

Energy Efficiency Policy Priorities

Ukraine

Scope

More than 80 Ukrainian energy efficiency stakeholders contributed to the findings in this document, which identifies demand-side energy efficiency policy priorities for Ukraine in the buildings, appliances, lighting, equipment, and industrial sectors. It also identifies measures such as data collection on end uses, financing, strategies and action plans, as well as measures concerning monitoring, verification and enforcement that are critical to the success of policies across all sectors.

Transport and supply-side energy efficiency measures are beyond the scope of this paper.

The IEA 25 Energy Efficiency Policy Recommendations² serve as a framework for the policy priorities covered in this report. IEA publications such as *Energy Policies Beyond IEA Countries: Ukraine 2012* and *Saving Electricity in a Hurry, 2011 update*³, also feed into this document.

Background

Ukraine is facing unprecedented energy security challenges as a result of ongoing geopolitical and financial crises. Improving energy efficiency across the economy could strengthen energy security by decreasing the country's reliance on fossil fuel imports, reduce pressure on public budgets that have historically shouldered billions of euros a year in energy subsidies (although some energy subsidies are now being phased out), reduce costs to consumers, and improve the comfort and health of its residents.

Moreover, scaling up energy efficiency could also improve the competitiveness of Ukraine's industry. Ukraine's economy is one of the most energy intensive in Eastern Europe, Caucasus and Central Asia (EECCA). Despite progress in energy efficiency in the industrial sector and the closure of some of the most energy-intensive industries in the 1990s, Ukraine ranks third among the most energy-intensive EECCA countries, behind Uzbekistan and Turkmenistan. Ukraine's economy is more than two and a half times more energy intensive than the average IEA member country's economy.

The good news is that there is a large potential for energy efficiency gains in Ukraine. Although end-use data is still limited, current indications are that energy efficiency potential

is greatest in the residential and industrial sectors. By implementing comprehensive and well-designed policies that target energy efficiency measures at levels similar to those in the European Union, Ukraine could save up to 17 million tonnes of oil-equivalent (Mtoe), or 20.5 billion cubic metres (bcm) of gas, per year, with a value of around EUR 7.3 billion (2010¹ prices). Given severe disruptions in coal production and electricity generation in the conflict regions and concerns about gas security, reducing energy consumption is a priority now more than ever.

To tap this energy efficiency potential in Ukraine, a package of measures will be needed. Ukraine's draft National Energy Efficiency Action Plan outlines some of these measures, but more will be needed. It is hoped that this IEA report will inform and strengthen the Action Plan by proposing measures such as widespread residential building envelope refurbishments, installation of building energy control systems and meters, replacement of inefficient appliances and equipment (including motors), information campaigns to reduce wasteful energy consumption and other programmes across sectors. Some of these measures can be put in place quickly with immediate results; others will take more time.

Acknowledgements

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The discussions and inputs from more than 80 Ukrainian energy efficiency stakeholders participating in these events provided the foundation of the findings presented in this brochure.

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¹IEA (2012), *Energy Policies beyond IEA Countries: Ukraine 2012*, OECD/IEA, Paris www.energy-index.com.ua/media/report/pdf/UEI-en.pdf.

²www.iea.org/publications/freepublications/publication/25recom_2011.pdf.

³www.iea.org/publications/freepublications/publication/Saving_Electricity.pdf.

