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Energy efficiency in Ukraine – slow progress despite political sabotage?

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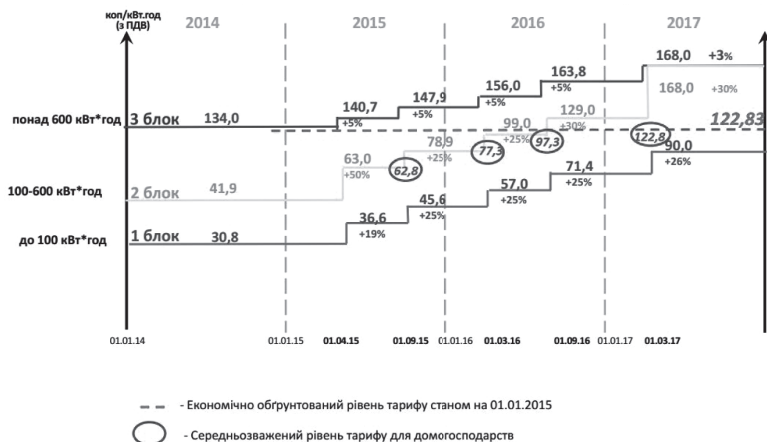
Introduction

Energy efficiency is reasonably considered to be the cheapest kind of energy because one does not have to pay for extraction, transportation and utilization since resources are saved. Given this, it has not been welcomed much by the Ukrainian state so far, despite the disastrous effects of energy-intensive consumption on industry and households, and the related political and existential threats.

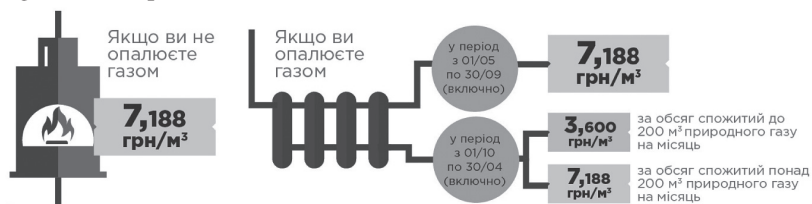
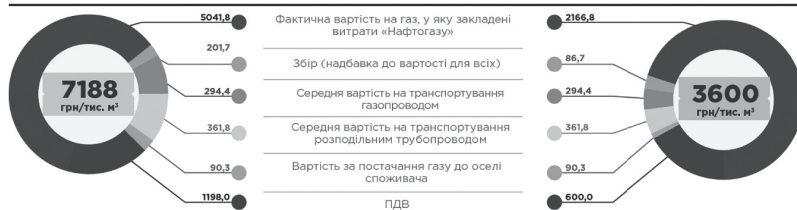
Energy efficiency attracts the attention of a wide audience only when it relates to high energy prices and the strong enforcement of laws on misuse and theft. Neither of these has been favored much by the Ukrainian authorities so far.

Changes from the bottom up, initiated by civil activists, cannot change the situation quickly; there is a need to combine state and public efforts. The unpopular but necessary price unification on the main energy sources, in particular gas and electricity, has been still not completed. Despite proclaimed course toward liberalized energy market and price unification, through 2016 and in first quarter 2017 electricity prices went up both for industries and for private households, thus keeping cross-subsidizing alive.

Figure 1. Electricity price dynamic for private households 2015–2017



Source: "В Україні сьогодні набувають чинності нові тарифи на ЖКГ" [New tariffs enter into force today for communal services in Ukraine] RBC Ukraina, April 1, 2015. Available online: <https://www.rbc.ua/ukr/news/ukraine-segodnya-vstupayut-silu-novye-tarify-1427815041.html> (accessed on April 1, 2015).

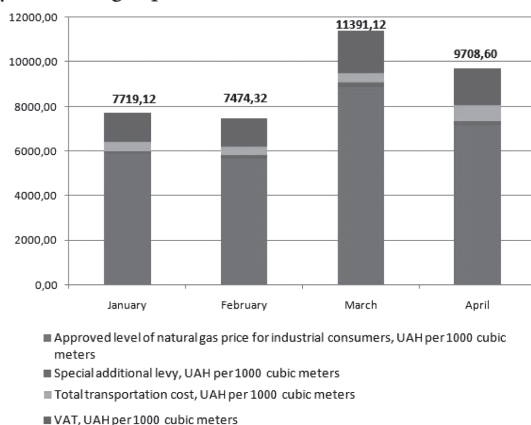
Figure 2. Gas prices for households as of October 2015**СТРУКТУРА ЦІН НА ПРИРОДНИЙ ГАЗ ДЛЯ НАСЕЛЕННЯ (ГРН/ТИС. М³)**

Винятком є смт. Солотвине, Закарпатської області, яке використовує природний газ безпосередньо із Солотвинського родовища, і роздрібні ціни на природний газ застосовуються з урахуванням коефіцієнта 0,8

За офіційними даними НКРЕКП

Source: “В Украине начали действовать зимние тарифы на газ для населения (инфографика),” [Today, the winter tariffs for gas for households enter into force] October 1, 2015. Available online: <http://fakty.ua/206657-v-ukraine-nachali-dejstvovat-zimnie-tarify-na-gaz-dlya-naseleniya-infografika> (accessed on October 1, 2015).

Industries have market based prices, which are changing each months:

Figure 3. Dynamic of gas price for industrial consumers

Sources: “Natural Gas Price in Ukraine in 2015,” Unconventional Gas in Ukraine, April 9, 2015. Available online: <http://shalegas.in.ua/en/tsina-na-prirodnyj-gaz-u-2015-rotsi/> (accessed on April 9, 2015).

Instead of subsidies, the state should provide more opportunities for income growth and make working towards energy efficiency and saving easier and more attractive for businesses, while the mass media should explain what energy saving is and build a positive attitude towards it among the population. Nevertheless, state budget has been increased once again in order to cover more subsidies, while their monetization is at the very beginning after two years of discussions.

