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## Letter From the Editor

We are happy to reach you once again in this second issue of Energy Review. The last week has been important in the field of energy in both Turkey and in Europe. The starting of the "National Marker" usage in the field of retail fuels has heated debate regarding who does what in avoiding smuggling of oil and fuels in Turkey. In addition the clouds over the status of the problem in electricity distribution "cancellation" or "postponement" still stayed alive last week. The problem with Iran regarding gas supplies to Turkey has been solved last week but brought forward the issue of spot and costly LNG purchases by BOTAS and the need for additional LNG terminals to be built in the country.

In this weeks' issue we have a commentary regarding last weeks' important announcements from the European Union regarding the future of energy in Europe and its implications for Turkey. There is another article on Azerbaijan's Gas Price Issue with Russia and another piece on Country Perspectives on Turkmenistan and also other pieces on price crash in oil, nuclear energy in Turkey.

We think that the increasing interest in our review reflects the importance of energy in our daily lives. We would like to thank our readers for tapping into our website and reading our work on the net. We are open to your comments and contributions. Have a very nice and energy full week.

Best Regards.

Editor

## 10th of January 2006: Important Day for European Energy and Its Implications for Turkey

European energy policy has three pillars: combating climate change, promoting jobs and growth, and limiting the EU's external vulnerability to gas and oil imports



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A core energy objective for Europe is that the EU should reduce greenhouse gas emissions from its energy consumption by 20% by

2020. This objective will make it possible for the EU to measure progress in re-directing today's energy economy towards one that will fully meet the challenges of sustainability, competitiveness and security of supply. The international action of industrial nations on climate change forces the EU to do more in reducing carbon emissions. The aim should therefore be to increase the target to a 30% reduction by 2020 and 60-80% by 2050.

Europe's security of energy supply and the wellbeing of its consumers and limitation of the EU's growing exposure to increased volatility and prices for oil and gas necessitate a more competitive EU energy market, and to stimulate technology and jobs.

EU has to reduce the amount of CO2 from its energy use by at least 20%, within the next 13 years.

EU has to reduce the amount of CO2 from its energy use by at least 20%, within the next 13 years. But this will help transform Europe into a highly energy efficient and low CO2 energy economy, able to face with confidence future energy challenges. It will mean the EU taking global leadership in catalysing a new industrial revolution. To achieve this objective, the Commission also proposes to focus on a number of energy related measures: improving energy efficiency; raising the share of renewable energy in the energy mix, as well as new measures to ensure that the benefits of the internal energy market reach everyone; reinforcing solidarity among Member States, with a more long term vision for energy technology development, a renewed focus on nuclear safety and security, and determined efforts for the EU to "speak with a single mind" with its international partners, including energy producers, energy importers and developing countries.

The package announced on the 10th January includes a ten-point energy Action Plan for Europe

The package announced on the 10th January includes a ten-point energy Action Plan for Europe which includes:

- a report on the implementation by the Member States of the internal market of gas and electricity as well as the results of an enquiry of the state of competition in these two sectors;
- a Plan of for Priority Interconnections in the electricity and gas networks of the Member States so that a European grid becomes a reality;
- proposals to promote sustainable power generation from non-fossil fuels;
- a roadmap and other initiatives to promote renewables, notably biofuels for transport;

- an analysis of the situation of nuclear energy in Europe;
- a work sheet for a future European Energy Strategic Technology Plan.

The Energy Efficiency Action Plan which the Commission adopted on 19 October 2006 also forms part of the Action Plan. The Commission's Communication "Limiting Climate Change to 2°" and "the Strategic Review" complement and reinforce each other.



The Commission will ask the European Council to endorse its proposals at its Spring Summit on 8/9 March 2007. A second Strategic Energy Review in two years' time will report on progress as Heads of State and Government have committed themselves to regularly discuss energy matters.

Turkey has to do more as a potential candidate for membership to the European Union in terms of establishing competition in these electricity, gas, oil, water and mining sectors.

In this respect Turkey has to do more as a potential candidate for membership to the European Union in terms of establishing competition in these electricity, gas, oil, water and mining sectors. It should endeavour developing interconnections and fortifications in its electricity and gas networks in order to be a part of the European grid. It should promote sustainable power generation from lignite with environmentally friendly technology. It should make investments into nuclear energy and and promote new energy technologies at households and at workplaces to boost energy efficiency and to protect the sustainability process of nature. It should also promote renewables and also biofuels. In this respect Energy Market Regulatory Authority (EMRA) President Yusuf Günay has told business people to invest in HydroElectric Power Plants (HEPP) yesterday. He said I cannot see any better investment than this. The president talked in a meeting in Ankara organized by Young Businessmen Association of Turkey (TUGIAD). Günay pointed out that investments should be made to domestic energy resources to reduce dependence on imports. He added that the 174 billion kwh electricity consumed in 2006 could be met by just the hydraulic resources of Turkey.

