

PN ACS-987

101-4-1

**UKRAINE LOCAL ELECTRIC COMPANIES  
DEMAND CURTAILMENT AND DSM  
(TASK D.2 AND D.3)**

**NIS Institutional Based Services Under the Energy  
Efficiency and Market Reform Project  
Contract No CCN-Q-00-93-00152-00**

**Ukraine Power Sector Reform  
Delivery Order No 18**

*Final Report*

*Prepared for*

U S Agency for International Development  
Bureau for Europe and NIS  
Office of Environment, Energy and Urban Development  
Energy and Infrastructure Division

*Prepared by •*

Hagler Bailly  
1530 Wilson Boulevard  
Suite 400  
Arlington, VA 22209-2406  
(703) 351-0300

September 11, 1998

---

## TABLE OF CONTENTS

<b>1</b>	<b>SUMMARY</b>	<b>1</b>
	1 1 Background	1
	1 2 Observations	2
	1 3 Recommendations	3
	1 4 Data Collection and Analysis Methods	4
	1 5 Report Organization	5
<b>2</b>	<b>BACKGROUND</b>	<b>5</b>
	2 1 Ukraine Economy	5
	2 2 Ukraine Energy Sector	6
<b>3</b>	<b>GENERAL OBSERVATIONS &amp; RECOMMENDATIONS</b>	<b>7</b>
<b>4</b>	<b>ENERGY EFFICIENCY</b>	<b>7</b>
	4 1 Observations	7
	4 2 Recommendations	10
<b>5</b>	<b>LOAD MANAGEMENT</b>	<b>11</b>
	5 1 Observations	11
	5 2 Recommendations	12
<b>6</b>	<b>PRICING – TARIFFS</b>	<b>13</b>
	6 1 Observations	13
	6 2 Recommendations	15
<b>7</b>	<b>CUSTOMER RELATIONS</b>	<b>15</b>
	7 1 Observations	15
	7 2 Recommendations	16
<b>8</b>	<b>METERING &amp; BILLING</b>	<b>19</b>
	8 1 Observations	19
	8 2 Recommendations	20
<b>APPENDIX A</b>	Draft USAID Action Plan	
<b>APPENDIX B</b>	Oblenergo Survey Outline	
<b>APPENDIX C</b>	List of Contacts	

---

# CUSTOMER RELATIONS AND ENERGY EFFICIENCY AT UKRAINIAN OBLENERGOS

## 1. SUMMARY

This report was prepared for the United States Agency for International Development in fulfillment of the objectives described in the Local Electric Companies Section of USAID Delivery Order #18 and the Financial Recovery Plan of the Power Sector of Ukraine. It specifically addresses Task 6 "A report and action plan on assessment of demand curtailment options and recommendations for DSM implementation", and Task 7 "Status report on results of demonstration of voluntary curtailment and demand side measures"

### 1.1 Background

Local Electric Companies (LEC's or Oblenergos) in Ukraine are faced by a set of formidable, interrelated problems

Ukraine was a center of heavy industry in the former Soviet Union. Ukrainian industry is among the most energy intensive in the world. Energy consumed per unit of GNP in Ukraine runs 5 times the world average. This energy intensity hampers Ukraine's ability to compete on world markets and contributes to the under-utilization and shut-down of Ukrainian industry.

Low cash collections by utilities are a serious problem. Cash collections average 12% of total billings for an electric distribution company. This lack of cash makes it difficult for the distribution utility to pay its bills to the wholesale market (Energomarket) and generators.

A majority of energy transactions are barter or offset-based and are not conducted through the Energomarket fund, adding to the weakness of that market.

Ukraine periodically does not have sufficient energy (fuel) to run its power plants and has to resort to involuntary rolling blackouts to reduce energy consumption. These outages, effecting all sectors of the energy market, are related to the lack of cash to purchase fuel.

Ukrainian utilities have moved from an industry where there was no competition for customers to one in which independent energy suppliers (IES) can compete to provide electricity to customers

## 1.2 Observations

Customer interest in energy efficiency has been mixed, and is related to the formidable collections problem. Customers who are currently paying their electric bills have generally shown interest in efficiency improvements, though they may not have the ability to implement them. Customers who are not paying their bills, or who don't see a correlation between efficiency measures and bill reduction, generally have little interest.

Interest in energy efficiency and activity by the Oblenergos has also been mixed. As Oblenergos move toward operating as private competitive businesses, different business strategies will evolve. The more entrepreneurial Oblenergos will view energy efficiency as a business opportunity they should pursue, while the more traditionally oriented Oblenergos will view it simply as a potential reduction in revenue from electricity sales.

Other players in the energy business, IES's and ESCO's, may be better positioned to pursue efficiency business opportunities than some Oblenergos.

Lack of reasonably priced investment capital is a significant barrier to efficiency implementation. Current high interest rates make all but the shortest payback projects uneconomic.

The current voluntary demand curtailment program is not working. A phased approach may have more success.

The potential of time of use or zone tariffs to send more appropriate price signals to customers is not being fully utilized.

Customer contacts are generally transaction-based. Some Oblenergos have the components of pro-active customer relations programs. Planning and integration assistance is needed.

Better metering and billing will not only help the collections issue, but by providing better usage feedback, should help efficiency efforts.

