

Towards Cost-reflective Energy Pricing in Ukraine

By Hi-chun Park*

Introduction

Ukraine has been in an energy crisis at least since the gas supply disruption from Russia in January 2006. The actual energy crisis has been triggered mostly by low energy prices which have implications both on energy supply and energy demand. Most Ukrainian energy providers have been unable to finance even their replacement investments as their revenues from sales did not cover all their costs. Their equipment is no longer energy efficient. Delayed payments of gas import bills by Naftogaz, the state gas corporation, have been one of the major reasons for the Russian gas supply disruption. At the same time energy consumers have not had enough incentive to save energy. Low energy prices have resulted in excessive energy consumption which in turn has aggravated the energy crisis.

Prices of gas, electricity and district heating for households are especially low, which has been made possible by subsidization and cross-subsidization from industrial consumers to households. This low energy price policy can no longer be pursued as Ukraine has to pay international market prices for gas imports from 2010. It has to equalize prices for imported gas and domestic production by the end of 2011 to fulfill one of the IMF's stand-by loan commitments. The price of gas from domestic production has been kept artificially low, at less than half of the price paid for foreign supplies.

The importance of cost-reflective energy prices has been well recognized in Ukraine. The Energy Strategy of Ukraine for the Period till 2030 (2006) calls for Ukrainian energy prices to gradually approach prices of liberalized EU markets over the 2008-2011 period. This paper first reviews the Ukrainian energy scene. It then analyzes Ukrainian energy pricing policy and finally discusses an option to improve this policy in Ukraine. This paper ends with conclusions and policy recommendations.

Ukrainian Energy Scene

Ukraine has not only coal but also oil and natural gas as its resources. However, Ukraine's energy production is not sufficient for its domestic consumption. Ukraine's economy is highly dependent on gas, a great deal of which has to be imported from Central Asia and Russia, solely through Russian gas pipelines. The oil and gas import dependencies of Ukraine were 73.5% and 74.8%, respectively, in 2007. This was high. Ukraine has maintained the low energy price policy that originated in the Soviet era. The Soviet Union, being rich in energy resources, and a socialist state provided industry and households with energy on a need basis. This tradition continued in Ukraine for a long time after independence from the Soviet Union in 1991. Energy security has become a big concern since the Russian gas supply disruption in January 2006.

Energy Pricing Policy

Energy prices in Ukraine are lower than in OECD countries. Most energy prices only cover operating costs and do not reflect the long-term costs of energy supply. There are no specific energy taxes in Ukraine except the value added tax (VAT) of 20%. As energy is somewhat regarded as a basic social service, its prices for households have been kept very low (Copsey and Shapovalova, 2009). Electricity and gas tariffs are regulated by the National Electricity Regulation Commission of Ukraine (NERC). District heating tariffs are subject to the local authorities' approval according to the Law on Heat Supply. Only prices of petroleum products are determined in the market.

Electricity tariffs

In Ukraine electricity consumers are divided into two groups, i.e., regulated tariff consumers and non-regulated tariff consumers. Regulated tariff consumers include households, settlements (lighting, group consumers) and other consumers (industrial and commercial companies, etc.). Non-regulated tariff consumers are big companies with special permits.

There was a big increase in household electricity tariffs from 15.5 kopecks/kWh in March 1999 to 24.4 kopecks/kWh in September 2006. Since then these tariffs have remained unchanged at 24.4 kopecks/kWh. According to the NERC, the 2006 electricity tariffs covered only 60% of the production costs (Tsarenko, 2007a). The NERC wanted to introduce a progressive electricity tariff system starting in April 2007. According to it, the first 125 kWh per month of electricity consumption would be charged at the prevailing rate, and anything above that would cost 60% more (Tsarenko, 2007a). However, this system could not be introduced.

Other consumers are divided into two groups. The first group covers consumers connected to a 0.4-10 kV network, the second group includes consumers connected to a 35-110 kV network. These consumers pay substantially higher electricity tariffs than households. Table 1 indicates that there is substantial cross-subsidization from other consumers (small and medium sized companies) to households and big companies.