Gunay: "174 billion kwh electricity consumed in 2006 could be met by just hydraulic resources of Turkey. "

EMRA awarded HEPP licenses totaling 3,000-MW installed capacity in 2006



Günay stated that they worked in harmony with the Energy Ministry and the State Hydraulic Works (DSİ); and they awarded HEPP licenses totaling 3,000-MW of installed capacity in 2006. He added that 2007 would be much more productive year. Pointing that wind energy investments were not as successful as the HEPPs. Günay has said that some changes to be made in the upcoming period in energy market regulations would increase the number of wind energy investors. Günay also said that 'Turkey stayed low profile in oil explorations, but Iraqi oil has already been shared out'

Turkey is geographically located in a region where more than 50 % of world's oil and natural gas supplies come from

Pointing that oil explorations required huge financial resources, and also oil production would not be sufficient on its own, EMRA President said, 'If it were sufficient, today Azerbaijan or Iran would have more income per capita than Turkey.' Günay stated that Turkey is geographically located in a region where more than 50 % of world's oil and natural gas supplies come from, and 'If we can make the most of this position, we can make more money than the producer countries, we can make billions of dollars just from transmission of natural gas.' Günay drew attention to Russia- Ukraine

natural gas crisis, and said the EU countries looked for new energy routes, and Turkey is the most important of such routes.

The 2006 Progress Report on Turkey reports the following on Turkey in energy:

“Preparations are fairly advanced with regard to security of supply. Turkey's oil stocks, however, are not calculated according to EU methodology. The Baku-Tbilisi-Ceyhan oil pipeline became operational.

Some progress has been made as regards the internal energy market.

Some progress has been made as regards the internal energy market. The privatisation process of distribution assets has started for three regions. Implementing regulations were enacted on electricity demand forecasting, and cross-border electricity trade. The threshold for eligible consumers has been reduced to 6 GWh. A new amendment, however, allows crosssubsidies and vertical integration. High electricity losses, including theft, persisted. Two sixhour blackouts occurred in July affecting 13 cities, mainly due to generation capacity constraints. Unchanged electricity tariffs in the context of rising gas import prices may in the short term result in real capacity reductions. Turkey is not yet a member of the Union for the Coordination of Transmission of Energy. Turkey has not signed the Energy Community Treaty establishing a regional energy market in southeast Europe. Regarding the internal gas market, no new implementing legislation has been issued. Some liberalisation took place: in-city natural gas distribution tenders were undertaken for 54 cities. The market share of any importer or wholesaler is limited by law to 20%. The state-owned company BOTAS has not transferred existing contracts and maintains its monopolistic position. Overall alignment in these areas is well underway, however implementation is lagging behind. Concerning state aids to the coal industry, no progress can be reported. Alignment in this area is low. No progress can be reported on energy efficiency. Turkey does not have a framework law for its promotion. Some progress has been made on renewable energy sources. However, Turkey has not set itself an ambitious target yet for their increase. An implementing regulation on the guarantee of origin has been issued. Turkey is partially aligned in this area. Regarding nuclear energy, Turkey's capacity to fulfil acquis requirements is fairly advanced. Turkey has no nuclear power generation plants yet, but has announced plans to promote the construction of a capacity of 5000 MW by 2020. The independence of the Turkish Atomic Energy Authority (TAEK) needs attention. Supervisory responsibilities are not separated from research and the promotion of nuclear energy. Turkey has reached a considerable degree of alignment as regards nuclear safety and radiation protection. No new implementing regulation has been enacted. Substantial upgrading of existing facilities will be needed, including radioactive waste management and storage facilities. Turkey has not acceded to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, to which Euratom became a contracting party in January 2006”

Administrative capacity and the independence of regulatory bodies need strengthening.

To conclude some progress has been achieved in the field of energy but many things remain to be developed. Administrative capacity and the independence of regulatory bodies need strengthening. We can say that there is much to be done in the area of energy.

This commentary has been prepared with the extensive use of europa.int and the EkoTürk News Agency.

## Central Asia's Gas Giant: Turkmenistan

Having an important geopolitical situation and rich natural resources, Turkmenistan is a country with a population of about 5,042,920 (June 2006 estimated) in a territory of 488,100km<sup>2</sup> and a gross national income per capita of about \$1,700 in 2005, according to the estimates of international financial organizations.

