Efficient Policies? Energy Efficient Policy in Ukraine, Russia, and Belarus

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ABSTRACT

Russia, Ukraine and Belarus were the Slavic siblings of the Soviet Union. Back then, energy efficiency was not high on anyone's agenda. Today, though, these three countries have taken different paths, both politically and in terms of their energy use. All three countries still have very high energy intensities and many profitable opportunities to improve energy efficiency. Yet because each country has taken a very different approach to energy efficiency policy, these trends are starting to diverge.

This paper analyzes the energy efficiency trends in each country to better understand the impact of policy. Russia has done very little in terms of national energy efficiency policy, though it has taken steps at the regional level. Belarus is making major government investments in energy efficiency and has a very "energetic" committee to promote and track energy efficiency efforts. Even though it is a totalitarian state with little private ownership, Belarus' president is very worried about the intense reliance on energy imports from Russia. Ukraine has made smaller investments, but has had a coordinated policy, at least until 2005. Now Ukraine stands at a juncture of whether to follow through on energy reforms or not.

Introduction

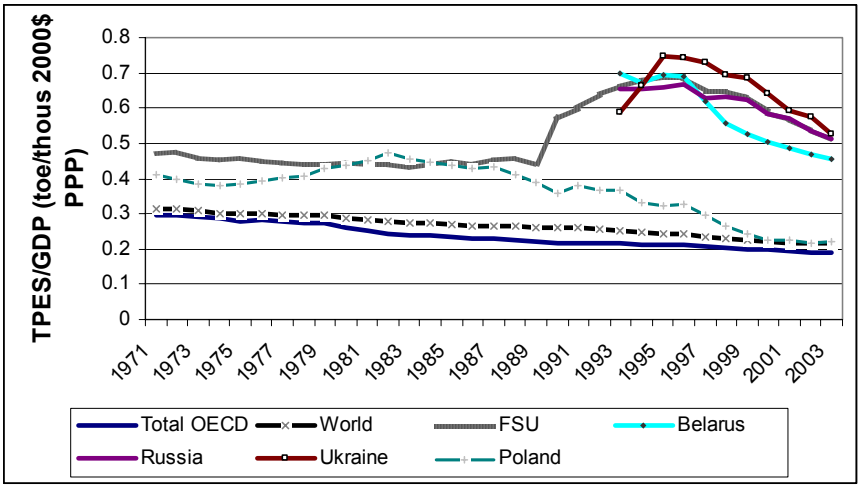
Russia and its Slavic neighbors, Ukraine and Belarus, waste a lot of energy. They have high energy use compared to the sizes of their economies; their energy intensity levels, as this ratio is known, are among the highest in the world. This energy waste is a product of old Soviet policies to promote energy production and to put less emphasis on quality. Energy was, and for the most part still is, cheap in these countries, which reduces the incentive to save energy. Both because of Soviet priorities and cheap energy, these three countries also have high levels of heavy industry, with their associated high energy use. Unlike other former-socialist countries, like Poland, these three former-Soviet nations have seen relatively little structural economic reform, probably because energy prices have not risen that much yet. Also Russia, Ukraine and Belarus are cold countries, necessarily leading to higher energy use. But this factor cannot come close to explaining all the excess energy use.

Figure 1 below shows how the Soviet Union and then these three post-Soviet states fared with energy intensity compared to the OECD, the rest of the world and neighboring Poland. Three points in particular jump out. First, the former Soviet Union has much higher energy use than other countries, as noted above. Second, there was a major increase in energy intensity in the former Soviet Union starting in the late 1980s. This was mainly caused by massive economic decline. Third, the former Soviet states have made significant improvements in their energy use, but compared to the trajectory these countries were on before the mid 1980s, they have yet to recover from the economic shock of Soviet collapse.

This paper focuses mainly on the past decade. In looking at the data, we are starting to see a new trend: the rate of energy efficiency improvements seems to be higher in those countries

(Belarus and Ukraine) that have more developed energy efficiency policies. Russia, Ukraine and Belarus have all seen their energy intensities drop, but Belarus has gone from most energy intensive of the three to the least. Ukraine saw its energy intensity first climb dramatically after its independence, but since the late 1990s, the rate of decline in its energy intensity has been very steep. While strong economic growth since 2000 has played a role, so has energy efficiency policy. Russia has seen energy efficiency improvement, with less dramatic annual progress.

