In-Depth Review of the Energy Efficiency Policy of UKRAINE

ENERGY CHARTER SECRETARIAT
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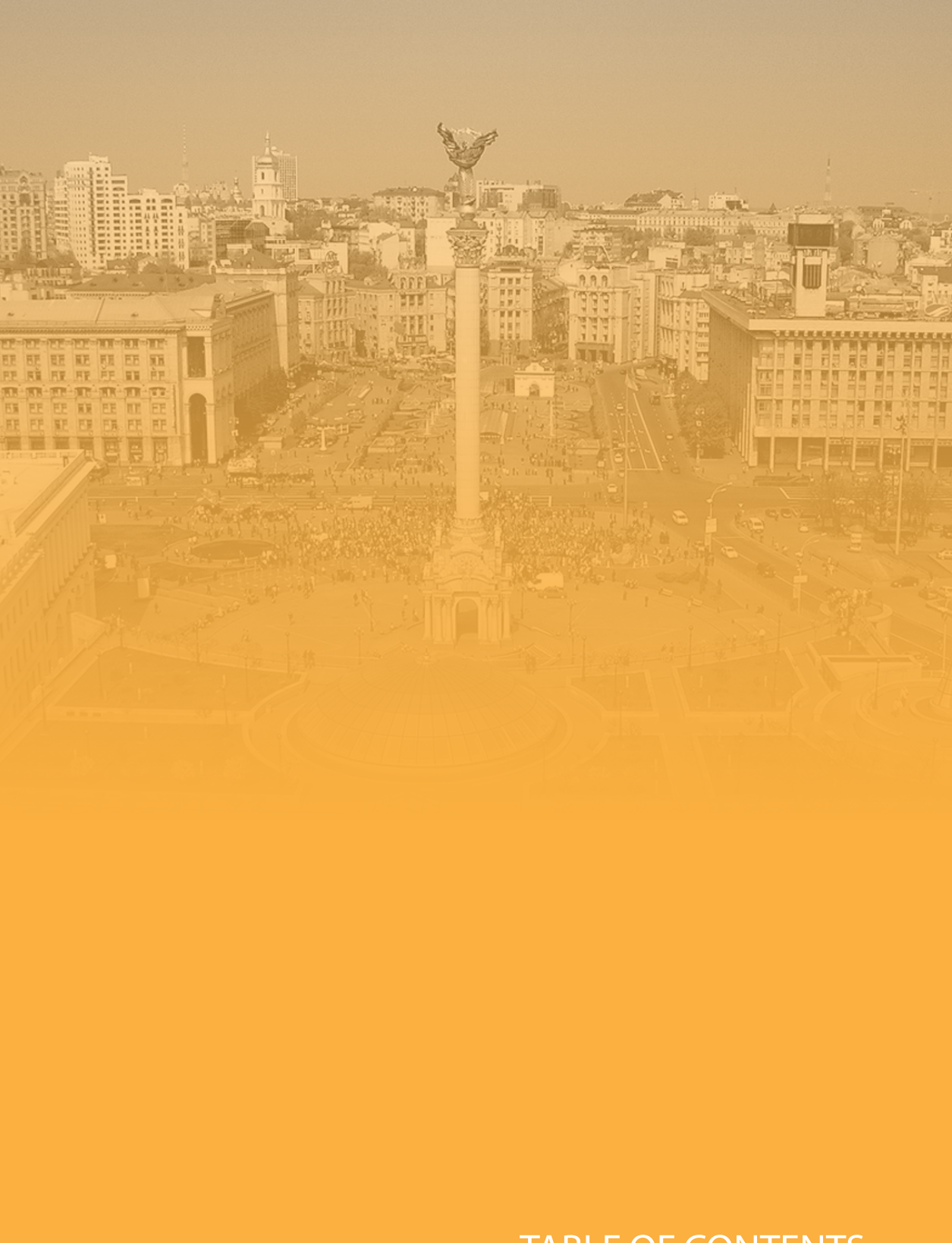

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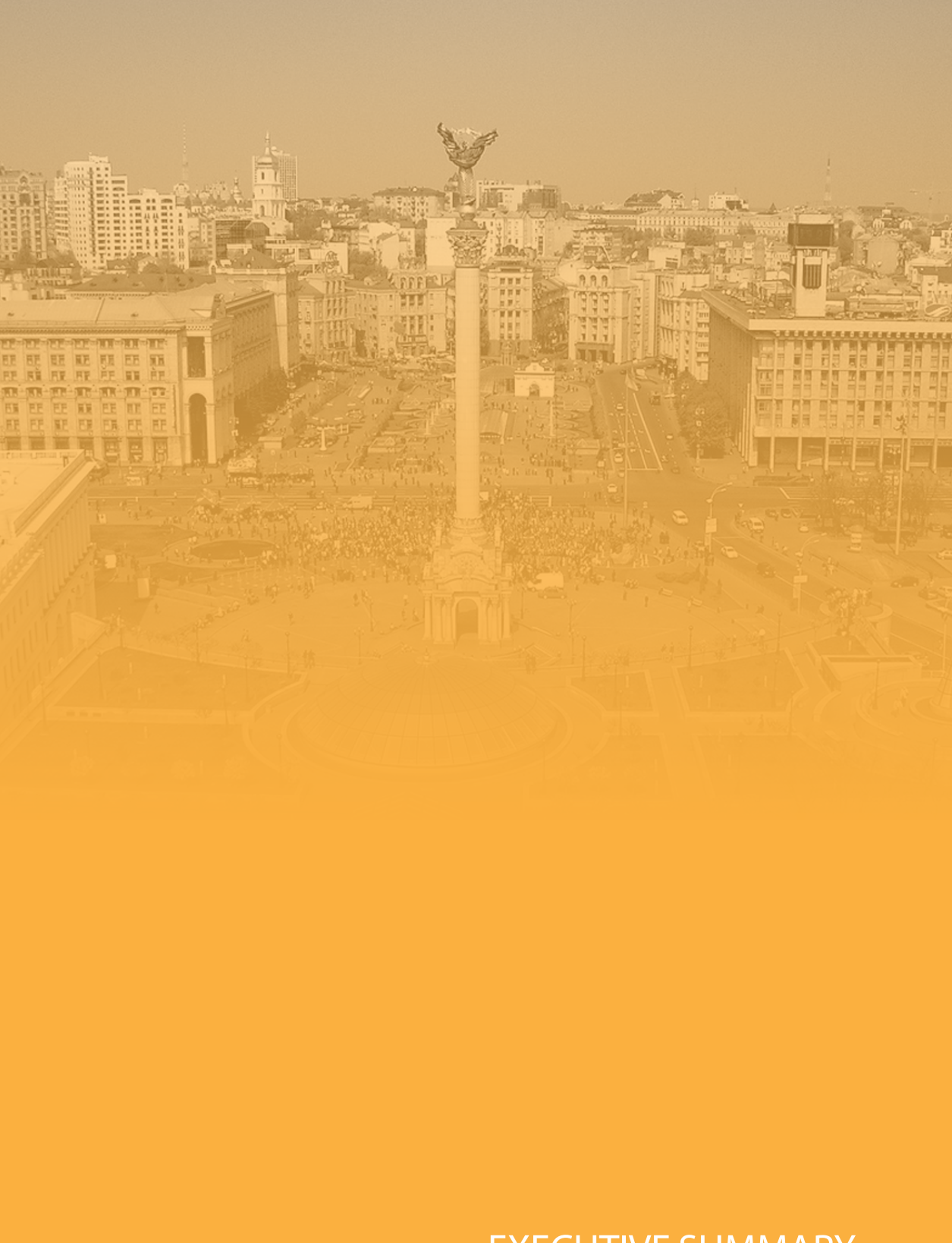


EXECUTIVE SUMMARY

Background

Ukraine occupies a fertile plain north of the Black Sea. It shares a land border with seven countries, three of which were part of the USSR until 1991. Ukraine suffered badly in the economic collapse of 2008 and its economy in 2013 is in a fragile state of recovery. Emigration is ongoing and the population continues to fall, with implications for domestic demand and the growth in age dependency.

The World Bank has been critical of Ukraine's economic performance, attributing the cycle of booms and busts since independence to failures in the country's governance system. It is not alone in its criticism: the European Union (EU), in assessing the candidature and subsequent performance of Ukraine in relation to agreements entailing commitments freely entered into, has been critical of the progress. Thus the widely held external view is that the pace of reform is too slow to deliver economic recovery.

The requirement for action on a broad front is recognised by the Ukrainian authorities. The president's Programme of Economic Reforms (PER) for 2010–2014 is an expression of the government's determination to focus on policy delivery to achieve a "Prosperous Society, Competitive Economy, and Effective State".

Popular support and acceptance of the consequences of this commitment to effective energy policies and other reforms advocated by a host of international bodies, external agencies and governments will be tested in the course of the implementation. Thus, while there are deficits in the practical application of policies, the aspiration to achieve freedom, democracy, good relations with its neighbours and a better life for Ukraine's citizens is widely endorsed.

Ukraine's entry into the World Trade Organisation (WTO) in February 2008 and the development of its relations with the EU in the frame of the Partnership and Cooperation Agreement (PCA) of 1998 and its intended successor by way of a commitment to an association agreement in 2008 are indicative of progress in the harmonisation of trade and the alignment of fundamental principles of human rights and justice.

The EU is committed to a policy of sequenced engagement with Ukraine to work towards political association and economic integration based on respect for common values. The EU's role in actively encouraging international financial institutions to contribute to the modernisation of Ukraine's gas transmission system is an important area of the EU-Ukraine bilateral agenda. Thus there are many aspects to the international dialogue and energy governance is one of the most pressing.

Energy and Energy Efficiency Policy

Energy sector reform in accordance with the EU acquis and in compliance with the Energy Community Treaty (EnC) is now one of the cornerstones of Ukraine's energy policy. Membership of the Energy Community provides a new focus and thrust towards creating the framework conditions for what needs to happen by way of investment, revenue flow, cost apportionment, elimination of subsidies and debt collection. The intent is to create the conditions in which the risk premium on investment in Ukraine's energy system is minimised. Ukraine's energy policy is evolving to give investors confidence in the hope that they will recover their investments and be adequately rewarded.

The natural resources and economic development of Ukraine, including mineral and hydrocarbon deposits, the extensive gas pipeline transit and transmission infrastructure and

the dominance of heavy energy-intensive industry combine with a history of low energy prices to ensure that, in the current circumstances in Ukraine, energy policy is a dominant societal issue. Economically hard-pressed businesses and consumers are struggling to adapt to higher energy prices.

The promotion of new and foreign direct investment (FDI) in Ukraine's energy production, transmission, distribution, supply and end-use sectors is one of the early responses identified by policy makers. With such investment Ukraine aims to deliver a modern and efficient energy system that will deliver affordable services sustainably over time. Towards this goal there is a government commitment to achieving an "ease of doing business objectives" — a metric on which Ukraine currently scores unfavourably in international comparisons.

In the energy sector the authorities have succeeded in establishing framework conditions for certain priority kinds of FDI, albeit with more or less effective conditions attached. The most recent example is petroleum exploration and production rights and, before this, the introduction of attractive renewable energy production tariffs. Among the less successful conditions are the politically popular but arguably less effective indigenous origin clauses attaching to renewable energy projects that may have unintended negative consequences.

The Draft Energy Strategy of Ukraine to 2030 went to public consultation in the summer of 2012. Since then there have been calls to revisit economic growth assumptions and energy demand. The International Energy Agency (IEA), in an extensive 2012 review[1] of energy policy in Ukraine, has stressed the benefits of moving to resolutely address challenges and grasping the opportunity to realise the untapped potential of energy efficiency and indigenous sources of energy. High on the IEA's list of policy priorities is energy efficiency improvements at all stages of the energy value chain.

Traditionally, low and subsidised energy prices for both consumers and industry and the slow progress in moving towards full cost recovery have sustained resistance to price reform among consumers and starved energy suppliers of funds. This is instrumental in the continued deterioration of the energy infrastructure of Ukraine. In the absence of prices that are fully cost reflective, energy efficiency outcomes will be below their economically justifiable level.

Electricity, gas and, especially, municipal CHP and heat utilities and to some extent their customers are all severely challenged by the rise in energy prices coupled with the embedded energy inefficiencies that are more costly and increasingly hard to bear. Thus, while the key elements of the situation have been clearly and accurately diagnosed in several technical assistance projects and other Ukrainian projects, the practical redress responses still need to be fully articulated.

A high proportion of the heating needs of consumers in Ukraine are met through district heating, often in combination with electricity generation. The supply of heat to domestic consumers is for the most part a municipal responsibility and one that increasingly cash strapped municipalities are challenged to meet. Part of the problem is the amount and proportion of unmetered heat that is subject to a flat rate charge with the consequence that there is little or no consumer incentive to conserve use. It is compounded by the low thermal performance of the building stock.

[1] *Ukraine 2012, International Energy Agency, Paris, 2012*

Thus utilities are faced with the need to carry out the following actions.

- Invest in modern energy conversion CHPs or district heating plants
- Renew and repair an ageing heat distribution pipe work infrastructure
- Put in place a satisfactory consumer metering system
- Collect sufficient billed revenue from cash strapped consumers to finance energy purchases and fund the necessary investment.

To date, policy has concentrated on ways of addressing the revenue gap and securing the required investment from private and public sources, resulting in a range of legislative initiatives to provide for public private partnerships, communities of end-users and individual consumption metering. A "Concept for the programme of modernisation and development of heat supply systems of Ukraine for the period 2012–2022" was proposed but failed to be adopted.

The State Agency on Energy Efficiency and Energy Saving of Ukraine (SAEE) was established to implement the state policy on energy efficiency, energy saving, renewable energy sources and alternative fuels. It is part of the executive authority system, directed and coordinated by the Cabinet of Ministers of Ukraine through the agency of the Minister of Economic Development and Trade of Ukraine. The SAEE is charged with providing its proposals for state sustainable energy policy, the development and approval of programmes of action, the provision of information, the establishment of norms and standards and monitoring for compliance as well as the appointment of directors to the institutions for which it is accountable.

On the matter of R&D and support for policy making the SAEE and its predecessor have supported research covering a wide spectrum of topics related to energy supply and demand. A full list of applications supported to date is available on the SAEE website database for analysis by project, technology and development as well as by sector. A great number of recent projects in the area of heat (32) concern the reduction of gas use and its displacement by other energy sources.

Several successful initiatives by the Ministry of Regional Development, Construction and Housing and Communal sector have demonstrated the potential for energy service companies (ESCOs) to deliver solutions for the effective heating service of apartment blocks. Weaknesses in the current framework have been identified and the costs of a Ukraine-wide programme of rehabilitation have been scoped.

Thus in key areas of energy services provision there is a detailed analysis and broad consensus of what needs to be done. The business of organising and delivering it at the necessary pace and scale remains to be tackled and financing continues to be the major challenge.