### 1.3 Recommendations

USAID should focus its future efficiency assistance efforts on the more entrepreneurial Oblenergos

One key theme of an Oblenergo's customer communications program should be to position themselves as energy experts and encourage all customers to use energy wisely and reduce waste

The more entrepreneurial and interested Oblenergos should either create, partner with or buy an energy services group or ESCO, invest in energy efficiency projects with key customers USAID should identify 2-3 entrepreneurial Oblenergos interested in establishing energy services business units and provide the needed advice, assistance and training

USAID should continue to encourage the IES to get into the ESCO business, by providing on-going advice and assistance business planning, project management, and financial analysis training, and access to reasonably priced capital

USAID should continue to provide project management and financial assistance and training to ESCO's through the Ukrainian Chapter of AEE The current CEM training should continue, and be supplemented with other seminars on specific topics such as life cycle cost analysis, project finance, and business planning

USAID should also work with World Bank to establish an Energy Efficiency Financing Fund that would provide access to reasonably priced capital for all ESCO's

The current VDC program should be redesigned and implemented in two phases USAID should help both the pool and retailers implement this phased approach to VDC

Oblenergos should implement mandatory zone tariffs for all large industrial customers, not just those who can immediately achieve a bill reduction Corresponding transit tariffs should also be differentiated by time periods, based on T&D system loading and load shifting objectives

Future tariff designs, particularly for new designs like zone tariffs, should include a monthly charge for the needed metering, and meter reading and billing costs in the tariff, rather than requiring the customer to pay for the meter up front and/or provide reading services

Oblenergos should have greater flexibility to design special tariffs tailored to the needs and load profiles of key customers This flexibility should equal that allotted IES's

USAID should provide extensive training and assistance to selected Oblenergos in rate design and cost of service analysis

Oblenergos should establish a key account program to build long term, mutually beneficial relationship with large industrial and other important customers. This program would encompass all activities, include communications, service, energy sales and delivery, metering, billing and collections, with customers over 750 kw, and with IES's. This program can build on the nucleus of the special collections groups, where they have been established

Oblenergos should institute pro-active communications programs with small business and residential customers to improve and manage relationships with these customer groups. This effort should involve multiple communications channels and messages, with the overall objective of improving public perceptions of the Oblenergo as concerned and caring about its customers, and committed to wise energy use. Implementation of a pro-active customer communications program may require some organizational modification

USAID should work with 2-3 selected Oblenergos to provide training and assistance in establishing a key accounts programs. This includes development of key account plans, relationship management, staff training, and the integration of current collections activities into a relationship program

USIAD should also provide training and assistance in establishing a residential and small business communication program. This includes assisting in research to determine communications needs, communication planning, message development and staff training

Oblenergos should install improved metering, demand meters for large commercial and industrial customers and TOU meters for those on zone tariffs. USAID should support several small demonstration efforts at selected Oblenergos

USAID should work with the multi lateral banks to develop programs and provide funding for more widespread implementation of improved metering equipment and systems

#### **1.4 Data collection and analysis methods**

Information on the current status of energy efficiency activities at oblenergos in Ukraine was gathered through a series of interviews with managers at 3 oblenergos, Zaporizhiaoblenergo, Vinnitsaoblenergo, and Khmelnytskyoblenergo, during the spring and summer of 1998, supplemented by discussions with other cognizant individuals

The interviews with the oblenergos included discussion of current energy efficiency activities, application of zone tariffs, and opinions regarding the role of efficiency and voluntary load curtailment in an oblenergo

These issues were included in a broader set of discussions which included current customer service practices, efforts to communicate with customers and build relationships, billing and collections practices, and payment arrangements. A list of people consulted and the outline used as the general guide for these interviews is attached.

## **1.5 Report Organization**

The report is organized into the following subject areas:

- General observations
- Energy efficiency
- Load management
- Tariffs
- Customer relations
- Metering and billing issues

For each issue, a set of observations describes the current status. Recommendations are then provided for the Oblenergos and other players in the Ukrainian energy sector, such as Independent Energy Suppliers, ESCO's, and the Energomarket. Recommendations are also provided in each area for future USAID action in support of on-going development of energy efficiency and customer relations capabilities. Finally, the recommendations to USAID are summarized in an action plan for USAID.

## **2. BACKGROUND**

### **2.1 Ukrainian economy**

Ukraine inherited a large defense sector and energy-intensive heavy industry from the former Soviet Union. The ability of this industry to compete in world markets has made the transition to a market economy particularly difficult for Ukraine. Market pricing, the interruption of supplier and customer relationships, and the need for serious economic reforms have led to substantial declines in industrial production. On a more positive note, Ukraine is located at the crossroads between Europe and Central Asia,

and has a strong scientific establishment and a skilled, educated workforce. Ukraine is a country with much potential but a substantial amount of work ahead to realize this potential.

## 2.2 Ukraine Energy Sector

The energy sector in Ukraine is currently in a period of transition. The fully integrated power sector has separated into 6 generating companies (genco's), comprising 4 thermal genco's, a nuclear genco and a hydro genco, a national transmission grid, a national wholesale market, (the Energomarket) and 27 distribution companies.

At the retail electricity market level, there are three major players, Oblenergos, who provide electricity delivery (transit) services to all customers within their geographic territory, and sell commodity electricity and ancillary services (demand, reactive) to most customers, Independent Energy Suppliers (IES's), who operate without a defined geographic territory, buying commodity electricity from the Energomarket or directly from genco's and selling to larger, cash-paying customers, for delivery over the Oblenergo's distribution system, and Energy Service Companies (ESCO's) who analyze customers energy use and provide energy efficiency and other ancillary services (such as meters).

An assessment completed for USAID by Hagler Bailly in 1995 (Demand-Side Management in Ukraine part 1 National Assessment, September 15, 1995) shows that the industrial sector uses over half of the electricity consumed in Ukraine. Further, industrial use is dominated by motors, which account for 90% of industrial consumption. The most common types of motor usage are compressed air (29%), HVAC (24%), machine tools (21%), and fans/blowers (16%). Lighting is the second major use, accounting for 5% of industrial energy consumption. Incandescent lighting represents over half of this usage. The remaining 5% of industrial energy use is for process energy.

The second largest electricity consumer is the residential sector, using about 16% of energy, primarily for lighting. The commercial/institutional sector accounts for about 12% of energy use and includes some industrial-like loads (e.g. municipal water pumping).

There is substantial potential for energy efficiency improvements, predominantly in the industrial sector and some industrial-like uses in other sectors. The above report identifies over 6 TWh/yr of cost effective energy efficiency and load shifting improvements.

### **3. GENERAL OBSERVATIONS & RECOMMENDATIONS**

The issues of energy efficiency and customer relations at Oblenergos can't be viewed in isolation but must be looked at in the broader context of the current business situation. These issues are interrelated with the issues of strategic and business planning, cash collection, metering & billing, retail and wholesale tariff design, and wholesale market operations.