Prioritising Policies

Priority	Recommendation	Status of policy development in Ukraine	Ease of implementation	Implementation timeline (yrs)
To improve energy efficiency across All sectors, the IEA recommends action that Ukraine:				
Urgent	Enhance capacity to collect and analyse energy data	Implementation underway	Less difficult	1–2
	Refine and implement Ukrainian Energy Efficiency Action Plan			Less than a year
	Continue to progressively remove energy price subsidies		Very difficult	2
	Leverage private investment	Not implemented	Difficult	More than 2
	Monitor, enforce and evaluate policies	Implementation underway	Challenging	1–3
To achieve significant energy savings in the Buildings sector, the IEA recommends that Ukraine:				
Very high	Improve the energy efficiency of existing buildings	Planning to implement	Difficult	1–3
	Require and enforce building energy codes and energy performance certificates (EPCs)		Enforcement complicated	2–3
	Modernise district heating networks	Implementation underway in some cities	Information not available	3–5
To achieve significant energy savings in the Appliances, Lighting & Equipment sector, the IEA recommends that Ukraine:				
Very high	Require minimum energy performance standards (MEPS) for major energy consuming appliances, lighting and equipment	Implementation underway	Monitoring & enforcement complicated	2–3
High	Phase-out inefficient lamps	Not implemented	Less difficult	1–2
	Put in place high-efficiency street lighting			
To achieve significant energy savings in the Industry sector, the IEA recommends that Ukraine:				
High	Require and enforce energy management protocols	Implementation underway	Less difficult	2–3
	Require MEPS for industrial equipment	Not implemented		1–2
	Promote energy efficiency for small and medium-sized enterprises	Planning to implement	Challenging	2–3
	Put in place complementary policies to support industrial energy efficiency		Less difficult	1–2
To achieve significant Energy Savings in a Hurry, the IEA recommends policies that Ukraine:				
Urgent	Launch energy savings information campaigns	Implementation underway on a small scale	Less difficult	Less than a year
High	Run appliance, lighting and equipment replacement programmes	Implementation underway for boilers		
As needed	Consider emergency demand management	Information not available		

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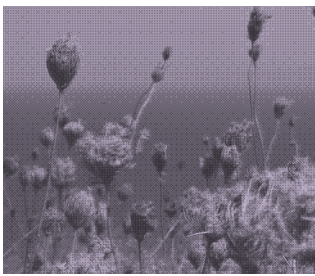
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Section photos:

Cross-sectoral by Jonas Nilsson Lee. Buildings by Kelly Sikkema. Appliances, Lighting & Equipment by Vee-O. Industry by Martin Wessely. Saving Energy in a Hurry by Maria Carrasco Rodriguez.

Overview of Energy Efficiency Priorities for Ukraine

Cross-sectoral



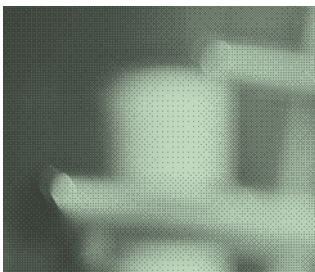
- 1 Enhance capacity to collect and analyse energy data
- 2 Refine and implement Ukrainian Energy Efficiency Action Plan
- 3 Continue to progressively remove energy price subsidies
- 4 Leverage private investment
- 5 Monitor, enforce and evaluate policies

Buildings



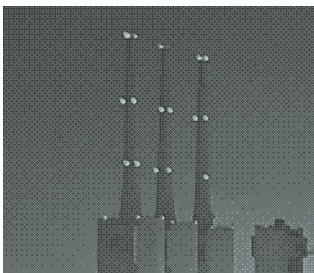
- 6 Improve the energy efficiency of building components and energy-using systems in existing buildings
- 7 Require and enforce building energy codes and energy performance certificates (EPCs)
- 8 Modernise district heating networks

Appliances, Lighting & Equipment



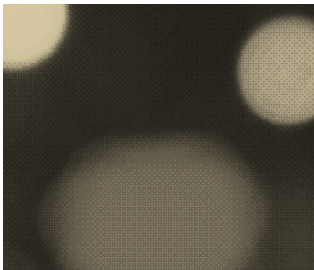
- 9 Require minimum energy performance standards for major energy consuming appliances, lighting and equipment
- 10 Phase-out inefficient lamps
- 11 Install high-efficiency street lighting

Industry



- 12 Require and enforce energy management protocols
- 13 Require minimum energy performance standards for industrial equipment
- 14 Promote energy efficiency for small and medium-sized enterprises
- 15 Put in place complementary policies to support industrial energy efficiency

Saving Energy in a Hurry



- 16 Launch energy savings information campaigns
- 17 Run appliance, lighting and equipment replacement programmes
- 18 Consider emergency demand management

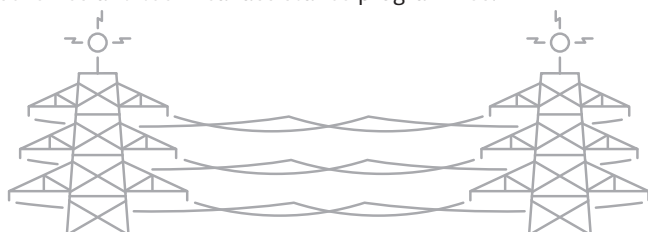
Cross-sectoral

Prioritising energy efficiency measures can be daunting, particularly given some of the challenges facing energy efficiency policy development in Ukraine. These challenges include:

- limited data on energy use by different sectors and subsectors
- highly subsidised energy (although reforms are underway)
- little capacity for enforcing regulatory policies
- low consumer and financial sector awareness of energy efficiency
- asymmetrical information between regulators and energy companies
- exchange rate risk for foreign lenders and investors and
- lack of incentives for energy companies to invest in energy efficiency.