Nevertheless, within the resources currently available, there are plans for additional pilot schemes and local initiatives to demonstrate the benefits of what can be achieved and improve the understanding of the state's role in creating the necessary conditions. However, it is clear from the analysis and experience to date that the financing of any project is closely linked to the value of the savings, which continue to be understated due to heat and gas prices that are too low.

Renewable Energy Policy

The history of state ownership and central planning, the relative abundance of cheap coal and natural gas and the dominance of nuclear energy in the electricity sector go some way to explaining Ukraine's low levels of renewable energy deployment.

In the electricity sector there are two large low-carbon sources: nuclear energy contributed 45.5% to the electricity supply in 2012 and the contribution of conventional hydropower was 5.6%.[2] The potential for wind and solar generated electricity in Ukraine is well recognised and the current feed-in tariff incentive is said to be generous and more than sufficient to stimulate activity although it suffers from administrative conundrums and legal uncertainties.

Others have pointed to the potential of biomass, citing the ubiquity of forest and agricultural wastes, which have the potential to be either directly fired to produce heat or fermented to produce gas of varying quality. The particular route advocated depends on the scale and circumstances surrounding the use of the output.

Following a decision by the Energy Community ministers and agreement to adopt renewable energy targets for 2020, Ukraine's target for renewable energy in terms of primary energy supply is 11% by 2020. While this target is modest by comparison with those of the large member states in the EU, it will be challenging for Ukraine, coming from a low base against a background of subsidised energy prices for consumers.

Ukraine needs to cast and progress its renewable energy action plan while taking into consideration the sustainable deployment of renewable energy and with an eye to the short-term impact on prices. Thus the plan should be strategically informed and economically effective and provide ample opportunity for competition and enterprise in its delivery. It should rest on an evidence base that is augmented in the course of the delivery and subject to regular reviews against transparent criteria.

Ukraine's status in the United Nations Framework Convention on Climate Change (UNFCCC) and the associated protocol provides an opportunity to further develop Ukraine's well-structured approach to joint implementation (JI) projects with the attendant opportunity to generate and earn the value of assigned amount units (AAUs).

Overall Assessment of Progress

The present circumstances in Ukraine are characterised by a fragile economic recovery, internal and external pressures for better governance, the geopolitical interests of its close neighbours and continuing economic uncertainty in the EU and globally. Thus the deepening of Ukraine's engagement with international institutions, treaties and the EU raises new challenges.

Because of its sheer size, strategic position, natural resources, technical capability and long-term economic potential, the development of Ukraine will have important consequences for its citizens and neighbouring countries. Most of the EU's current energy preoccupations are reflected in the five roadmaps for bi-lateral cooperation on energy by the EU and Ukraine. These are nuclear safety, the integration of gas and electricity markets, the security of energy supplies and the transit of hydrocarbons, the coal sector and energy efficiency.

[2] *Kovalev, I., SAEE Presentation to Review Team, June 2013*

Energy policy figures prominently in domestic politics and forward planning. Ukraine's actions and outlook are of great interest to Russia and the EU and there are vital commercial and security of supply interests at play. Thus the recent commitment to the EnC sets a direction for the evolution of Ukraine's energy policy that acknowledges the superiority of markets, properly regulated and structured for competition, in delivering sustainable energy services.

Because of the importance of public and private FDI for economic renewal, there is a growing appreciation of the importance and urgency of reducing the risk premium for investors in Ukraine to manageable levels. Ukraine's improved ranking on ease of business objectives from 152nd in 2012 to 137th in 2012 is evidence of progress in this regard.

Artificially low energy prices have combined with other factors to create a situation where many energy users are caught in an affordability trap. Higher energy prices are affecting their ability to pay and the impact of these prices is amplified by excessive energy usage (real or nominal) resulting from the gross inefficiency of the supply and end-use systems. Thus the sourcing and application of funds to modernise and upgrade dilapidated energy infrastructure are a key priority in Ukraine's energy policy. A solid and predictable economic, energy policy and regulatory framework will help to attract the necessary funds.

The availability of funds for investment is always conditional upon a satisfactory appraisal of the whole spectrum of risks. In Ukraine's energy sector these include policy, regulatory, market and technology risks. In the absence of a credible and stable energy policy and a sufficiently robust and independent regulatory regime, most investors will choose to wait for clarity. The calls for a revision to the energy policy at public consultation in 2012 have to be seen in this light. Judging by the public statements emanating from the US and elsewhere the assumptions and projections of the draft energy policy have to be revisited. In the opinion of the IEA a stronger focus on the demand side is warranted.

Structured energy markets that are the subject of competition need the assurance of impartial and professional regulation by suitably empowered regulators. The continued development of the regulatory function in line with the commitments and obligations of the EnC is of vital importance to Ukraine. Upon this rests its ability to attract the necessary investment in gas, heat and electricity generation facilities and networks. Whilst its initial performance gave cause for concern, Ukraine appears to have reached a better understanding of the requirements and benefits of the Energy Community. In view of the legislative effort, the cost and the new institutional development involved it will be important to have a solid understanding of the benefits in terms of when and to whom they will flow.

The settling of a robust energy policy and the enactment of its provisions with appropriate regulatory and policy oversight constitute the start of a longer and deeper process that has to capture the whole of the energy system from resource development to end-use. With cost-reflective pricing, robust regulation, clear market rules, sensible permitting and rigorous project appraisal, investment in large energy infrastructure will, in the absence of any distorting factors (such as an excessive cost of capital), tend to lead towards robust decisions being made in the specification of the energy performance of new equipment.

However, where decisions are smaller or where expertise is limited and focussed elsewhere there is no guarantee that energy efficiency considerations will be either sufficient or robust. Recognising this the Ukrainian authorities have resorted to regulation. Examples of over-prescriptive regulation abound where a softer, more market-friendly approach focussing on information and awareness could achieve a more satisfactory outcome.

Where regulation is appropriate the main consideration has to be effectiveness. Thus the principal determinant of the effectiveness of any regulation is the extent to which it is economically proportionate, practical and enforceable. Compliance can be assured at a reasonable cost once the conditions of proportionality and practicality are fulfilled.

Therefore, while many of the policy objectives of the Ukrainian authorities are clear, the means to achieve them effectively are less detailed and in many cases insufficiently elaborate for an implementation action plan. This is understandable as the formulation of energy efficiency policy at an intellectual level implies a balanced consideration of its interaction with other policies, often also in a similarly formative stage. Inevitably, there are trade-offs within energy policy between the classic affordability, security and environmental impacts to which social acceptance must be added in Ukraine's circumstances. In acknowledging that this is a job in itself, it will be clear that the process of implementation is a far larger, more disparate and untidy task that is only fully revealed in the act of implementation.

Implementation is in the province of the market — a fragmented market of many actors — each with his own set of customers, suppliers and regulatory agencies. No single policy maker can be reasonably expected to have a complete and sufficient picture of the market. Nor indeed will the market have a full appreciation of what the policy maker has in mind. This is the essence of the consultative approach, in which the government sets out its proposals and invites comments. While simple in outline, without careful preparation and recourse to a solid base of empirical data the process becomes skewed and the result is not balanced or fair. Governments in many countries have recourse to institutions to fill gaps in the data by way of research — research that continues into the implementation phase with the specific intent to monitor and review progress.

In the first half of 2013, less than three years into a four-year programme, 2010–2014, it is already evident that the first of the four key energy efficiency targets has not been met, and the fourth may not be capable of being measured. Thus there is doubt over the level of understanding, commitment and ability to formulate, resource and deliver on energy policy goals. The evidence points to the need for deep reforms to the policy process, which can be assisted by a much greater openness to a wider set of inputs, transparency of decision making and the fixing of accountability and responsibility for delivery.

Recommendations

General

- The Government of Ukraine should meet legitimate expectations for a recast energy strategy based on well-founded assumptions, realistic projections and the acknowledged potential for huge energy efficiency gains according to the needs of various stakeholders. The finalisation of the strategy should be expedited.
- The Government of Ukraine should accelerate all necessary and desirable reforms so as to radically improve i) the prospects for investment and ii) perceptions of Ukraine as measured by the metrics of reputable international bodies.
- The Government of Ukraine should ensure that its published policy intent is backed up by solid programmes of action that are subject to periodic evaluation, review and adjustment according to clearly stated principles.

- The Government of Ukraine, in the spirit of the PER, should take steps in the formulation of its energy policies to ensure that it can benefit from the work of public and private institutions and interested NGOs.
- The Government of Ukraine should continue to support measures aimed at raising awareness of energy efficiency and educating public officials and the wider population on local, regional and national levels.

Institutional Framework

- The Government of Ukraine should, with recourse to appropriate institutions and to public consultation, ensure that high standards of governance are obtained in the formulation of energy and energy efficiency policies and in their implementation through energy market liberalisation, utility privatisation and the regulation of competition.
- The Government of Ukraine should, as a matter of urgency, take steps to ensure that it has the institutional capacity appropriately structured to effectively formulate, monitor, analyse and review energy and energy efficiency policies and their implementation and enforcement.
- The Government of Ukraine should provide for the development of institutions for the promotion of sustainable energy, including energy efficiency, renewable energy and JI opportunities.
- The Government of Ukraine should improve the status of the SAEE and establish it as a separate structure within the government.
- The Government of Ukraine should ensure that sufficient human and financial resources are allocated to the SAEE as the leading agency, as well as to all units within ministries and regional administrations responsible for the development and implementation of energy efficiency programmes.
- The Government of Ukraine should ensure that supporting educational institutes and professional bodies concerned with educational formation and skills development are well informed about energy efficiency goals, targets and programmes.
- The Government of Ukraine must enable, resource and underpin the impartiality and independence of the energy regulator with legislation.

Energy Market and Pricing

- The Government of Ukraine should evidence the strength of its commitment to cost-reflective energy pricing. It needs to provide for an integrated approach to individual metering, end-use efficiency, comfort and other benefits in tandem with price rises. It should proceed at an appropriate pace of reform in a secure market and policy framework.
- The Government of Ukraine should ensure that energy affordability is closely monitored and that remedial action to alleviate hardship is promoted through an expert body.
- The Government of Ukraine should ensure that its guidance for the regulator is transparent, rooted in energy policy and thought through to avoid unintended consequences.
- The Government of Ukraine should make adequate provision for the effective regulation of monopolies and competition in the electricity, natural gas and heat distribution markets.

- The Government of Ukraine should ensure that the reforming of district heating is in the long-term interests of consumers and sensitive to their short-term needs. The government should make sure that the framework conditions for heating service provision are conducive to securing new investment to improve energy efficiency and service delivery.

Energy Efficiency funding

- The Government of Ukraine should, on the basis of robust energy projections and economic analysis, budget sufficient expenditure to leverage the huge energy efficiency potential of the economy to improve welfare, competitiveness and environmental impact.
- The Government of Ukraine should ensure that the available funding and budget allocations are multi-annual and balanced between institutions and their programmes.
- The Government of Ukraine should allow for multi-annual municipal budgeting and for the retention of savings resulting from investment in energy efficiency, so as to provide appropriate incentives for municipal actions.
- The Government of Ukraine should consider an energy efficiency obligation as a condition of any energy utility supply licence.
- The Government of Ukraine should give careful consideration to the nature and flexibility of any energy efficiency obligation to ensure that it is economically effective and capable of delivering the desired outcome in the interests of consumers.
- The Government of Ukraine should draw on the experience of IFIs in framing tax policies and allowances for energy efficiency and renewable energy so as to maximise the effectiveness of any such concessions.

Energy Efficiency Programmes and Measures

- The Government of Ukraine should ensure that all energy efficiency programmes are material in relation to their desired outcomes.
- The Government of Ukraine should complete the introduction of cost effective administrative measures such as energy efficiency labels for household appliances. In addition, it should analyse and consider the introduction of well-proven energy performance standards for different categories of energy using products on a voluntary basis.
- The Government of Ukraine should ensure that the reforming of the district heating sector proceeds at a pace and in a sequence that will provide early returns and minimise the risks of either underinvestment or the standing of valuable assets.
- The Government of Ukraine should ensure that retrofit programmes are legally facilitated with regard to compulsory participation of homeowners, appropriate standards and quality assurance.
- In the process of finalising the Law on Energy Efficiency in Residential and Public Buildings, the Government should adopt a strategic approach to the implementation of the EU Directive on the Energy Performance of Buildings to maximise benefits and minimise compliance costs.
- The Government of Ukraine should adopt and deliver a national energy efficiency action plan preparatory to the launch of new measures in pursuit of its 2020 targets.

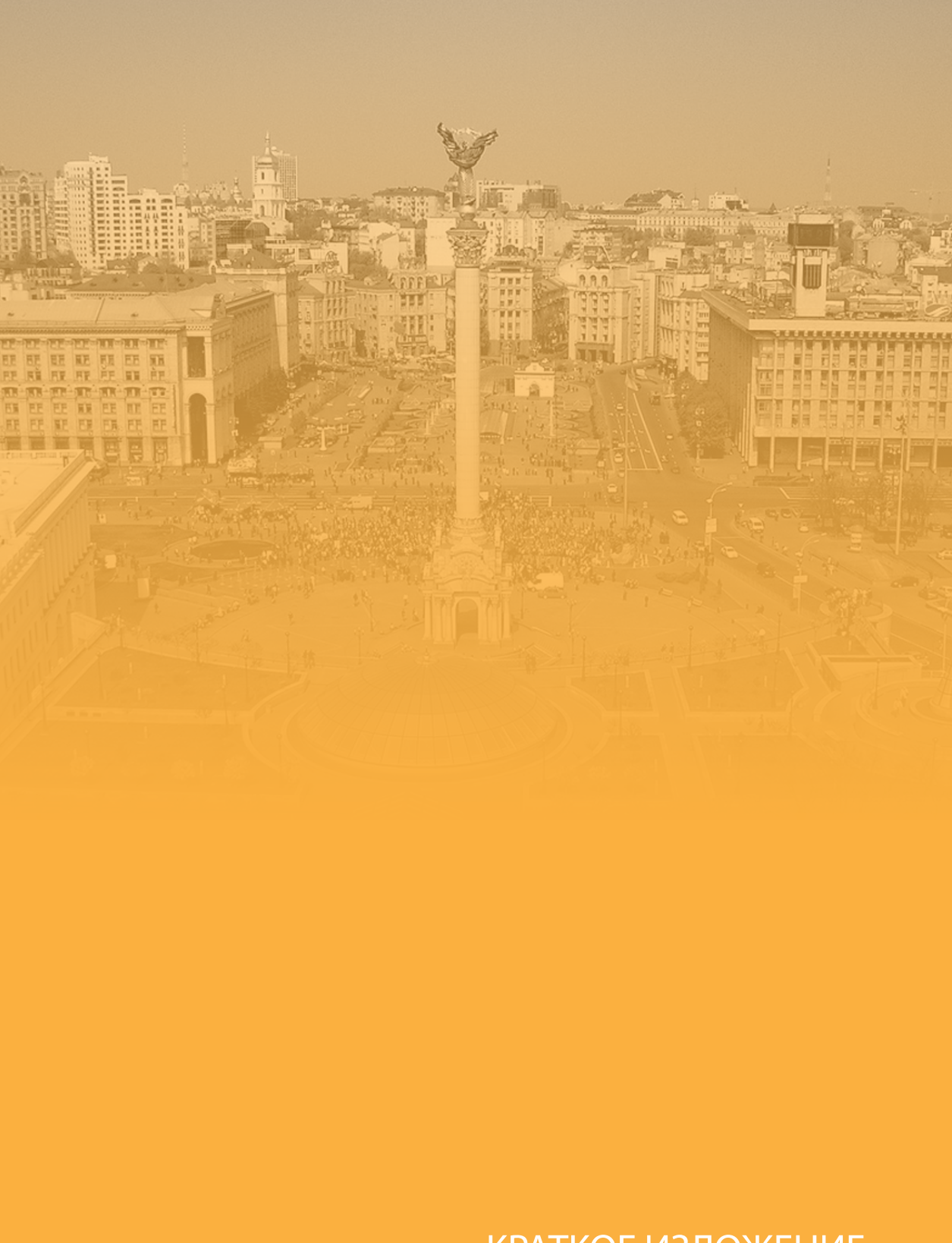
- The Government of Ukraine should promote the adoption of ISO 50 001 standards to large industrial enterprises, incorporating a standardised approach to energy auditing.
- The Government of Ukraine should encourage the SAEE to develop best available technology programmes of interest to donors and IFIs.