Figure 1. Energy Intensity in Selected Countries and Regions



Source: IEA Statistics

We know from the experience in OECD countries that well-designed energy efficiency policy can have a major impact on energy use and intensity. This is particularly true when overall policies include measures that both "push" the market (e.g. mandatory efficiency requirement for equipment) and "pull" the market (e.g. incentives such as labelling). The International Energy Agency (IEA) has studied a core group of its member countries and found that since 1973, energy efficiency has been the biggest new "fuel", resulting in 50% lower energy use than we would have seen based on pre-1973 energy trajectories (IEA 2005). Even countries and regions as different as California and Denmark have seen their energy use level off after adopting strong energy efficiency policies, so the impact does not appear to be limited to unique circumstances. The post-Soviet states present an interesting case because they started with a common history and set of policies, which can help us interpret the changes they have undergone since the end of the Soviet Union.

Russia

Energy Use and Intensity Trends

Russia is considered by its own energy efficiency experts as the "Saudi Arabia" of energy efficiency. Its strong economic growth since the financial collapse in August 1998 has depended not only on its vast natural resources but also on more energy-efficient use of those resources and will increasingly depend on this in the future.

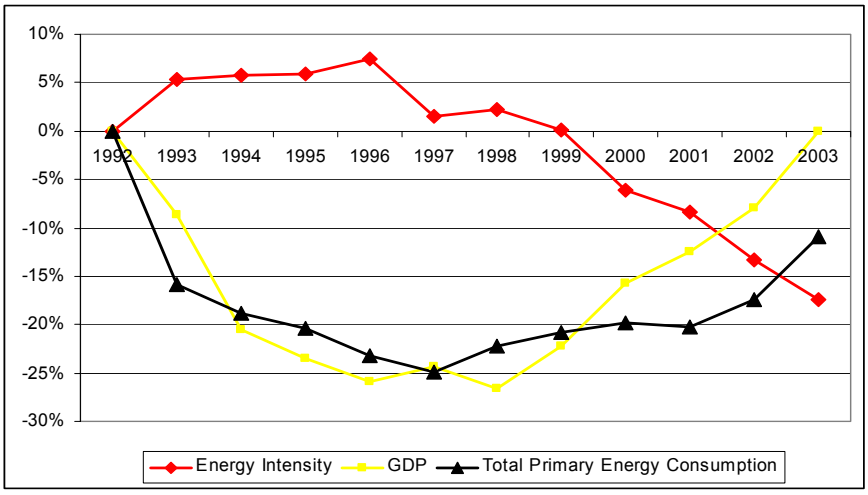
After the collapse of the Soviet Union, Russia's GDP dropped by about 25% from 1992 to 1998. Its total primary energy consumption dropped less than this and so its energy intensity

increased during this period by 5-7%. This does not sound dramatic; however, it was already starting from a high base. In 1996, for example, Russia's energy intensity was more than double Canada's and over three times that of the OECD average. By 2003, Russia's energy intensity had improved somewhat reaching levels just over two-and-a-half times the OECD average. GDP growth has been phenomenal since 2000 and energy consumption has grown at a slower pace.

The potential for improvement was and still is immense – and the incentives are growing with domestic energy prices. The stimulus to become more efficient is all the greater given the high export value of these commodities to Russia, a major oil and gas exporter.

Russia's economic growth depends not only on its vast natural resources but also on more energy-efficient use of those resources, in heating systems, companies, buildings, houses and transport. Efficient energy use is also the quickest, most economic way to ease budget deficits in municipalities across all regions. In Russia it is not uncommon for city governments to spend 25% to 40% of their budgets on district-heating systems.

Figure 2. Russian Energy Trends, 1992-2003



Source: IEA data

Policies and Institutions[1]

Despite the central place of energy efficiency in the 1995 Energy Strategy, only limited success was visible by 2000. The increase in the energy sector's share of GDP and the prevalence of low prices for energy inputs did not help this.