Put more simply, customers who are not getting accurate price and billing signals and are not paying their bills have little incentive to save energy. Thus, substantially improving the cash collection situation is an enabling pre-condition to increasing electric energy efficiency in Ukraine.

Oblenergos, with support and encouragement from USAID and the multi-lateral banking community, should continue to place first priority on improving collections, restructuring customer debt, and putting in place an industry financial system that will be supported and used by all parties (Oblenergos, Genco's, Energomarket, and Minenergo). USAID should continue to work with interested Oblenergos to provide assistance in commercialization and privatization activities, including collections improvement, business planning, customer relations, and energy efficiency.

As the competitive retail electricity market continues to evolve, we can expect two types of Oblenergos to evolve: those that choose a more traditional role as providers of commodity electricity at established tariffs and electricity delivery services over the distribution system, within a defined geographic region, and those that choose a more entrepreneurial path, selling a wider variety of energy options and related products, including efficiency services. The recommendations below will be more applicable to the latter group, and it is these entrepreneurial Oblenergos where USAID should focus its future efficiency assistance efforts.

### **4. ENERGY EFFICIENCY**

#### **4.1 Observations**

The level of customer interest in energy efficiency is tied to the cash collection issue. To quote one Oblenergo Deputy Director, when asked about customer interest in saving energy:

“Those who pay cash are interested,  
Those who do not pay are not interested at all”

Customers who are not paying their bills have little or no incentive to reduce energy consumption. The current very low level of cash collection from industrial customers must improve before we can expect increased interest in aggressively pursuing efficiency measures. For customers without clear profit motivation, for example state and local budget customers, clear cost cutting targets may be needed for motivation.

Among the Oblenergos, the level of interest in energy efficiency varies. At one end of the interest spectrum, Zaporizhiaoblenergo views efforts to improve customer efficiency and shift load as a potential reduction in company revenue. At the other end, officials at Vinnitsaoblenergo perceive the positive customer relationship benefits and business opportunities presented by energy efficiency.

It's not surprising, therefore, customer energy efficiency initiatives vary between Oblenergos. Vinnitsaoblenergo, for example is conducting energy efficiency audits for industrial customers and making recommendations for efficiency improvements. This effort involves customers in both the above and below 750 kva tariff classes. These efficiency recommendations consist primarily of energy efficient motor replacement and the use of efficient lighting. Vinnitsaoblenergo reports that almost none of their recommendations have been implemented, however, due primarily to lack of capital on the part of customers to make efficiency improvements. Other oblenergos report little or no organized energy efficiency activity. They state that the energy inspector may make energy efficiency recommendations at the time of a periodic customer visit, or during disconnection procedures.

There is an on-going effort by some oblenergos to train their staff in energy efficiency technology and skills. Vinnitsaoblenergo was one of the sponsors of a recent Association of Energy Engineers (AEE) Certified Energy Manager (CEM) course. This course is the same as that currently offered by AEE in the United States, with modifications to fit the energy and economic situation in Ukraine. The course is conducted under USAID sponsorship by the Ukrainian Chapter of AEE. Vinnitsaoblenergo sent several of their staff for this training, including the General Director. This may also be an indicator for the generally higher level of interest in energy efficiency at Vinnitsa. If the General Director is interested in energy efficiency enough to participate in the CEM training, that interest can be expected to percolate down through the organization.

Another factor at some Oblenergos may be confusion of roles and responsibilities regarding energy efficiency. The State Committee on Energy Efficiency and Energy Saving has formed energy saving departments within each Oblast Administration. At least one Oblenergo believes that these committees should take the lead role in promoting and implementing energy saving measures with local budget customers,

residences, small businesses and industries, with the Oblenergo functioning only in a supporting role Vinnitsaoblenergo, however, views energy efficiency as an opportunity to improve service to its customers and create a new line of business, and therefore will take a more pro-active position

The differences in interest, activity, training, and perception of roles all may be indicative of differing business strategies emerging at the Oblenergos As discussed above, some Oblenergos appear to choose a more traditional strategy, as providers of commodity electricity at established tariffs and electricity delivery services over the distribution system, within a defined geographic region These Oblenergos would be expected to be less interested in non-traditional activities like energy efficiency Other Oblenergos choose a more entrepreneurial path, and expect the future to also include selling a wider variety of energy options and related products, including efficiency services

All of the Oblenergos report little implementation of efficiency measures by industrial customers, due to a combination of a lack of available, reasonably priced investment capital and a lack of interest This observation is supported by some of the ESCO's active in the energy efficiency improvement business, who also report little success in implementation of energy efficiency measures with industrial customers due to lack of reasonably priced capital Currently in Ukraine, financing for this type of activity is available typically at annual interest rates 50-80% with a maximum period of 6 months The relatively high cost of money and short duration of financing make efficiency improvement projects uneconomic that would pass financial screening under typical US criteria

The exception to this lack of implementation success seems to be activity by some ESCO's to install demand metering on industrial customers This results in customer bills being based on measured, rather than estimated, demand, and a potential reduction in customers' bills with no change in usage While this could understandably be viewed negatively by the Oblenergos, since to them it represents a revenue reduction, this activity is worthwhile from an efficiency standpoint, since more accurate usage and price signals will help encourage wiser use of energy

There appears to be substantial opportunity for energy efficiency improvements An assessment completed for USAID by Hagler Bailly in 1995 (Demand-Side Management in Ukraine part 1 National Assessment, September 15,1995 ) shows that there is a potential for over 6.4 TWH/yr of cost effective energy efficiency and load shifting improvements in Ukraine, primarily in the industrial sector

## 4.2 Recommendations

Even with the current cash-poor position of the Oblenergos, it's still possible for them to encourage energy efficiency among their customers with relatively modest expenditures. As part of their efforts to help build positive customer relationships, Oblenergos should position themselves as energy experts and encourage all customers to use energy wisely and reduce waste. This effort should be one key theme of an Oblenergo's customer communications program (see below). These communications can be used to encourage residential and small business customers to implement low cost energy saving measures, as well as to pay bills promptly. Oblenergos can also support and work with the local oblast branches of the State Committee on Energy Efficiency and Energy Saving. These arms of the local Oblast administration will have more influence over local budget and municipal service customers than the oblenergo and therefore should take the lead in efficiency efforts in these sectors.

