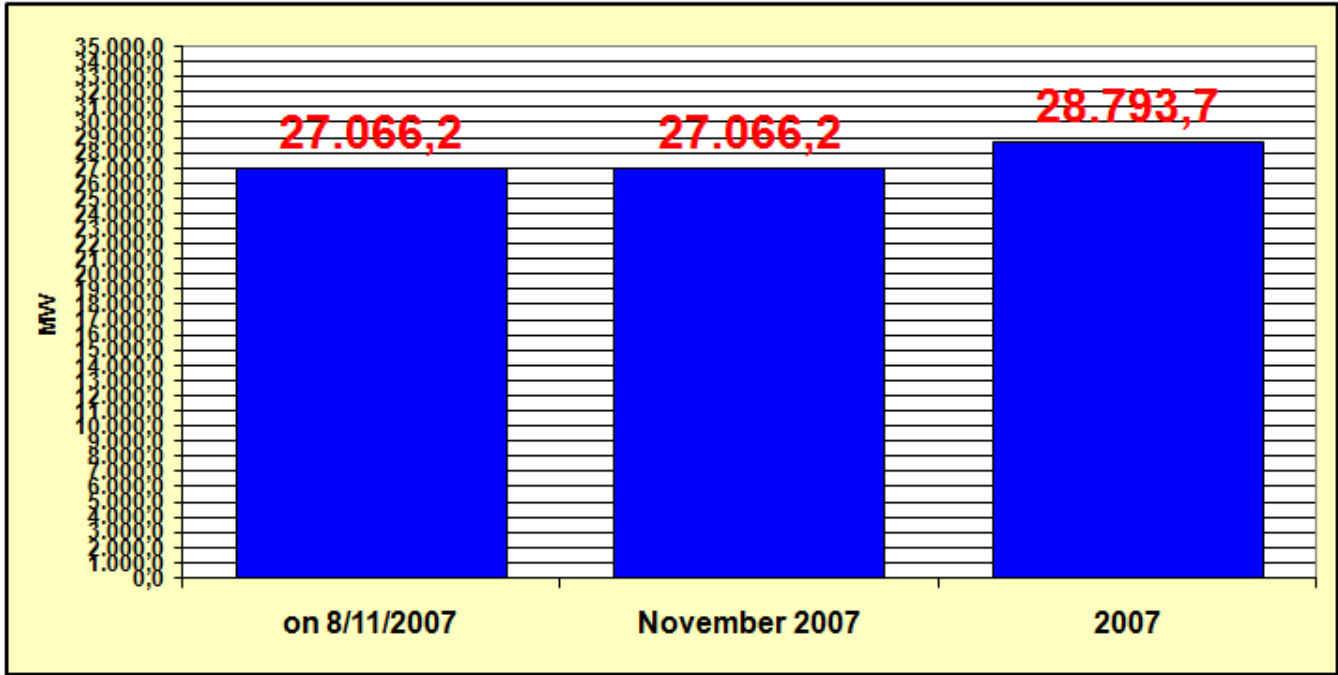
### OPEC's Basket Price



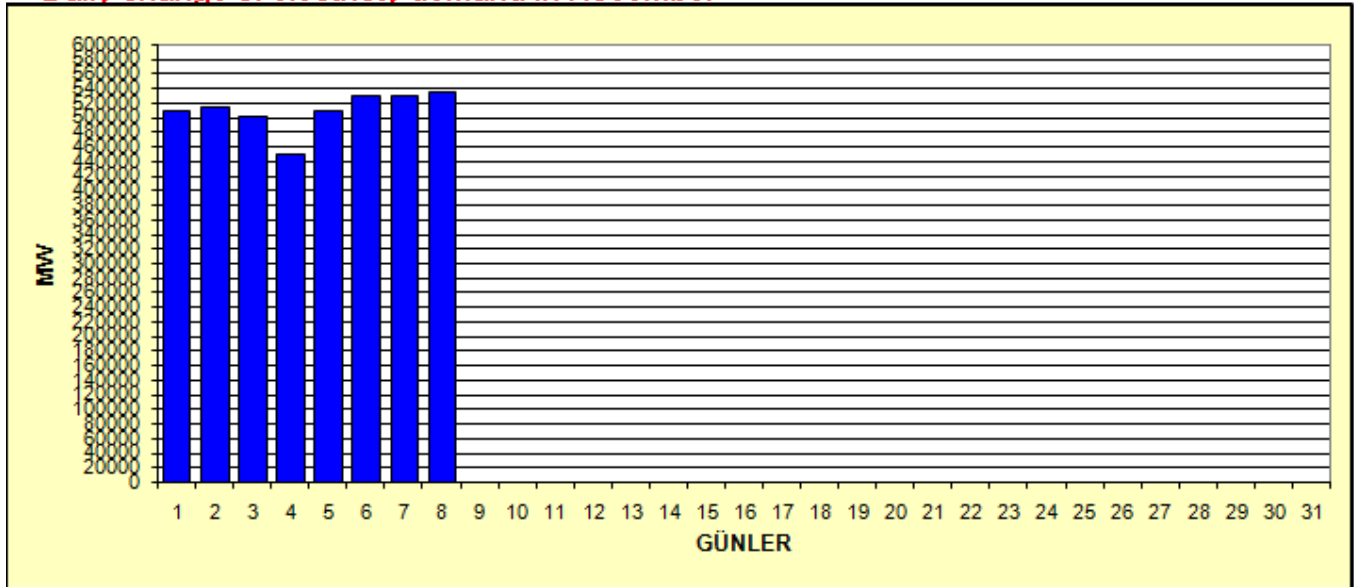
## Indicators

### Turkish Electricity Consumption for November 2007

#### Peak Consumptions



#### Daily change of electricity demand in November





## Indicators

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Indicative Exchange Rates Announced at 15:30 on 09/11/2007 by the Central Bank of Turkey

CURRENCY		EXCHANGE RATES		EXC.RATES ON BANKNOTES	
		Buying	Selling	Buying	Selling
USD/TRY	1 US Dollar	1.1794	1.1851	1.1786	1.1869
EUR/TRY	1 EURO	1.7333	1.7417	1.7321	1.7446
GBP/TRY	1 British Pound	2.4834	2.4964	2.4817	2.5001