President Boris Yeltsin signed the federal Law on Energy Conservation in April 1996 which made energy efficiency an official priority. It called for more accountability of producers and consumers and the inclusion of energy-efficiency requirements in federal standards for equipment, materials, buildings and vehicles. It introduced standards and certification of energy-consuming equipment. It made energy audits compulsory at large companies and set a target for metering all energy consumption in Russia by 2000, as well as improved statistical reporting on energy consumption. It provided mechanisms to promote investment in energy efficiency,

[1] The historic part of this section is drawn from International Energy Agency (IEA). 2002. *Russia Energy Survey*. Paris: IEA/OECD

including government guarantees. It called for differentiated energy tariffs by season and time of day. Yet the law has not been implemented or enforced in many important areas.

The 1996 law divided the responsibility between the federal and regional governments. Regions with a real interest in efficiency improvements were given substantial room to develop their own legislation, though not all regions took this up.

In January 1998 the federal programme on "Energy Conservation in Russia" was adopted by Government Decree No. 80. It recommended that regional administrations develop their own programmes. This programme aimed to reduce energy intensity by 13.4% by 2005. It intended to do this so by implementing the main energy-efficiency policies identified in the 1995 Energy Strategy and the Law on Energy Conservation. The government was to use market mechanisms, regulation, the reduction of energy subsidies and the reform of energy prices. Its main emphasis was on the energy, residential and commercial sectors, energy-intensive industries and the electricity generating industry. Metering was also listed as a priority. The estimated investment needs of the program were $9.2 billion, to be financed by company profits (47%), bank credits (30%), local budgets (20%) and the federal budget (3%).

A new Federal Target Programme "Energy Efficient Economy for 2002-2005 with an outlook to 2010" was adopted in 2001 along the same lines as the old programme. Currently, in 2006, a new energy efficiency programme is being formulated, but the details are not yet clear. That being said, in Russia's unattractive investment environment, any of these federal programmes have a somewhat hypothetical character. They lack a clear distribution of responsibility for implementation. Institutional and financial support from the federal government is minimal. Critics argued that the modest quantitative target of the first programme — to reduce energy intensity of GDP by just 13.4% in the eight year period to 2005 — would be reached in any case with the structural changes accompanying economic recovery. Indeed, by 2003 energy intensity had dropped 15% below 1998 levels. With limited financial support from the federal government, the programmes depend mostly on regional administrations and the private sector.

Over the last five years, despite legislative interest in Russia in supporting and promoting investment in energy efficiency, few successes have emerged at the federal level. Much of the improvements in energy intensity have been due to the booming economic growth fuelled mainly by its energy sector. High international energy prices for its oil and gas exports have also played a factor. The increasing government presence in Russia's oil and gas sector through its state monopolies does not bode well for efficiency or streamlining in the future. Clearly, the gains in efficiency to date in industry have been spurred on by competition and the private sector, not Russia's state monopolies.

Energy consumption in industry in Russia is generally in line with other industrialised countries, except for the iron and steel, and machinery sector, where energy is an extremely large input to the production process. Despite a 20% drop in energy consumption between 1995 and 1999, the iron-and-steel and machinery sectors remain very energy intensive. Over the 1990s, some proactive plants achieved remarkable energy efficiencies. Uralmash is a case in point. These energy efficiency success stories in Russia to date illustrate the benefits of competition.

Over the last few years, there has been some progress in promoting increased efficiency in some sectors. For instance changes to energy-efficient building codes have been adopted both at the regional (in the majority of Russian regions) and federal level. New federal standards were developed for windows and practices such as audits and blower door tests. Also, there have been