State policy on energy efficiency – from independence to the present day

Since Ukraine became independent, energy efficiency has never seriously been regarded as a part of national energy policy nor as a powerful tool to counter economic challenges and political populism in Ukraine. Although it has featured in programs for economic development, energy efficiency has received little attention in relation to its possible effects on the future economic structure of the country. The main reasons for this are as follows:

- a. Ukraine's energy intensive economy was given a chance to continue functioning due to the long-term moderate price of energy sources, primarily gas and electricity and despite the introduction of a cross-subsidy system in 1990th and first part of 2000th.
- b. The opaque privatization of many industry assets has occurred alongside the continuous emergence of links between the new owners, senior politicians and the system of law enforcement. Energy toucans used overconsumption to gain their profits and impact on governmental policy to ensure own revenues on the expense of state budget and respective all tax payers.
- c. The creation of a handful of oligarchic groups with unlimited and uncontrolled access to the energy industries determined the future model of national economic development – the preservation of energy intensive industries, profits for the oligarchs, state debts, subsidies and mass events (football) for poor people to avoid social vulnerabilities.
- d. Politicians have fueled the continued consumption by preserving low prices for public and private users at regulated tariffs, by nomi-

nating volumes and extending state subsidies instead of introducing measures to reduce energy use.

- e. State enterprises have been used as an instrument of massive manipulations and bribery under senior politicians, providing funds for numerous elections and information campaigns; there are also kick-backs and misuse of state budget funds.
- f. NAK Naftogaz of Ukraine has become the biggest “black hole,” siphoning off public funds and is the main reason for the state budget deficit. Only in 2016, NAK became a profitable state enterprise due to price increase and introduction of corporate governance, which limited informal political impact on the company.
- g. The state began to borrow externally on an intensive scale to cover growing state expenditure, mainly incurred, directly or indirectly, by the energy sector. Still, unreformed as yet electricity sector require significant state financial interventions to avoid negative dynamics of development.
- h. Despite the clear overconsumption, state authorities have continued to raise indicators for future energy needs in a number of energy strategies and economic development programs, ignoring capacities and opportunities to cut energy consumption without negatively impacting on economic activities. Only ongoing discussion about actual energy needs, based on energy efficiency and saving approach, might change target number in the Energy Strategy of Ukraine until 2035.

This trend has to change if Ukraine is to retain its independence and compete on the global market. Energy efficiency may become one of the drivers for economic recovery in the coming years, as the altered infrastructure needs modernization. This will create new jobs, attract investments and provide opportunities for the development of small and medium-sized businesses.

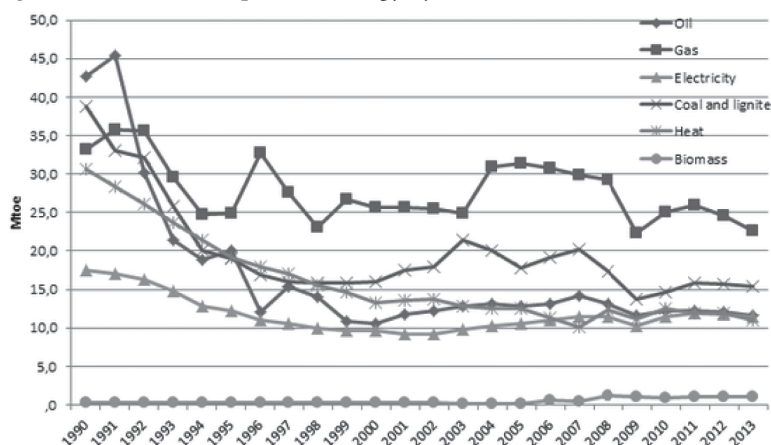
Ukraine has started to develop national legislation on energy saving, and the Law of Ukraine on Energy Saving was adopted on July 1, 1994.¹ It stipulates the basic energy saving requirements, relations between the state, businesses and private consumers and provides incentives for the introduction of energy saving technologies. A special state agency was created by presidential decree in 1995 to draft secondary legislation on energy saving to enable implementation of the Law on Energy Saving. Regional inspec-

¹ “Закон України «Про енергозбереження»,” [Law of Ukraine on Energy Saving], No. 75/94-BP] Verkhovna Rada of Ukraine, July 1, 1994. Available online: <http://zakon5.rada.gov.ua/laws/show/74/94-%D0%B2%D1%80> (accessed on November 27, 2015).

torates and energy saving departments were created. In 1997, the Cabinet of Ministers of Ukraine adopted the Directive on the Comprehensive State Energy saving Program of Ukraine.²

However, efforts were mainly concentrated on substituting energy sources instead of reducing consumption. For instance, in 1997, the Directive of the Cabinet of Ministers of Ukraine on the State Support Program for the Development of Renewables and Small Hydro and Thermal Power Plants came into force. In 2003, the Law of Ukraine on Alternative Energy Sources was adopted. At the same time, back in 2000, the Directive of the Cabinet of Ministers of Ukraine on Urgent Measures to Implement the Comprehensive State Energy Saving Program of Ukraine came into force. It was designed to facilitate energy saving, at least in state-controlled sectors, but did not produce any significant results (see Figure 1).

Figure 4. Final consumption of energy by source, Ukraine, 1990–2013.



Source: Austrian Energy Agency, December 2014. Available online: <http://www.enercee.net/countries/country-selection/ukraine.html> (accessed on November 27, 2015).