To co-ordinate energy efficiency efforts across sectors, Ukraine has drafted a National Energy Efficiency Action Plan (in line with the European Union Energy Community Treaty and the *Acquis Communautaire* on energy) and submitted it to the European Commission in 2015 for input. This Action Plan outlines energy efficiency measures that seek to achieve energy savings of 9% in 2020 compared to the average domestic final consumption for the period 2005-09. These savings would be equal to around 6,5 Mtoe (which is roughly the equivalent in scale to 41% of gas imports in 2014). The target should be reviewed in light of the economic crises and structural changes occurring in industry and across the economy.

This Action Plan and energy price increases as a result of ongoing gas and electricity price reforms (in co-operation with the International Monetary Fund) are serving as powerful drivers for energy efficiency policy and market development. To scale up financing for energy efficiency projects, multi-lateral development banks such as the European Bank for Reconstruction and Development (EBRD) and the International Finance Corporation (IFC) have been putting in place financing schemes and technical assistance programmes.⁴



1. Enhance capacity to collect and analyse energy data

Data collection during the design, implementation and evaluation phases is an essential part of any energy efficiency programme. Data analysis can provide Ukraine with critical information for decision making, including future scenarios, baselines and indicators, which are necessary for tracking progress and conducting monitoring and evaluation of energy efficiency initiatives. Ukraine should strengthen its long-term energy data collection and analysis regimes and ensure its authority to require data submissions.

2. Refine and implement the Ukraine Energy Efficiency Action Plan

Based on analysis of energy use, markets, technologies, and efficiency opportunities, Ukraine should apply best practices when refining and implementing its National Energy Efficiency Action Plan. Best practice strategies and action plans should:

- assign responsibility and allocate resources for policy development, implementation and oversight
- assess opportunities for energy efficiency improvements and prioritise action in sectors and end uses
- set clear objectives and timelines, and establish evaluation methods and
- ensure coherence with energy, environmental, climate, and economic strategies and plans.

3. Continue to progressively remove energy price subsidies

Energy price reform is needed to unlock the potential of energy efficiency in Ukraine. Ukraine is progressively reducing subsidies on energy prices in co-operation with the IMF. Targeted subsidies, which serve social welfare objectives, should be made available where necessary.

4. Leverage private investment in energy efficiency

Ukraine should facilitate private investment in energy efficiency by:

- Developing financing vehicles for energy efficiency projects with financial institutions. Policies should include:
 - establishing funding mechanisms to jump-start energy efficiency financing, particularly in the short term, in order to help small and medium enterprises (SMEs) overcome the initial high set-up costs and
 - engaging with international financial institutions to establish credit lines for local banks for lending to the residential sector, SMEs and municipalities.
- Supporting the Energy-Service Company (ESCO) industry by standardising contracting vehicles, measurement and verification protocols, and accreditation procedures.

5. Monitor, enforce and evaluate policies and measures

Ukraine should monitor, enforce, evaluate and periodically update energy efficiency policies and measures in all sectors. Policy and programme effectiveness should be evaluated during and after implementation and the results used as an input to subsequent decision making. Non-compliance should be identified with a fair and transparent process and be reported and made public.

⁴Other organisations involved in energy efficiency lending and technical assistance in the Ukraine include (but are not limited to) the Council of Europe Development Bank (CEB), the European Investment Bank (EIB), the Eastern Europe Energy Efficiency and Environment Partnership (ESP), the Nordic Environment Finance Corporation (NEFCO) and KfW.

Buildings

Almost 75% of the housing stock in Ukraine was built before 1970 and 70% of these buildings require deep renovations.

Residential buildings account for more than 40% of Ukraine's heat consumption (2009 levels), but fewer than 25% of these buildings contain heat meters or control systems even at building-level. Without control systems, occupants are unable to adjust heating levels, other than by opening windows. Installing metering and control systems is thus a priority.