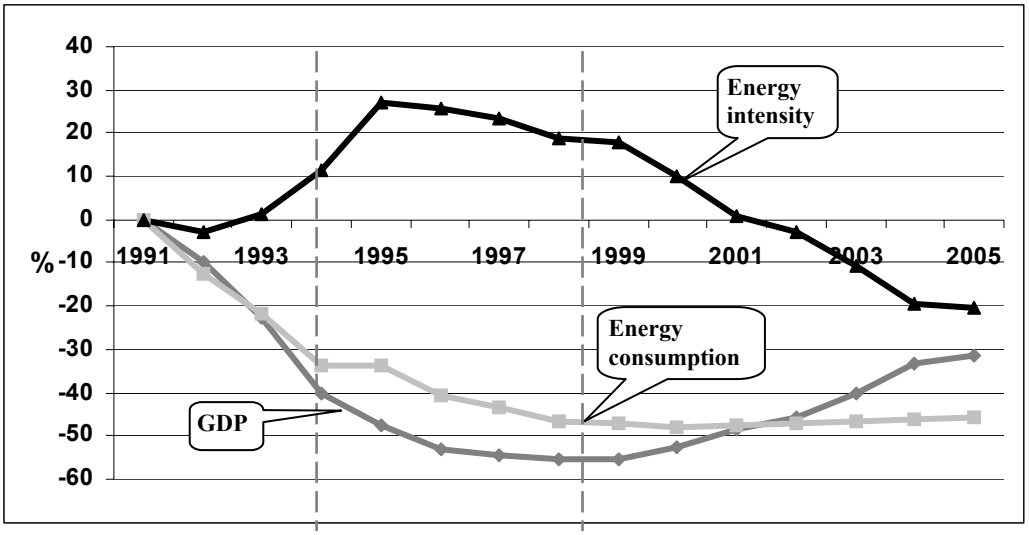
pockets of "success stories" in various regions, in particular in the residential sector, with the co-operation of Russian or foreign based energy efficiency agencies. The Norwegian initiative (NEEG) in North-western regions of Russia and the German initiative (DENA) are only a few of these. In addition, energy efficiency centres (some originally funded by the EU) exist in several regions and conduct energy audits and training at the regional level. The Moscow-based Centre for Energy Efficiency (CENEf) is a major driver of energy efficiency thinking and projects in Russian regions.

Ukraine

Energy Use and Intensity Trends

Ukraine is one of the most energy intensive countries in the world, even more so than energy-rich Russia. This is not news to the government. Ukraine first passed a law on energy conservation in 1994 and created a State Committee on Energy Conservation shortly after. However, funding for energy efficiency and a willingness to dedicate high-level attention to the issue have not always matched the scope of the problem. The committee was disbanded in 2005. (In comparison, Russia never had such an independent committee).

Figure 3. Ukrainian Energy Trends, 1991-2005*



Source: IEA, Derzhkomstat; *TPES for 2005 is estimated due to the huge drop in GDP growth that year.

After the Soviet collapse, Ukraine's domestic production dropped substantially. As a result, in 1991-1995 energy intensity grew by 30% (Figure 3). As the economic decline slowed down and energy consumption continued to decrease from 1996 to 1999, Ukraine's energy intensity stabilized. Since 2000, Ukraine has experienced substantial economic growth while energy consumption remained relatively stable. This is quite an achievement and it means that from 2000-2005 Ukraine's energy intensity dropped by 40%. It is now about 20% more energy efficient than it was in 1990, based on IEA data.

The improvements in energy intensity have not resulted from sectoral shifts in the economy, but rather from technological improvements in individual sectors. We can see this

because of the data the government collects on energy use per unit of output in each sector and subsector. For example, the fertilizer industry has reduced its energy use per unit of ammonia produced by over 30%; glass factories have reduced their energy use per unit by almost 50% and refineries have reduced their per unit use by about 25%. (The electricity and cement sectors are among the few that have actually seen slight increases in energy use per unit of output (Maslichenko and Danilin 2005)). Prices were not at world levels. Rather, two things drove this change. The first is energy efficiency policy. The second is the fact that manufacturers had hard-budget constraints and, in many cases, private owners, who realized that even at really cheap energy prices, there were energy savings to be had.