As an expansion of their lines of business, the more entrepreneurial and interested Oblenergos should encourage, recommend, and invest in energy efficiency projects with key customers, where the project will improve profitability for both the customer and the Oblenergo. These oblenergos can either create internal energy services groups, or partner with or buy an existing ESCO or IES. Oblenergos are established, well positioned businesses within their geographic areas and, given the appropriate technical, managerial, and financial support could develop viable energy service business units. Initial interest in this type of business activity has been expressed by Vinnitsaoblenergo. For example, Vinnitsaoblenergo has mentioned that it needs help in procuring energy audit equipment for its staff. USAID should identify 2-3 entrepreneurial Oblenergos interested in establishing energy services business units and provided the needed advice, assistance and training to start these internal ESCO's. This assistance should focus on the management of ESCO's, business planning, project development and economic analysis, project financing, and general business aspects of this activity. Technical training can also be provided through the Ukrainian chapter of AEE.

Other organizations can play equally important roles in the development of an energy efficiency industry. To develop a viable, competitive, energy service industry, managerial, financial, and technical training and support is needed by a number of ESCO's and IES's.

The more active Independent Energy Suppliers (IES) generally appear to be exercising more creativity and flexibility in energy pricing and financing than Oblenergos. They could also use this creativity and flexibility to provide energy efficiency services, if provided with the managerial, technical, and financial advice and assistance to establish energy service businesses. USAID should continue to encourage the IES to get into the

ESCO business This effort was started at a USAID sponsored seminar in June 1998 While the seminar was successful in creating some initial interest, on-going advice and assistance is needed to help interested IES with business planning, project management, and financial analysis training, and access to reasonably priced capital

There are several start-up ESCO's in Ukraine Currently they are engaged mostly in metering improvement projects These ESCO's, with a business purpose specifically focussed on energy efficiency can play a significant role in the Ukrainian energy industry USAID has already provided significant help to the development of an energy services industry through it's support of the Ukrainian Chapter of the Association of Energy Engineers, and the sponsorship of a number of industrial energy efficiency audits Activity by others includes TACIS support of the Institute of Energy Saving and Energy Management, and the Training Center for Energy Management at Kiev Polytechnic Institute EBRD is also providing funding for an ESCO effort called UKRESKO USAID should continue to provide project management and financial assistance and training to ESCO's through the Ukrainian Chapter of AEE The current CEM training should continue, and be supplemented with other seminars on specific topics such as life cycle cost analysis, project finance, and business planning

High interest rates and short loan terms for project capital will continue to be a key issue for many of the ESCO's USAID should also work with World Bank to establish an Energy Efficiency Financing Fund that would provide access to reasonably priced capital for all ESCO's, not just UKRESKO

## **5. LOAD MANAGEMENT**

### **5.1 Observations**

Currently, the Ukrainian power system experiences periodic involuntary load curtailments (command load), due to fuel shortages at the generating plants These involuntary curtailments are administered and implemented by the Oblenergos at the direction of the national dispatch center, and impact all customer segments

There are provisions in the wholesale Energomarket rules to encourage voluntary load curtailment and load shifting during periods of capacity shortage First, when a shortage of available capacity occurs (defined as a reduction in hourly gross reserve margin below 600 mw), the Energomarket will add an "Availability Price" to the hourly system marginal price when calculating the wholesale purchase price to be paid by Oblenergos and Independent Energy Suppliers (IES) This availability price is currently set at a maximum of \$60/mwh, (which is 2 orders of magnitude below the peak prices recently

experienced in the market-driven wholesale markets of the US and UK, during capacity shortages)

Availability pricing at the wholesale level can provide an incentive to retailers, Oblenergos and IES's, to encourage customers to curtail their usage during periods of capacity shortage and/or shift some portion of their load to lower priced periods. However, this price signal is currently not transmitted through to the retail market and therefore is not seen by the retail customer.

The second provision establishes a mechanism for the sale of voluntary demand curtailment (VDC) to the pool during periods of capacity shortage. Oblenergos and Independent Energy Suppliers who can recruit customers to accept voluntary curtailment, can bid it into the Energomarket, specifying the amount of load to be curtailed and the price (percent of availability price) for that curtailment. If the Energomarket can purchase demand curtailment cheaper than additional capacity, it will do so. To date, there has been no use made of this VDC mechanism by the pool. Further, discussions with Oblenergos indicate a general unfamiliarity with the potential specific applications of VDC bidding or marketing, which raises the question that even if the wholesale market were to implement the VDC provisions, would there be any bids by Oblenergos?

## **5.2 Recommendations**

Although the current VDC mechanism is not working, it does offer the potential for creating a viable market for curtailment in competition with added capacity. It is however, a complex implementation challenge and we should therefore look for an alternative approach.

As contemplated, the proposed VDC program will require major efforts by the wholesale market and participating retailers. The Energomarket must establish procedures and criteria to evaluate VDC bids on par with capacity payments, and then select and notify successful bidders and administer the program. The Oblenergos and IES's must successfully market the concept of VDC to large customers, and recruit them for some price, and they will have to establish procedures to bid VDC into the pool, at a price that will be attractive to customers. All of these steps are substantial changes from where the wholesale market is today.