In accordance with the International Monetary Fund (IMF) programme, Ukraine seeks to achieve universal gas and heat metering and move to Universal consumption-based billing by end of 2016.

Ukraine has drafted a law on energy efficiency in buildings, in line with the European Union's Energy Performance of Buildings Directive, but this law has not yet been adopted. In parallel to this policy effort, Ukraine, with support from financial institutions, should prioritise the improvement of building insulation. Façade replacement in multi-family homes could greatly decrease heating demands and improve comfort. Rooftop/attic insulation is a priority for single-family homes.

Housing associations are being created to make decisions about building management and reserve funds are being formed to save money for building repairs, but it remains to be seen if residents will prioritise energy efficiency improvements. Increasing energy prices and a growing discourse linking nationalism, energy security and energy efficiency will be powerful drivers for energy efficiency development.

Around 43% of Ukrainian households (7.5 million) are connected to district heating networks (with energy losses due to excess capacity, inadequate maintenance, pipeline leakages, poor insulation and old equipment). Modernising district heating systems in Ukraine could lead to energy savings of around 40%.



6. Improve the energy efficiency of building components and energy-using systems in existing buildings

Ukraine should approve the draft law on buildings and implement a package of policies that encourages energy efficiency improvements in existing buildings, including programmes to:

Install energy controls, including individual heating substations and temperature regulating valves (TRV). The majority of the building stock in Ukraine does not have energy control systems, even at a building level.

Insulate buildings, particularly façade replacement for Ukraine's multi-family building stock, and rooftop/attic insulation for single-family homes.

Set minimum energy performance standards for key building components (such as windows and roofs) and energy-using systems (such as ventilation and heating).

Aid building owners, occupants, and manufacturers to improve energy efficiency through:

- building energy audits, energy rating, and certification schemes
- incentives to encourage investment in high-performing building envelopes and building energy-management systems and increased market penetration of new high-efficiency products with tax incentives or dedicated credit lines.

Improve energy efficiency of public-sector buildings through mechanisms such as green or preferential procurement policies.

7. Require and enforce building energy codes and energy performance certificates (EPCs)

Ukraine should require all new buildings, as well as buildings undergoing renovation, to adhere to energy codes, MEPS and to display building energy labels or certificates. The aim is to minimise life-cycle costs of buildings' energy use and to provide information to owners, buyers and renters.

Building energy codes, MEPS, and labels should take a holistic approach that includes the building envelope and the lighting, ventilation and water-heating systems within the building.

To maximise the effect of these policies, governments should:

- support capacity building and the institutional set-up required for the implementation and enforcement of building energy codes and MEPS, as well as monitoring the resulting savings and
- support infrastructure development, testing and rating.

8. Modernise district heating networks

To encourage the modernisation of district heating networks, Ukraine could put in place policies that facilitate:

- energy measurement and reporting
- investment and advice from Energy-Service Companies (ESCOs)
- pilot studies on smaller networks to allow for institutional and capacity building.

Appliances, Lighting & Equipment

Residential appliances, lighting and equipment account for around 33 terawatt hours (TWh) or 25% of the total final consumption (TFC) of electricity in Ukraine and the market for these products is steadily increasing.

Minimum energy performance standards (MEPS) and energy efficiency labelling have proven to be cost-effective policies for encouraging the reduction of the average energy consumption of appliances, lighting and equipment without reducing consumer choice or triggering sustained increases in prices.

Ukraine's national energy standards and labelling policies are being based on European Union schemes (in line with the requirements of the *Acquis Communautaire*), led by the State Agency for Energy Efficiency (SAEE).

Since 2002, SAEE has elaborated eight national energy labelling regulations for household appliances, and these have been applied on a voluntary basis. In addition, MEPS and voluntary labelling for household refrigerators, freezers and washing machines have been enacted in line with the European Commission Ecodesign Regulation 643/2009. Information campaigns to encourage consumers to buy more efficient products are detailed in the National Energy Efficiency Action Plan.

Regulations for energy labelling of room air conditioners, televisions, electrical lamps and luminaires, household dishwashers and household tumble dryers are in development.