Natural gas tariffs

Household gas tariffs depend on the yearly consumption with meters installed on consumer's side. There are four progressive tariff steps, i.e., consumption

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Tariff period	House-Holds	First Group	Second Group	Big Companies
Jan 2008 – Dec 2008	24.4 (4.6)	39.8 (7.6)	53.4 (10.2)	24.8 (4.8)
Jan 2009 – Sept 2009	24.4 (3.2)	52.3 (6.8)	70.2 (9.1)	27.5 (3.5)

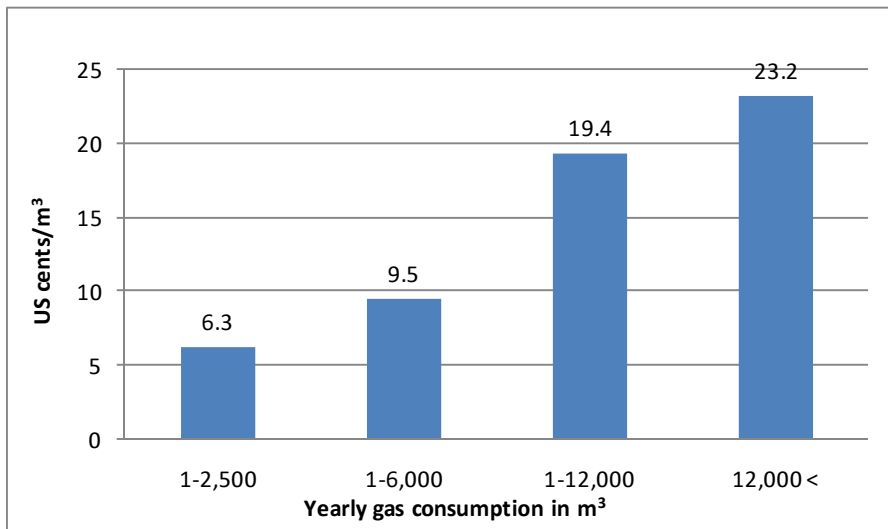
Sources: NERC; State Company “Energorynok” (ARENA-ECO, 2009).

Notes: First group (0.4-10 kV); second group (35-110 kV); big companies (92 with special permits).

Table 1: Electricity Tariffs for Households and Industrial Consumers, kopecks (US cents)/ kWh

some refinement. Considering per household yearly gas consumption in the Netherlands with 1432 m³ (12.1 Gcal) in 2006 (Weiss et al., 2009) and in Korea with about 11 Gcal in 2007 (Park and Kim, 2008), the range of Ukrainian tariff steps or the intervals between tariff steps are too large and the tariff steps of up to 6000 m³, 12,000 m³ and over 12,000 m³ are too high. According to ARENA-ECO, a majority of Ukrainian households consumed less than 6000 m³ gas and 39% of households consumed less than 2500 m³ gas in 2009.

Industrial consumers paid 20.3 and 22.2 cents per m³ in September 2008 and January 2009, respectively. They paid substantially more than households consuming less than 6000 m³ per year. The weighted average gas tariff with VAT for district heating was 11.6 cents/m³ in 2008. The gas tariffs for households and district heating are low because they have been supplied with gas extracted in Ukraine. Its production cost was much lower than the imported gas price (Tsarenko, 2007b).



Source: NERC (ARENA-ECO, 2009).

Figure 1: Natural Gas Tariffs for Households with Gas Meters, valid from December 2008.

comparison to district heating and electricity. Table 3 shows relative household prices of gas, district heating and electricity in Germany, Korea and Ukraine. Ukrainian household energy prices are lower than those of Germany and Korea. Assuming a generation efficiency of 35 to 40%, electricity has to cost two to three times the price for gas and district heating. The price ratios of gas to electricity in Ukraine were 1 to 4.5 (yearly gas consumption up to 6000 m³) and 1 to 6.7 (yearly gas consumption up to 2500 m³) in 2008.

While the price ratio of gas to district heating in 2008 were about 100 to 110 in Germany and Korea, such a ratio in Ukraine was 100 to more than 310. District heating costs almost as much as electricity in Ukraine. It is not at all economic.

Ukrainian household gas prices are also low in comparison to those for industrial consumers. According to Table 4, in 2007 Ukrainian industrial consumers paid USD 378.1 per ton of oil equivalent (toe) of natural gas, while households paid only USD 84.5 per toe (22% of the industrial tariff) and USD 126.7 per toe (34% of the industrial tariff). These price ratios of industrial consumers to households are quite different from that of the OECD average of USD 428.9 (100) to 690.8 (161) per toe. Ukrainian house-

up to 2500 m³ (20.1 Giga calories), 6000 m³ (48.3 Gcal), 12,000 m³ (96.6 Gcal) and over 12,000 m³ per year (Figure 1). Households consuming up to 2500 m³ gas per year pay 6.3 US cents per m³ since December 2008. Households consuming more than 2500 m³ but less than 6000 m³ per year pay for the whole consumption at 9.5 cents per m³. For instance, a household having used 2400 m³ gas until the end of November and consuming 200 m³ gas in December will have to pay until November 6.3 cents per m³ but in December USD 19 (0.095 * 200) plus USD 76.80 [(0.095 – 0.063) * 2400].

