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Energy Efficiency in Ukraine: Policy Implications for SIDA Assistance

Executive Summary

- Energy efficiency in Ukraine is a policy objective of the utmost importance given that Ukraine will begin to pay the world price for gas from 2010, bringing an end to the distortion of the price mechanism that hampered energy efficiency efforts in the past. Whilst this is to be welcomed in the long-term, it will hit poorer consumers who may not be able to pay for insulation and other energy efficiency measures immediately;
- Energy efficiency gains are also the shortest path towards greater energy security by reducing dependence on imports from other states, notably Russia;
- The main weaknesses of the Ukrainian state in the effective implementation of energy efficiency policy are finance, administrative capacity and political risk;
- There may be a need for international donors to provide guarantees on a much larger scale than is currently the case to Ukrainian banks lending money to pay for energy efficiency measures. The returns on capital invested are obviously attractive; if international donors could dispel banks' fears about getting their money back, then this could potentially make a huge difference to the availability of domestic capital to fund energy efficiency projects.
- SIDA is in a strong position to provide technical assistance to larger donors given its extensive experience in providing assistance for energy efficiency as well as to fund smaller projects that would make a difference to the Ukrainian states capacity to design policy in this field in an informed and intelligent manner.

Introduction

Increased energy efficiency in Ukraine is a policy objective of the utmost importance. Energy policy more broadly is of critical significance in Ukraine since its impact on other policy areas, including but not limited to, economic efficiency, national security, environmental protection and poverty reduction is decisive. As Ukraine's periodical disputes with Russia over both the price of gas and the cost of transporting it show, energy policy in Ukraine is not purely an issue for domestic policy-making given Ukraine's pivotal position in the trade of gas between Russia and Europe. That policy-making in the sphere of

energy and energy efficiency in Ukraine has proven extremely complicated is precisely because it is linked to so many other highly sensitive political issues. A more positive interpretation is that if Ukraine can get its energy policy right, this in turn will have a very positive effect on so many of the other seemingly intractable public policy dilemmas that the Ukrainian state faces. For this reason, it is highly appropriate that SIDA concentrates much of its assistance to Ukraine on the improvement of public policy-making in this field.

The structure of this paper is as follows. First, it explains why energy efficiency is of such pressing importance. Second, it reviews the potential for energy savings in both the generation of energy from gas, nuclear power and coal and in the consumption of energy in district heating – an area where perhaps the most energy savings can be made. Third, it looks at the current state of government policy-making in energy efficiency and identifies the major weaknesses. Fourth, it looks at the work of other international donors in this field to demonstrate where SIDA could have maximum impact. Fifth, it makes suggestions for potential SIDA projects designed to improve Ukraine's administrative capacity in the area of energy efficiency.

I. Ukrainian Energy Efficiency Policy: the Case for Immediate Action

Ukrainian energy comes predominantly from three sources: gas, coal and nuclear energy. A modest amount of electricity is also generated from renewable (primarily hydro electric) sources. Energy efficiency is very low; indeed Ukraine has the lowest level of energy efficiency of any industrialised economy in the world (bar those of the Middle East) falling not only well behind the EU but also behind Russia and Belarus in terms of output yielded per unit of energy. Ukraine's profligate use of energy has serious negative consequences in terms of economic efficiency, environmental degradation and national security. All of these issues have been well-documented by both the Ukrainian government and international donors for a very long time. However, until quite recently, none of these issues received quite the attention that they merited since they were not felt to be particularly threatening in the short-term, in comparison with other pressing public policy questions. By 2010, none of the excuses that justified Ukraine's inertia in the field of improving energy efficiency will stand up to closer examination, as the following three reasons illustrate.

First, in terms of economic efficiency, until 2005, Ukraine paid a fraction of the world (i.e. European Union) price for its gas, which meant that there was little incentive for Ukrainian industry and consumers to improve energy efficiency since the necessary investments were costly and the time period needed to recoup these upfront expenses was drawn out. Between 2005 and 2010, Ukraine has been moving steadily towards paying the world price for its gas. Once this is complete, inefficient Ukrainian industry will be at a very serious disadvantage in comparison with is international competitors.