Renewable Energy Sources and CHP

- The Government of Ukraine should place the economic analysis, technical assessments and environmental impacts of its renewable energy (RE) deployment projections in the public domain.
- The Government of Ukraine should focus on the cost and sufficiency of incentives and the removal of barriers to the deployment of RE rather than, for example, creating barriers to competition.
- The Government of Ukraine should consult on, finalise and commit to the implementation of its renewable energy action plan, preparatory to the launch of new measures to support the deployment of renewable energy in pursuit of the 11% 2020 target.
- In the light of the strong advocacy for biomass by international and Ukrainian commentators the Government should commit to a number of regional pilots to validate the potential of straw and wood biomass to avail of a "learning by doing" approach.
- The Government of Ukraine should ensure that CHP is an integral part of the renewable energy action plan as the technical, market, regulatory and environmental challenges are all of a piece in terms of delivering a robust solution.
- High efficiency cogeneration should continue to be promoted in the interests of making the best use of the available gas.

Data Collection and Monitoring

- The Government of Ukraine should continue to promote the collection, collation and timely publication of energy supply and demand statistics by placing the onus to provide on primary sources of information, and publication on the National Statistics Service.
- The accuracy of the energy balance is important for public and private planning. The Government should ensure that users have access to accurate aggregate, sector-specific data for energy supply and use.



КРАТКОЕ ИЗЛОЖЕНИЕ

Исходная информация

Украина занимает плодородную равнину к северу от Черного моря. Она имеет сухопутную границу с семью странами, три из которых до 1991 года входили в состав СССР. Украина серьезно пострадала в ходе экономического кризиса 2008 года, и в 2013 году ее экономика находится в фазе кратковременного подъема. Продолжается процесс эмиграции и сокращения населения, что влияет на внутренний спрос и рост демографической нагрузки.

Всемирный банк критикует экономические показатели Украины, относя циклы подъемов и спадов с момента обретения независимости на счет сбоев в системе государственного управления. В своей критике он не одинок; ЕС критически относится к прогрессу при оценке кандидатуры Украины и вытекающего из этого выполнения добровольно заключенных ею Соглашений. Таким образом, за рубежом широко распространено мнение, что реформа проводится слишком медленными темпами, чтобы обеспечить восстановление экономики.

Украинские власти признают необходимость действий на широком фронте. Президентская программа экономических реформ на 2010–2014 годы является выражением решимости правительства сосредоточиться на реализации политики для обеспечения «зажиточного общества, конкурентоспособной экономики и эффективного государства».

Народная поддержка и приемлемость последствий этой приверженности эффективной энергетической политике и другим реформам, за которые выступает целый ряд национальных и международных организаций, зарубежных агентств и правительств, подвергнутся испытанию в ходе реализации. Таким образом, несмотря на недостатки в практическом применении политики, стремление к свободе, демократии, хорошим отношениям со своими соседями и лучшей жизни для граждан Украины получают широкую поддержку.

Вступление Украины во Всемирную торговую организацию (ВТО) в феврале 2008 года и развитие ее отношений с ЕС в рамках Соглашения о партнерстве и сотрудничестве (СПС) 1998 года и его предполагаемого преемника посредством принятия обязательств по Соглашению об ассоциации в 2008 году свидетельствуют о прогрессе в гармонизации торговли и унификации фундаментальных принципов соблюдения прав человека и справедливости.

ЕС является приверженцем политики последовательного взаимодействия с Украиной с целью политической ассоциации и экономической интеграции на основе уважения общих ценностей. Важным вопросом двусторонней повестки дня ЕС и Украины является роль ЕС в активном поощрении вклада международных финансовых учреждений в модернизацию газотранспортной системы Украины. Таким образом, международный диалог имеет множество аспектов, и одним из наиболее актуальных является энергетическое управление на последующем этапе.

Политика в области энергетики и энергоэффективности

В настоящее время, в соответствии с законодательством ЕС (EU acquis) и согласно Договору об учреждении Энергетического сообщества, одним из краеугольных камней энергетической политики Украины является реформа энергетического сектора. Членство в Энергетическом сообществе обеспечивает новый фокус и импульс к созданию рамочных

условий для необходимых действий с помощью инвестиций, поступления доходов, распределения затрат, ликвидации субсидий и взыскания долгов. Цель заключается в том, чтобы создать условия, при которых премия за риск осуществления инвестиций в энергосистемы Украины была бы сведена к минимуму. Энергетическая политика Украины меняется, чтобы вселить в инвесторов уверенность в том, что они вернут свои инвестиции и будут надлежащим образом вознаграждены.

Природные ресурсы и экономическое развитие Украины, в том числе месторождения полезных ископаемых и углеводородов, обширная инфраструктура транзитных и транспортных газопроводов и преобладание тяжелой энергоемкой промышленности сочетаются с традиционно низкими ценами на энергию, что в нынешних условиях Украины обеспечивает доминирование энергетической политики среди социальных проблем. Предприятия и потребители, подвергающиеся большому экономическому давлению, с трудом адаптируются к более высоким ценам на энергию.

Поощрение новых и прямых иностранных инвестиций (ПИИ) в секторы производства, передачи, распределения, поставок и конечного использования энергии в Украине является одной из первых мер по исправлению положения, указанных разработчиками политики. С помощью таких инвестиций Украина стремится создать современную и эффективную энергетическую систему, которая будет стабильно предоставлять доступные услуги в течение длительного времени. Для достижения этой цели существует обязательство Правительство в отношении «целей в сфере легкости ведения бизнеса» - системы показателей, по которой при сопоставлении на международном уровне оценочный результат Украины является неблагоприятным.

В энергетическом секторе властям удалось создать рамочные условия для определенных приоритетных видов ПИИ, хотя и в зависимости от более или менее эффективных условий. Последним примером являются права на разведку и добычу нефти и газа, а до этого - введение выгодных тарифов на производство энергии от возобновляемых источников. В числе наименее удачных условий - политически популярные, но, пожалуй, менее эффективные оговорки о местном происхождении, которые свойственны проектам в области возобновляемых источников энергии и могут влечь за собой непредвиденные негативные последствия.

Проект Энергетической стратегии Украины до 2030 года был вынесен на общественное обсуждение летом 2012 года. С тех пор раздаются призывы пересмотреть прогнозы экономического роста и спроса на энергию. В обширном обзоре энергетической политики Украины 2012 года[3]. Международное энергетическое агентство (МЭА) подчеркнуло преимущества перехода к решительному урегулированию проблем и использованию возможности реализации неиспользуемого потенциала энергоэффективности и местных источников энергии. Одно из первых мест в списке политических приоритетов МЭА занимает повышение энергоэффективности во всех звеньях энергетической цепочки.

Традиционно низкие и субсидируемые цены на энергию для потребителей и промышленности и медленный прогресс на пути к полному возмещению затрат способствуют противодействию реформе цен со стороны потребителей и лишают средств поставщиков энергии. Это способствует продолжающемуся ухудшению состояния

[3] *Ukraine 2012, International Energy Agency, Paris, 2012*

энергетической инфраструктуры Украины. При отсутствии цен, полностью отражающих затраты, результаты энергоэффективности будут ниже их экономически обоснованного уровня.

Электроэнергетические и газовые коммунальные предприятия и, особенно, муниципальные ТЭЦ и тепловые компании, а также, в некоторой степени, их клиенты – все они испытывают большие трудности из-за повышения цен на энергию в сочетании с присущей им энергетической неэффективностью, которая обходится все дороже и становится все более обременительной. Таким образом, в то время как ключевые элементы этой ситуации были четко и точно диагностированы в рамках ряда проектов технического содействия и других украинских проектов, ответные меры для реального исправления положения все еще предстоит сформулировать в полном объеме.

Значительная доля потребительских нужд в отоплении в Украине будет удовлетворяться с помощью централизованного теплоснабжения, зачастую в сочетании с производством электроэнергии. За теплоснабжение бытовых потребителей в основном отвечают муниципалитеты, и испытывающим все более значительные финансовые трудности муниципалитетам сложно выполнять эту функцию. Частью проблемы является объем и доля неучитываемого тепла, которое оплачивается по фиксированной цене, что приводит к тому, что у потребителей немного или нет стимулов к экономии потребляемой энергии. Эту ситуацию усугубляют низкие тепловые характеристики фонда зданий.

Таким образом, коммунальные предприятия стоят перед необходимостью:

- Осуществления инвестиций в современные преобразующие энергию ТЭЦ или теплоцентрали;
- Обновления и ремонта изнашивающейся инфраструктуры теплораспределительной сети;
- Создания отвечающей требованиям системы учета потребления; и
- Сбора достаточного объема поступлений по выставленных счетам с испытывающих финансовые трудности потребителей для финансирования закупок энергии и необходимых инвестиций.

На сегодняшний день политика сосредоточена на способах решения проблемы дефицита поступлений и привлечения необходимых инвестиций из частных и государственных источников, что привело к принятию ряда законодательных инициатив для обеспечения создания государственно-частных партнерств, сообществ конечных потребителей и учета индивидуального потребления. Была предложена «Концепция программы модернизации и развития систем теплоснабжения Украины на период с 2012 по 2022 годы», но она не была утверждена.

Государственное агентство Украины по энергоэффективности и энергосбережению (Госэнергоэффективности Украины) было создано для реализации государственной политики в области энергоэффективности, энергосбережения, возобновляемых источников энергии и альтернативных видов топлива. Оно входит в систему исполнительной власти; руководство им и координацию его деятельности осуществляет Кабинет Министров Украины через Министра экономического развития и торговли Украины. В его обязанности входит внесение предложений по государственной политике в области устойчивой энергетики, разработка и утверждение программ действий,

предоставление информации и установление норм и стандартов и мониторинг их соблюдения, а также назначение директоров подведомственных ему учреждений.

Что касается НИОКР и содействия разработке политики, то ГОСЭНЕРГОЭФФЕКТИВНОСТИ УКРАИНЫ и его предшественник поддерживали исследования, охватывающие широкий спектр вопросов, связанных с предложением и спросом в энергетике. Полный список поддержанных на сегодняшний день заявок имеется в базе данных на сайте ГОСЭНЕРГОЭФФЕКТИВНОСТИ УКРАИНЫ для анализа по отдельным проектам, технологиям и разработкам, а также по секторам. Большое количество последних проектов в сфере отопления (32) связано с сокращением использования газа и его заменой другими источниками энергии.

Несколько успешных инициатив Министерства регионального развития, строительства и жилищно-коммунального хозяйства продемонстрировали потенциал ЭСКО в разработке решений по эффективным системам отопления многоквартирных домов. Были выявлены слабые стороны нынешней системы и предварительно оценены расходы на всеукраинскую программу реконструкции.

Таким образом, в ключевых областях предоставления энергетических услуг имеется детальный анализ и широкий консенсус в отношении того, что необходимо сделать. Деятельность по организации и реализации необходимыми темпами и в необходимых масштабах еще не началась, и основной проблемой по-прежнему является финансирование.

Тем не менее, существуют планы по реализации дополнительных пилотных проектов и местных инициатив в рамках имеющихся в настоящее время ресурсов с целью демонстрации преимуществ того, что может быть достигнуто, и более глубокого понимания роли государства в создании необходимых условий. Тем не менее, из анализа и имеющегося на сегодняшний день опыта очевидно, что финансирование любого проекта тесно связано со стоимостью сэкономленной энергии, которая по-прежнему недооценивается из-за того, что цены на тепло и газ являются слишком низкими.

Политика в области возобновляемой энергетики

История государственной собственности и централизованного планирования, относительное обилие дешевого угля и природного газа, а также доминирование в электроэнергетическом секторе атомной энергии в той или иной степени объясняют низкие уровни освоения возобновляемых источников энергии в Украине.

В электроэнергетическом секторе имеется два крупных низкоуглеродных источника: доля атомной энергетики в поставках электроэнергии в 2012 году составила 45,5%, а доля традиционных ГЭС – 5,6% . Потенциал производства электроэнергии на базе ветровой и солнечной энергии в Украине широко признан, и считается, что существующая льгота в виде льготного закупочного тарифа является щедрой и более чем достаточной для стимулирования этой деятельности, хотя она и страдает от административных проблем и правовой неопределенности.

Другие указывают на потенциал биомассы, ссылаясь на повсеместное наличие лесных и сельскохозяйственных отходов, которые можно либо непосредственно сжигать для производства тепла, либо подвергать брожению для производства газа различного качества. Поддержка конкретного метода зависит от масштаба и условий использования произведенной продукции.

В соответствии с решением министров Энергетического сообщества и соглашением о принятии целевых показателей в области возобновляемых источников энергии на 2020 год, целевой показатель Украины по возобновляемым источникам энергии в предложении первичной энергии составляет 11% к 2020 году. Хотя в сравнении с крупными государствами-членами ЕС эта цель скромна, её достижение потребует больших усилий от Украины, начинающей с низкого уровня в условиях субсидируемых цен на энергию для потребителей.

Украине необходимо разработать свой План действий в области возобновляемой энергетики и приступить к его реализации, исходя из устойчивого освоения возобновляемых источников энергии и с учетом воздействия на цены в краткосрочной перспективе. Поэтому этот план должен основываться на имеющейся стратегической информации, быть экономически эффективным и обеспечивать широкие возможности для конкуренции и предпринимательства в ходе его выполнения. Его основой должна служить база фактических данных, которая будет расширяться в процессе его реализации, и он должен регулярно пересматриваться на основе критериев прозрачности.