These tariffs have to be improved. First, the tariff level is too low. Household gas tariffs have to be raised at least by a factor of two. Second, the Ukrainian tariffs require

Districing heat tariffs

As can be seen in Table 2 the average district heating tariff for households per Gcal was USD 38.76 in 2008, which was substantially lower than that for commercial consumers paying USD 87.24. This tariff difference is doubtless the result of cross-subsidization from commercial to residential consumers.

Relative energy prices

The Ukrainian household gas prices of 0.69 cents/kWh (yearly consumption up to 2500 m³) and 1.03 cents/kWh (yearly consumption up to 6000 m³) in 2008 were only one seventh and one fourth, respectively, of the German price of 4.8 cents/kWh. Ukrainian household gas prices are not only very low in absolute terms compared to OECD countries but also very low in com-

holds would have to pay 4.7 times (161/34) or 7.3 times (161/22) the price they pay for gas today, if the OECD price ratio applied.

Improvement of Energy Pricing Policy

As discussed Ukrainian household gas, district heating and electricity prices are very low and distorted. A substantial increase in these prices is required to remove this price distortion. A solution which does not too adversely affect living conditions of low-income households, while adjusting low energy prices to cost-reflective price levels, is the introduction of a progressive tariff system. Such a system can enable a country with relatively low average prices to encourage energy conservation and to supply low-income households with low-priced energy. This is necessary as poverty has increased in the transition from the Soviet system to a market economy. Non-payment of energy bills has been relatively high in Ukraine (Tsarenko, 2007a).

An example of such a system is the Korean household electricity tariff system which has a very steep progression in 6 steps, going from the first step of monthly consumption up to 100 kWh (5.5 US cents/kWh) to the last step of monthly consumption of over 500 kWh (64.4 cents/kWh) per household (Figure 2). Households using over 500 kWh per month have to pay 11.7 times the tariff for those using up to 100 kWh per month. As the (average) household electricity tariff in Korea was one of the lowest among the OECD countries at 10.2 cents/kWh in 2007, (OECD average: 14.3 cents/kWh; Japan: 17.6 cents/kWh), one could expect a relatively high per capita household electricity consumption in Korea. However, due to the steep progression, Korean households, in 2007, consumed only 1118 kWh per capita against 2278 kWh per capita in Japan. Korean households generally do not use electricity for cooking and heating because of the progression.

Conclusions and Policy Recommendations

Conclusions

The energy crisis in Ukraine has been triggered mostly by low energy prices. Electricity, gas and district heating are sold at below production costs. Distorted are not only relations among gas, district heating and electricity prices for households but also the ratio of household to industrial energy prices. Household energy prices in Ukraine are substantially lower than those for industrial consumers. To approach cost-reflective energy prices, which is the price policy aim in Ukraine, household energy prices have to be raised by at least a factor two. Ukrainian households would have to pay 4.7 to 7.3 times the price they pay for gas today, if OECD price ratios applied.

A solution which does not too adversely affect living conditions of low-income households while adjusting low energy prices to cost-reflective price levels, is the introduction of a progressive tariff system. Such a system can enable a country with relatively low average prices to encourage energy conservation and to supply low-income households with low-priced energy. This is especially necessary as poverty has increased in the transition from the Soviet system to a market economy since the independence from the Soviet Union in 1991.

	Net costs	Approved tariffs	Net costs	Approved tariffs
	2008		2009	
Residential consumers	239.88 (45.60)	204.00 (38.76)	282.48 (36.60)	286.44 (37.08)
Commercial consumers	319.68 (60.72)	459.36 (87.24)	508.92 (65.88)	684.48 (88.56)

Source: Ministry of Housing and Communal Services of Ukraine (ARENA-ECO, 2009).

Table 2: Average Estimated District Heat Tariffs with VAT, UAH (USD)/ Gcal

	Gas	Heat	Electricity	Gas	Heat	Electricity
	US cents/ kWh			Gas price = 100		
Germany	4.8	5.3	14.6	100	110	304
Korea	3.8	4.2	8.2	100	111	216
Ukraine	0.69 1) 1.03 2)	3.25	4.6	100 100	473 314	671 445

Sources: BMWT, Entwicklung von Energiepreisen und Preisindizes, 2009;

KEEI, Yearbook of Energy Statistics 2009; Tables 1 & 2; Figure 1.