Policies and Institutions

Since the Orange Revolution, energy efficiency has become a hot topic in Ukraine. As a result, the President has announced the creation of a new National Agency on Efficient Energy Use[2], the government has developed number of draft laws and sectoral programmes on energy efficiency and several legislative amendments passed. On the other hand, until very recently, there has been a vacuum of political will at the highest levels of decision making, which has made it difficult to push through the most important policy changes needed to improve energy efficiency, including tariff reform. Energy prices are low and do not cover the full, long-term costs of energy supply. Real prices for energy have actually declined from 2000 to 2005.

Ukraine has enormous potential for reducing its energy consumption. The Draft Energy Strategy foresees a more than two-fold reduction in energy intensity by 2030 (Government of Ukraine 2006). This would correspond to energy savings of 390 Mtoe (570.3 Mtce), or 65% of planned energy consumption in a "business as usual" scenario. 228 Mtce, or 40%, of this reduction would come from structural changes as the economy shifts away from heavy industry to a more service-oriented GDP. An even larger share of the reduction would result from technological improvements.

Under the SCEC's initiative, the Cabinet of Ministers approved a Decree "On Managing Energy Savings" in January 1996, which required government ministries and regional administrations to establish energy saving departments. These departments are responsible for increasing the effectiveness of activities aimed at improving energy efficiency. Apart from that, in 1999 the State Inspection on Energy Conservation was created by the government in order to provide oversight for compliance with energy efficiency regulations and standards.

Within Ukraine, there is now a strong base of expertise on energy efficiency. For example, there are several non-governmental organisations and research institutes that promote energy efficiency. The non-profit Agency for Rational Energy Use and Ecology (ARENA-ECO) is the oldest and largest of such non-governmental organisations. It is fair to say that these institutions and the State Committee for Energy Conservation played a major role in the energy intensity improvements Ukraine has seen after 1995.

Sectoral energy efficiency policies have also benefited from the SCEC's guidance.

Buildings: Ukraine has building standards that cover energy use; the standards are called DBN, a Ukrainian acronym for state construction norms. While the name has changed since Soviet times (when these standards were called SNiP), the content of the standards has not

[2] The full name of the organization according to the decree that created it is "National Agency of Ukraine on Questions of Providing Efficient Use of Energy Resources."

changed radically regarding energy efficiency. One problem with all the building energy codes, according to Ukrainian building design experts, is that they are regularly ignored (KievZNIIEP 2005). There are some proposals to radically change the standards, though they seem to be at a fairly preliminary stage of development.

Ukraine is also experiencing a boom in electric appliance sales. The appliance standards system of Ukraine is based on the law "On Standardisation" passed in 2001. Energy labelling was introduced for the first time in 2003 by an order of the State Committee for Energy Conservation on technical regulations of appliances. The new energy efficiency standards are based on the European Union appliance standard directive. Ukraine has minimum efficiency and labelling standards for the following appliances: electric refrigerators and freezers; clothes-washers and drying machines; dishwashers; ovens; water-heaters; lighting facilities; and air conditioning units. While they have been adopted, they are not being enforced because of the State Committee on Energy Conservation's demise.

Industry: In 2003 Ukrainian industry accounted for 42% of total final energy consumption. Ukrainian policy toward industrial energy efficiency has focused on four main points: normative regulation of energy use, energy audits, financing mechanisms and training. Normative regulation appears by far the most important in terms of staff: the Energy Savings Inspectorate has several hundred staff, a large share of whom focus on developing norms for energy use by sector and product. The State Committee for Energy Conservation also had a well-developed outreach programme with training, seminars and information on energy efficiency for industrial managers and workers.

Transportation: The transport sector's share in Ukrainian energy consumption is small compared with that in OECD countries. Ukraine's transportation system in the early 1990s was relatively energy efficient, featuring a high share of public transportation and a low level of car ownership. The economic transition has spurred the demand for private cars.

The government has implemented some measures to limit the increase in road traffic, namely high fuel excise taxes, and investments in rail and public transport systems. Soviet-era cars are now being replaced by more energy efficient, Western-style cars. Government policy has played a role in this. For example, the government provided taxes on car imports based on the age of their age; older cars are typically less efficient. Vehicles older than 5-8 years old cannot be imported at all.