9. Require MEPS and labels for appliances, lighting and equipment

Ukraine should continue to adopt and regularly update mandatory MEPS and energy labels for appliances, lighting and equipment and:

- prioritise MEPS and labels for appliances, lighting and equipment that are commonly in use in households and businesses, considering energy savings, economic and environmental benefits and
- allocate resources to monitoring compliance, verifying accuracy of claimed performance, and enforcing mandatory MEPS and labels for appliances, lighting and equipment regardless of whether they are imported or locally-manufactured.

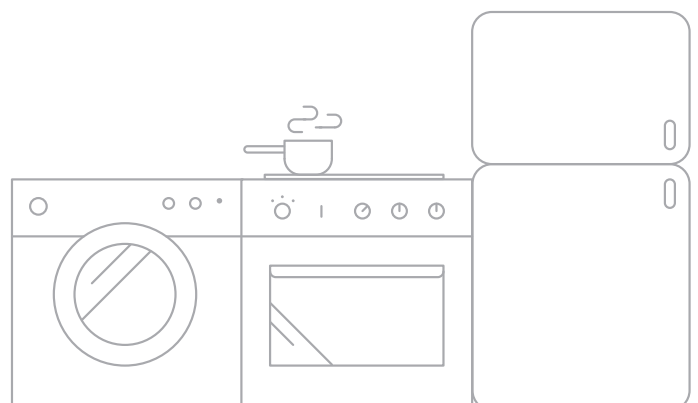
10. Install efficient lighting products and systems

Ukraine should:

- phase out the manufacture, import and sale of inefficient incandescent bulbs as soon as commercially and economically viable and
- develop phase-out policies that are comprehensive and integrated, and include provisions for the sound disposal of used lamps as well as arrangements to reduce the high initial costs of efficient lighting, especially for lower-income consumers.

11. Install high-efficiency street lighting

Ukraine should support the deployment of high-efficiency street and public lighting by co-operating with municipalities and development agencies to mobilise the necessary investment. The SEAD-initiative Street Lighting Tool could be useful for officials to evaluate the quality, efficiency, technical compatibility and lifetime cost of different street lighting products.



Industry

Industry is the largest energy-consuming sector in Ukraine. Opportunities to save energy in this sector include: heat recovery and co-generation; process optimisation and automation; improved energy management systems and procedures, advanced metering and upgrades in technology.

Historically, low energy prices contributed to the development of a heavily energy-intensive industrial sector in Ukraine, a sector that now has significant potential for saving energy. Approximately 40%⁵ of the country's steel is produced using inefficient technologies. Introducing more efficient equipment could decrease energy consumption per unit of output by more than fourfold. In addition, other manufacturing industries, such as chemical, agricultural and food production also have significant potential for energy saving.

ESCOs have experienced inconsistent growth in the country. Generally, ESCOs in Ukraine perform the role of middlemen between banks, equipment manufacturers and clients, and they are mainly concentrated in the industrial sector. The potential size of the ESCO market in Ukraine is approximately EUR 100 million in the building and industrial sectors.⁶ Ukraine recently passed a law on energy savings procurement that will allow the government to enter into contracts with ESCOs. Ukraine could further promote the development of ESCOs by providing training, certification and accreditation.

12. Require and enforce energy management protocols

Ukraine should require large industrial energy users to conform to ISO 50001 or an equivalent energy management protocol, implement actions to deliver cost-effective energy savings, and periodically report on their efforts. Enterprises must have access to sufficient information on energy efficiency opportunities. Energy management measures should include assessing energy saving opportunities by measuring consumption and comparing measurements to benchmarks, acting on identified energy-saving opportunities deemed to be economical, and reporting the energy-saving opportunities identified and the actions taken to capture them.

13. Require minimum energy performance standards (MEPS) for industrial equipment

Industrial equipment standards have rarely been adopted in Ukraine. The government should adopt MEPS for industrial-scale electric motors and consider MEPS for other categories of industrial equipment. Changing old fashioned industrial processes could also be an option. Governments should take advantage of regional co-operation, through networks such as the Energy Community and other non-governmental organisations to jointly consider international best practice suitable for the region.