Implementation of VDC could be smoother if approached in two steps. In the first step, The Energomarket would establish a wholesale and retail market for VDC at an established price. This would require the Energomarket to establish a fixed price to be paid for demand curtailment, when called for by the pool. This effort can be carried out as part of the efforts by the Energomarket Board to Retailers would then be able to

market this fixed price to customers (with perhaps some other criteria like number and length of curtailments) It should be easier to recruit customers when the price and other parameters of the offer are clear This should also provide feedback to the market regarding the price level needed to attract customers to the program This interim step is similar to some curtailable load programs used successfully in the U S, in the New England Power Pool, for example The fixed price interim step would be in place for 2-3 years

Once retailers and customers become comfortable with the process of selling demand curtailment to the pool, and the implementation mechanisms are tested and refined, then the pool can institute a bidding process to replace the fixed price The retailers would be free to continue to offer a fixed price to their retail customers, or to change to a percentage of bid approach

USAID should help both the pool and retailers implement a phased approach to VDC USAID should provide assistance to the Energomarket to redesign the VDC program and establish interim VDC pricing levels and procedures for purchasing and managing VDC It should also provide training and assistance to interested Oblenergos, and IES's in marketing and administering a VDC program with customers As recommended above under energy efficiency, USAID should seek to work closely with a few interested Oblenergos and IES's Finally, USAID should develop a program to track and monitor the success of the revised VDC program and provide early course correction as needed

## **6. PRICING - TARIFFS**

### **6.1 Observations**

Tariffs can influence energy efficiency and load management efforts in two ways, price level and tariff design First, price levels must reflect marginal supply and delivery costs, and tariffs must be set to recover the marginal cost of service plus a contribution to fixed costs For transit tariffs (the price charged by the oblenergos for delivery of energy to customers supplied by IES's) one oblenergo reports that it is currently allowed to charge 1.7 kopecks/kwh while to cover costs it needs to charge 2.2 kopecks

Second, the design of the tariff can be used to encourage efficiency and load management Specifically, the application of tariffs which vary prices by time periods to more closely track changing electricity costs, called time of use or zone tariffs, can provide more appropriate signals regarding diurnal variations in costs and encourage customers to improve the efficiency of their operations and shift load to lower cost

periods Time of use tariffs can have a number of different periods or zones, representing various blocks of time, and can also vary by season or month Real Time Pricing (RTP) can be viewed as a time of use tariff with as many as 8760 periods

Time of use tariffs are currently available to industrial customers in Ukraine on an optional basis The structure is a three zone tariff, with the on-peak price set at 1.8 times the standard price, the mid-peak set at 1.0x, and the off-peak set at 0.4x

Another issue is the application of time of use tariffs on a voluntary basis When given the option of time of use tariffs, only those customers who perceive a clear benefit (in the form of cost reduction) are likely to accept This approach is workable if the tariffs are cost based, and the resulting decrease in net revenue is reallocated to the remaining customers through revised base tariffs Otherwise, the voluntary approach simply results in a saving without action for a few customers and a revenue reduction for the Oblenergo The alternative approach is mandatory application of time of use tariffs within a tariff class

In the case of Zaporizhiaoblenergo, for example, 78 industrial customers were considered eligible for time of use tariffs, but only two customers were placed on them These were two customers who could save money on the tariff, with no change on usage level or pattern This results in a reduction in revenue to the oblenergo, with no gain in reduced on-peak usage

Application of time of use tariffs requires a time of use or interval meter, which the customer must purchase This additional up-front cost can be a barrier to adoption of these tariffs See the discussion under metering, below

Another factor to consider in Ukraine is that application of time of use tariffs is intertwined with the collections problem Applying time of use tariffs to customers who are not paying their bills now, could simply compound the payment problem Increased collections must continue to be the priority

Interruptible tariffs are not in use There is a system of Command Load, employed by NDC, which is the process of involuntary curtailment of load to conserve fuel or react to a system emergency

Tariff flexibility is not uniform among retailers Oblenergos do not deviate from the standard tariffs established by NERC These tariffs provide for one standard price per customer class, except for the zone option discussed above Any creative pricing schemes appear to be the province of the IES's who are currently "cream skimming" oblenergo customers Thus there does not appear to be a level competitive field

## 6.2 Recommendations

Improved retail pricing design, based on marginal cost principles, and the individual cost structure of the Oblenergo, can help put the Oblenergo on sounder financial footing and send better price signals to customers

Specifically, Oblenergos should implement mandatory zone tariffs for all large industrial customers, not just those who can immediately achieve a bill reduction. While the voluntary piecemeal approach might be closer to market driven principles, the mandatory approach will send appropriate signals to a wider customer audience over a shorter period of time. To lessen the immediate bill impact, this could be phased in over a one year period.

Corresponding transit tariffs should also be differentiated by time periods, based on T&D system loading and load shifting objectives.

Future tariff designs, particularly for new designs like zone tariffs, should include a monthly charge for the needed metering, and meter reading and billing costs in the tariff, rather than requiring the customer to pay for the meter up front and/or provide reading services. These impediments to new tariff implementation should be removed.

Oblenergos should have greater flexibility to design special tariffs tailored to the needs and load profiles of key customers. This flexibility should equal that allotted IES's. These special tariffs could allow the Oblenergo to offer inducements to new business or add load at off peak periods. For example, as part of the VDC program revision discussed above, Oblenergos should be encouraged to design optional curtailable tariffs.

To facilitate implementation of increased pricing flexibility and cost-based pricing, USAID should provide extensive training and assistance to selected Oblenergos in rate design and cost of service analysis.

## 7. CUSTOMER RELATIONS

### 7.1 Observations

As Oblenergos in Ukraine move to become private electric distribution companies, they will be competing with independent energy suppliers for customer sales. To maintain market share, Oblenergos will have to establish and maintain market-based

relationships with their customers, particularly their key customers, similar to the current efforts of their western counterparts

Currently, customer relations interactions seem to revolve around service issues (service hook-up, modification, change, inspection) and the billing/collections cycle. Even in billing and collections, if a small customer is reading their own meter and paying their bill on time at the bank, there is little routine interaction with the utility.

Some procedures for responding to service issues seem overly cumbersome. For example, the connection of a business customer may involve up to 10 people, including multiple review and approval steps, and there could be 4 trips to the customer's location by different specialists (inspector, technical team, metering). Responsibility for meeting connection requirements is primarily the customer. Average time from request to connection is one month. (It should also be noted that similar examples of cumbersome requirements exist in some US utilities!)