Статус Украины в РКИК ООН и Протоколе к ней обеспечивает возможность дальнейшего развития хорошо структурированного подхода Украины к проектам совместного осуществления с сопутствующей этому возможностью создавать единицы установленного количества (ЕУК) и получать доход от их стоимости.

Общая оценка прогресса

Для нынешних условий в Украине характерны нестабильное восстановление экономики, внутреннее и внешнее давление с целью совершенствования руководства, геополитические интересы её близких соседей и сохраняющаяся экономическая неопределенность в ЕС и во всем мире. Поэтому расширение взаимодействия Украины с международными организациями, договорами и ЕС создает новые проблемы.

Из-за огромных размеров, стратегического положения, природных ресурсов, технических возможностей, а также долгосрочного экономического потенциала, развитие Украины будет иметь важные последствия для её граждан и соседних стран. Большинство текущих озабоченностей ЕС в сфере энергетики отражено в пяти дорожных картах для двустороннего сотрудничества ЕС и Украины в области энергетики. Это ядерная безопасность, интеграция рынков газа и электроэнергии, надежность энергоснабжения и транзита углеводородов, угольный сектор и энергоэффективность.

Энергетическая политика занимает видное место во внутренней политике и перспективном планировании. Действия и перспективы Украины представляют большой интерес для России и ЕС, и на кону стоят жизненно важные интересы коммерческого характера и надежности поставок. Поэтому недавнее принятие обязательств по Договору об учреждении Энергетического сообщества задает вектор эволюции энергетической политики Украины, которая признает преимущество рынков, надлежащим образом регулируется и структурирована для конкуренции в сфере предоставления устойчивых энергетических услуг.

В связи с важным значением прямых государственных и частных иностранных инвестиций для экономического обновления, растет понимание важности и срочности снижения премии за риск для инвесторов в Украине до приемлемых уровней. Улучшение

позиции Украины в рейтинге легкости ведения бизнеса со 152 в 2011 году до 137 в 2012 свидетельствует о прогрессе в этом отношении.

Искусственно заниженные цены на энергию в сочетании с другими факторами создали ситуацию, при которой многие потребители энергии попали в ловушку доступности. Повышение цен на энергию сказывается на их платежеспособности, а последствия этих цен усугубляет чрезмерное потребление энергии (фактическое или номинальное) вследствие общей неэффективности систем снабжения и конечного использования. Поэтому привлечение и использование средств на модернизацию и обновление изношенной энергетической инфраструктуры является ключевым приоритетом энергетической политики Украины. Стабильность и предсказуемость экономической и энергетической политики и нормативно-правовой базы будут способствовать привлечению необходимых средств.

Наличие средств для инвестиций всегда зависит от надлежащей оценки всего спектра рисков. В энергетическом секторе Украины в их число входят политические, регулятивные, рыночные и технологические риски. При отсутствии заслуживающей доверия и стабильной энергетической политики и достаточно разумного и независимого режима регулирования, большинство инвесторов предпочтет дождаться определенности. Призывы к пересмотру энергетической политики в ходе консультаций с общественностью в 2012 году следует рассматривать в этом свете. Судя по публичным заявлениям, исходящим из США и других стран, исходные посылки, расчеты и прогнозы в проекте энергетической политики надлежит пересмотреть. По мнению МЭА, необходимо сделать больший акцент на стороне спроса.

Структурированным энергетическим рынкам, являющимся предметом конкуренции, необходима уверенность в беспристрастном и профессиональном регулировании надлежащим образом уполномоченными органами регулирования. Постоянное совершенствование функции регулирования в соответствии с обязательствами и обязанностями по Договору об учреждении Энергетического сообщества имеет для Украины жизненно важное значение. На этом базируется ее способность привлекать необходимые инвестиции в сети и объекты по производству газа, тепловой и электрической энергии. Хотя его выполнение на начальном этапе вызывало озабоченность, похоже, что Украина достигла лучшего понимания требований и преимуществ Энергетического сообщества. Учитывая работу в законодательной сфере, затраты и связанное с этим новое институциональное развитие, которые с этим связаны, важно будет четко понимать преимущества в плане того, когда и кто их будет получать.

Определение эффективной энергетической политики и введение в действие ее положений при соответствующем регулятивном надзоре и контроле политики является началом более длительного и глубокого процесса, который должен охватить всю энергосистему - от освоения ресурсов до конечного использования. В отсутствие каких-либо искажающих факторов (например, слишком высокая стоимость капитала), при наличии отражающего затраты ценообразования, разумного регулирования, четких правил рынка, надлежащей выдаче разрешений и строгой оценке проектов, при инвестициях в крупную энергетическую инфраструктуру будет иметь место тенденция к принятию обоснованных решений при спецификации энергетической эффективности нового оборудования.

Однако в случаях, когда решения менее значительны или компетенция ограничена и сфокусирована на иных аспектах, нет никакой гарантии того, что соображения энергоэффективности будут достаточными либо вескими. Признавая это, власти Украины прибегали к регулированию. Существует множество примеров чрезмерного регулирования в случаях, когда более удовлетворительных результатов можно было бы достичь с помощью более мягкого и ориентированного на рынок подхода с упором на информирование и осведомленность.

В тех случаях, когда регулирование является надлежащим, основным соображением должна быть эффективность. Поэтому главной детерминантой эффективности любого регулирования является степень его экономической пропорциональности, практичности и осуществимости. Обеспечение соответствия при разумных затратах возможно лишь после соблюдения условий пропорциональности и практичности.

Таким образом, хотя многие цели политики украинских властей ясны, способы их эффективного достижения менее детально и зачастую недостаточно проработаны для действий по осуществлению. Это понятно, поскольку разработка политики в области энергоэффективности на интеллектуальном уровне подразумевает сбалансированный учет её взаимодействия с другими направлениями политики, часто находящимися на такой же стадии формирования. В энергетической политике неизбежны компромиссы между традиционной доступностью, безопасностью и воздействием на окружающую среду, к которым в Украине следует добавить социальную приемлемость. При признании сложности этой работы как таковой станет ясно, что процесс реализации является гораздо более обширной, многогранной и нечетко обозначенной задачей, которая в полной мере выявляется лишь в процессе осуществления.

Выполнение относится к сфере рынка – фрагментированного рынка со многими участниками, каждый их которых имеет свой собственный круг потребителей и поставщиков, и органов регулирования. Неразумно ожидать, что у какого-либо разработчика политики есть полная и адекватная картина рынка. Да и у рынка не будет полного понимания того, что имеет в виду разработчик политики. В этом суть консультативного подхода, при котором Правительство представляет свои предложения и предлагает высказать замечания. Хотя в общих чертах этот процесс прост, без тщательной подготовки и использования надежной базы эмпирических данных он извращается, а результат является несбалансированным или неверным. Правительства во многих странах прибегают к помощи институтов для заполнения пробелов в данных путем исследований - исследований, которые продолжаются и после начала этапа выполнения с конкретной целью мониторинга и анализа прогресса.

В первой половине 2013 года, менее чем через три года выполнения четырехлетней программы на 2010 – 2014 годы, уже очевидно, что первая из четырех ключевых целей в области энергоэффективности не достигнута, а четвертая, возможно, не поддается измерению. Таким образом, имеются сомнения относительно уровня понимания, готовности и способности формулировать цели энергетической политики, выделять средства и обеспечивать их достижение. Свидетельства указывают на необходимость глубоких реформ политического процесса, чему может способствовать существенное повышение открытости, более широкий набор данных, прозрачность принятия решений, а также установление подотчетности и ответственности за достижение целей.

Рекомендации

Общие рекомендации

- Правительству Украины рекомендуется оправдать законные ожидания в отношении пересмотра энергетической стратегии на основе обоснованных исходных посылок, реалистичных прогнозов и признанного потенциала значительного повышения энергоэффективности в соответствии с потребностями различных заинтересованных сторон. Рекомендуется ускорить окончательную доработку стратегии.
- Правительству Украины рекомендуется ускорить все необходимые и желательные реформы с тем, чтобы радикально улучшить i) перспективы для инвестиций и ii) представления об Украине, основывающиеся на системах показателей авторитетных международных организаций.
- Правительству Украины рекомендуется обеспечить подкрепление опубликованных им политических намерений серьезной программой действий, подлежащей периодической оценке, пересмотру и корректировке в соответствии с четко изложенными принципами.
- Правительству Украины рекомендуется предпринять шаги в разработке энергетической политики в духе Программы экономических реформ на 2010-2014 годы для обеспечения возможности получения отдачи от работы государственных и частных учреждений и заинтересованных НПО.
- Правительству Украины рекомендуется по-прежнему поддерживать меры, направленные на повышение осведомленности об энергоэффективности и просвещение государственных служащих и широких слоев населения на местном, региональном и национальном уровнях.

Институциональная структура

- Правительству Украины, с помощью соответствующих учреждений и консультаций с общественностью, рекомендуется обеспечить достижение высоких стандартов управления при разработке политики в области энергетики и энергоэффективности и в ходе ее реализации путем либерализации энергетического рынка и приватизации коммунальных предприятий и регулирования конкуренции.
- Правительству рекомендуется в срочном порядке принять меры к обеспечению наличия надлежащим образом структурированного институционального потенциала для эффективной разработки, мониторинга, анализа и пересмотра политики в области энергетики и энергоэффективности, ее реализации и обеспечения её осуществления.
- Правительству Украины рекомендуется обеспечить развитие учреждений для продвижения устойчивой энергетики, включая энергоэффективность, возобновляемые источники энергии и возможности совместной реализации.
- Правительству рекомендуется повысить статус Агентства по энергоэффективности и учредить его в качестве отдельной структуры в Правительстве.
- Правительству рекомендуется обеспечить выделение достаточных кадровых и финансовых ресурсов Агентству по энергоэффективности как ведущему агентству,

а также всем подразделениям министерств и региональных администраций, ответственным за разработку и реализацию программ в области энергоэффективности.

- Правительству Украины рекомендуется обеспечить высокую степень информированности соответствующих учебных заведений и профессиональных организаций, занимающихся образованием и повышением квалификации, относительно целей, задач и программ в области энергоэффективности.
- Правительству рекомендуется обеспечить условия, ресурсы и поддержку для обеспечения беспристрастности и независимости органа регулирования энергетики.

Энергетический рынок и ценообразование

- Правительству Украины рекомендуется доказать степень своей приверженности отражающему затраты ценообразованию в энергетике. Параллельно с повышением цен, ему необходимо обеспечить комплексный подход к индивидуальному учету, эффективности конечного использования, комфортности и другим преимуществам. Ему рекомендуется продолжить проведение реформ надлежащими темпами на прочной рыночной и политической основе.
- Правительству рекомендуется обеспечить тщательный мониторинг доступности энергии и содействие принятию корректирующих мер для облегчения трудностей с помощью экспертного органа.
- Правительству Украины рекомендуется обеспечить, чтобы его директивные указания органу регулирования были прозрачными, проистекали из энергетической политики и были тщательно продуманы во избежание непредвиденных последствий.
- Правительству рекомендуется принять надлежащие меры для эффективного регулирования монополий и конкуренции на рынках электроэнергии, природного газа и распределения тепла.
- Правительству Украины рекомендуется обеспечить проведение реформы централизованного теплоснабжения в долгосрочных интересах потребителей и с учетом их потребностей в краткосрочной перспективе. Правительству рекомендуется проследить за тем, чтобы рамочные условия предоставления услуг по отоплению способствовали привлечению новых инвестиций с целью повышения энергоэффективности и качества предоставляемых услуг.

Финансирование энергоэффективности

- Правительству Украины, исходя из надежных энергетических прогнозов и экономического анализа, рекомендуется закладывать в бюджет достаточные расходы на использование огромного потенциала энергоэффективности в экономике с целью повышения благосостояния, конкурентоспособности и уменьшения воздействия на окружающую среду.
- Правительству Украины рекомендуется обеспечить, чтобы предоставляемое финансирование и бюджетные ассигнования были долгосрочными и сбалансированными между институтами и их программами.
- Правительству Украины рекомендуется предусмотреть долгосрочное муниципальное финансирование и право муниципалитетов удерживать средства, сэкономленные в

результате инвестиций в энергоэффективность, с целью обеспечения надлежащих стимулов для деятельности на муниципальном уровне.

- Правительству Украины рекомендуется рассматривать обязательство по повышению энергоэффективности в качестве одного из условий предоставления лицензии на энергоснабжение любой энергетической компании.
- Правительству Украины рекомендуется тщательно изучать характер и гибкость любого обязательства в области энергоэффективности, чтобы удостовериться в его экономической эффективности и способности достижения желаемого результата в интересах потребителей.
- Правительству Украины рекомендуется использовать опыт МФУ при разработке налоговой политики и налоговых льгот на энергоэффективность и возобновляемые источники энергии для максимальной эффективности любых льгот такого рода.