The Energy Strategy of Ukraine up to 2030 contained several indicators for assessing progress on energy consumption, and also foresaw sources being substituted by moderate growth in renewables but had no clear strategy on energy saving and energy efficiency. However, it has been pointed

² “Закон України «Про комплексну державну програму енергозбереження України,” [Law on comprehensive state energy saving program of Ukraine] No. 148, Verkhovna Rada of Ukraine, February 5, 1997. Available online: <http://zakon5.rada.gov.ua/laws/show/148-97-%D0%BF> (accessed on November 27, 2015).

out that the existing legislation was outdated and of a declarative nature, and that new draft laws tend to remain on the list for consultation on the Ukrainian parliament website for two years at least, as was the case, for example, with the Draft Law on the Effective Utilization of Fuel and Energy Materials.³

The draft of the Energy Strategy of Ukraine up to 2035, developed by a group of Ukrainian experts in response to the current challenges and opportunities and which was not influenced by oligarchic groups has been up for consultation on the Ministry of Energy and Coal Industry of Ukraine's website since January 2015.⁴ Having no energy strategy, Ukraine continues to regulate its energy sector using ad-hoc measures initiated by the Government in response to events on the ground rather than as part of a sustainable and carefully calculated course of action. The Cabinet of Ministers of Ukraine adopted the National Action Plan for Renewables up to 2020 in October 2014,⁵ and the National Action Plan for Energy Efficiency up to 2020 was adopted after almost two years of consultation by government on November 25, 2015.⁶

Figure 5. National energy efficiency action plan up to 2020

Tabulated summary of the NEEAP measures implementation

No	The scope of economic activity in which the measures of NEEAP are implemented	Expected savings in 2014, thousand toe	Expected savings in 2020, thousand toe	Responsible executive	Overall funding for the period of 2012-2020 billion UAH	Source of funding
1	Population: residential buildings	511	2303,9	Ministry of regional development, construction and housing and communal services of Ukraine	670	investments
2	Sector of public services: public and commercial buildings	23,2	104,4		144,5	investments
3	Industry	615,1	2773,4	Ministry of Industry	89	investments
4	Transportation	234,7	1066,5	Ministry of Infrastructure	107,8	investments
Total		1384	6283,3		1011,3	investments

Available online: http://sae.gov.ua/documents/NpdEE_eng.pdf

³ “Проект Закону про ефективне використання паливно-енергетичних ресурсів,” [Draft law on effective utilization of fuel and energy materials] No. 3071, Verkhovna Rada of Ukraine, August 12, 2013. Available online: http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=48018 (accessed on November 27, 2015).

⁴ See the Ministry of Energy and Coal Industry of Ukraine website. Available online: <http://mpe.kmu.gov.ua/minugol/control/uk/doccatalog/list?currDir=50358> (accessed on November 27, 2015).

⁵ See the State Agency for Energy Efficiency and Energy Saving of Ukraine website. Available online: http://sae.gov.ua/sites/default/files/documents/Presentation_NAPRES_Norw_OCT_3_ukr.pdf (accessed on November 27, 2015).

⁶ See the State Agency for Energy Efficiency and Energy Saving of Ukraine website, op. cit.

Its main goals include plans to create an energy efficiency fund, which is to become an independent financial instrument enabling low-interest loans and investments to be used in medium and small-scale energy efficiency and saving projects. However, without comprehensive changes to tariffs, access to energy saving technologies, the wider introduction of ESCO companies and services, broader rights for condominiums and local communities, changes to the electricity market, feed-in procedures and so forth, it will simply become another example of a declarative policy that preserves the existing overconsumption and encourages the search for ways of gaining subsidies or of avoiding market-based pricing.

Problems, gaps and challenges in developing energy efficiency projects

For many years, the Ukrainian authorities and population have ignored the fact that energy efficiency and saving are integral to successful economic development and prosperity. Private consumers were satisfied with the moderate energy prices, while state officials and energy businesses (oligarchs and managers of state-owned energy enterprises) succeeded in retaining their control over the financial flows in the energy sector, including direct revenues for supplying energy or state subsidies and donations. End consumers are excluded from the financial flow and recent changes to the system of subsidies have not succeeded in monetizing them, nor in targeting and achieving a final reduction in energy consumption.

Debates on further modernizing state financial support for private consumers on low incomes will inevitably continue in the coming period. One of the main preconditions will be the growing demand related to the devaluation of the Ukrainian currency, massive falls in income and growing energy tariffs.⁷

Poverty will therefore remain one of the biggest problems in shifting away from mass state financial support to end consumers paying market-based energy prices (to compare, see Table 1.).

⁷ “МВФ прогнозує подвійне збільшення витрат на субсидії в Україні наступного року,” [IMF predicts twofold increase in cost of subsidies next year] UNIAN, August 5, 2015. Available online: <http://economics.unian.ua/realestate/1108417-mvf-prognozue-podviyne-zbilshennya-vitrat-na-subsidiji-v-ukrajini-nastupnogo-roku.html> (accessed on November 27, 2015).

Table 1. Comparison of income levels in Ukraine for 2013–2015

Subject descriptor	units	scale	2013	2014	2015
GDP per capita, constant prices	National currency	units	26,588.740	24,847.299	23,518.145
GDP per capita, current prices	National currency	units	34,151.013	36,627.369	43,339.113
GDP per capita, current prices	US dollars	units	4,185.481	3,054.601	2,001.646
GDP product based on purchasing-power-parity (PPP) valuation of country GDP	Current international dollar	billions	392.250	370.786	353.329
GDP product based on purchasing-power-parity (PPP) per capita GDP	Current international dollar	units	9,142.606	8,668.331	8,277.601
GDP product based on purchasing-power-parity (PPP) share of world total	per cent		0.381	0.344	0.314

Source: *World Economic Outlook Database, International Monetary Fund, April 2015*. Available online: <http://www.imf.org/external/pubs/ft/weo/2015/01/weodata/weorept.aspx?pr.x=62&pr.y=7&sy=2013&ey=2020&scsm=1&ssd=1&sort=country&ds=.&br=1&c=926&s=NGDPRPC%2CNGDPPC%2CNGDPDPC%2CPPPGDP%2CPPPPC%2CPPPSH&grp=0&a#cs1> (accessed on November 27, 2015).