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According to specialists, Turkmenistan has 54,6 billion m<sup>3</sup> natural gas per year and 203,400 barrel oil per day production.

Turkmenistan is one of the world's leading natural-gas producers, rank among the top ten with proven reserves of natural gas in the world and first among the Central Asian republics, yet faces challenges in transporting natural gas to world markets. According to specialists, Turkmenistan has 54,6 billion m<sup>3</sup> natural gas per year and 203,400 barrel oil per day production. Turkmenistan is essentially self-sufficient in energy resources. Turkmenistan is a major exporter of natural gas, oil and refined oil products, and electricity. largely untapped oil resources. It still imports small amounts of coal to meet its local needs.

Natural gas is found primarily in the south-center of the country, near Mary, accounting for 80 % of annual production of the country. Turkmenistan is a major exporter of natural gas to the former USSR republics and besides Russia, it is the only country to export natural gas to Europe. 84 % of the natural gas production is exported and 2/3 of this is exported through the Russian energy giant Gazprom.

While Russia is Turkmenistan's biggest market, several former Soviet republics such as Ukraine, Georgia, Kazakhstan, Uzbekistan, and Azerbaijan pay huge amounts of money to Turkmenistan. Additionally, in 2005-2006, Turkmenistan negotiated for its natural gas a nearly 50 % increase in the export price with Russia and Ukraine. Additionally, in the spring of 2003, Turkmenistan signed a 25-year agreement with Russia, and in the spring of 2006, a 30-year agreement with China for natural gas exports. It is hoped that these trades will help maintain Turkmenistan have a huge amount of foreign exchange inflow in the future. Proven reserves of natural gas are estimated at 3 TCM.

Small quantities of oil is produced in the west of the country on the Cheleken Peninsula, near Nebitdag and Kum Dag, and along the Caspian lowlands. Proven oil reserves totaled but existence of huge amounts of

A ten-year program has been initiated to raise production to almost 1 million barrels of oil per day by 2010.

Saparmurat Niyazov promised to make his country the "Kuwait of Central Asia"

The 3 billion American dolar Trans-Caspian project that will carry the 30 billion m<sup>3</sup> natural gas per year

The Nabucco Pipeline appears as an opportunity for European states to purchase gas from sources other than Gazprom of Russia.

largely untapped oil resources is speculated. Turkmenistan's proved oil reserves are 546 million barrels and it is estimated that probable and possible reserves in explored areas are more than 2 billion barrels. But areas yet to be explored are estimated to contain huge amount of largely untapped reserves. A ten-year program has been initiated to raise production to almost 1 million barrels of oil per day by 2010. However, refining capabilities are limited and refineries need modernization. 11,41 billion kWh elektrik is produced, while 8,847 billion kWh of this amount is consumed within the borders of the country, remaining amount is exported and given to Afghanistan freely for the infrastructure formation of the country.

Potential geopolitical and economic impact of the death of Turkmenistan's President Saparmurat Niyazov, who promised to make his country the "Kuwait of Central Asia" once upon a time, will probably effect Turkmenistan's economy in the near future. In the period of repressive policies of Niyazov's, foreign investment hesitated to initiate some steps in the country due to high risk on account of the centralized government planning system and the autocratic political structure. The economic development of the country and the energy sector development depend on the level of market transparency and political stability the country. It wasn't seen secure enough to invest in Turkmenistan because of the possibility of nationalization. In addition, the threat of Russia manipulating the political arena and economy of the country.



Currently, the political restructuring of the political system and the new successor of Niyazov will determine whether a more favorable environment for foreign investment can be established. If it will be so, Turkmenistan can build new infrastructure and diversify its gas routes. Russian energy giant Gazprom tries to control Turkmen market in the region. So, Turkmenistan is developing alternatives to Russia's monopoly over the pipeline network to increase its natural gas exports. Therefore, in the long term Turkmenistan may seek new routes through Turkey. The 3 billion American dolar Trans-Caspian project that will carry the 30 billion m<sup>3</sup> natural gas per year from Kizilkum Region through the Caspian Sea to Azerbaijan, Georgia, Turkey and Europe. The share of Turkey from this gas will be 5-15 billion m<sup>3</sup>.

EU with the new German presidency is expected to make some moves toward Turkmenistan. China also needs more natural gas in order to secure its economic growth. The United States, in the past tried to block Russian sphere of influence in the region and its expected to do so after Niyazov's death. Iran also has interest in Turkmen gas but as we saw in the past experiences, the probability of Iran to have a say on the Turkmen gas is seem to be small. Pakistan and India are the remaining actors in the game but Russia has effective control again on this issue. Researches for transporting Turkmen gas through Afghanistan to India and Pakistan is continuing.