Программы и меры в области энергоэффективности

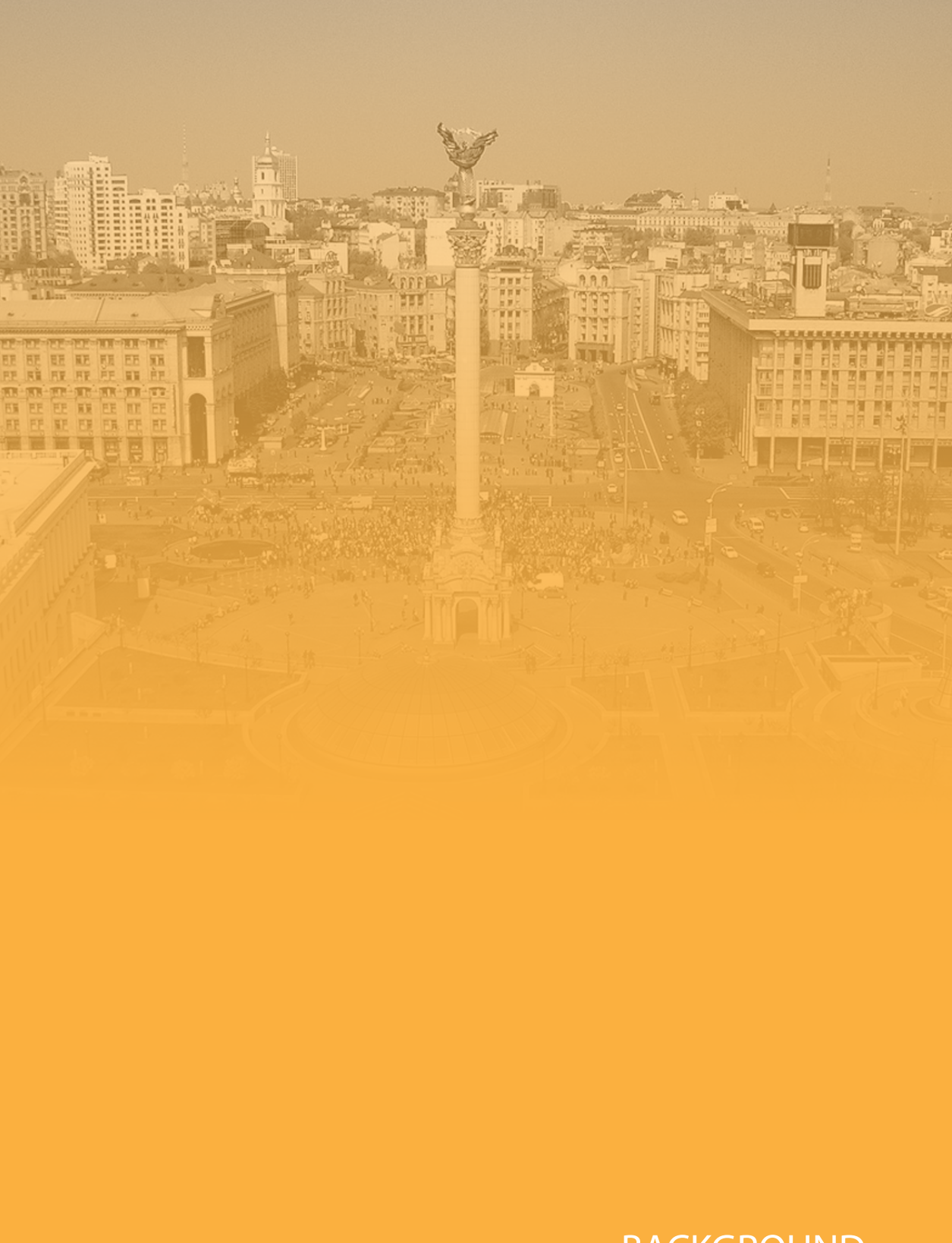
- Правительству Украины рекомендуется обеспечить реалистичность всех программ в области энергоэффективности с точки зрения их желаемых результатов.
- Правительству рекомендуется завершить введение экономически эффективных мер административного характера, таких как маркировка энергоэффективности бытовых электроприборов. Кроме того, ему рекомендуется проанализировать и рассмотреть вопрос о введении на добровольной основе хорошо зарекомендовавших себя стандартов энергоэффективности для различных категорий энергопотребляющих товаров.
- Правительству Украины рекомендуется обеспечить продолжение реформы сектора централизованного теплоснабжения такими темпами и в такой последовательности, которые обеспечат быструю окупаемость и сведут к минимуму риски, связанные с недостатком инвестиций или состоянием ценных активов.
- Правительству Украины рекомендуется обеспечить правовое содействие программам реконструкции в том, что касается обязательного участия собственников жилья, надлежащих стандартов и гарантии качества.
- В процессе доработки Закона «Об энергоэффективности в жилых и общественных зданиях», Правительству рекомендуется применить стратегический подход к реализации Директивы ЕС по энергетическим показателям зданий для получения максимальных выгод и сведения к минимуму издержек выполнения.
- Правительству Украины рекомендуется принять и реализовать Национальный план действий в области энергоэффективности, прежде чем вводить новые меры в стремлении к достижению своих целевых показателей на 2020 год.
- Правительству Украины рекомендуется содействовать внедрению стандартов ISO 50 001 для крупных промышленных предприятий, включающих стандартизированный подход к проведению энергоаудитов.
- Правительству Украины рекомендуется рекомендовать Государственному агентству по энергоэффективности разработать программы с использованием наилучших имеющихся технологий, представляющие интерес для доноров и МФУ.

Возобновляемые источники энергии и когенерация

- Правительству Украины рекомендуется размещать экономический анализ, технические оценки и экологические последствия своих планов по освоению возобновляемых источников энергии (ВИЭ) в открытых источниках.
- Правительству Украины рекомендуется в большей степени сосредоточиться на стоимости и достаточности стимулов и устранении барьеров освоению ВИЭ, чем, к примеру, на создании препятствий конкуренции.
- Правительству Украины рекомендуется провести консультации по Плану действий в области возобновляемой энергетики, доработать его и взять на себя обязательство по его выполнению, прежде чем вводить в действие новые меры в поддержку освоения возобновляемых источников энергии в стремлении достичь целевого показателя 11% в 2020 году.
- В свете активной пропаганды биомассы международными и украинскими обозревателями, Правительству рекомендуется взять на себя обязательство по осуществлению ряда региональных пилотных проектов для валидации потенциала соломы и древесной биомассы с использованием подхода «обучение в процессе деятельности».
- Правительству Украины рекомендуется проследить за тем, чтобы когенерация являлась неотъемлемой частью Плана действий в области возобновляемой энергетики, поскольку технические, рыночные, регулятивные и экологические проблемы образуют единое целое при вынесении разумного решения.
- Рекомендуется по-прежнему содействовать развитию высокоэффективной когенерации в интересах оптимального использования имеющегося газа.

Сбор данных и мониторинг

- Правительству Украины рекомендуется по-прежнему содействовать сбору, обобщению и своевременной публикации статистических данных о спросе и предложении в энергетике, возложив ответственность за их предоставление на первичные источники информации, а за публикацию – на Государственную службу статистики.
- Точность энергетического баланса имеет важное значение для государственного и частного планирования. Правительству рекомендуется обеспечить доступ потребителей к точным сводным данным по энергоснабжению и энергопотреблению в отдельных секторах.



BACKGROUND

Geography

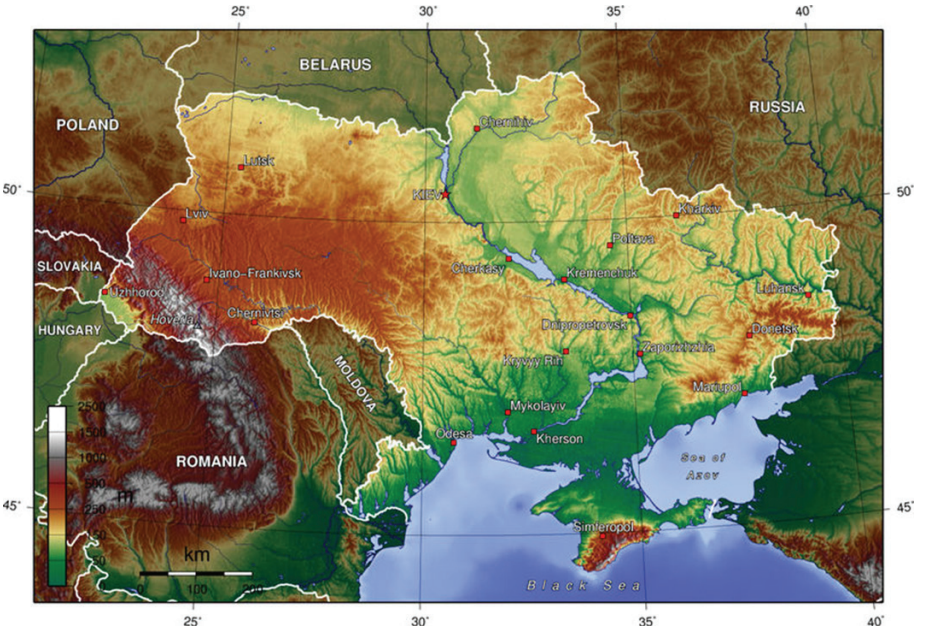
Physical

Ukraine occupies an area of 603,000 km^2 and consists almost entirely of fertile plains that form a large portion of the East European Plain. The World Factbook[4] describes the climate as temperate continental, and Mediterranean only on the southern Crimean coast. The precipitation is disproportionately distributed, highest in the west and north and lower in the east and southeast. The winters vary from being cool along the Black Sea to cold farther inland, and the summers are warm across the greater part of the country, and hot in the south.

The Dnipro Lowland is the central part of the country. Other lowlands extend along the shores of the Black Sea and the Azov Sea in Southern Ukraine, while the Crimean Peninsula, in the extreme south, has both lowlands and uplands. The Carpathian Mountains extend across Western Ukraine for more than 240 km.

The principal rivers of the Dnipro, Don and Dniester all drain southward through the plains and flow into the Azov-Black Sea Basin. Ukraine's most important river, the Dnipro, is dammed along much of its course for hydroelectric, water management and irrigation purposes.

Figure 1 Physical geography of Ukraine



Population

According to the State Statistics Service of Ukraine (SSU or Urkstat) and the 2001 population census, in 2001 ethnic Ukrainians made up more than 77.8% of the population of 48.45

[4] *World Factbook 2013–14. Washington, DC: Central Intelligence Agency, 2013*

million. The population has since declined and was estimated to be 45.6 million in 2012. Preparations for a new census are underway in 2013. Russians are the largest minority group, accounting for about 17% in 2001. Other ethnic minorities, each accounting for less than 1%, are Belarusians, Moldavians, Tartars, Poles, Bulgarians, Jews and Greeks. The population density averaged 75.8 persons/km^2 in 2012 and is highest in the industrialised Donetsk Basin and Dnipro Bend regions and in the agriculturally productive forest-steppe belt.

The Ukrainian language is related to both Russian and Belarusian and belongs to the Slavic group of languages. Ukrainian and Russian are the principal ethnic languages and are widely understood. Crimean Tartar is the principal language of the Autonomous Republic of Crimea, where Russian is widely spoken.

Natural Resources

The belt of mixed forest and steppe running east-west across south-central Ukraine has rich black soils and their intense cultivation has established the country as a major producer of winter wheat and sugar beets. Other crops include sunflower seeds, maize, potatoes, grapes, oats, rye, millet and buckwheat. Fruits and vegetables are grown on the outskirts of cities, and cattle and pigs are raised throughout the country.

Ukraine has rich reserves of iron ore, bituminous and anthracite coals and manganese-bearing ores located in close proximity to each other. Where they occur, in the east-central Ukraine, is the industrial heartland of the country and one of the major heavy-industrial and mining-metallurgical complexes of Europe.

Ukraine also produces natural gas and petroleum, though reserves are now in many cases depleted. Nevertheless there are good prospects for the discovery and development of additional petroleum and shale gas resources. The Ukrainian economy largely depends on heavy industry and agriculture. Besides its basic mining industries, the Donetsk Basin has ferrous-metal industries that produce iron and steel in large quantities. Durable goods manufactured in the Donetsk Basin include mining and metallurgical equipment, automobiles and tractors.

Political System

Ukraine's political system underwent rapid change in the early 1990s after the country gained its independence from the Soviet Union in late 1991.

During the Soviet period (1922–1991), Ukraine was governed by the Ukrainian Communist Party, which in turn was subordinate to the Communist Party of the Soviet Union. After independence, Ukraine's legislature was converted to a functioning parliament, the Verkhovna Rada, whose members, the people's deputies, are elected to five-year terms in freely contested elections.

The chief executive of Ukraine is the directly elected president. The day-to-day administration of the government rests in the hands of the prime minister, who heads the Cabinet of Ministers and is chosen by the president with parliamentary approval.

In June 1997 the Parliament of Ukraine adopted a new constitution that confirmed the authority of the president, maintained a unicameral parliament and affirmed that Ukrainian is the state language, while making allowances for the use of other languages (Russian and Crimean Tartar, for example) in areas where they were the primary languages spoken.

Ukraine has improved relations with Russia without, however, abandoning the priority of European integration. The country has completed technical negotiations on a deep and comprehensive free trade area (DCFTA) and an association agreement with the EU.

The country is administered through a structure of 24 oblasts, one autonomous republic, Crimea, and two municipalities with oblast status, Sevastopol and Kyiv.

Figure 2 Principal cities of Ukraine

Economic Background

On independence, Ukraine inherited substantial capacity in terms of its metallurgy and chemicals, energy infrastructure, revenues from levies on the transit of energy resources from Russia to Europe and abundant resources of fertile land. This inheritance, according to a document by the World Bank,[5] created economic rents that allowed Ukraine to muddle through without deep reforms.

According to the same source, the following is the case.

"The transition recession of the early 1990s has left deep scars. The outcome of the early transition years was the concentration of wealth in the hands of the few and the erosion of social security and public service standards. The combined failures of early reform efforts to deliver tangible improvements and of government to stem state capture and corruption have sapped public support for reform and prompted successive administrations to opt for short-term fiscal handouts instead."

However, after the indifferent economic performance led to an economic crisis, the government achieved a psychological breakthrough in September 1996 with the introduction of a new currency, the Ukrainian hryvnia.

In January 2012 the World Bank saw Ukraine as the juncture of an association agreement with the EU, including a DCFTA that would provide an anchor for economic reforms. It acknowledged that there is growing understanding among the country's leadership that, without a more constructive dialogue with civil society and business, ambitious development goals will not be achieved. However, it opined "the government faces significant economic and political challenges in the face

[5] *World Bank, Washington, Report No. 66279-UA of 20 January 2012*

of public resistance against unpopular measures to bring sustainability to public finances, such as pension reform, utility price increases, or the reform of social privileges".

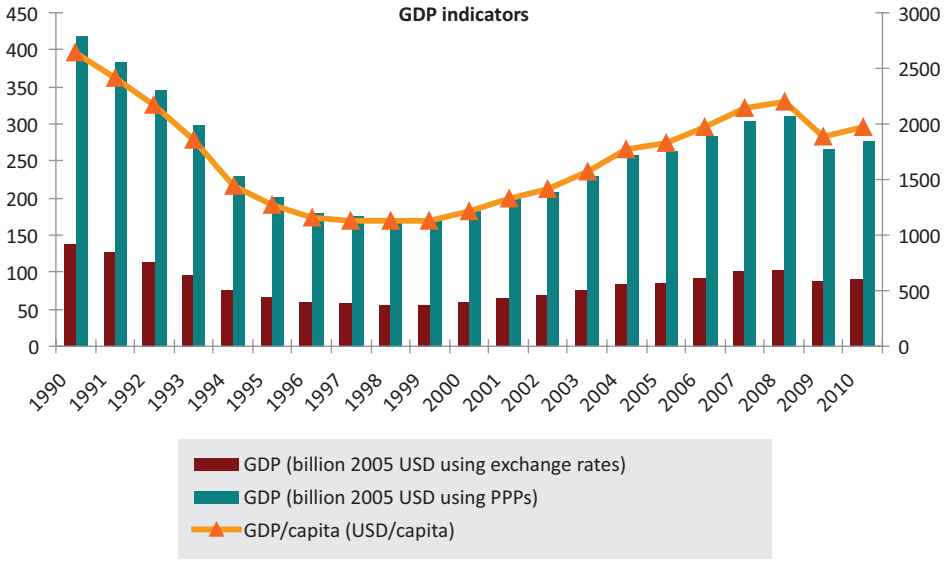
Ukraine's civil society is vocal and strong. In 2010, there were about 4,000 active civil society organisations (CSOs), with some 40% having three or more permanent staff members. Support of donors in building the capacity of CSOs will continue to be very important.