Energy Transformation: Ukraine consumes 15% more energy to produce a kWh of electricity and 30% more to produce a unit of heat than the OECD average, based on IEA data. Moreover, government data show that electricity transmission losses are over 18% today compared to 8% in 1990, and 6% in the OECD. Residential energy consumption, where district heating accounts for at least half of the energy consumed, amounted to 30% of total final consumption in 2003. District systems have distribution losses of up to 30%. Most district heating distribution networks are outdated and poorly insulated. Poorly insulated buildings lose about 30 to 50% of the heat delivered.

In addition, Ukraine has a well-developed policy for energy efficiency at the regional level. Under the State Committee for Energy Conservation's initiative each regional administration established an energy saving department. Almost all the regions of Ukraine have developed comprehensive energy conservation programmes. Regional administrations play a crucial role in raising public awareness on energy efficiency, providing information support for local enterprises and budget organisations as well as training the local energy managers.

Investment in energy efficiency has grown significantly in Ukraine since the economy took off in 2000 (Table 1). Yet it is still low compared to the potential and compared to the energy subsidies in Ukraine.

Table 1. Investments in Energy Efficiency in Ukraine, $ million

	2002	2003	2004
State budget	0.3	1.3	1.2
Local budgets	13.9	21.8	52.5
Enterprises funds	142.7	204.0	154.2
Loans, foreign investments	36.1	63.6	40.9
Total investments	**193.0**	**290.7**	**248.8**

Source: SCEC; own calculations

It is also important to note that Table 1 probably underestimates the level of investment. For example, no estimates exist for residential energy efficiency investments paid for by residents or housing service companies, but anecdotal evidence indicates such investments are probably well over a hundred million dollars annually. The government has recently announced plans to create a $150 million fund for energy efficiency investments in district heating and buildings. Also, the Dnipropetrovsk region announced that it has allocated $47 million for energy efficiency in the region from 2006-2010. However, despite this progress in energy efficiency financing in recent years, the level of these investments remains very low. State budget investments in energy efficiency account for only 0.01% of total budget spending, and in local budgets the figure is only 0.7%. At the same time, these numbers are higher than in Russia.

Overall, Ukraine has seen significant improvements in its energy efficiency, particularly after it established a State Committee on Energy Conservation and adopted a law on the topic. It also has much room for further improvement, compared to the OECD average.

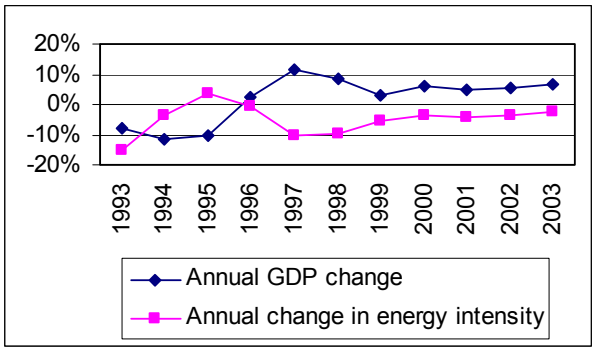
Belarus

Belarus saw very dramatic drops in its energy intensity after independence. It also focused on energy efficiency policy somewhat earlier than Russia and Ukraine. The government created a Committee for Energy Efficiency and Control in 1993 and passed a Law on Energy Savings in 1998. At the same time, the country has not undergone systemic economic reforms. There was a brief period of reform before President Lukashenko was elected in 1994, but since then, most reforms have ground to a halt. Energy prices have also remained low by international standards, though not particularly low compared to Russia and Ukraine. Possibly in part because it still gets cheap energy from Russia, Belarus has seen less of an economic decline compared to its neighbors.

In looking more closely at Belarus' energy intensity (Figure 4), it is clear that the intensity has improved significantly since Belarus' independence in 1991. Data for the early years is not high quality, but particularly since the mid 1990s, we see drops in energy intensity of up to 10% per year. The early years of independence also saw a sharp drop in the country's GDP.