Second, the issue of environmental degradation caused by the unnecessary emission of greenhouse gases as a result of overconsumption of energy has really only just begun to creep onto the public policy agenda in Ukraine.

Ukraine has signed the Kyoto protocol and in common with other ex-Soviet countries should meet its targets for emissions reduction. However, the signing of an Association Agreement with the EU that envisages the implementation of costly environmental protection means that the further reduction of greenhouse gas emissions will become a government priority if Ukraine wishes to integrate with the EU rapidly. It is unlikely that Ukraine will achieve full access to the Single Market until the EU is satisfied that Ukrainian industries are competing on more or less the same basis in terms of environmental protection as those of the Member States.

Third, the national security aspect of energy policy has been thrown into stark relief in the years since 2005 when Gazprom has periodically suspended the supply of gas to its Ukrainian consumers, following the failure of talks to agree on a means of settling both Ukraine's existing gas account and the future price of gas. Given that some 80% of the gas supplied to the European Union by Gazprom flows through Ukraine, it was long supposed by the Ukrainians that Russia would be reluctant to cut supply to its profitable European consumers. European and Turkish consumers represent only 29.2% of the volume of gas sold by Gazprom, but they account for a very sizeable 59.3% of total Gazprom earnings. The three week suspension of supply to Ukraine and the consequent drop in pressure experienced by Gazprom's consumers across Europe have disabused Ukrainian policy-makers of the notion that they have a particularly strong hand in negotiations with Russia. This is all the more evident since it now appears likely that Russia will push ahead with the construction of the Nord Stream pipeline (through the Baltic Sea directly to Germany – and possibly Poland) and the Turks and Europeans will push harder for the construction of the Nabucco pipeline bringing gas from the Caucasus through Turkey to Europe. Both of these projects will reduce Ukraine's strategic importance to both Russia and Europe.

Ukraine stands at a crossroads in terms of the need for greater energy efficiency. There is no excuse for inaction.

II. Energy Use in Ukraine

Natural Gas

Ukraine produces around 25% of its current requirements for natural gas. The rest is imported through Russia. Ukraine also has potential to increase the domestic production of gas (and oil) through off-shore drilling in the Black Sea, but improving energy efficiency makes better economic sense and is much more environmentally friendly.

Potential energy efficiency gains could be made in the production and distribution of natural gas, where losses are rather higher than in OECD countries. However, the real efficiency gains here are to be made in the use of energy, particularly in the heating and industrial sectors. At the present, the price of gas to industrial and residential consumers of gas is not set by the market – although there have been substantial increases in the price paid by Ukrainian consumers for their gas. In 2006, the cost of gas for residential

consumers doubled between May and July. This trend is to be welcomed, since it provides the best spur for energy efficiency, although it must be borne in mind that such steep increases in the price of gas hit poorer consumers very hard – and poverty rates in Ukraine are already very high. Nonetheless, this is still better than the normative pricing of gas that prevails at the moment and depends to a certain extent on who the user is – there is far too great an opportunity here for corruption to say nothing of the market distortion that this entails. A recent trend to be welcomed is the increased use of metering of gas although this development is still in its infancy.

Nuclear

Around half of Ukrainian electricity is generated at its four operational nuclear power plants (the last reactor was shut down at Chornobyl in 2000). The government currently plans to expand the production of electricity from nuclear power as a means of reducing energy dependency on Russia. This will require considerable investment in the processing of uranium (which is currently mined but not processed in Ukraine) to produce fuel rods, which at present Ukraine buys from Russia. Ukraine does not have a domestic nuclear power station construction industry and would have to buy this in from abroad. This move is to be welcomed in terms of increased energy efficiency since the building of new plants would increase efficiency of power generation and reduce the level of nuclear waste produced. Moreover, the generation of electricity from nuclear power does not produce greenhouse gases.