Economy

Outlook

According to the 2 April 2013 Ukraine Economic Update of the World Bank the economy of Ukraine is in recession because of weak external demand and delays in policy adjustment. Growth in 2013 is projected to remain weak and vulnerable to external shocks. The World Bank argues that, along with macroeconomic adjustment, structural reforms are needed to jumpstart growth.

Figure 3 GDP indicators 1990–2010



Source: 2012 IEA online electronic statistical database and national statistics, provided by Ukrainian authorities

Referring to Figure 3 above and according to the World Bank Update (2013) cited above, "after a 14.8% Gross Domestic Product (GDP) decline in 2009, the economy grew 4.2% in 2010, and posted 6.6% growth in the third quarter of 2011. Domestic demand has played an increasing role in driving growth in 2010 and 2011, in contrast with 2009".

The update notes that industrial production has also recovered but with volatile growth rates, highlighting the dependence on a few commodity prices, such as that of steel. FDI flows remain low compared to their pre-crisis level, partly due to governance concerns and the poor investment climate. The state-owned oil and gas enterprise, Naftogaz, was expected to run a 1% GDP deficit in 2010 and balance its finances in 2011. The target for 2010 was missed, chiefly

on account of a larger deficit in Naftogaz. Steady tariff increases in gas and heating are needed to entrench fiscal consolidation, the World Bank opines.

"After significant deposit outflows during October 2008 – March 2009, the situation has stabilised; banks have been recapitalised, and deposits have returned to the system. The banks' non-performing loans remain high at around 40%, with few policy measures so far taken to address them."

The World Bank's base case forecast is for a continued but fragile recovery that is not free of risks. The increased uncertainty in international financial markets has resulted in a lower appetite for risk, and investors have opted to reduce their exposure to several emerging markets, including that of Ukraine.

Business Environment and Competitiveness

The World Bank, in giving its assessment of the business environment, has commented on a range of issues impacting on the prospects for economic growth in Ukraine:

The World Bank highlights the scale of the shadow economy.

"According to national statistics, in 2010, 4.7 million people in Ukraine between the ages of 15–70 worked in the informal sector, equivalent to about 23% of total employment. International comparative studies put the shadow economy at 55% of GDP (average over 1999–2007), or 145th the largest out of 151 countries for which estimates have been produced. Informality is concentrated in rural areas, partly because of the prevalence of informality in the agricultural sector."

On the ease of doing business, Ukraine ranks 137th out of 185 countries according to the Doing Business 2013, up from 152nd in 2012.[6] Low ranking metrics are dealing with construction permits (183rd), obtaining electricity (166th) and registering property (149th). According to the World Bank, reforms to entry regulations, the tax system and construction permits account for the improvement in the overall ranking.

FDI has been lacklustre; moreover, FDI has been concentrated on thin capitalisation schemes of existing businesses often recycling domestic capital via tax havens. Transformational FDI in the real sector that would bring technology, enable modernisation and foster diversification — central to the economic development strategy of the country — has been insignificant.

Improvement in Ukraine's medium-term growth prospects requires substantial private investment to modernise industrial facilities, increase energy efficiency and improve agricultural yields. Ukraine has significant unexploited efficiency reserves in the real sector but, without significant complementary private investment and public spending to improve transport, energy and municipal infrastructure, these reserves cannot be tapped. Lack of competitive pressures and a poor investment climate have tilted private sector incentives against investing in the official real sector, and instead sponsored a burgeoning shadow economy. Constraints in the business environment have also limited opportunities for Ukraine to better exploit its scientific and research potential.

While some progress has been made on regulatory issues, barriers to successful business remain high. Ukraine has been trapped in a self-perpetuating low equilibrium of high entry

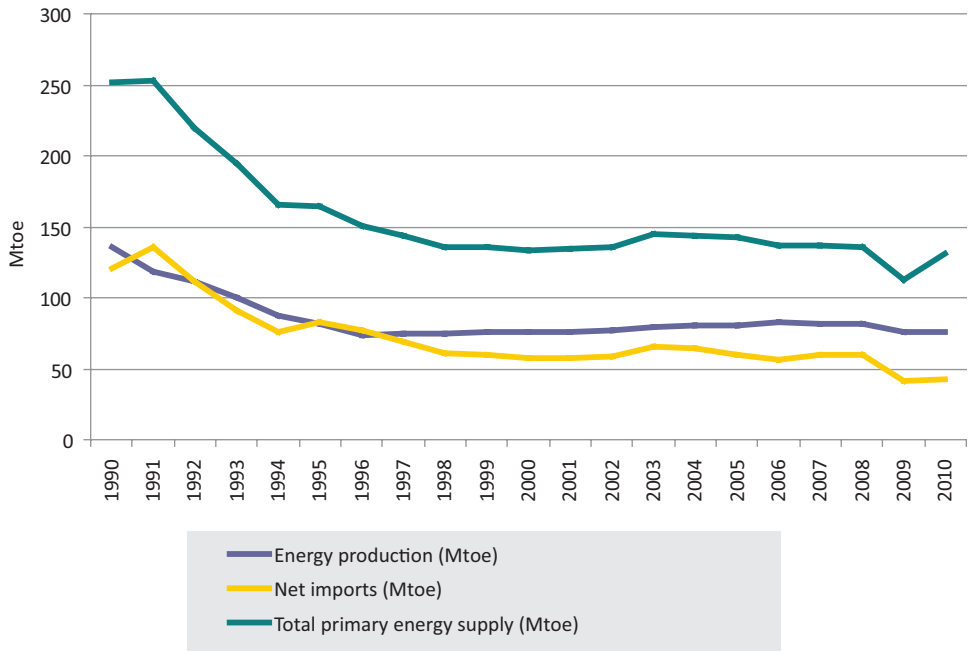
[6] *Doing Business 2012: Doing Business in a More Transparent World, IFC and World Bank*

barriers, low competition, limited incentives for technology adoption, low export diversification and sophistication, high vulnerability to commodity prices and incumbent fears of reduced rents if entry barriers were reduced. Heavy handed administrative practices hinder market contestability and competition, create corruption opportunities and ultimately generate losses for the economy. Regulatory barriers affect mainly small and medium enterprises (SMEs) and FDI.

Energy Supply

Ukrstat, the state agency responsible for statistics, with the assistance of the IEA, has been working to establish an energy balance for Ukraine. The completed Energy Balance of Ukraine for 2011 estimates the total primary energy supply (TPES) of Ukraine is 126.351Mtoe.

Figure 4 Trends in energy production, imports and primary energy supply

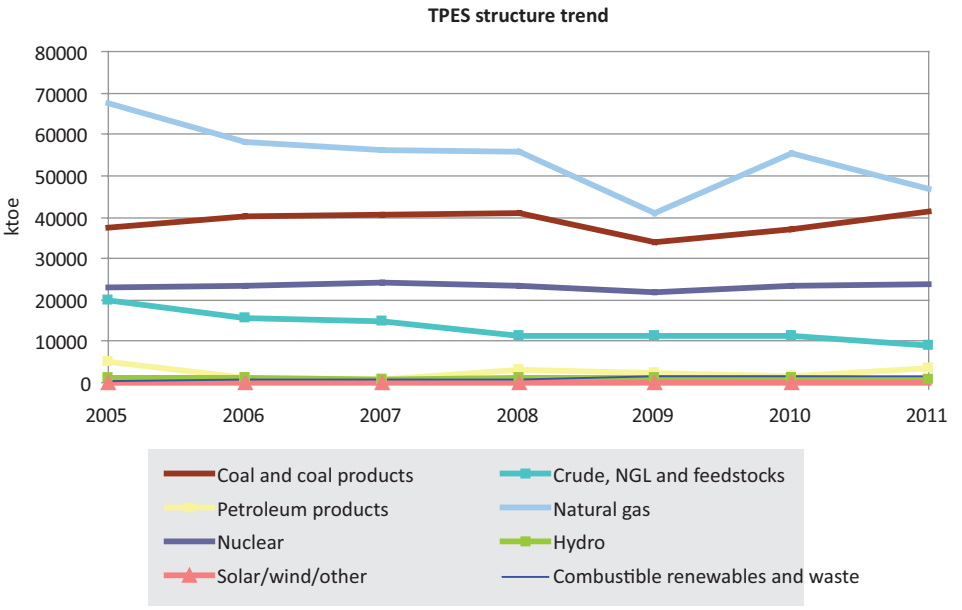


Source: IEA online electronic statistical database and national statistics, provided by Ukrainian authorities

From 1990 to 2010, the TPES dropped by 47% due to Ukraine's economic depression in the 1990s and structural changes in the economy, such as the decline in manufacturing and the increase in the service sector in the 2000s. Referring to Figure 4, net imports were the same in 2005 and 2000 and declined to a new low since 1990 in 2010.

Ukraine is well endowed with coal and there is further potential for the discovery of petroleum and gas resources. Coal production declined significantly from 1990 to 1996 and has stabilised since the end of the 2000s. While Ukraine's coal production covers most domestic demand, it is dependent on gas and oil imports. Total energy import dependency is 39% (Ukraine 2012).

Figure 5 Structure of TPES by energy source



Source: IEA online electronic statistical database and national statistics, provided by Ukrainian authorities

As illustrated by the trends in Figure 5 above, the dominance of natural gas in Ukraine's energy mix decreased to 40% of the TPES in 2010, from 47% in 2004. Coal accounted for 31% in 2010, compared with 23.6% in 2004. Nuclear power has maintained a relatively stable share — about 17% of supply in 2010.

Hydropower contributed up to 2% to the TPES over the period, as shown in Figure 5 above. The recorded contribution from other renewable energy sources was marginal. However, as reliable data on heat production from renewable sources is difficult to collect, and as official statistics may underestimate real consumption of biomass products, the share of renewable energy in the primary energy mix might be slightly higher.

Notwithstanding progress in energy efficiency in the industry sector, and closure of some of the most energy-intensive industries in the 1990s, Ukraine's economy remains one of the most energy intensive in the region. While the situation has improved through most of the decade since the year 2000, when GDP growth was 1.5 times higher than energy demand growth, there has been a deterioration in the broad energy intensity indicator in recent years.

Electricity

According to National Energy Regulatory Commission (NERC) supplied data on the Energy Regulators Regional Association's (ERRA's) website, the contribution from fossil fuel plants accounted for 45.8% of the output in 2011 with nuclear power contributing 48.2%. Total Ukrainian power production in 2011 was 176 592TWh, of which 6454.9GWh was exported.

Table 1 Total installed capacity of electricity generating plants 2011

Type of power plant	Installed capacity, MW	Output, %
Thermal power plants	30 536	45.8
Nuclear power plants	13 835	48.2
Hydro power plants (HPP)	4 596	5.8
Hydro storage plants (HSP)	861	-
Renewable sources	156	0.2

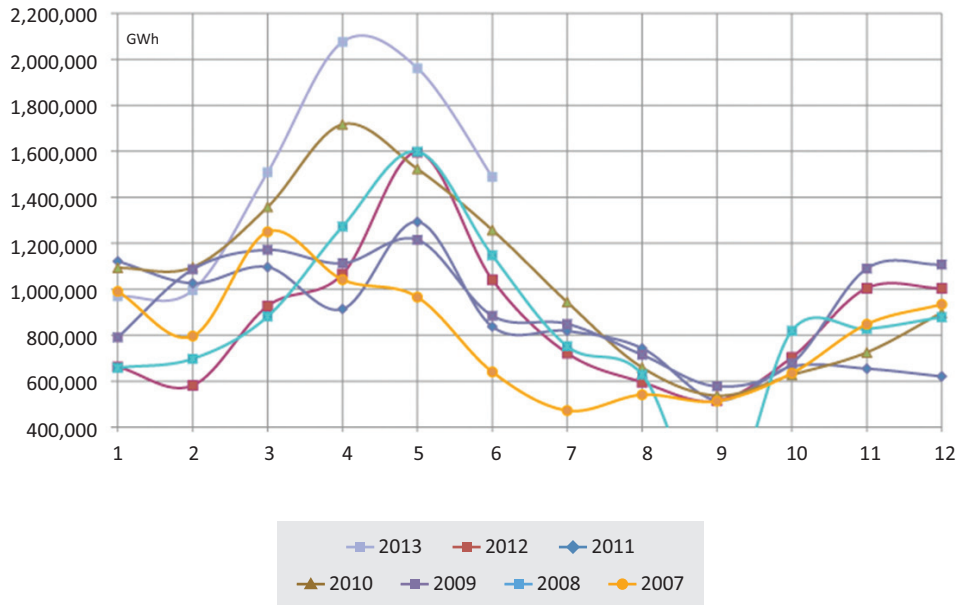
Source: "Statement on Security of Energy Supply", Ministry of Energy and Coal Industry of Ukraine, Kyiv, January 2012

Five power-generating companies, Dnyproenergo, Donbasenergo, Tsentrenergo, Zahydenergo and Skhydenergo, operate 14 thermal power plants (TPPs). The total installed capacity, is 27.3GW.

The website[7] of the state-owned joint stock company "Ukrhydroenergo" (UHE) reports that it operates 101 hydropower plants (HPPs) on the rivers Dnipro and Dnister. The total installed capacity was 4,964MW in 2010. The most powerful HPP, Dniprovska HPP, has an installed capacity of 1,500MW. The largest pumped storage plant (PSP), the Dnistrovska HSP, has a hydroelectric generator with a capacity of 324MW.

Hydropower output varies seasonally with rainfall and from year to year. The figure below, which is taken from UHE's website, shows its monthly hydropower production for the years 2007–2012, with a strikingly high output for the first half of 2013 as compared with previous years.

Figure 6 Monthly hydropower output



Source: Ukrhydroenergo, 2013

[7] *http://www.ecu.gov.ua/en/company/structure/ukrhydro*

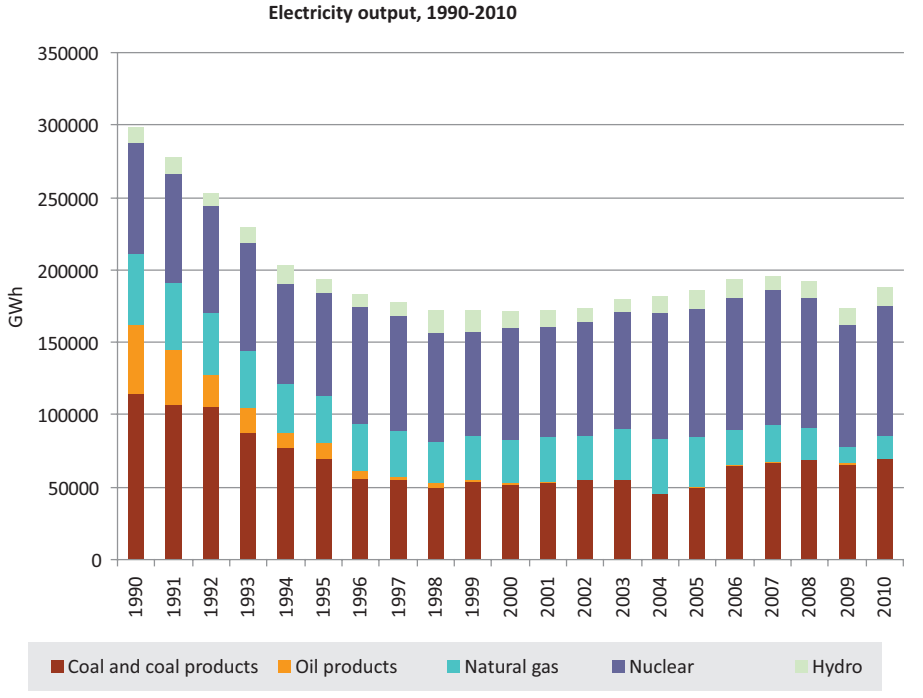
In addition to providing the electricity that drives the Ukrainian economy, and drinking water for local populations, each hydroelectric station is first and foremost tasked with flood protection. Many hydropower stations are in densely populated areas, with each reservoir holding millions of cubic meters of water — water that needs to be controlled.