Oligarchic groups are the second important problem in the transition to energy efficiency. Many oligarchs have revenues dependent on direct state support from donations (coal). Other issues include a controlled energy regulator and anti-trust state institutions, the absence of energy metering and audits, overpricing for public enterprises and institutions, a monopolistic position on the market, neglect of modernization and maintenance of generation assets, corrupt state officials and obstacles to projects that reduce energy intensity.

Political populism is the third important problem. The introduction of a market economy in Ukraine has not led to the end of rudimentary socialistic practices, among which state regulated prices and cross-subsidies have the greatest impact on the state budget. The cumulative effect of the growing price of imported gas and the lack of energy efficiency reform has been an increase in state expenditure for NAK Naftogas of Ukraine alone in 2014 of up to 110 billion UAH. The increase in energy prices in 2015 has resulted in reduced gas consumption by private consumers and a budget deficit for NAK Naftogas of Ukraine.

These problems have created several gaps which present significant difficulties for energy efficiency. The most important of them are:

The lack of a comprehensive energy efficiency program

The core objective should be to decrease energy consumption through a set of measures on tax, regulation, pricing and information. Increases in energy prices is one of the main drivers of savings and even a modernized system of subsidies should be considered as the very last kind of treatment for the poorest families.

However, governmental plans are still different. The monetization of subsidies in Ukraine is planned to be conducted in two stages. This was stated by Vice Prime Minister – Minister of regional development, construction and housing and communal services during a visit OSBB “Kyivenergo” on March 18, the press service of the Cabinet of Ministers.

“The first is at the level of enterprises, service providers, second – level consumers of housing services. For this it is necessary to specify lists of people who really need help. Not one to ignore, however, that public money is not used the crooks,” he said.

The program should clearly indicate that subsidies are a temporary form of state support and that they will decrease to a minimum in the coming years. Simultaneously it should radically change the existing system of subsidies, offering instead preferably near-to-zero or zero-interest loans for thermal insulation, the replacement of windows and doors, and discourage energy-wasting household appliances, thereby providing incentives to reduce energy consumption (heating, lighting, hot water, cooking etc.). It could become a core financial instrument promoted by the State Agency for Energy Efficiency (SAEE) Energy Efficiency Fund. A draft law is also being developed and submitted for consultation to the Ukrainian government.⁸

Energy audits should become one of the core instruments in the program, and the state could take responsibility for the quality and availability of audits, in addition to making audits a precondition to begin awarded a loan and linked to affordable repayment conditions.

State-supported information campaigns should be broadcast on the main TV channels at “peak periods” in the morning and evening, and news and talk shows could create positive images of energy efficiency projects, promote energy saving as a progressive and modern lifestyle, and show success stories from all around the country.

⁸ See the State Agency for Energy Efficiency and Energy Saving of Ukraine website, op. cit.

Dated or absent legislation on energy efficiency

A clear distinction should be made between energy efficiency and renewable resources and a set of laws should be passed in order to facilitate implementation of the above-mentioned programme. One of the most important draft laws on the commercial metering of the resources consumed (heat, hot and cold water, and wastewater) has been under consideration for several years but has never been passed by the government and parliamentary committees in its full comprehensive state. At the same time the Law of Ukraine “On Gas Metering” has already driven distributors to request that their clients apply for gas metering devices to be installed at the cost of the company. This should help, along with limits on normative levels of household consumption of gas for water heating and cooking, and the provision of extensive gas consumption metering through the country by January 2016 and complete gas meter installation for all private consumers by January 2018.

At the same time, current heat loss levels in Ukraine are on average about 40 per cent, while water loss in the water supply networks, including hot water, averages near to 70 per cent. Given this, the introduction of metering for end consumers will reduce bills, while service providers will be forced to modernize supply networks and boilers.

In April 2015 the Ukrainian parliament passed a public sector law on ESCO⁹, thus enabling it to introduce energy service contracts and conduct thermal modernization, including guaranteed payments based on the differences in the cost before and after modernization. In 2016 and first quarter of 2017, Ukrainian parliament adopted several amendments to this law, providing for public procurements through Prozzoro platform and extension of payback period for ESCO service contracts.

The situation regarding residential housing, in particular condominium houses, was positively tackled by the passing in May 2015 of the Law on Condominiums,¹⁰ which deals with the rights and responsibilities of apart-

⁹ “Закон України Про запровадження нових інвестиційних можливостей, гарантування прав та законних інтересів суб’єктів підприємницької діяльності для проведення масштабної енергомодернізації,” [Law of Ukraine on the Introduction of New Investment Opportunities, Guarantees of the Rights and Interests of Business in the Implementation of Full-scale Energy Modernization] No. 327-19, Verkhovna Rada of Ukraine, April 09, 2015. Available online: <http://zakon5.rada.gov.ua/laws/show/327-19> (accessed on November 27, 2015).

¹⁰ “Закон України Про особливості здійснення права власності у багатоквартирному будинку,” [Law of Ukraine on the Conditions Relating to the Exercising of Property Rights in an Apartment House] No. 417-19, Verkhovna Rada of Ukraine, July 14, 2015. Available online: <http://zakon5.rada.gov.ua/laws/show/417-19> (accessed on November 27, 2015).

ment owners with regard to service and non-residential areas, and aspects relating to the building's construction. However, the law requires secondary legislation and amendments before it can be effectively implemented. Moreover, apartment owners still have to pay additional costs and obtain additional permits, as the Ukrainian government and parliament failed to pass the Law on Energy Efficiency in Buildings. Among other things, it was to provide standardized templates and projects for residential buildings and simplify other proceedings.