At least, Turkey is interested in being a mediator between Central Asian Turkic republics and European states. The Nabucco Pipeline appears as an opportunity for European states to purchase gas from sources other than Gazprom of Russia.

## The rocky path to nuclear energy in Turkey

In 2006, Turkey has paid 26 billion USDs for imported energy sources.



Turkey needs a huge amount of energy investment to sustain its fast growing economy. Where this money come from is a big question. But the rising oil prices and dependency on foreign natural gas and oil has inflated the import numbers. In 2006, Turkey has paid 26 billion USDs for imported energy sources. In 2007, this number is expected to

increase at least %5, around 1 billion USD.

So with basic math, one can easily deduct that in 5 years time, this money adds up to 5 billion dollars, which is more than enough to finance the cost of a 4500 MWs of nuclear plant construction. But the finance side of the problem is not that easy...

After canceling (or delaying) the privatization of electricity distribution, there have been quite a bit of disappointment among both foreign and domestic investors

After canceling (or delaying) the privatization of electricity distribution, there have been quite a bit of disappointment among both foreign and domestic investors. The government has reasoned the decision as a means to protect customers from price increases and preparing a better privatization framework. But the result of this decision will probably have a negative impact for financing a possible nuclear project.

As a capital intensive investment, a nuclear power plant construction is a big risk for investors especially in a market environment. There has to a secure investment environment. But this is never enough; government involvement and solid support of the state is needed.



The decision for a nuclear power plant had to be supported by other state institutions including the National Security Council (MGK).

When considering the political environment of Turkey and turmoil in the energy industry, the decision for a nuclear power plant had to be supported by other state institutions including the National Security Council (MGK).



National Security Council is the country's higher council for discussing the security concerns of Turkey. While discussing all sorts of security concerns, bypassing a nuclear power plant decision is a cheap way of escaping the responsibilities of such a project that will have an impact on country's energy security and independence, hence national security for a period of at least 50 years.

With such a decision, the project can be rescued from populist, everyday politics. But a pessimistic and realist guess is, the military personal will play the safe side by avoiding confrontation with the anti-nuclear Turkish public.

Even financial and executive problems have been solved; this anti-nuclear public opinion had to be converted.

Even financial and executive problems have been solved; this anti-nuclear public opinion had to be converted. The technical and financial solutions had to be coupled with a well-informed public opinion until the end of construction for securing the completion of the plant.

But the things are not good on this side either. The sentimentality against nuclear energy in the country , mainly in the Black Sea region where Sinop, a possible location for the project is located, the over confidence in country's natural resources and highly ideological NGOs are the main obstacles.

of the past experiences in the energy sector which can be summarized with the Ottoman's Janissary soldiers' march. Two steps forward one step back.

Finding solutions to all these problems requires quite a head scratch. Adding up to all these, is the unfortunate history of the past experiences in the energy sector which can be summarized with the Ottoman's Janissary soldiers' march. Two steps forward one step back.

Despite all these, Mr. Guler, Minister for Energy, has the historic chance. His firmness and stance is an indication of his commitment, but the road to civilian nuclear technology is not bed of roses and Mr. Guler is aware of it. But without an attractive investment environment, National Security Council decision and a well-informed public opinion, his roadmap for an energy secure Turkey is doomed by political games.



## Azerbaijan's gas struggle with Russia

It is uncertain whether the Caucasus and Central Asia will be another alternative to "Middle East", but day by day Central Asia and Caucasus are increasing its importance in terms of the energy supplies. Nevertheless, no one in the neighbourhood can escape from Russia's aspirations to control region through energy politics.

This winter Russia poured cold water on Belarus and Georgia by increasing the gas price. Azerbaijan, the next country to face Russian price raise, is trying to find ways to escape from the same fate. But domestic prices have been hit by the crises.



Azerbaijan has a population of around 8.5 millions

Azerbaijan, located at the crossroads of Eastern Europe and Southwest Asia, has a population of around 8.5 millions. According to US Department of Energy, Azerbaijan sits on 7 billion barrels of oil and 48 trillion cubic feet of natural gas (proven) reserves. With vast energy resources, its importance and international media coverage is increasing.

Azerbaijan imported 4.5 billion cubic meters of Russian gas in 2006.

Last week, Azerbaijan was at the centre of attention again, after receiving a two fold price increase from Russia. As an importer of 4.5 billion cubic meters of Russian gas in 2006, Azerbaijan has been demanded 235 USD instead of 110 USD per 1,000 cubic meters of gas. (International Herald Tribune)

President Aliyev said Azerbaijan had no other way to ensure its electricity security but to cut oil exported via the Baku-Novorossiysk pipeline.