There is the beginning of an on-going pro-active customer relations and communications program at least one oblenergo. This effort is just in its initial stages and is not fully developed in terms of scope of effort. I have not observed any real key accounts programs, although Khmelnitskyoblenergo's Special Collections Group is performing many of the functions of a key accounts group, and should be commended for its initiative. Generally, while there may be some assignment of customers for metering inspection or collection purposes, there does not seem to be a single person or point of contact within the Oblenergo responsible for actively managing all interactions with larger customers.

Communications with other classes of customers are limited. Information appears to be confined to meter reading, payment, and tariff changes. In one example of a pro-active communications effort, an oblenergo has started a weekly information article in the regional newspaper, on subjects such as the need for cash payment of bills. They have even started publishing the names of large debtors. This type of communication can be relatively low cost and reach a relatively wide audience. The coordinated use of mass media and other communication channels can help the Oblenergo build and maintain a more positive relationship with its customers.

## **7.2 Recommendations**

### **7.2.1 Large customers – key accounts**

Oblenergos should establish a key account program to build long term, mutually beneficial relationship with large industrial and other important customers. This program would encompass all activities, include communications, service, energy sales

and delivery, metering, billing and collections, with customers over 750 kw, and with IES's Other key customers may be added as identified This program can build on the nucleus of the special collections groups, where they have been established

The responsibility for this program should be assigned to the Oblenergo Deputy Director responsible for commercial activities This person is directly responsible to the General Director for the success of the program, and all activities with identified key customers Management of key accounts should be centralized at the Oblenergo level, rather than be administered by the local REM

The Deputy Director should assign an account manager(relationship manager) to each key account This person will be responsible for building and maintaining an active mutually beneficial relationship with, and serve as the primary point of contact for all company communications with his/her assigned customers He/she will also be responsible for negotiating and managing contracts, coordinating metering and billing, and collections activities, developing forecasts of demand and energy consumption and revenue, installation, maintenance, and modification of the service interconnection, and coordinating with other company departments for any needed support This person would be directly responsible to the Deputy Director for a portfolio of up to 20-40 customers

The Oblenergo should also organize a customer support team for these account managers This purpose of this team is to work with the account manager within their areas of expertise to fulfill the Oblenergo's responsibilities and provide service to the customer Where special collections groups have been created, they can provide the functions of this team This team should include the following specialists

Energy Engineer(s)  
Finance and Contracts Specialist  
Billing and Data Analyst  
Lawyer

In addition to the customer support team, the account manager should be able to call on the services of other specialists from anywhere within the Oblenergo as needed These specialists include metering, legal, communications, market research, environmental, and technical

National and local budget customers should be treated as a special class of key account While individually, some of these accounts are quite small, the decision-making behind them is centralized, and carries political overtones

A relationship manager should be assigned to both local and national budget accounts, if one does not already exist on a de-facto basis. This individual should have good interpersonal and political skills.

## **7.2.2 Small Business and Residential Customers**

These customers are too numerous, and individually do not yield sufficient margin, to justify the effort described above. Relationships with these customers can be improved and managed, however, through a pro-active communications effort. This effort should involve multiple communications channels and messages, with the overall objective of improving public perceptions of the Oblenergo as concerned and caring about its customers, and committed to wise energy use.

Implementation of a pro-active customer communications program may require some organizational modification. Each Oblenergo should have a Customer Communications Group whose purpose is to develop and manage a pro-active communications effort. This group should be staffed with individuals skilled at developing and communicating messages through a variety of channels. This group should also report to the Deputy Director for commercial activities. In order to ensure that customer needs are being met and that the communications program is effective, each Oblenergo also should conduct periodic research among its various customer groups. The objective of such research would be to measure customer satisfaction levels and identify information needs. This effort should be carried out by a small market research group, reporting to the Deputy Director for commercial activities, and can be supplemented by outside contractors as needed. Both of these groups should be staffed by internal transfer, where feasible.

Mass media can be a powerful tool for Oblenergos to communicate their message to large numbers of customers. Khmelnytskyoblenergo, for example, is already having articles published in the local newspaper. This effort should be continued and expanded. One or more Oblenergos could also place ads on local television stations, sharing costs to make this more affordable.

Informational brochures can be another good communication tool, if the information is interesting to the target audience and timely. Suggested topics include tariff changes and options, the importance of bill payment, and the benefits of energy efficiency along with saving tips.

Direct mail can be used with targeted audiences for specific purposes. It can reinforce other channels like personal contact. The mail is already being used for billing and collection purposes, but it can also be used for marketing and relationships. Examples include sending information on new technologies to a key contact or marketing VDC to large customers.

Point of contact displays can reinforce mass communications and call attention to current items of interest. Tariff announcements and energy efficiency tips are examples of information that can be conveyed in a display card.

Special events provide opportunities to meet customers in person and communicate the Oblenergo's message. The common themes of tariffs, the importance of payments, and wise energy use can all be good event themes.

### **7.2.3 Other Customers**

Treatment of other classes of customers is dependent on their concentration and size within a particular oblenergo. Khmelnytskyoblenergo, for example, may want a specialist in agricultural energy use assigned as the key account manager of these customers.

USAID should support efforts to improve customer relationships by Oblenergos, to help ensure their successful transition to private operation. Specifically, USAID should work with 2-3 selected Oblenergos to provide training and assistance in establishing a key accounts program. This includes development of key account plans, relationship management, staff training, and the integration of current collections activities into a relationship program.

USAID should also provide training and assistance in establishing a residential and small business communication program. This includes assisting in research to determine communications needs, communication planning, message development and staff training.

## **8. METERING & BILLING**

### **8.1 Observations**

Currently in Ukraine, customers pay for their own meters, which are then installed by the Oblenergo. This applies whether the meter is purchased from the Oblenergo or a third party. Customers changing rate forms, such as converting to zone tariffs, are expected to purchase the needed TOU meter. For larger customers, most maximum demand levels used for billing are estimated. If these customers want to meter their demand they also have to provide their own meters. Given the current shortage of investment capital, the requirement to initially purchase a meter can be a substantial deterrent to implementation of tariff changes or improved demand measurement.

Currently, residential and small commercial customers have simple kwh meters installed, which they read themselves, and take the readings to the local bank for bill calculation and payment. The utility inspects and verifies meter readings, nominally on an annual basis, although they readily admit it is difficult to adhere to that schedule. Meters are normally located inside the dwelling.