In June 2016, Ukraine failed to introduce obligatory management of apartment houses by condominiums or management company, ordered by local authorities, thus freezing for another year problem of effective changes in residential sector. Massive subsidies to private consumers also made negative impact on readiness to joint activities over own apartment houses. Only high prices remain leading driver for changes, but mainly in cities and towns, where already few condominiums have proven to reduce monthly bills of their inhabitants in comparison to neighboring apartment houses.

There is no legislation on energy audits. On April 29, 2016, an official standard for energy audit¹¹ has been adopted and came into force since September 1, 2016. In June 2015, the Ministry of Regional Development, Construction, Housing and Public Utilities of Ukraine used order No. 120 issued on May 29, 2015 to prohibit the SAE¹² from licensing private companies to perform energy audits until a special law has been developed and enacted.

National Standard Guidelines came into force on October 1, 2015 regulating the thermal modernization of residential buildings in accordance with Order No. 389 of the Ministry of Regional Development, Construction and Housing and Utility Services of Ukraine of December 31, 2014.¹³ However, the guidelines are not provided to all interested parties but can be purchased via the “State construction standards of Ukraine” official website.¹⁴

¹¹ “ДСТУ ISO 50002:2016 Енергетичні аудити. Вимоги та настанова щодо їх проведення (ISO 50002:2014, IDT).” Available online: http://online.budstandard.com.ua/catalog/doc-page.html?id_doc=64370 (accessed September 15, 2016).

¹² See the State Agency for Energy Efficiency and Energy Saving of Ukraine website, op. cit.

¹³ “1 жовтня 2015 набрав чинності національний стандарт ДСТУ-Н Б В.3.2-3:2014 Настанова з виконання термомодернізації житлових будинків,” [On October 1, 2015, National standard DSTU-N B V.3.2-3:2014 Guidelines on the Thermal Modernization of Residential Buildings comes into force], *Teplotydim*, October 1, 2015. Available online: http://teplotydim.com.ua/uk/news/view/1016/standard_termomodernizatsia_1_oct_2015_ukr (accessed on November 27, 2015).

¹⁴ See the State Construction Standards website. Available online: http://dbn.at.ua/load/normativy/dstu/dstu_n_b_v_3_2_3_2014_nastanova_z_vikonannja_

Working state programs to support energy efficiency

Ukraine is not a country that has a high level of income per capita. Therefore, the success of energy efficiency measures will greatly depend on support from the state and local authorities. In October 2014, Ukraine's government started to implement the State Program on Energy Savings for 2010–2015, enacted by Decree No. 243 of the Cabinet of Ministers of Ukraine of March 1, 2010. According to Government Decree No. 491 of 1 October 2015,¹⁵ anyone seeking to replace a gas boiler with one that uses an alternative energy source can apply to the state for reimbursement of up to 20 per cent of the loan for the new equipment. Since May 12, 2015, a state program called “Warm House” has made it possible for up to 30 per cent of loans taken out by private consumers to make energy efficiency changes (thermal insulation, replacing equipment) to apartments and houses to be reimbursed, and up to 40 per cent for condominiums.¹⁶ Government Decree No. 614 of August 12, 2015 enables private consumers, approved for subsidies, to apply for reimbursement of up to 70 per cent of the cost of energy efficient equipment and thermal insulation materials.¹⁷

However, these programs do not solve the problem of access to long-term and low-interest credit lines for energy efficiency. State banks, which provide loans reimbursed from the state budget, have substantial interest rates – 24.5 per cent plus 3 per cent loan fees and a pay-back period of up to

termomodernizaciji_zhitlovikh_budinkiv/5-1-0-1199 (accessed on November 27, 2015).

¹⁵ “Директива КМУ «Про внесення змін до Порядку використання коштів, передбачених у державному бюджеті для здійснення заходів щодо ефективного використання енергетичних ресурсів та енергозбереження»,” [Directive of the Cabinet of Ministers of Ukraine on Amendments to the Use of Funds Provided in the State Budget for the Implementation of Measures for Energy Efficiency and Energy Saving] No. 491, Verkhovna Rada of Ukraine, October 1, 2014. Available online: <http://zakon5.rada.gov.ua/laws/show/491-2014-%D0%BF> (accessed on November 27, 2015).

¹⁶ “Державна підтримка термомодернізації житлових будівель в Україні: умови та перспективи впровадження енергоефективних заходів,” Держенергоефективності України, November 16, 2015. Available online: http://sae.gov.ua/sites/default/files/16_11_2015.pdf (accessed on November 27, 2015).

¹⁷ “Про внесення змін до Порядку використання коштів, передбачених у державному бюджеті для здійснення заходів щодо ефективного використання енергетичних ресурсів та енергозбереження,” [Changes in the use of funds provided from the state budget for the implementation of energy efficiency and energy saving measures] Cabinet of Ministers of Ukraine, Directives, August 18, 2015. Available online: <http://www.kmu.gov.ua/control/uk/cardnpd?docid=248431083> (accessed on November 27, 2015).

36 months.¹⁸ Since reimbursement is often postponed, loans for energy efficient equipment and thermal modernization are only affordable to families on above-average incomes.

Lviv Region is a “success case” with regard to the number of loans issued when compared with other administrative units in Ukraine. The local authorities have supported the state energy saving program by introducing their own energy savings program for inhabitants of Lviv Region. This program is financed from the region’s budget and reimburses 15–20 per cent of the interest on an energy efficiency loan.¹⁹ Lviv Region has applied for and received four times as many loans as the Ukraine average.