The country responded by refusing to pay such amount and cut the crude oil exports to Europe through Russian controlled Baku-Novorossiysk pipeline. Azerbaijan's President Ilham Aliyev said Azerbaijan had no other way to ensure its electricity security but to cut oil exported via the Baku-Novorossiysk pipeline to Russia. (Baku Today)

Last year, SOCAR has reported to export 1.172 million tons of oil via this pipeline

Azerbaijan has been supplying around 80,000 barrels per day(10700 tons) of oil to Russia through the Baku-Novorossiysk oil pipeline which belongs to the Russian pipeline company Transneft. Last year, SOCAR has reported to export 1.172 million tons of oil via this pipeline.



stations.

But domestic electric prices couldn't escape a three fold increase. After the crude oil export cuts, gasoline exports also halted. Azerbaijan's state oil company, SOCAR(ARDNS), in a statement to the public, explained the reason for the sudden stop to deliver more straight-run fuel oil to the power

According to Interfax, the decision is limited to the first quarter of 2007 so far. "We expect that the extraction of natural gas from Shakh Deniz field will increase by April and the need for fuel oil will decline. In this case it will become possible to resume oil transportation along the Baku- Novorossiysk pipeline," the SOCAR spokesman said.



Turkey is also scheduled to buy 6.3 billion cubic meters (bcm) per year after Shakh Deniz projects becomes fully operational.

Turkey is also scheduled to buy 6.3 billion cubic meters (bcm) per year after Shakh Deniz projects becomes fully operational. The test flows had started by mid December, but halted in the last week of December due to a leak discovered on the first well.

In 2007, Turkey is expected to buy 3 bcm from the production.

Shakh Deniz project worth 4 billion\$ and a large amount of gas is due to be exported to Turkey over Georgia. In 2007, Turkey is expected to buy 3 bcm from the production.

An Iranian delegation will soon get to Baku to negotiate on the start of gas exports to Azerbaijan for 2007

While waiting the gas from the Shakh Deniz project, Azerbaijan is also considering Iranian gas. An Iranian delegation will soon get to Baku to negotiate on the start of gas exports to Azerbaijan for 2007 amid Azerbaijan's having refused to buy Russia gas in a price row. (Baku Today)



Experts question the Iran's capacity for such an agreement after Iran's failure to supply gas to Turkey between mid December 2006 and first week of January due to cold weather in the country.

## Oil Markets - This Week

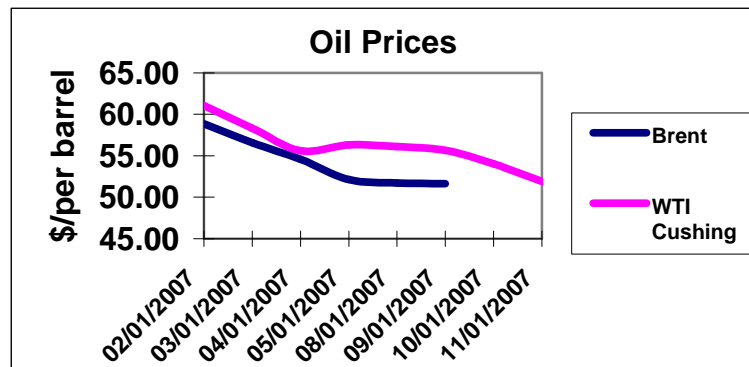
### Oil Prices are falling, but will the trend continue?

After a decisive increasing trend, oil prices have begun to decrease since August 2006. This pattern has not changed with the New Year. Some reasons have been suggested for this downward trend; such as decrease in demand for oil due to slow down in the world's growth, increase in inventories and now mild weather. It should be noted that in oil prices more than one factor is effective and for this time of the year weather is a priority determinative factor for oil prices, since the temperature fluctuations are effective on oil demand due to its heating function. Accordingly, now the mild weather can be shown as an important factor for this downward trend of oil prices. As can be seen from the below graph, from the beginning of this year oil prices have decreased almost 13% both in WTI and Brent Oil.

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According to Anatolian Agency (AA), OPEC members are not satisfied with these price decreases, OPEC closely follows the developments in the oil markets and if it would be necessary OPEC could take initiative to maintain stability in the oil markets. However, it is argued that the taken decision to cut down production starting from November 1 has not been realized according to a Bloomberg survey in November 2006 daily production decreased 550000 barrel and 245000 barrel in December, this causes doubts to grow about OPEC's cut down decisions. (Shenk, M., 2007) When this factor carefully examined it can be said that the precautions that was taken by OPEC in November to prevent the price decreases in oil markets have not been effective, since oil supply has not decreased 1.2 million barrels per day as expected.