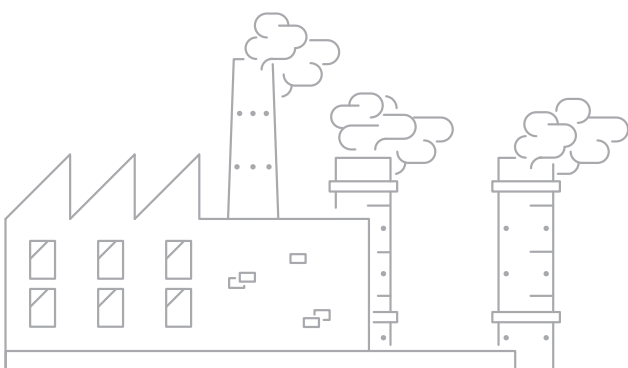
14. Promote energy efficiency for small and medium-sized enterprises (SMEs)

The SME sector is critical in driving economic development and job creation. The government should design policies and measures to promote energy efficiency in SMEs. Complementary policies should include supporting energy audits, access to information on proven energy efficiency practices relevant to SME operations, and access to affordable financing, as appropriate to each business sector.

15. Put in place complementary policies to support industrial energy efficiency

The government of Ukraine can further strengthen industrial energy efficiency by:

- encouraging industrial energy efficiency programmes through targeted financial incentives (particularly tax incentives), fostering private finance of energy efficiency upgrades in industry through risk-sharing or loan guarantees with private financial institutions, and enabling the market for energy performance contracting and
- improving the market for ESCOs and/or energy performance contracting by providing training, certification and accreditation programmes.



⁵ IEA (2012), *Energy Policies beyond IEA Countries: Ukraine 2012*, www.iea.org/publications/freepublications/publication/Ukraine2012_free.pdf.

⁶ Eastern Europe and South Caucasus Initiative: Sector Competitiveness Strategy for Ukraine Phase III (25 March 2015), OECD, Kyiv, First meeting of Focus Group Session

Saving Energy in a Hurry

Given the urgent need to decrease energy consumption in Ukraine, a series of measures designed for rapid energy savings, in parallel with long-term policy efforts, should be considered across the economy.

The first short-term measure should be a series of information campaigns to inform consumers about what they can do to decrease gas and electricity consumption as the tariff reforms go into effect and as energy prices increase. Information campaigns can be rapidly designed and launched to impact a large number of consumers by reinforcing messages via multiple media, e.g. television, the internet including social media, radio, newspapers and energy bills. Campaigns should be developed with a clear understanding of the target group (from school children to professionals in the industrial or commercial sectors), the specific messengers, messages and channels of communication needed to encourage the target group to take action.

Technology replacement programmes are another proven measure to quickly decrease energy consumption. For example, Ukraine is currently rolling out a boiler replacement programme. Efficient windows are a technology that could have a particularly high impact. Other programmes could:

- deploy energy-efficient lighting, especially compact fluorescent lamps and light-emitting diodes
- replace old equipment, ranging from refrigerators to traffic signals, with newer, more efficient technology
- retrofit and/or adjust existing equipment to make it more efficient
- install load-control devices on selected appliances, lighting and equipment.

Finally, Ukraine could put in place emergency demand management schemes that incentivise consumers to decrease their energy consumption at certain times of the day, month or year subject to incentives or penalties. Rationing can be targeted at specific users, e.g. administrators would decide which users should cut back and by how much; or it can be implemented more generally, e.g. to an entire geographic area, economic activity or load type.

16. Launch energy saving information campaigns

When designing information campaigns, the following questions should be addressed:

- Who will the campaign target?
- What actions will be requested of the target group?
- What proven-practice behaviour change techniques will be used to motivate the audience to act?
- Who will be the messenger of the campaign?
- Who should implement the campaign?
- How will the campaign be evaluated?

17. Run appliance, lighting and equipment replacement programmes

Replacing older, inefficient technology is crucial to reducing peak load. Rapid deployment of certain high-impact efficient technologies, such as LEDs and CFLs, can be a quick way to decrease electricity consumption. Replacing windows could be a particularly effective measure to reduce heat losses in Ukraine.

18. If needed, consider emergency demand management

The following energy conservation and management measures could be put in place quickly:

District heating companies

- run boilers at reduced capacity where safe and appropriate

Public sector

- restrict energy use (in terms of time and/or quantity)
- require audits focused on identification and resolution of losses or waste that can be fixed via no-cost/low cost actions

Industry

- incentivise reduction in energy use and load shifting (when applicable)
- mandate energy savings targets