Several small towns have developed their own programs to support energy efficiency projects. For instance, the town of Slavuta in Khmelnytsky Region initiated the creation of a revolving fund for thermal insulation and renewables.²⁰ The fund will provide low-interest loans to private consumers and will reinvest revenues. A similar project is in operation in Voznesensk. Ukrainian legislation enables civil society organizations to operate revolving funds such as these.

In 2016, private consumers has indicated rapidly growing interest to the “Warm loans” programme and by July 2016 the SAEE has spent to limits respective budget support. It took two months of governmental negotiations, before a decision about extension and additional 100 mln UAH was adopted. However, changes occurred with regard to reduction of remuneration level for subsidy receivers from 70 per cent up to 35 per cent. The recent level remained in force only for condominiums and was calculated into general estimation of remuneration amount for a loan to respective condominium.

Improving the investment climate and the ongoing changes in taxation for medium and small businesses are still among the significant constraining forces for national and foreign businesses alike.

Prices for consumed energy and services

For years, cross-subsidies have been one of the biggest obstacles to achieving energy efficiency in Ukraine. Political populists used to buy voter sympathy by promising low prices. Since elections have been held regularly in Ukraine during the last 10 years, this “low price mantra” should be perceived as an anti-energy efficiency information campaign and a kind of political crime, committed by many political leaders and parties.

¹⁸ See the Oschadbank data. Available online: <http://www.oschadbank.ua/ua/private/loans/programs/energy/index.php> (accessed on November 27, 2015).

¹⁹ “Державна підтримка термомодернізації житлових будівель в Україні: умови та перспективи впровадження енергоефективних заходів,” **op. cit.**

²⁰ See the official Slavuta town council website. Available online: <http://www.slavuta-mvk.info/index.php?page=syte/text/addnews/full.php&rfile=2454> (accessed on November 27, 2015).

If one were to calculate how much funding has been spent on state donations, subventions and subsidies, and how many loans have been obtained from abroad and misused to cover the budget deficit rather than economic development, it would become clear why Ukraine is still among the poorest nations in the world in terms of GDP per capita. If the money had been spent on economic development, the average Ukrainian might be on a much higher income today and paying energy bills would be less painful.

In 2014, under pressure from creditors and external aggression, the Ukrainian government introduced a program to raise gas and electricity energy prices to an economically viable level with the aim of deregulating the energy market after 2017.²¹ Gas suppliers began to improve gas metering after a nearly threefold decrease in the nominal norm for unmetered gas consumption.

To protect low-income families and avoid social vulnerabilities, the Ukrainian government approved a multibillion package of subsidies, simplified procedures and began an information campaign promoting its social initiatives. However, these activities may negatively affect the section of the Ukrainian population which still waits passively for state support. Partly, it is also the most unscrupulous debtor with different social preferences, protecting those consumers from being cut off. The costs are usually calculated as an uncollectable outstanding amount, which is then added to the regular tariffs and incurred by prompt payers.

One of the most challenging issues is heating. Together with the hot water supply, this public utility service is regulated by decisions taken by the National Energy and Utilities Regulatory Commission which sets different prices for each supplier, usually early on and taking into account changes in energy prices and technical capacities (the most recent was Regulation No. 1171 of March 31, 2015 as amended).²²

The existing nominal normative for heat supply covers the surplus costs of service providers, and they are not interested in improving metering for consumers. Even condominium houses equipped with heat metering devices are often subjected to unjustified checks and miscalculations. The situation is even more serious in medium-sized and small towns where central heating is usually provided from a single boiler station and supply networks dozens of kilometers long suffer from a lack of maintenance. Heat losses could rise by up to 50 per cent, and it is impossible to regulate the heat supply and ensure comfortable temperatures in the condominium houses or that houses and infrastructure meet the technical standards.

²¹ "On the increase in electricity tariffs and retail prices for natural gas for the population," National Commission for State Regulation of Energy and Public Utilities, March 24, 2015. Available online: <http://www.nerc.gov.ua/?id=15406> (accessed on November 27, 2015).

²² "On setting tariffs for central heating and services for the centralized hot water supplied by the public entities providing these services," National Commission for the State Regulation of Energy and Public Utilities, March 31, 2015. Available online: <http://www.nerc.gov.ua/index.php?id=15472> (accessed on November 27, 2015).

Despite the poverty, resistance by monopolists, weak state support and external aggression, Ukraine is improving its energy efficiency. The official data for the last two years clearly indicate that gas and electricity consumption has fallen.²³ At the same time, apartment and house owners have actively sought to improve energy efficiency by replacing windows, doors and installing thermal insulation and metering. Small towns have increasingly opted for independent heating systems. More and more people are looking for alternative energy sources, such as photovoltaic and solar thermal panels, windmills and heat pumps. In October 2014–September 2015, state owned banks (Oschadbank, Ukrgasbank and Ukreximbank) provided over 61,810 “warm” loans on energy efficiency worth more than one billion UAH (see Figure 2.).

[illegible]

²³ A. Belousov, "Ukraine's energy sector: seeking new sources," UNIAN, January 05, 2015. Available online: <http://www.unian.info/politics/1029050-ukraines-energy-sector-seeking-new-sources.html> (accessed on November 27, 2015).

Figure 2 shows the growing interest in energy efficiency improvements among private households and condominiums. According to SAEЕ calculations,²⁴ investments in energy efficiency will increase tenfold in 2016 over 2015 and will rise to over 3 billion euros per year in 2020.

The largest investments will be made by households, with single-family houses and condominium houses requiring over 30 billion euros by 2030 for renovations and maintenance. They will require small (from 1,000 to 20,000 euros) and medium loans (100 – 1,000 thousand euros), available from the nation-wide banking system at affordable terms and conditions (potentially very low interest rates and state programs for reimbursement). Ongoing programs, operated by Oschadbank and Ukrgasbank proved to be effective in 2015.