Oil supply has not decreased 1.2 million barrels per day as expected.



Source: Energy Information Association

#### What to expect from the future:

For the next week according to a Bloomberg's News Survey 20 of the 47 analysts expect this decreasing pattern to continue whereas 16 of them expects a price increase. (Shenk, M, 2007)

OPEC's decision on December 14<sup>th</sup> to cut down oil supply for 500.000 barrels a day begins on February 1

It should be recalled that the decision taken by OPEC on December 14<sup>th</sup> to cut down oil supply for 500.000 barrels a day begins in February 1. This might negatively affect this downward trend in the short term. Moreover, problems that can occur in the delicate supply areas like in Iraq, Nigeria or in Iran can cause price fluctuations.

Resources(Bloomberg)

## Indicators

### Proved Reserves of Eastern Europe and Former USSR Countries

Country/Region	Oil (Billion Barrels) Review <sup>2</sup> Year-End 2005	Oil (Billion Barrels) Oil & Gas Journal <sup>3</sup> January 1, 2007	Oil (Billion Barrels) World Oil <sup>4</sup> Year-End 2005	Natural Gas (Trillion Cubic Feet) Review <sup>2</sup> Year-End 2005	Natural Gas (Trillion Cubic Feet) CEDIGAZ <sup>2</sup> January 1, 2006	Natural Gas (Trillion Cubic Feet) Oil & Gas Journal <sup>3</sup> January 1, 2007	Natural Gas (Trillion Cubic Feet) World Oil <sup>4</sup> Year-End 2005
Armenia	0	0.000	Not Separately Reported	Not Separately Reported	6.215	Not Separately Reported	Not Separately Reported
Azerbajjan	7.000	7.000	Not Separately Reported	48.361	48.382	30.000	Not Separately Reported
Belarus	Not Separately Reported	0.198	Not Separately Reported	Not Separately Reported	Not Separately Reported	0.100	Not Separately Reported
Estonia	Not Separately Reported	Not Separately Reported	Not Separately Reported	Not Separately Reported	Not Separately Reported	Not Separately Reported	Not Separately Reported
Former U.S.S.R.	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Georgia	Not Separately Reported	0.035	Not Separately Reported	Not Separately Reported	Not Separately Reported	0.300	Not Separately Reported
Kazakhstan	39.620	30.000	Not Separately Reported	105.900	67.099	100.000	Not Separately Reported
Kyrgyzstan	Not Separately Reported	0.040	Not Separately Reported	Not Separately Reported	Not Separately Reported	0.200	Not Separately Reported
Latvia	Not Separately Reported	Not Separately Reported	Not Separately Reported	Not Separately Reported	Not Separately Reported	Not Separately Reported	Not Separately Reported
Lithuania	Not Separately Reported	0.012	Not Separately Reported	Not Separately Reported	Not Separately Reported	0.000	Not Separately Reported
Moldova	Not Separately Reported	Not Separately Reported	Not Separately Reported	Not Separately Reported	Not Separately Reported	Not Separately Reported	Not Separately Reported
Russia	74.436	60.000	74.400	1.688.046	1.688.763	1.680.000	1.688.749
Tajikistan	Not Separately Reported	0.012	Not Separately Reported	Not Separately Reported	Not Separately Reported	0.200	Not Separately Reported
Turkmenistan	0.546	0.600	Not Separately Reported	102.370	102.414	100.000	Not Separately Reported
Ukraine	Not Separately Reported	0.395	Not Separately Reported	39.007	39.023	39.000	Not Separately Reported
Uzbekistan	0.594	0.594	Not Separately Reported	65.305	65.333	65.000	Not Separately Reported
Other-Country	0.692	Not Applicable	48.823	9.358	3.637	Not Applicable	351.994