The National Nuclear Energy Generating Company (NNEGC) "Energoatom" has, according to the website below,[8] four nuclear power-generating facilities with two to six units per facility. There are 13 units with a capacity of 1,000MW and a further two have capacities of 415MW and 420MW. The oldest operating plant was commissioned in 1980 and 12 more built in this decade are operating today. The most recent plants to be commissioned were in 2004, at the Rivne NPP and the Khmelnitsky NPP sites.

According to Energoatom, nuclear power occupies one of the most prominent places in the Ukrainian economy. The industry employs more than 38,000 people. With 22.8% of the installed capacity on the Ukrainian power system, nuclear power meeting autumn and winter maximum loads generated about 53% of the electricity. The annual share of nuclear electricity generation is stable: in 1996 it was 43.8 %, in 2000 45.3%, in 2005 52.3% and in 2007 47.4%.

The electricity system of Ukraine includes, along with the power plants of the Ministry of Energy and Coal Industry (MECI), power plants of other ministries and institutions, as well as TPPs in municipal ownership (557MW) and additional privately owned TPPs (317MW).

Figure 7 Electricity output 1990–2010



Source: IEA online electronic statistical database and national statistics, provided by Ukrainian authorities

[8] *http://www.jso.kiev.ua/*

Electricity output in the period since 1990 has broadly reflected the trend in GDP but without either falling to the same extent as the trough of 1999 or indeed rising to the same extent as the peak of 2008. Thus the electricity intensity of GDP reduced through the period 2000–2008, reflecting the changing structure of the economy and energy efficiency gains to the extent that they occurred. Over the same period output from coal fired plants declined rapidly from 1990 to 1998 before staging a modest recovery from 2006 through to 2010.

Table 2 below gives the most recent figures from the MECI, who report a growth in electricity production of 2.1% in 2012 compared with in 2011. The growth in electricity exports of 51.5% was met by a combination of increased production and a reduction in home consumption.

Table 2 Electricity production 2012

Indicators for Electricity Million kWh	December 2012	Compared to December last year		2012	Relative to the previous year	
		+ / -	%		+ / -	%
Production	19 157.5	772.3	104.2	198 119.4	4 015.6	102.1
Export	798.7	104 , 1	115.0	9 745.3	3 312.3	151.5
Consumption (net)	13 778.9	72.8	100.5	150 720.1	- 48.2	100.0

Source: Ministry of Energy and Coal Industry

Natural Gas

Ukraine has considerable amounts of locally extracted gas, but it also imports natural gas, mainly from Russia. Natural gas consumption in 2010 was 57bcm while imports in the same period were 36.5bcm. In 2011, Russian gas imports were about 44.8bcm compared with a take-or-pay contract of 40.0bcm. The total expected volume of gas consumption in 2011 was 59.3bcm. An unusual feature is the gas budget — the allocations for 2011 are shown in Table 3 below.

Table 3 Structure of the natural gas budget for 2011

Sector	Allocations, %
Industrial enterprises	46.5
Households	28.8
Municipal heat and energy companies	14.0
SC "Ukrtransgaz"	7.5
Oblgazi	1.7
Budgetary institutions (public entities)	1.5

Source: "Statement on Security of Energy Supply", Ministry of Energy and Coal Industry of Ukraine, Kyiv, January 2012

More than 97% of the oil and gas that is extracted in Ukraine is either produced by Naftogaz or by its subsidiaries. Naftogaz is a vertically integrated oil and gas company subordinated to the MECI of Ukraine.

Oil

Ukraine has abundant coal resources. In parallel with the decline in coal fired power station electricity generation, coal extraction declined from 1990 to 1996 and was stable through to 2008. Extraction dropped again in the years 2009 and 2010. According to the MECI of Ukraine, production increased by 4.8% in 2012 as compared with in 2011. As is evident in the table below the bulk of this increase in output was consumed in non-power-generation energy production.

Table 4 Coal production and consumption in Ukraine 2012

Indicators Production (000 tonnes)	December 2012	Compared to December previous year		2012	Relative to the previous year	
		+ / -	%		+ / -	%
Coal Production	7.206.5	- 43.4	99.4	85.946.0	3.954.6	104.8
Coking coal	2.085.3	- 77.3	96.4	24.823.5	- 198.6	99.2
Coal to Energy	5.121.2	33.9	100.7	61.122.5	4.153.2	107.3
Coal consumption	5.054.7	- 146.8	97.2	61.207.1	3.578.1	106.2
Coal to Power plants	2.582.0	- 251.7	91.1	32.227.6	542.1	101.7

Source: Ministry of Energy and Coal Industry

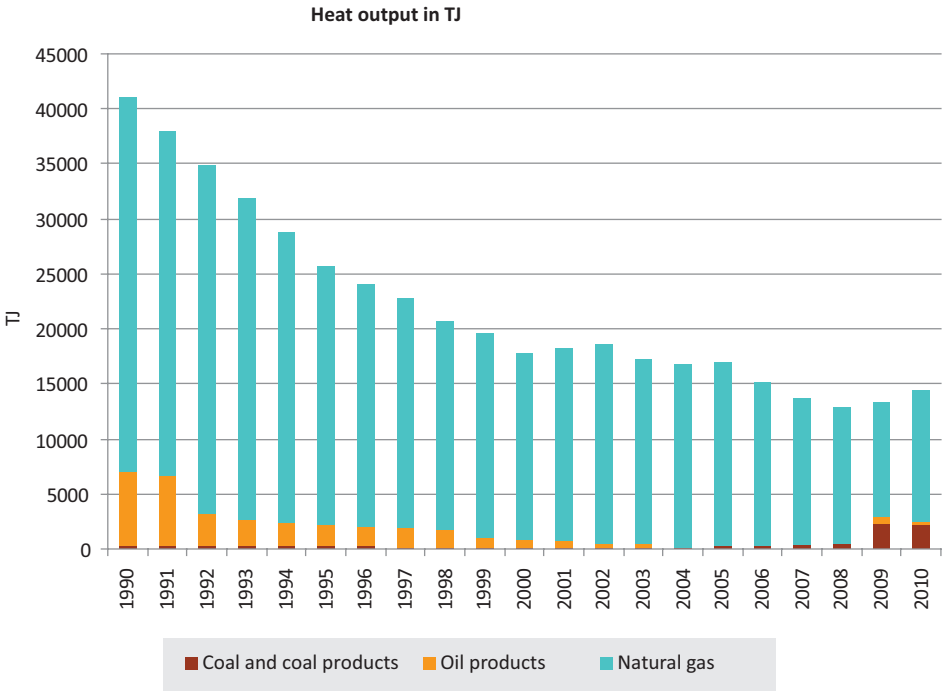
The industry is in the throes of a reform to improve the efficiency of the extraction and increase the output from a reduced number of workings with greatly improved safety and environmental standards.

District Heating

District heating is widely deployed in Ukraine to meet heat demand in the industry and residential sectors. Over 40% of residences in Ukraine are connected to a district heating system and 50% of the heat produced in such systems is delivered to industry. The principal fuel used is natural gas and some of the conversion to heat is effected in CHP plants. According to the Ministry of Housing, heat-only plants account for about 60% of heat production and about 85% of the plants are in urban areas.

There are almost 900 local heat supply companies (TKEs) that operate district heating plants and distribution networks. For the most part they are owned and managed by local governments and municipalities who use separate entities for billing customers. The TKEs are heavily indebted to Naftogaz, impacting on its profitability, its business prospects and the return to the state. Naftogaz holds shares in large CHP plants as well as many smaller plants that are controlled by regional electricity supply companies.

Figure 8 Heat generation 1990–2010



Source: IEA online electronic statistical database and national statistics, provided by Ukrainian authorities

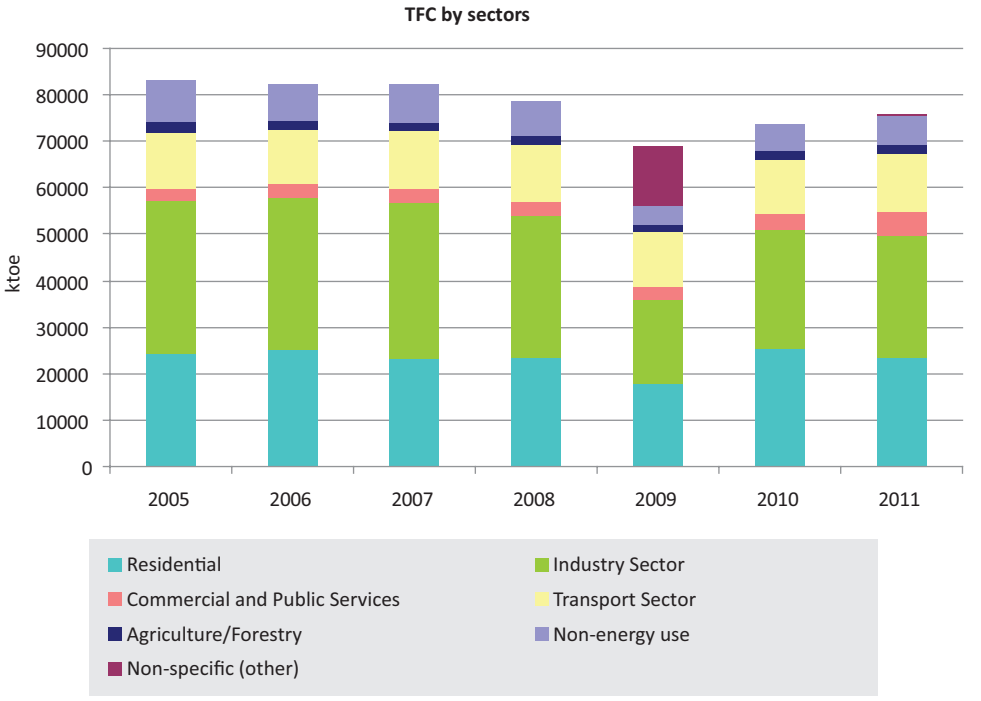
As is clear from Figure 8, heat output declined continuously over the period 1990–2005 and in the period 1990–2002 this was accompanied by a phasing out of oil as an energy source. For a brief period in 2004 gas supplied the total heat output before coal made an entry, which was followed by a re-entry of oil in 2009. These developments reflect the ruling prices and may be expected to intensify as the price gap between coal and gas widens.

Energy Demand

Energy balances provide a foundation for medium- and long-term energy projections and scenarios, which can help governments to make and evaluate policy decisions.

According to Ukraine 2012, in 2011, electricity demand in Ukraine was 65% of its 1991 level and the highest for a decade. Industry accounted for about 50% of the demand and of this the majority was base load. Analysts hold that, with the changing structure of industry, the growth of services and the projections for a growth in household demand, the load profile of demand will generate higher peaks and a greater hourly variation in electricity demand. The value of demand management services will increase with this trend.

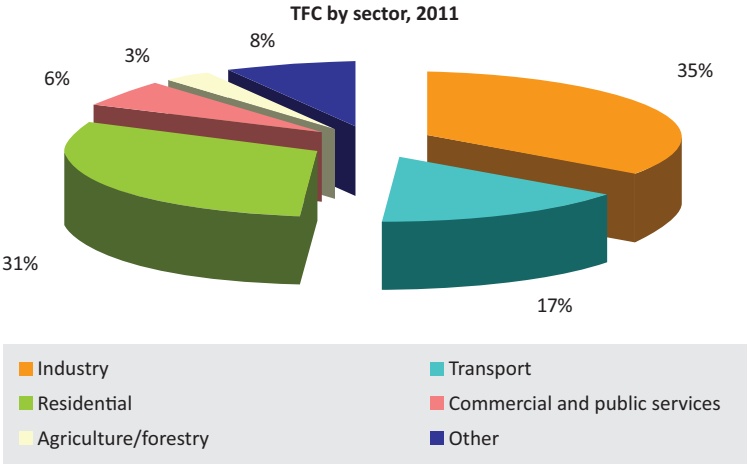
Figure 9 Final energy consumption by sector 2005–2011



Source: IEA online electronic statistical database and national statistics, provided by Ukrainian authorities

Total final energy consumption (TFC) declined through 2008 because of the decline in industry, while the transport and commercial and public services sectors have grown. TFC for 2011 is illustrated by sector in the pie chart below.