The state bank reimbursement program for private consumers generally reflects the slowly growing demand and will have an increasing positive effect in the next two to three years. A promising incentive was introduced in September 2015 and that is the reimbursement of 70 per cent of the cost for subsidy recipients to cover thermal modernization and the switch to alternative fuels, but this will only show an effect from 2016 onwards.

Revolving funds could become another important source for financing small energy efficiency programs at the local level, covering the most urgent problems to gradual improvement of infrastructure and landscape. The first “success cases” were discussed at the 6th International Ecologic Forum in Kherson Region on November 19–20, 2015.²⁵ A separate financial program may be introduced to facilitate utilization of this instrument, perhaps through the Energy Efficiency Fund,²⁶ to ensure sufficient co-financing initially.

Growing demand from consumers for energy efficient materials, technologies and services is creating new incentives for business and economic development in the country. In Ukraine, the production of boilers that run on alternative (solid) fuels is increasingly popular among national companies. There are also a number of meter manufacturers, generally operating in joint ventures with EU companies. ESCOs may enter the market once the secondary legislation has been enacted. Photovoltaic and solar thermal panels are generally supplied to Ukraine’s energy market via distributors. Some of them provide a range of services from project calculation to installation and feed-in procedure. Generally, there is great potential for small and medium-sized enterprises to develop all over the country.

²⁴ “Державна підтримка термомодернізації житлових будівель в Україні: умови та перспективи впровадження енергоефективних заходів,” *op. cit.*

²⁵ See the 6th International Ecological Forum official website. Available online: <http://www.ecoforum.kherson.ua/> (accessed on November 27, 2015).

²⁶ See the State Agency on Energy Efficiency and Energy Saving of Ukraine website, *op. cit.*

In Ukraine, international organizations – IFC, USAID, GIZ, UNIDO, EBRD, and the World Bank – have been involved in energy efficiency issues for many years, and they are familiar with the situation, have the available facilities to provide technical and financial support and may well be ready to work on projects with district level municipalities. Several projects have already been successfully implemented in the regional capitals of Zhytomyr,²⁷ Vinnitsa²⁸ and Dnipropetrovsk.²⁹

Enterprises could also become a part of the energy efficiency program if the government ensures special credit sources for reducing energy intensity. Many international financial institutions are ready to finance medium and large projects.

In 2015, Memorandum of Cooperation on energy efficiency, energy saving and renewable energy sources between the State Agency for Energy Efficiency and Energy Saving of Ukraine and the Slovak Innovation and Energy Agency (SIEA) has been signed, following respective intergovernmental agreement between Ukraine and V4 countries on sectoral support and experience exchange.

Since that time, under support of SlovakAid, Slovakia and Ukraine started several projects on sharing best practices from V4 and especially Slovakia in energy efficiency and renewable energy. Four seminars for state officials were organized and conducted in Kyiv, followed by a study to number of Slovak cities, where respective projects were implemented.

Two international conferences and fairies of Slovak companies experience were organized in Lviv and Dnipro afterwards, followed also by two already organized and one planned for summer 2017 study tours for municipal authorities and energy managers. One pilot project of comprehensive energy audit for municipal infrastructure in Khotyn city (Chernivtsi region) has been implemented, thus opening opportunities for further implementation of renovation projects.

The above activities gathered over 100 participants each and 20 visitors per each study tour to Slovakia and Czech Republic, showing significant interest to experience and lessons learned by local authorities while passing the same path of soviet infrastructure modernization.

The main concerns of participants are still lack of access to affordable loans and sufficient experience in doing energy efficiency projects of compre-

²⁷ See *Zhytomir.Today*. Available online: <http://zhitomir.today/news/tag-%D0%B5%D0%BD%D0%B5%D1%80%D0%B3%D0%BE%D0%B5%D1%84%D0%B5%D0%BA%D1%82%D0%B8%D0%B2%D0%BD%D1%96%D1%81%D1%82%D1%8C/> (accessed on November 27, 2015).

²⁸ See *Vinnitsa.info*. Available online: <http://www.vinnitsa.info/news/u-vinnitsi-trivaye-vprovadzhennya-shveytsarskoyi-programi-energozberezhennya.html> (accessed on November 27, 2015).

²⁹ See *Gorod.dp.ua*. Available online: <http://www.gorod.dp.ua/news/108838> (accessed online: on November 27, 2015).

hensive nature, including most of energy-wasting areas and gaps. Cooperation between Ukrainian local councils and Slovak local authorities seems to be quite important for further success of modernization projects in Ukraine.

Opportunities in energy efficiency for partners from V4 countries

Since at least 2005 energy efficiency has been on the agenda of EU–Ukraine bilateral relations.³⁰ Since that time, the EU has prioritized energy efficiency as a leading EU energy policy goal, while Ukraine has struggled to do so because the big oligarchic groups and associated political parties have gained significant profits in Ukraine’s opaque and inefficient energy intensive economy.

Efforts by several countries and international institutions to appeal to the Ukrainian government and propose energy efficiency solutions have thus far had little effect on the internal processes. The political implications of such a move and the external aggression make this even more urgent, but desperate acts of sabotage at the governmental and parliamentary levels have hindered the legislative process.

However, the energy deficit and growing number of civil society activities along with decentralization have led to energy efficiency projects being initiated at the grass-roots level. Some medium-sized and small towns in Ukraine have introduced their own programs to financially support energy efficiency projects, including revolving funds and the reimbursement of the interest on loans. Increasing numbers of civil society organizations are getting involved in energy efficiency and renewable projects all over the country. They are looking for experience, technologies and start-up capital. The lack of unified state standards for energy efficiency projects, in particular thermal modernization, has resulted in different approaches emerging in relation to the technical terms of reference and construction work. Private households often install primitive forms of thermal insulation, opting for short-term and cheap solutions rather than effective sustainable ones.