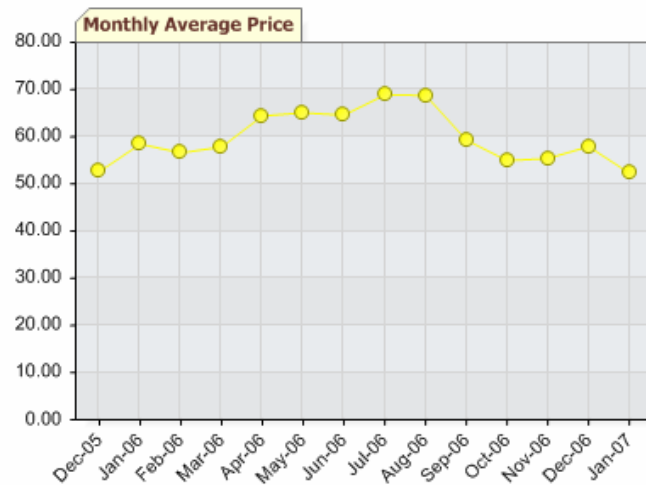
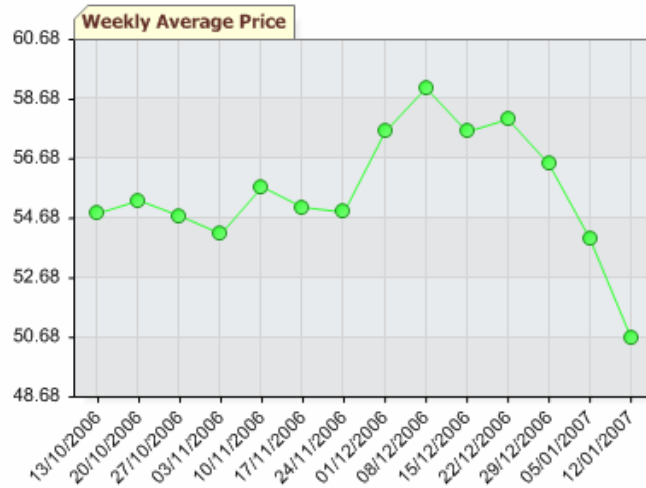
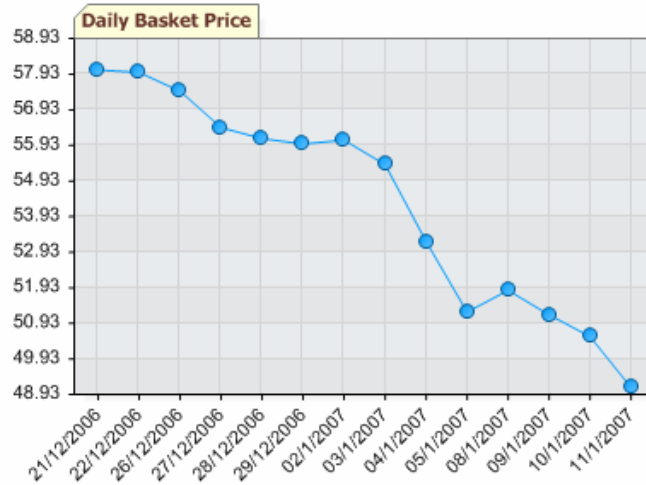
## Indicators

### The advantages and disadvantages of different sources of electrical energy (EU)

Energy sources	Technology considered for the cost estimate	2005 Cost (€/MWh)	Projected Cost 2030 (€ / MWh with €20-30/tCO <sub>2</sub> )	GHG emissions (Kg CO <sub>2</sub> eq/MWh)	EU-27 Import dependency		Efficiency	Fuel price sensitivity	Proven reserves / Annual production
					2005	2030			
Natural gas	Open cycle gas turbine	45 - 70	55 - 85	440	57%	84%	40%	Very high	64 years
	CCGT (Combined Cycle Gas Turbine)	35 - 45	40 - 55	400			50%	Very high	
Oil	Diesel engine	70 - 80	80 - 95	550	82%	93%	30%	Very high	42 years
	PF (Pulverised Fuel with flue gas desulphurisation)	30 - 40	45 - 60	800			40-45%	medium	
Coal	CFBC (Circulating fluidized bed combustion)	35 - 45	50 - 65	800	39%	59%	40-45%	medium	155 years
	IGCC (Integrated Gasification Combined Cycle)	40 - 50	55 - 70	750			48%	medium	
Nuclear	Light water reactor	40 - 45	40 - 45	15	Almost 100% for uranium ore		33%	low	Reasonable reserves: 85 years
Biomass	Biomass generation plant	25 - 85	25 - 75	30			30 - 60%	medium	
	On shore	35 - 175	28 - 170	30			95-98%		
Wind	Off shore	35 - 110	28 - 80						
	Off shore	50 - 170	50 - 150	10	nil		95-98%	nil	
Hydro	Large	60 - 150	40 - 120						
	Small (<10MW)	25 - 95	25 - 90	20			95-98%		
Solar	Photovoltaic	45 - 90	40 - 80	5 <sub>26</sub>			95-98%		
		140 - 430	55 - 260	100			/		

## Indicators

### OPEC's Basket Price



## Indicators

Indicative Exchange Rates Announced at 15:30 on 12/01/2007 by the Central Bank of Turkey