Larger commercial, industrial and budget customers also have kwh meters installed for billing (a few have demand meters). Large industrial customers also typically have installed interval metering for research purposes, although these meters are not typically certified for revenue metering. Demand charges and reactive charges are typically billed on an estimated basis based on calculations by the utility. Meters are read monthly and the bill is calculated and prepared by the utility. Large customers (over 750 kva) are expected to pay their bill three times per month, all others monthly.

Large customers are allocated an electricity consumption limit, which they are not supposed to exceed. If the limit is exceeded, they can be billed at 5x the normal tariff. This applied whether or not the customer is paying their bill, in cash or by offset.

## **8.2 Recommendations**

Metering and billing are related to energy efficiency since, if a customer doesn't have accurate and timely feedback information on how much energy he is using and the cost involved, he will not be motivated to save. Billing demand charges based on an estimated calculation does not provide the feedback mechanism and incentive to manage demand that billing based on measured demand would.

Coupled with improved tariff design, Oblenergos should install improved metering, this specifically includes demand meters for large commercial and industrial customers and TOU meters for those on zone tariffs. For large customers (over 750 kva) particularly those who receive service through an IES or directly from the wholesale market, the current interval metering system should be upgraded to revenue certification levels. Concurrent with the improved metering, demand billing should change from an estimated to a measured basis, to provide better feedback to customers on demand control efforts.

This is a major task that will require considerable time and money to implement. The benefits of this effort will need to be clearly demonstrated. USAID can support these efforts by providing assistance in implementing improved metering programs. Specifically, USAID should support several small demonstration efforts at selected Oblenergos. These demonstrations should include

A mandatory zone tariff pilot

A remote meter reading pilot  
A measured demand billing pilot  
A budget reading & billing pilot

USAID should also work with the multi lateral banks to develop programs and provide funding for more widespread implementation of improved metering equipment and systems

---

## **APPENDIX A**

### **DRAFT USAID ACTION PLAN**

#### **CUSTOMER RELATIONS AND ENERGY EFFICIENCY**

SEPTEMBER 1998

USAID sponsored efforts have made significant strides in assisting Oblenergo commercialization and privatization efforts, and providing advice and assistance to Ukrainian efforts to improve the efficiency of energy use. The job is not finished. Throughout this report there have been recommendations on next steps that Oblenergos could take in the areas of customer relations and energy efficiency to continue their progress toward full commercialization. There have also been recommendations on actions that USAID could take to continue to provide assistance to Oblenergos and other energy related entities. These recommendations have been compiled into a draft action plan for USAID efforts to support continued development of energy efficiency and customer relations activities.

#### **OBJECTIVES**

- To continue the improvement of customer relations capabilities at selected Oblenergos
- To continue the development of a market driven energy efficiency business in Ukraine
- To implement a successful voluntary demand curtailment program

#### **ACTIONS**

##### **GENERAL**

USAID should continue to work with interested Oblenergos to provide assistance in commercialization and privatization activities, including collections improvement, business planning, customer relations, and energy efficiency.

USAID should specifically seek out 2-4 of the more entrepreneurial Oblenergos and concentrate these assistance efforts on them. Successful results can then be shared with other Oblenergos as a blueprint for their own action. Concentration of effort should result in the enhancement of close working relationships between the selected Oblenergos and USAID advisors and greater overall program success.

**CUSTOMER RELATIONS**

Provide training and assistance to selected Oblenergos in establishing a key accounts programs This includes development of key account plans, relationship management, staff training, and the integration of current collections activities into a relationship program

Provide training and assistance in establishing a residential and small business communication program Assist in research to determine communications needs, communication planning, message development and staff training

**ENERGY EFFICIENCY**

Provide advice, assistance and training to 2-4 selected Oblenergos interested in establishing energy services business units This assistance should focus on the management of ESCO's, business planning, project development and economic analysis, project financing, and general business aspects of this activity Assist them in obtaining reasonable cost financing for economically viable projects Provide ongoing technical training through the Ukrainian chapter of AEE

Provide advice, assistance and training to 2-3 of the existing ESCO's USAID should continue to provide business planning, project management and financial assistance and training to ESCO's through the Ukrainian Chapter of AEE

USAID should also work with World Bank to establish an Energy Efficiency Financing Fund that would provide access to reasonably priced capital for all ESCO's, not just UKRESCO

Continue to encourage the IES's to get into the ESCO business USAID should provide on-going advice and assistance to interested IES in business planning, project management, and financial analysis training, and access to reasonably priced capital

**LOAD MANAGEMENT**

Assist the Energomarket in re-invigorating and redesigning the VDC program Develop an interim program based on a fixed wholesale price for controlled demand, and defined criteria for application Help the Energomarket establish interim fixed VDC pricing levels and develop workable procedures for purchasing and managing VDC Provide training for Energomarket, Oblenergo, and IES staff

Provide training and assistance to interested Oblenergos, and IES's in marketing and administering a VDC program with customers

Develop a program to track and monitor the success of the revised VDC program and provide early course correction as needed

**TARIFFS**

Provide training and assistance to selected Oblenergos in rate design and cost of service analysis, including emphasis on the development of zone tariffs and curtailable tariffs

**METERING AND BILLING**

Provide assistance in implementing improved metering programs. Specifically, USAID should support several small demonstration efforts at selected Oblenergos. These demonstrations should include

- A mandatory zone tariff pilot
- A remote meter reading pilot
- A measured demand billing pilot
- A budget reading & billing pilot

Work with the multi lateral banks to develop programs and provide funding for more widespread implementation of improved metering equipment and systems

---

## APPENDIX B

### OBLENERGO SURVEY OUTLINE

#### ENERGY EFFICIENCY AND CUSTOMER SERVICE PRACTICES

NOTE This is intended to serve as an outline to guide discussions with Oblenergo managers regarding customer relationships, customer service, and DSM activities. It should not be used as a survey form.