Coal

The Ukrainian coal industry is long established and provided much of the necessary energy to power the industrialization of the Russian Empire and the Soviet Union in the 19th and 20th centuries. In common with other long-industralised countries, such as the UK, Germany or Belgium, Ukraine's coal supplies are not worth mining from a purely economic point of view. The reserves of coal that remain are both hard to extract and in general of poor quality. In contrast to other early industrialisers, Ukraine's mines remain open – 47% of Ukrainian mines have been in operation for over 50 years and 22% have been open for over 70 years – and despite a 50% fall in coal production between 1991 and 1996, production has increased slightly in recent years in response to a government drive to reduce dependence on imports of Russian oil and gas. The total size of Ukraine's coal reserves is disputed. The World Energy Council puts the figure at 52 billion tons the Ukrainian government estimates 117.5 billion tons. Proven reserves that can be exploited profitably are far lower.

Improving energy security by switching towards greater production of coal would not be easy. First, production in the Ukrainian coal industry is subsidized. Coal has been mined at a loss and sold to the steel industry, which is one of the reasons why Ukraine's steel industry was so profitable during the commodity boom of the early 21st century that led to such high GDP growth in Ukraine between 2000 and 2008. Second, the coal industry has received very low levels of investment in recent years and would require a

huge injection of capital to boost productivity. Third, the coal industry is very dangerous – only Chinese mines have a worse safety record. In addition, the increased production of coal and a greater reliance on burning coal to produce energy will lead to higher emissions of greenhouse gases. This is not to deny that coal should continue to have a place in Ukraine's energy mix; merely it should be stated that increased domestic coal production is no panacea for improving the diversity and security of Ukraine's energy supply. Nonetheless, the Ukrainian state has provisionally planned to invest $9.6 billion in the coal industry between now and 2030 – although no funding is set aside to deal with the environmental impact of coal mining.

In terms of improving energy efficiency in the coal industry, the first step should be to bring an end to the distortion of the price mechanism that currently prevails in Ukraine. At present, the price of coal is effectively set by the state and large industrial enterprises working in collusion with each other. Ukraine's coal industry must become profitable. The closure of mines that would be necessary to bring this about would have serious political ramifications for numerous mining communities (the long term effects of pit closures on social deprivation are well-documented) and in consequence for certain political forces, notably the Party of Regions, which enjoys strong support from miners.

District Heating

District heating in Ukraine provides perhaps the greatest opportunity for relatively straightforward energy efficiency increases with relatively minimal levels of investment necessary to achieve this. Around two-thirds of Ukrainian homes are heated by district heating systems, which theoretically is the most efficient way of heating homes and businesses in cities where buildings are in close proximity. Most district heating systems are outdated and inefficient. Moreover, in Kyiv in 2005 only 3% of homes had a meter to gauge their consumption of heat. District heating is treated more as a social service than as a business. This is a major disincentive to improve efficiency.

District heating in Ukraine needs to move to a market-based model where companies not only cover the costs of providing heat, but also make profits, which can be invested in making the business more energy efficient. The sharp increase in prices necessary to do this will also provide the necessary boost for households, firms and the public sector to reduce their consumption of energy.

III. The Current State of Government Policy-Making and Major Weaknesses

Ukraine's government moved the energy efficiency issue up its agenda in the mid-1990s. The Law on Energy Saving was adopted in 1994 (upgraded in 2005), the State Committee and the State Inspectorate for Energy Saving was established in 1995 and a detailed policy plan, the 'Comprehensive State Program on Energy Saving', was approved in 1997 (upgraded in 2000).

However, in contrast with the Central European countries where corporate restructuring, price liberalisation and privatisation served as the main factors for improving energy efficiency, Ukraine's industry and individual consumers lacked effective signals and incentives to encourage them to conserve energy.