Notes: 1) and 2) Yearly gas consumption up to 2500 m³ and 6000 m³, respectively.

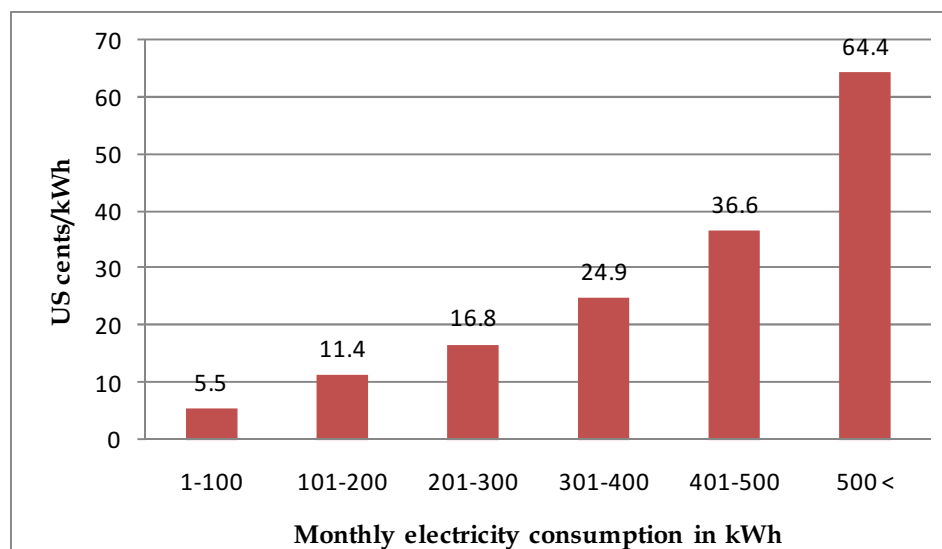
Table 3: Relative Household Energy Prices in Ukraine and Other Countries, 2008

		Industry	Household	Industry	Household
		Industry = 100			
Electricity	Ukraine 2007	8.9	4.6	100	52
(US cents/kWh)	OECD 2007	11.0	15.0	100	136
Natural gas	Ukraine 2007	378.1	84.5 1) 126.7 2)	100	22 34
(USD/toe)	OECD 2007	428.9	690.8	100	161
District heat	Ukraine 2008	87.2	38.8	100	44
(USD/Gcal)	2009	88.6	37.1	100	42

Sources: IEA, Energy Prices and Taxes, 2009 Third Quarter; Tables 1 & 2; Figure 1.

Notes: 1) and 2) Yearly gas consumption up to 2500 m³ and 6000 m³, respectively.

Table 4: Relative Energy Prices for Households and Industry in Ukraine and OECD Countries



Source: Korea Electric Power Corporation.

Figure 2: Monthly Household Electricity Tariffs in Korea, Valid Since January 2007

Policy Recommendations

All subsidies and cross-subsidies between different economic sectors should be removed as soon as possible. At the moment the cross-subsidies from industrial/commercial consumers to households are very large. Prices for imported gas and domestic production have to be equalized as requested by the IMF's stand-by loan agreement. The price ratios of industrial consumers to households in OECD countries should be considered while readjusting Ukrainian energy prices to cost-reflective price levels. Furthermore, the ratio between different energy resources used by households should be also taken into consideration.

A progressive household tariff system for electricity and district heating should be introduced to alleviate the effects of price increases on low-income households while adjusting low energy prices to cost-reflective price levels. And the existing progressive gas tariffs should be also revised to make them more effective. Progressive tariff systems could have the following tariff structures:

- Household electricity tariffs in 5 progressive steps: e.g., monthly consumption up to 100 kWh, 200 kWh, 300 kWh, 400 kWh and over 400 kWh per household;
- Household district heating tariffs in 5 progressive steps: e.g., monthly consumption up to 0.5 Gcal, 1.0 Gcal, 1.5 Gcal, 2.0 Gcal and over 2.0 Gcal per household;
- Household natural gas tariffs in 5 progressive steps: e.g., monthly consumption up to 50 m³, 100 m³, 150 m³, 200 m³ and over 200 m³ per household.

Such progressive tariff systems will enable Ukraine to reduce household energy consumption while maintaining relatively low average household electricity, gas and district heating prices. Thus, Ukraine would not need to raise average energy prices too much.

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