While the energy intensity reductions seemed to stabilize at around 2-4% per year in the early 2000s, the Belarusian government reports a 7.8% drop in energy intensity as recently as 2004. These are truly astounding numbers by OECD standards, where annual drops in energy intensity of 1-2% are the norm. This is even more impressive when one considers that by 2000, the Belarusian economy had grown to its pre-independence size.

Figure 4. Change in Belarus' Energy Intensity and GDP



Source: IEA Statistics

Importantly, total primary energy supply in Belarus was actually smaller in 2003 than it was in 1993, despite the fact that the country's economy was larger. In fact, energy use is 35% lower today. This is quite an achievement, and because energy prices did not substantially grow over this period, it is likely that energy efficiency policy played a large role.

Belarus is heavily dependent on energy imports from Russia. IEA data shows that it imports almost 90% of the energy it uses. Natural gas makes up almost 60% of total primary energy supply, and this number has actually increased significantly since independence. Oil makes up most of the rest. Use of biomass is growing rapidly, but from a very small base, so today, it only makes up 4% of the total. Industry is by far the largest consumer of energy, taking 42% of the total (and the chemical and petrochemical industries by themselves account for 23% of total energy demand). Industry's share is growing, which goes back to the fact that Belarus has not gone through major structural reforms. The residential sector uses 29% of the country's energy, and this share too has grown since independence. Transportation represents a small (and shrinking) share of energy use with 12% of the total in 2003.

Policies and Institutions

Belarus began its work on energy efficiency with the creation of a dedicated state committee in 1993, two years after independence. It adopted a Law on Energy Savings in 1998, and has approved three 5-year programs on energy savings (in 1995, 2000 and 2005). The government has significantly increased the amount of money it allocates to energy efficiency measures, and the State Committee for Energy Conservation monitors national energy intensity daily (see Table 2). The Council of Ministers has laid out several very aggressive goals on energy consumption. The most important of these in the medium term is that Belarus' energy intensity should drop by 25 to 30% between 2006 and 2010. To meet the aggressive new 25% goal, the government anticipates investments of $2.6 billion total, which will likely represent over 3% of GDP each year (President of the Republic of Belarus 2005). In the Belarusian

Concept of the National Strategy of Sustainable Development, the government also lays out aggressive, longer term goals for reducing energy intensity step by step to 2020.

The State Committee on Energy Savings is responsible for implementing these goals in most economic sectors. It reports directly to the Council of Ministers, though the majority of its budget comes from a fund made up of energy taxes and controlled by the Ministry of Energy (for example, there is a 3% energy efficiency surcharge on electricity, which funds many of the state energy efficiency investment). The Ministry of Energy reserves part of this surcharge revenue for energy efficiency improvements in the state energy companies Belenergo, Beltransgaz and Beltopgaz,[3] funding, for example, energy efficiency improvements at cogeneration plants owned by Belenergo. Belarus also receives a limited amount of funding for energy efficiency projects from international development banks, though few new projects have been signed in recent years.

Table 2. Investments in Energy Efficiency in Belarus

Source of Financing	1996-2000		2001-2005		2005-2010	
	Mill. $	%	Mill. $	%	Mill. $	%
Enterprises*	164.2	44.3	433.3	54.5	1001	38.5
Innovation Funds	168.0	45.3	274.3	34.5	917.1	35.6
National and Local Budgets, incl. Energy Savings Fund	37.3	10.1	35.8	4.5	508.2	19.5
Loans and Equity Investments	1.0	0.3	43.7	5.5	164.7	6.3
Foreign Investors	0.0	0.0	7.9	1.0		
Total	370.5	100	795.0	100	2,600	100

* includes low-interest loans, money from the Energy and Resource Savings Funds, profit, and capital amortization funds. Sources: *Republican Programme for Energy Savings from 2001-2005; GET 2006.*

The Program for 2005-2010 puts particular priority on efficiency in power generation, district heating, distribution systems and the use of local fuels (biomass and peat). A local, Western-sponsored economics institute called the Institute for Management and Privatization, views the goals of the latest Program as feasible, but probably only if there is greater privatization and competition in the energy sector. It is not clear that this will happen (Pavel, Tochitskaya & Chubrik, 2005).