This section of the paper overviews policy developments in the field of energy efficiency since 2005, examines current as well as future priorities and looks at the main obstacles for the effective implementation of energy saving policies.

Policy Developments since 2005

- Energy Strategy to 2030
- Institutional changes
- EU-Ukraine cooperation with the Memorandum of Understanding (MoU)

The sharp increase in gas import prices in 2006, which followed the Ukraine–Russia gas conflict, spurred Ukraine's government to approve the 'Energy Strategy of Ukraine to 2030', which stressed the importance of increased energy efficiency in order to reduce dependence on Russia. According to the Strategy, the use of energy is expected to fall by 50% through increased energy conservation in the most energy intensive sectors: metals, chemicals, utilities and power. The authors of the strategy argue that greater efficiency and structural changes in the use of energy will make it possible to reduce the level of Ukraine's external energy dependence from 54.8% presently to 11.7% by 2030. According to the plan, gas use will be cut by 36 percent, with accompanying slight increases in oil, coal and power use. The IMF estimates that investment of $6 billion (six percent of Ukraine's 2006 GDP) through 2010 will be required to implement the Ministry of Fuel and Energy's plans.[1]

Re-emphasizing energy efficiency policy, the President reformed the State Committee for Energy Conservation into a National Agency on Efficient Energy Use (NAER) as a central executive body under the Cabinet of Ministers. This started operating in 2006 and the National Agency is responsible for the following: the realisation of state policy on efficient energy use and conservation; securing an increase in the share of non-traditional and renewable energy production; establishing a state system to monitor energy production, consumption, exports, and imports; improving the system of registering and controlling energy consumption; and ensuring the functionality of the system of industrial energy consumption norms.

Since 2005, the energy component has also become a key element in Ukraine–EU cooperation. Energy-related objectives appeared in the European Neighbourhood Policy Action Plan between the EU and Ukraine (2005). In December 2005, Ukraine and the EU agreed a Memorandum of

1 International Monetary Fund, Ukraine: Selected issues, Country Report No. 07/47, February 2007, p.7.

Understanding (MoU) on cooperation in energy matters. In the MoU, the parties recognised that the "gradual convergence of Ukraine's energy sector with the EU's internal energy market, aiming ultimately at its integration, remains a shared priority for the EU and Ukraine". Initially, the MOU envisaged developing a road-map in four areas: nuclear safety; integration of electricity and gas markets; enhancing the security of energy supplies and the transit of hydrocarbons; and structural reform and enhanced safety and environmental standards in the coal sector; however, it was decided to establish a road map in the fifth area — cooperation in energy efficiency and promotion of renewable energies.

The enhanced energy dialogue with the EU resulted in acquiring an observer status in European Energy Community in November 2006 and opening of negotiations on the full accession which is conditioned upon a satisfactory assessment of safety levels in all of Ukraine's operational nuclear power plants and time-framed commitments to implement the *acquis communautaire* required by the Treaty Establishing the Energy Community. It is expected that the last round of negotiations will be held in April 2009 and that Ukraine will join the Energy Community in January 2010. As a member, Ukraine will have to comply with EU law in the fields of energy, the environment and competition as well as to cooperate with the Union on social issues. The Energy Community pays particular attention to energy efficiency. Since 2008 an Energy Efficiency Task Force has been in operation.

Current and Future Priorities

- EU-Ukraine Roadmap on Energy Efficiency
- Priorities for 2008–09
- Priorities for 2010–15

In March 2008, the EU–Ukraine working group signed the roadmap on energy efficiency, renewable energies and measures to tackle climate change. First, the roadmap envisages that Ukraine will improve the normative and legal framework in the given field and will approximate its legislation to that of the EU, in particular to support and review action plans to implement the Energy Strategy to 2030 as well as the draft laws on biofuels and energy saving. The Commission will comment on the proposals and share its experience and recommendations.