#### ENERGY EFFICIENCY PRACTICES

##### Tariffs

###### **What is the general tariff structure?**

Are time-of-use (zone) tariffs available?  
For which customers? How many available/using?  
Voluntary or mandatory?  
Opinions regarding use  
Financial results

###### **Are interruptible/curtailable tariffs available?**

For which customers? How many available/using?  
Voluntary or mandatory?  
Opinions regarding use  
Financial results

###### **Are any other special tariffs available?**

For which customers? How many available/using?  
Voluntary or mandatory?  
Financial results

##### Load management

###### **Is there any voluntary load curtailment program?**

Bidding to Energo-market? How much (MWh)  
Available to retail customers? Who/how many?

Opinions regarding use  
Financial results

**How is the involuntary load shedding program run?**

Planning – load, circuits, timing  
Customer selection/notification

**Any appliance load management?**

**Efficiency programs**

Are there any of the following currently available?

Education/information programs  
Technical assistance/audits  
Financing/rebates

If so, describe –

What is offered,  
Who it is offered to and by whom  
What are the conditions  
What are the results

General opinions regarding efficiency programs

What are the rates of internal losses (technical and commercial)?

What technical loss reduction programs/activities are in place?

Does the oblenergo implement energy management programs for its own facilities?

**CUSTOMER SERVICE POLICIES AND PROCEDURES:**

Describe current practices/procedures for the following services

New service connections  
Connection to a new facility  
Transfer of responsibility for electric bill at existing facility  
Regulations for business and industry  
Regulations for apartments and residences  
Extension of networks to new facilities  
Billing questions/complaints

What is the normal process for reading meters and preparing bills?

What is the normal payment process?  
How are payment disputes resolved?  
Payment arrangements (debt rescheduling) (for customers behind on payments)  
Are they used? What are the policies/guidelines?

- What is the process for establishing a payment arrangement?
- What is the process for tracking a payment arrangement?
- Is there a contract required?
- Are the rules different for different types of customers?
- What happens if the customer fails to keep the agreement?

#### Disconnection process

- What is the policy for disconnecting customers for non-payment of bills?
- What is the process for disconnecting customers for non-payment of bills?
- Is it the same for all customers?
- If not what customers are treated differently and how?
- To what extent is the disconnection process influenced by others (e.g. Oblasts)?
- Provide examples

### **Customer Relationships and Communications**

#### Key Account Program

- Does the oblenergo define any key accounts?
- How many customers over 750 kva does the Oblenergo have?
- What percentage of load and revenue do they represent?
- What budget customer groupings does the Oblenergo have?
- What size are they (any big ones)?
- Does the Oblenergo assign account managers(KAM) to key accounts
- How many per KAM?
- What are the duties and responsibilities of KAM's?
- What organization/individuals support KAM's?
- Where in the organization is this program located?

What organization/process does the oblenergo use to build/maintain relationships with other classes of customers?

- Is there a formal customer communication program?
- What does it consist of?
- What use is made of advertising/news releases? (print, media, D/M)
- What other channels are used? (phone, office, bank, site visits)?
- Any samples of messages?

Does the Oblenergo provide customers with information or assistance on -

- Prices/tariffs and options?
- Billing and payment options?
- Energy efficiency or energy use issues?
- Electric safety information/education?

How to report outages and process for restoration of service?

What are the current systems for general customer contact?

Customer visits to Oblenergo offices?  
Customer visits to banks or other locations?  
Customer calls to Oblenergo offices?  
Customer calls to telephone centers?  
Oblenergo visits to customer locations?

**CUSTOMER DATABASES:**

What are the current customer data bases used?

What data do they contain?

Mainframe

PC

Manual

---

## APPENDIX C LIST OF CONTACTS

### ZAPORIZHIA OBLENERGO:

Mr Viktor S Seroshantov	Chief Engineer
Ms Lilia Vishnevskaya	Acting Deputy Director, Energonadzor and Energy Sales
Mr Yevgheny Yedimenko	Energonadzor Expert

### ZAPORIZHIA OBLENERGO CENTRAL DIVISION

Mr Gvozdiov	Chief of (Subscriber) Customer Service
Mr Bepalchenko	Deputy Chief of (Subscriber) Customer Service
Mr Aleksandr Chumak	Deputy Director, Ergonadzor

### VINNITSA OBLENERGO.

Ms Yefrosinia Nechipailo	Deputy Chief Accountant
Ms Lyudmila Pastushenko	Head of Foreign Economic Relations
Mr Nickolay Zazgarsky	Head of Sales Dept
Mr Anatoly Sapozhnikov	Head of Economics Dept
Mr Valery Kievsky	Head of the Technical Production Dept
Mr Eugeny Oleynichenko	Deputy Director, Electricity Sales
Mr Vadim Fesenko	Deputy Chief Engineer

### KHMELNYTSKY OBLENERGO:

Mr Nickolay Kuninets	Deputy Director, Networks and Inspections
Mr Victor Okhov	Assistant Director and Liaison to Advisor
Mr Boris Kravets	Head of Special Collections Group

## OTHER INDIVIDUALS CONTACTED\*

### Energy Efficiency and Customer Service Practices

#### Burns & Roe

Mr Alexander Filippov	Director, Burns & Roe
Mr Charles Farfard	Vice President, RMA

#### Ukrainian Association of Independent Energy Suppliers

Ms Elena Zolotariova	Vice President and Executive Director
----------------------	---------------------------------------

#### Ukrainian Chapter, Association of Energy Engineers

Mr Alexander Petrov,	President
Mr Alexander Novoseltsev	Vice President

#### Training Center for Energy Management, Kiev Polytechnic Institute

Prof Arthur Prakhovnik and Energy Management	Director of the Institute of Energy Saving
Mr Evgenij Inshenkov	Training Center Director

### Hagler Bailly

Mr David Wolcott	Chief of Party
Mr Eric Haskins	Manager, LEC Advisors
Mr Vladimir Tsyssin	Senior Advisor, LEC
Ms Svetlana Golokova	Manager, Energomarket Advisors
Mr James Stanfield	Manger, NERC Advisors
Mr Bahman Daryanian	Senior Advisor, Wholesale Market