Prices have risen recently, but are still well below international levels. For example, in the early 2000s natural gas prices for industry and the residential sectors rose 17% and 520% respectively, but still are both under $70 per thousand cubic meter (while in Western Europe gas prices are several times this amount). Likewise, heat tariffs cover only about half of the estimated costs. Non-payments are not a major problem now. Metering, however, is not always in place and expanded metering will be essential to meet the government's future energy efficiency targets.

In short, Belarus has achieved incredible reductions in energy intensity. It has increased government funding for energy efficiency significantly since 2000. While the country is likely to continue to see energy intensity improvements well above the rates more common in the West, the goals of major decreases in energy use are probably not realistic without fundamental structural change. This requires raising energy prices to economic levels and attracting

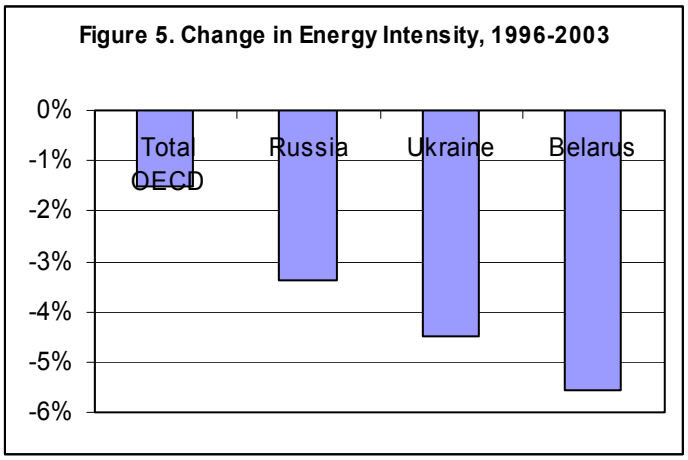
[3] Respectively, these companies deal with electricity, gas transportation and gas sales.

investment, which may only be possible through greater private sector involvement and market opening.

Conclusions

Many factors influence energy intensity: economic structure and growth, climate, prices and policy. In comparing Russia, Ukraine and Belarus over time, we cannot totally isolate the impact of policy, but we can get a good indication of it because these countries started in similar positions. These countries have also had similar energy prices and have all experienced relatively little structural change in their economies. It is clear that all three countries saw greater improvements than the OECD average, which mainly reflects how energy intensive these countries were at the break-up of the Soviet Union.

IEA statistics tell us that Russia's energy intensity improved more slowly than that in Ukraine or Belarus (see Figure 5). Looking at this another way, Belarus' energy intensity declined by 34% from 1996 to 2003, while Russia's declined by 22% over the same period. Comparative IEA data for 2004 are not yet available, but based on the countries own data for that year, it seems that energy intensity in Ukraine and Belarus improved at a much faster pace in those countries in 2004 than in Russia (Belarus reports a decline in energy intensity of 7.8% in 2004). Of these three countries, Russia had the least aggressive energy efficiency policy at the national level. Belarus had the strongest policy and the largest share of government funding for efficiency (as a % of GDP), and it also had the greatest improvements in energy intensity. Moreover, because Russia underwent economic reforms earlier, one would have expected greater improvements in Russia, all else being equal. Reforms are important because they helped attract private capital and provided the hard budget constraints that made energy efficiency worthwhile for companies. Russia's economy grew faster than Ukraine's, though not as fast as Belarus'. Energy prices were roughly similar in the three countries over the period (and significantly below Western levels). All of these countries could also benefit from better energy indicator data, which would allow greater sectoral analysis of energy use and energy efficiency policies (ECS 2003).



In sum, differences in energy efficiency policy seem a core reason behind the difference in energy intensity in these three countries. Had Russia's energy intensity improved as quickly as Belarus' after 1995, then Russia would have saved over 10% of its total energy consumption in 2003.[4] Clearly it is in the interest of Russia, Ukraine and others to strengthen their energy efficiency policies.

[4] This assumes that Russia's growth rate would not have changed. In fact, greater improvements in energy efficiency would likely have improved Russia's competitiveness, and hence its economic growth, so the overall impact may have been even greater.

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