Second, the roadmap defines priority fields for the promotion of energy efficiency and the introduction of energy saving technologies. These are energy efficiency in the building sector; improvement of the domestic metering system of energy use in the housing sector; the creation of an information system for energy production and consumption and a single energy audit system; and the enhancement of the state administrative capacities in the field (e.g. Twinning project for the NAER is to be developed).

Third, the roadmap discusses priorities to promote the production and use of renewable and alternative energy sources in Ukraine (e.g. the switch to local fuel supply in public buildings; regulatory standardization of biofuels used in

the transportation sector, development of the projects for the promotion of alternative energy sources).

Both sides have also agreed to cooperate in winning funds from international donors and to develop energy services companies (ESCO) in Ukraine. The Commission has committed itself to look into the financing of the implementation of these declared priorities.

On the eve of the last gas dispute with Russia, in October to December 2008, the government of Ukraine adopted several policy plans on energy efficiency. First, the government approved six priorities for action on energy efficiency and energy saving for 2008–09 (16 October 2008). These are the following:

- The introduction into the law of administrative responsibility for the inefficient use of energy resources;
- The introduction of an obligatory register and a system of indicators of energy balance;
- The development of new technologies for biofuels production;
- The introduction of new energy saving technologies in the public sector and housing (e.g. facilities in energy transformation, co-generation, district heating and the public sector);
- An increase in the use of alternative energy resources and renewable energies (water, sun, ground heat, coal mine methane and gas produced from underground coal burning);
- The establishment of energy labelling.

Second, the concept of the new state economic programme of energy efficiency for 2010-2015 was approved on 19 November 2008 as the existing complex programme will expire by 2010. The government has recognized as 'unsatisfactory' the current level of energy efficiency in Ukraine despite a number of adopted legal changes during the recent years.

According to the government analysis, the reasons for the enduring problems are the following:

- the lack of a normative and legal framework and standards;
- the lack of economic incentives for the modernization of enterprises;
- an inadequate mechanism for establishing prices and tariffs for energy supplies (e.g. the practice of cross subsidy);
- increasing debts for energy supplies;
- the poor introduction of new technologies and a lack of comprehensive innovative infrastructure;
- insufficient access of legal and physical persons to credit resources;
- an inadequate system of energy management in production and non-production spheres, lack of automatized systems;
- an insufficient level of introduction of metering systems for energy resources measurement;
- a lack of energy balance between production of energy from domestic and imported sources as well as the lack of a system for monitoring energy use.

The future programme is to implement the goals set out in the 'Energy Strategy to 2030' in terms of energy efficiency and by emphasizing economic incentives, attracting investments, applying the EU *acquis,* developing a state system of monitoring and control of energy use, awareness raising campaign as well as better monitoring of the adopted sectoral and territorial policy plans on energy efficiency. The concept itself does not elaborate any quantified targets or indicators of the excepted outcomes, thus one should expect that quantitative targets and more detailed measures for achieving them will appear in the programme to be drafted by January 2009. Another weak point is that the concept does not define any other sources of financing of energy saving measures but the state budget funds aim to cover the costs of the development of legislative changes and standardization as well as the development of state implementation and monitoring capacities. However, these funds are likely to be limited due to scarce budget resources during the period of the present economic crisis in Ukraine.

Third, on 17 December 2008, the government issued a decree on development of sectoral programmes of energy efficiency and programmes of energy saving in the public sector due to July 2009 for their implementation during 2010-2014. The government expects to reduce energy consumption in the public sector by 2014 by at least 20% of the 2009 level. To date, there are only three sectoral programmes of energy saving developed by the Ministry of Housing and Communal Services, the Ministry of Transport and Communication and the state oil and gas company "Naftogaz of Ukraine".