³⁰ “Memorandum of understanding on co-operation in the field of energy between the European Union and Ukraine,” European Commission, December 1, 2005. Available online: https://ec.europa.eu/energy/sites/ener/files/documents/2010_ukraine_mou.pdf (accessed on November 27, 2015).

Given the above, Slovakia and other V4 countries have privileged conditions in comparison to Germany or Scandinavian countries which have more experience but seek out expensive and large-scale projects. The V4 countries could consider entering the Ukrainian energy efficiency market at the level of small and medium-sized towns, sharing their experiences of locally adapted European energy efficiency technologies and initiating horizontal cooperation on a mayor-to-mayor basis and providing support by attracting European funds.

Ukrainian towns are facing new challenges in relation to their growing responsibility for a sustainable energy supply and for public utilities services, as a result of decentralization. Following the local elections in October 2015, new mayors will have to take more responsibility because central government will reduce financial support from the state budget. The most active councils have already started looking for ways to emulate the experiences of “success cases.” The main requirements are the following:

- education and training of municipal energy managers;
- support towns by developing comprehensive and sustainable energy efficiency road maps for them;
- joint ventures with local counterparts for production of materials, equipment and services;
- facilitation of access to financial resources in form of loans and grants to establish revolving funds or similar instruments;
- sharing technical and technological experience between municipalities and communal utility enterprises (here it is important to identify similar problems, solved later through cooperation with business or from own sources, which technologies were used); here Ukraine needs some more information on web-resources of Slovak cities with successful energy efficiency projects;
- providing successful information campaigns and incentives for inhabitants.

Slovakia and other V4 members could help Ukraine overcome the two most challenging issues – partial thermal modernization of apartment buildings and switching from centralized heating to individual boilers. The first is widespread in town and cities throughout the country, and even in new buildings. Sharing experiences of best practices, incentives and penalties, which could be introduced by local authorities, and the provision of modern effective technical solutions at affordable prices would create opportunities for broad cooperation.

The second is connected to problems affecting the old centralized heating networks and municipal resistance to modernizing public utilities at a time when there are significant subventions from the state budget. Individual boilers are usually installed in new buildings up to nine stories high. However, given the growing gas prices in Ukraine, small and medium cen-

tralized biomass boiler stations will become more competitive against individual boilers in the coming years. In particular, towns will favor alternative local fuel-based boiler units with flexible operation modes.

Ukraine still wastes most of its by-products from agriculture, livestock raising, and the forest and wood industries. A significant amount of this could be used as biomass in local communities, but reprocessing developments are being hindered by a lack of experience, funding and technologies.

Conclusions and recommendations

Ukraine has just started taking its first steps toward implementing energy efficiency measures in its most outdated areas – housing, public utilities and the energy supply. For many years, populist political campaigns favoring low prices for private consumers, state responsibility for the energy supply and promises to solve any problems arising have resulted in Ukrainians adopting irresponsible and passive attitudes.

Big oligarchic groups have gained control over the infrastructure, service providers and generation assets, thus preserving their monopolistic position and opposition to reducing energy consumption and reforming the energy intensive economy. They use political parties and state officials to block new legislation on energy efficiency and the introduction of an independent energy market regulator.

Numerous attempts by some countries and the EU generally to support progress in energy efficiency have failed because the central authorities have silently sabotaged projects and recommendations. Even in the face of external aggression and the shortage of energy reserves many important draft laws remain under consultation for at least a year in ministries and state institutions.

Given the above, the most promising direction for energy efficiency reforms is from the bottom up, which means local authorities becoming involved in small and medium-sized projects across the country. The local authorities have been taking more responsibility for the situation at the municipal level and, given the fall in financial support from the national government, are interested in reducing energy consumption and in modernization. Mayor-to-mayor collaboration could facilitate greater cooperation, particularly in energy management and business relations.

The growing financial independence of the local authorities could become a good basis for creating long-term instruments, like revolving funds, that would ensure sustainable development through the implementation of

energy efficiency projects and further improvements to the infrastructure etc. The experience of V4 countries in attracting European funds, fundraising and grants will evidently accelerate the financial self-sufficiency of local authorities and multiply energy efficiency projects.

Joint ventures between Slovak companies with experience of energy efficiency projects and their Ukrainian counterparts will create opportunities to produce the materials and equipment required, simplify the process of entering the market, create jobs, increase revenues and enhance the demand for qualified services.

Ukrainian cities need support and advice by doing next steps in energy efficiency and renewables:

1. to identify the buildings most in need of improvement (here it is about support by energy audit projects, both via financial instruments and proving quality of provided energy audit services by experienced Slovak experts or qualified by Slovak experts local professionals. City councils should be interested in keeping some money in their budgets for doing these activities on regular basis too, it might become one of preconditions for cooperation with V4 counterparts.
2. to collect and analyze data, much of which require detailed on-site measurement and in some cases specialized equipment
3. to start collecting energy consumption data for as much objects as possible
4. to introduce energy management and automatic control of energy supply on municipal level
5. to find out projects and similar state of affairs in other cities, for instance, in Slovakia
6. to acquaint as much experience about solutions for modernizing city infrastructure as possible from open sources and communication with partner cities
7. to develop proposals and prepare documents for open calls from international and national donors
8. to introduce budget lines and ensure allocation of funds for energy efficiency measures within available sources, but on a constant nature
9. to start cooperation with local non-governmental organizations with regard to their possible intervention into monitoring of problems, development of solutions and management of respective projects
10. to create a team of English speaking persons in a form of project management office and to apply to all available grant programmes and initiatives. It should become a must for each city council and be supported at least on organizational level through provision of premises, Internet access and PCs.
11. to introduce open budget initiative and allocate even small but regular funds for projects, initiated by city inhabitants on a competitive and open web-portal.