CURRENCY		EXCHANGE RATES		EXC.RATES ON BANKNOTES	
		Buying	Selling	Buying	Selling
USD/TRY	1 US Dollar	1.4263	1.4332	1.4253	1.4353
EUR/TRY	1 EURO	1.8404	1.8493	1.8391	1.8521
GBP/TRY	1 British Pound	2.7781	2.7926	2.7762	2.7968

## Turkish Refinery Output Price

Product Name	YTL/TON	YTL/M3	Special Concise Tax	Dividend	Exclusive of VAT	VAT	VAT included price	Validity Date
<b>Unleaded Petrol 95 OCTANE</b>			<b>YTL/M3</b>	<b>YTL/M3</b>	<b>YTL/M3</b>	<b>YTL/M3</b>	<b>YTL/M3</b>	
İzmit	744,77	566,03	1.362,50	1,32	1.929,85	347,37	2.277,22	12/01/2007
İzmir	744,77	566,03	1.362,50	1,32	1.929,85	347,37	2.277,22	12/01/2007
Kırıkkale	749,08	569,30	1.362,50	1,32	1.933,12	347,96	2.281,08	12/01/2007
Batman	779,24	592,22	1.362,50	1,32	1.956,04	352,09	2.308,13	12/01/2007
<b>Jet Fuel</b>			<b>YTL/M3</b>	<b>YTL/M3</b>	<b>YTL/M3</b>	<b>YTL/M3</b>	<b>YTL/M3</b>	
İzmit	864,00	691,20	0,00	1,29	692,49	124,65	817,14	05/01/2007
İzmir	864,00	691,20	0,00	1,29	692,49	124,65	817,14	05/01/2007
Kırıkkale	876,75	701,40	0,00	1,29	702,69	126,48	829,17	05/01/2007
<b>Kerosene</b>			<b>YTL/M3</b>	<b>YTL/M3</b>	<b>YTL/M3</b>	<b>YTL/M3</b>	<b>YTL/M3</b>	
İzmit	864,00	691,20	760,50	1,29	1.452,99	261,54	1.714,53	05/01/2007
İzmir	864,00	691,20	760,50	1,29	1.452,99	261,54	1.714,53	05/01/2007
Kırıkkale	885,25	708,20	760,50	1,29	1.469,99	264,60	1.734,59	05/01/2007
Batman	892,34	713,87	760,50	1,29	1.475,66	265,62	1.741,28	05/01/2007
<b>Diesel 7000</b>			<b>YTL/M3</b>	<b>YTL/M3</b>	<b>YTL/M3</b>	<b>YTL/M3</b>	<b>YTL/M3</b>	
İzmit	756,23	639,01	834,50	1,27	1.474,78	265,46	1.740,24	12/01/2007
İzmir	756,23	639,01	834,50	1,27	1.474,78	265,46	1.740,24	12/01/2007
Kırıkkale	777,77	657,22	834,50	1,27	1.492,99	268,74	1.761,73	12/01/2007
Batman	792,13	669,35	834,50	1,27	1.505,12	270,92	1.776,04	12/01/2007
<b>Diesel 50</b>			<b>YTL/M3</b>	<b>YTL/M3</b>	<b>YTL/M3</b>	<b>YTL/M3</b>	<b>YTL/M3</b>	
İzmit	776,20	655,89	927,00	1,27	1.584,16	285,15	1.869,31	09/01/2007
İzmir	776,20	655,89	927,00	1,27	1.584,16	285,15	1.869,31	09/01/2007
Kırıkkale	797,46	673,85	927,00	1,27	1.602,12	288,38	1.890,50	09/01/2007
<b>Fuel Oil 4</b>			<b>YTL/TON</b>	<b>YTL/TON</b>	<b>YTL/TON</b>	<b>YTL/TON</b>	<b>YTL/TON</b>	
İzmit	488,05		476,00	1,42	965,47	173,78	1.139,25	12/01/2007
İzmir	488,05		476,00	1,42	965,47	173,78	1.139,25	12/01/2007
<b>Fuel Oil 6</b>			<b>YTL/TON</b>	<b>YTL/TON</b>	<b>YTL/TON</b>	<b>YTL/TON</b>	<b>YTL/TON</b>	
İzmit	361,81		204,00	1,42	567,23	102,10	669,33	12/01/2007
İzmir	361,81		204,00	1,42	567,23	102,10	669,33	12/01/2007
Kırıkkale	368,99		204,00	1,42	574,41	103,39	677,80	12/01/2007
Batman	368,99		204,00	1,42	574,41	103,39	677,80	12/01/2007

Source : [www.tupras.com.tr](http://www.tupras.com.tr)