The programme of Ministry of Housing and Communal Services from January 2006 is aimed at reducing natural gas consumption in the residential sector by 15 to 20%. The programme envisages the modernisation and replacement of district heating systems as well as wide use of co-generation technologies. The Naftogaz programme foresees the replacement of old individual gas boilers by new energy-efficient ones. During the first stage of programme implementation, 200 000 boilers will be replaced. The Ukrainian national railway, Ukrzaliznytsia, announced plans to invest $6 million in energy-efficiency improvements starting in 2005.

There are also regional programmes on energy efficiency. Each regional administration has a department for energy saving that deals with raising public awareness of energy efficiency, providing information support for local enterprises and budget organisations as well as training the local energy managers. Regional administrations also implement energy efficiency measures in the public sector. However, the NAER report shows that such reforms are going too slowly due to lack of funds, political will and a comprehensive and coherent approach to the problem.

To sum up, the main priorities of the Ukraine's energy efficiency policy are:

- improving the legal framework, approximation of the EU law, elaboration of standards and technical requirements;
- sectoral priorities: building; housing and communal services; the public

sector; energy transportation;
- the complete introduction of metering in the housing sector;
- the registration of energy production and consumption, the creation of an energy balance system and monitoring of its indicators, a single energy audit system;
- the enhancement of the state administrative capacities in the field, e.g. monitoring;
- energy labelling;
- financing (prices and tariffs, access to loans, Kyoto arrangements).

Obstacles to Implementation

- Financing
- Administrative capacity
- Political will

The NAER last report for 2008 is quite pessimistic about the implementation of reform. The process of change is going too slowly. Three main obstacles which impede implementation of policy plans can be identified:

Financing remains the main problem for implementation of ambitious and numerous priorities and measures. So far the main source of financing for the energy saving measures has been enterprises' own funds. Market competition gives the strongest incentives to industries to reduce energy consumption. Metallurgy has been the most active in investing in energy saving, in particular, in co-generation systems, replacing natural gas by pulverized coal and, generally, in installing new equipment. The situation differs in the state-dominated sectors.

When presented with the annual report on energy efficiency in December 2008, the Head of NAER mentioned that there had been an increase of energy consumption in production and services such as water distribution (14.3%), transportation by rail freightage (8.28%), gas transportation (8.28%). The reason given was the lack of financing for the modernisation of production. To look deeper, a lack of market-based tariffs for energy supplies and other services provided by the state monopolies caused the exhaustion of the budgets of companies like the communal services providers, Naftogaz of Ukraine and Ukrainian Railways and they now lack funds to invest in the modernisation of infrastructure and improving energy efficiency.

In order to finance energy efficiency, the government has to ensure that prices cover the full, long-term cost of energy supply. While prices for industrial consumers are rapidly approaching the world market levels, the government continues to subsidise individual consumers. Long lasting electoral campaigns and tough economic conditions have prevented the government from implementing a significant and continuous increase in prices. This practice is to be ended in 2010-2011. The IMF made its loan to Ukraine conditional on the government's commitment to equalising prices for imported gas and domestic production by the end of 2011 and bringing an end to price differences for individual consumers by 1 July 2010. This means that prices

and tariffs for gas, district heating and water heating will increase during 2010–11 which will give additional incentives for introduction of energy saving in households and release state funds for investing into energy efficiency.

Another problem is access to credit loans: the local communal services providers appear to be unreliable borrowers, as the local authorities do not have a stable source of tax income. The Head of NAER has proposed establishing a specialised credit agency to finance projects of enterprises and individuals. Tax incentives have not been applied to boost energy efficiency. The mechanisms of the Kyoto Protocol have not been used yet. The Prime Minister has announced that Ukraine will finally start trading in emissions and will use the income to finance transition from gas to electricity for heating.

While much effort has been put into developing policy plans and the elaboration of implementation plans, monitoring and evaluation suffers. An improvement in the collection of statistical information is also needed to ensure policy efficiency. Both the national agency and the relevant departments of regional administrations and local governments have insufficient **administrative capacity** to introduce reform. They often lack powers and funds. The new Agency responsible for energy efficiency policy seems to have more broad powers and political support than its predecessor, nevertheless, **political risks** are still significant for the adoption of new legislation and implementation of reforms.

Ukraine's energy efficiency policy is to be regarded within the context of Ukraine energy policy as a whole. The latter is driven by business interests which have captured the main decision-makers. This is coupled with the short-term concerns of political elites worried that reforms with long-term benefits might cost electoral support in the short run. Thus there have been no reforms in the energy sector since 2000. Only the gas sector has experienced albeit limited transformation, and this is due more to external factors such the imported gas price increase. The entire energy sector in Ukraine continues to suffer from a lack of stable and clear regulation, a lack of transparency in decision-making and public finance, insufficient economic competition and poor implementation of adopted initiatives. The breaking point for reforms might be 2011–12, when the process of transition comes to an end and residential consumers will be paying market level prices.

IV. Work of Donors

EBRD

Energy efficiency is a priority for the EBRD in Ukraine. The EBRD provides a €100 million credit facility, Energy Efficiency for Ukraine (UKEEP), which Ukrainian banks can draw upon to finance energy efficiency projects. This project relies on donor support from Austria and Sweden but the bank plans to supplement these donor funds with more of its own resources in future. Sixty clients have thus far benefited from UKEEP in Ukraine, including a cement mill, a paper mill and a bread producer.

UNDP

The UNDP combines energy efficiency and environmental policy under one heading. The UNDP estimates that around 25% of all energy consumption in Ukraine is on heating buildings and this is one of the principal areas where savings can be made. Particular emphasis has been paid to energy efficiency savings in district heating, with a pilot project taking in Rivne in western Ukraine. The project aims to look at optimal energy savings practices in the three stages of the energy cycle: energy generation, energy transmission and energy consumption. The project aims to share lessons with other municipalities. The public sector can act as an exemplar of best practice in energy saving, which is why the UNDP's pilot project in Rivne and its larger project on boosting energy efficiency in the educational sector are so important.

The World Bank

Between 2000 and 2005, the World Bank lent $18 million (with $2 million provided by the Government of Sweden and $10 million by the local authority) to fund improvements to and renovation of the heating systems in around a thousand public buildings in Kyiv. The project paid for insulation improvements and for more effective thermostatic control systems that dispersed heat more evenly around the building, which also had a positive effect on public health. The project is estimated to save around $3 million annually in energy bills. What is interesting about energy saving projects of this sort is that other lenders do not seem to be willing to lend on this basis, given that the project appears to provide an annual return of about 10% on the capital invested. If the private banking sector is not willing to lend with a return of 10% on capital invested, it may be because of concerns about the payment of interest and repayment capital. A large-scale system of guarantees for private sector lenders on the part of international donors might therefore be appropriate.

European Union

EU aid to Ukraine in the field of energy policy is more concentrated on improving Europe's energy security – the INOGATE programme – by boosting the diversity of supply through Ukraine by encouraging investment in new pipelines – obviously a great many countries other than Ukraine are involved in this project, but it gives an indication of where EU priorities lie.

The EU also provided finance to Ukraine to cover the cost of closure of the Chornobyl nuclear plant in the early years of this century. Aid, however, was concentrated on financing the purchase of fossil fuels to meet Ukraine's short-term energy needs. Some EU funds were set aside to provide aid to regulatory and technical improvements in the energy sector, but generally EU aid has not until now been targeted on boosting energy efficiency – although as indicated above, this would be the best way of improving the energy security of both the EU and Ukraine.

The European Investment Bank

The EIB has limited funding available in Ukraine but has recently funded a project to divert the existing power line that ran from Khmelnitska to Chernobyl and link Ukraine better into the European energy market. This will produce some gains in the form of more efficient energy transmission and enhanced security of supply to the Kyiv area.

USAID

Together with the Alliance to Save Energy, USAID has co-sponsored a programme to promote energy saving, particularly in the domestic heating sector, as part of the Municipal Network for Energy Efficiency. The aim here has been to fund smaller pilot projects that act as beacons and examples of best practice that could be rolled out across Ukraine. Projects have been funded in the fields of, *inter alia*, improving finance for energy efficiency, policy-making to take account of energy efficiency, in creating a more effective energy market. It is not clear how effective these programmes have been. Energy efficiency is not in itself a major priority for USAID and is subsumed under the 'economic growth' field of donor activity.

GTZ

Energy efficiency has been much lower on the list of GTZ priorities than reform of the Ukrainian economy and the development of a market-based system. However, this is likely to change in the near future as GTZ's interests shift towards three new themes: the prevention of trafficking of women, HIV/AIDS prevention and, crucially, energy efficiency.

Summary of Donor Aid

With the exception of the EBRD and the UNDP, energy efficiency has not been at the top of the priority list for foreign donors to Ukraine. It does not feature greatly on the priorities of major bi-lateral donors, such as Poland or Canada. This, however, appears to be undergoing change – albeit gradually. The challenge for SIDA here is to ensure that its efforts complement those of other donors. Therefore, the SIDA priority should be set first on helping the Ukrainian government to embed energy efficiency into policy-making across the whole area of state activity.

V. Implications for SIDA

The principal obstacle that stood in the way of Ukraine improving its energy efficiency performance until now was the distortion of the price mechanism for energy, particularly in the case of gas. From 2010, nearly all price distortion should have come to an end, which will create the necessary incentives both for producers to reduce the amount of energy wasted in production and transmission, and for consumers to make significant reductions in the amount of energy they use. The downside to this is that many poorer and more vulnerable consumers will face sharp increases in their energy bills from next

year. Such consumers may not be able to afford the necessary insulation and other energy saving investments required to reduce consumption.

Given the sheer scale of investment needed, SIDA is not in a position to fund exclusively the provision of energy saving improvements to Ukrainian households. What it can do, however, is to co-fund energy efficiency programmes through the provision of technical assistance to programmes sponsored by the larger donors. SIDA can also advocate by itself and through the government of Sweden that Ukraine receive more funding from larger donors, such as the European Union and the EBRD, to finance energy saving measures. As things stand at present, the availability of funds to pay for energy efficiency measures from Ukrainian lenders is likely to be low given the particularly serious impact that the global credit crunch has had on Ukraine. Thus the value of funds from international donors is even greater than it would be in normal circumstances.

Moreover, as the World Bank's lending for energy efficiency appears to demonstrate, there may be a need for international donors to provide guarantees to Ukrainian banks lending money to pay for energy efficiency measures. The returns on capital invested are obviously attractive; if international donors could dispel banks' fears about getting their money back, then this could potentially make a huge difference to the availability of domestic capital to fund energy efficiency projects.

There are also potentially a number of smaller projects that SIDA could fund in the field of energy efficiency, which are linked to the weaknesses of the Ukrainian state identified in the previous section.

First, the Ukrainian government lacks reliable statistical data on energy efficiency, which is a necessary prerequisite to intelligent policy design. SIDA could fund a study that examines how best Ukraine could reform the collection and analysis of reliable data in this field.

Second, administrative capacity for the implementation of energy efficiency legislation is inadequate, at both the national and regional level. SIDA could commission a study into how this situation can best be remedied.

Third, with regard to the monitoring of industry's compliance with energy efficiency savings, SIDA could consider providing modest seedcorn funding to NGOs that could act as pressure groups to improve the present situation. This might be the most effective means of operating, given that many of the problems of industrial compliance stem not only from a lack of administrative capacity, but also from corruption and the collusion of politicians with industrialists. NGOs might find it easier to highlight the problems in a way that could embarrass government into take more action to reduce corruption in this field.

Fourth, SIDA could fund a study that would examine how energy efficiency policy could best be programmed into the whole swathe of governmental

activity, so that energy efficiency policy is automatically one of the factors considered by policy-makers in all sectors from defence to education.