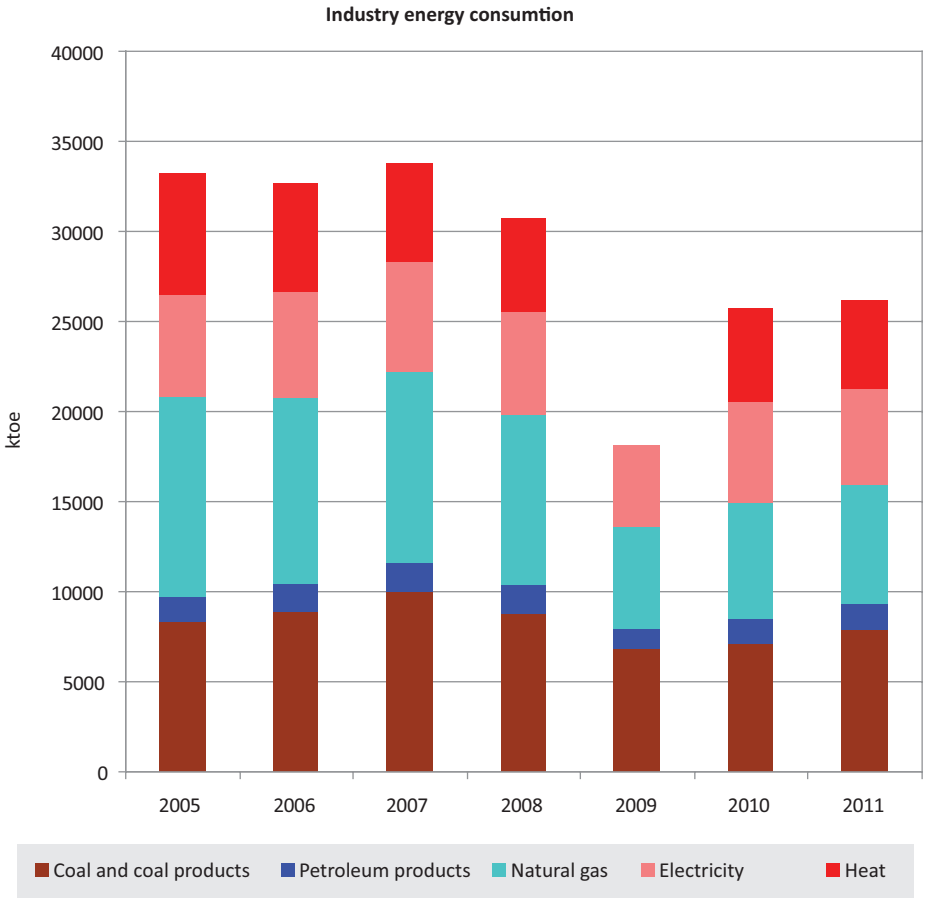
Figure 10 Final energy consumption by sector 2011



Source: IEA online electronic statistical database and national statistics, provided by Ukrainian authorities

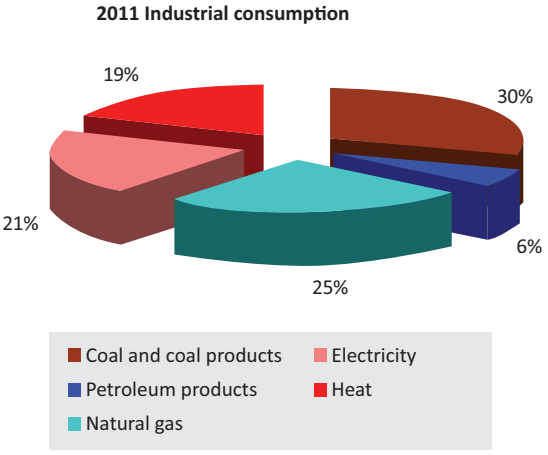
Industry energy consumption trends are presented in the following two figures, in which the scale of the crisis of 2009 is very evident. Industrial consumption in 2011 was running at 80% of its pre-crisis level with the largest drop being in gas.

Figure 11 Industry sector energy consumption trends



Source: IEA online electronic statistical database and national statistics, provided by Ukrainian authorities

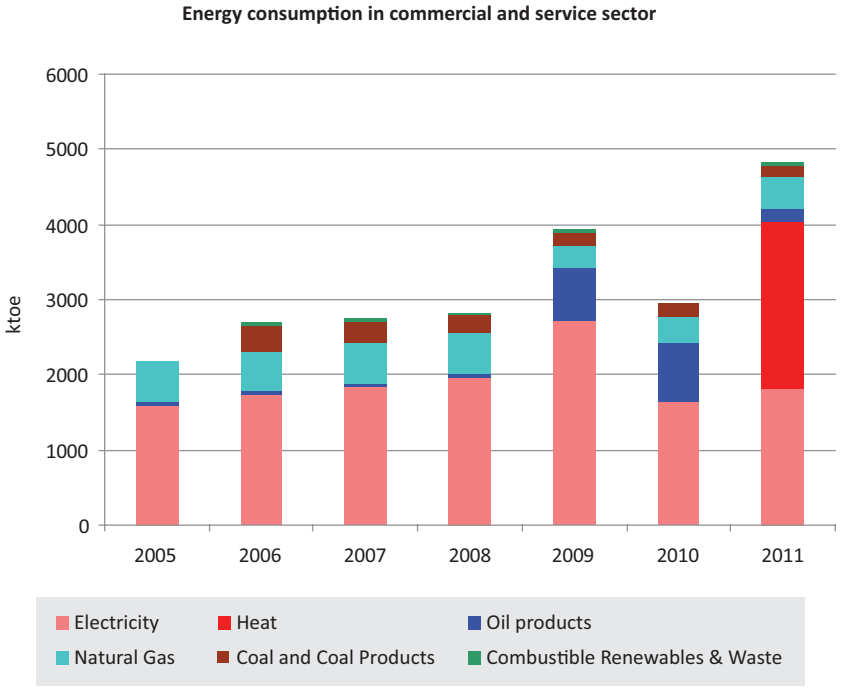
Figure 12 Industry sector energy consumption 2011



Source: IEA online electronic statistical database and national statistics, provided by Ukrainian authorities

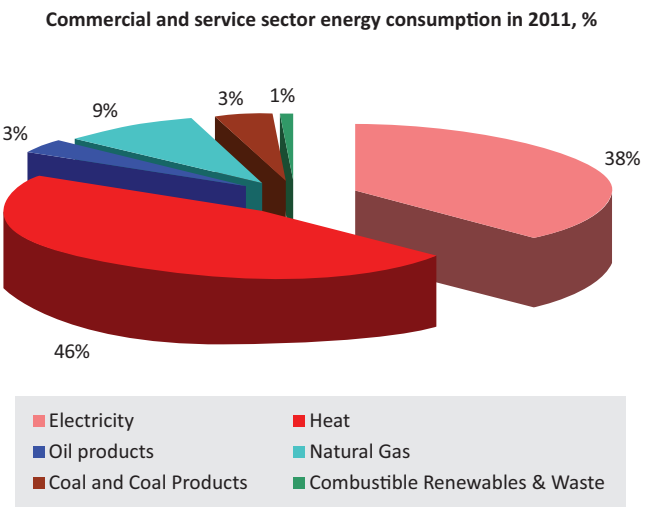
In contrast the energy consumption of the commercial and services sector continues to exhibit an underlying growth trend, notwithstanding the anomalies in the data presented in the following figure.

Figure 13 Commercial and service sector energy consumption 2005–2011



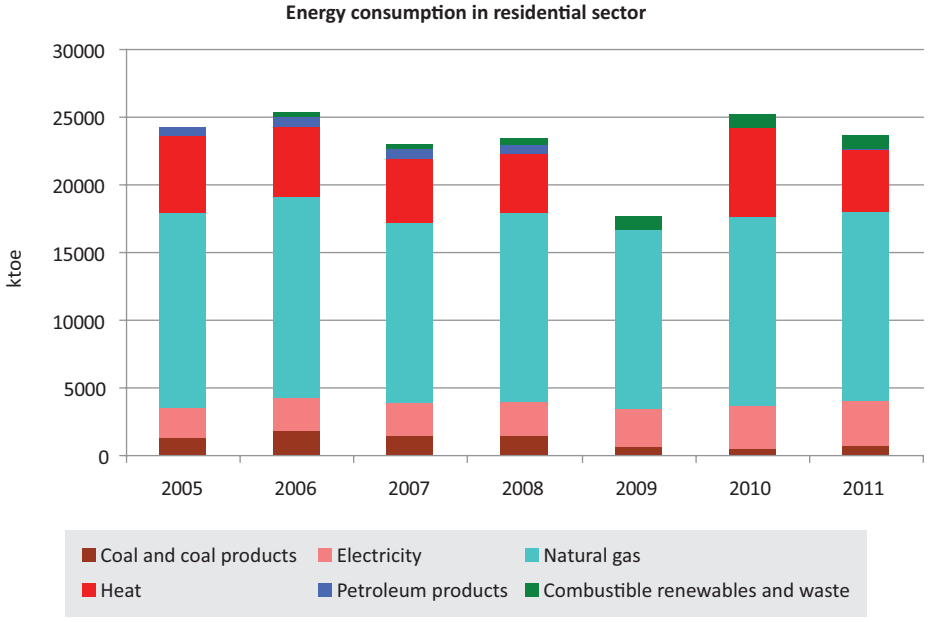
Source: IEA online electronic statistical database and national statistics, provided by Ukrainian authorities

Figure 14 Commercial and service sector energy consumption 2011



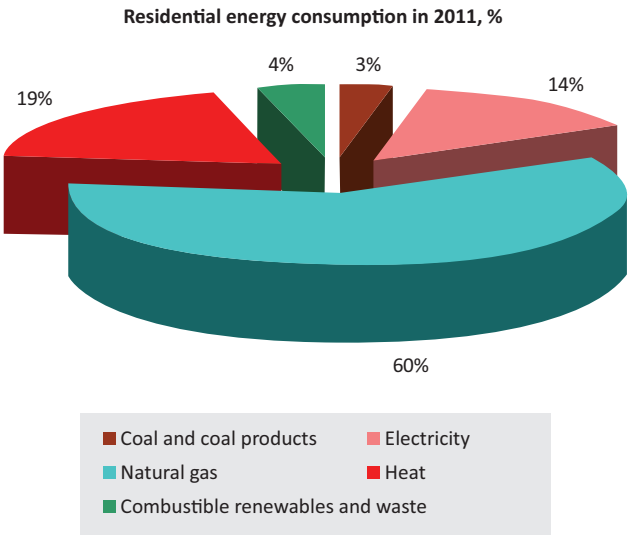
Source: IEA online electronic statistical database and national statistics, provided by Ukrainian authorities

Figure 15 Energy consumption in the residential sector 2005–2011



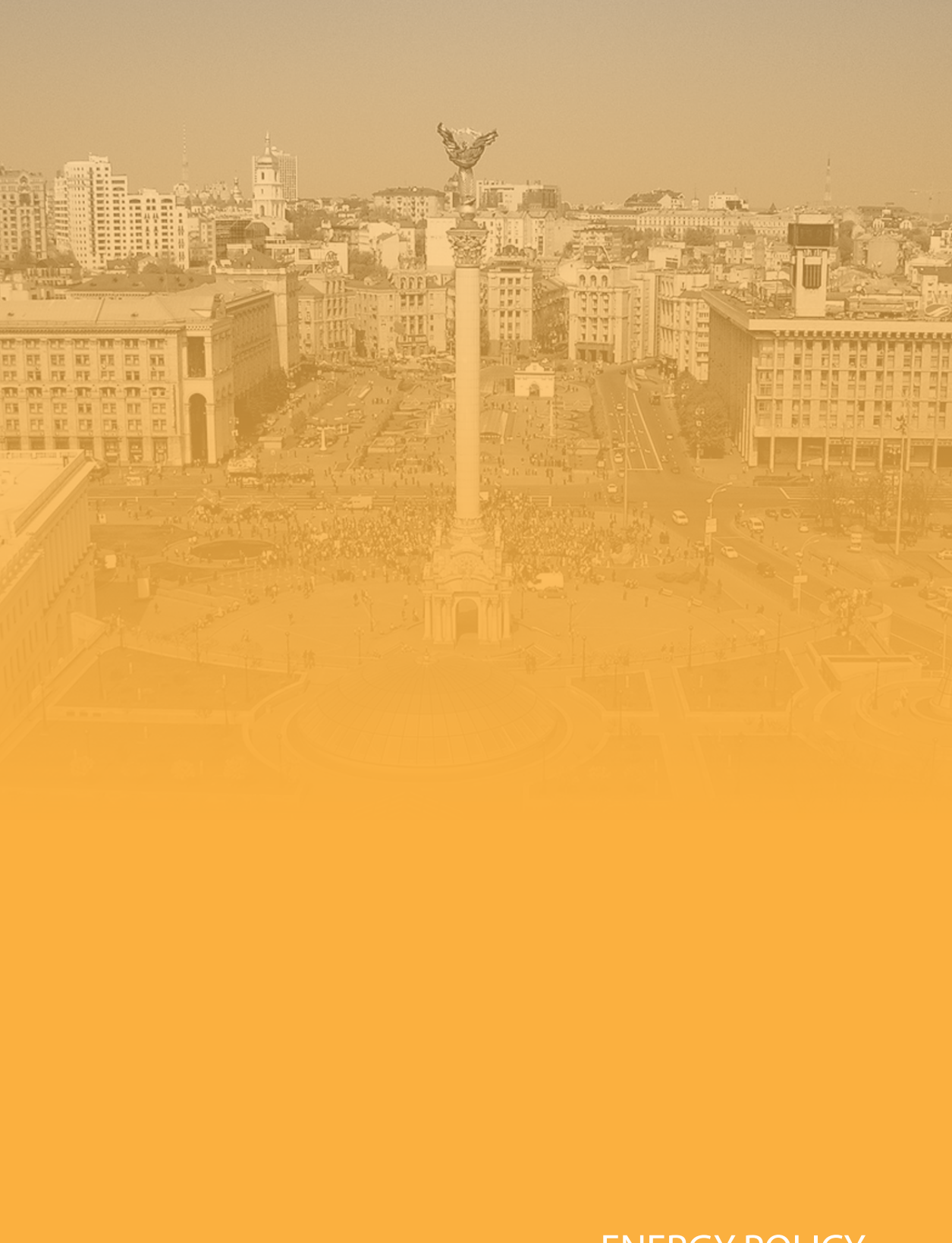
Source: IEA online electronic statistical database and national statistics, provided by Ukrainian authorities

Figure 16 Energy consumption in the residential sector 2011



Source: IEA online electronic statistical database and national statistics, provided by Ukrainian authorities

Figures 15 and 16 show energy consumption in the residential sector for 2005–2011. Aside from the discontinuity in 2008 the most notable feature is the increase in electricity use and the decline in coal use. Gas accounted for 60% of residential energy use in 2011.



ENERGY POLICY

Outline

The energy policy of Ukraine is evolving in line with long established directions on privatisation and with renewed commitments to competition and sustainability arising from the international treaties and agreements that Ukraine has concluded.

At the core of Ukrainian energy policy is a determination to enhance the country's energy security, to capitalise on the revenue from its gas transit infrastructure and to make strong efforts to exploit its untapped oil and gas resources

Reform of the energy sector features prominently in the president's Programme of Economic Reform 2010–2014 and is set out in detail in the chapter on "Modernisation of Infrastructure and Primary Sectors", where the challenges, aims and objectives and necessary steps are analysed before three stages of reform to 2014 are laid out and timetabled, and it concludes with a set of four success indicators.

- Tariffs for households brought to an economically viable level by the end of 2012
- Privatisation of power supply and thermal power generation completely by the end of 2014
- New wholesale electricity market model up and running from late 2014
- Specific energy efficiency of the economy improved by at least 20% by the end of 2014.

Thus there is a clear statement of short-term goals the achievement of which would contribute to the "Prosperous Society, Competitive Economy, Effective State", which the programme seeks to create.

Cooperation in the energy sector is a key element in EU-Ukraine relations within the framework of the Eastern partnership. A memorandum of understanding (MOU) was signed on 1 December 2005 in the context of the implementation of the EU-Ukraine Action Plan. The MOU establishes a joint strategy towards the progressive integration of the Ukrainian market with that of the EU: its substance is a series of five roadmaps covering i) nuclear safety, ii) the integration of gas and electricity markets, iii) security of supply and the transit of hydrocarbons, iv) the coal sector and v) energy efficiency.

Further to a request from the MECI of Ukraine, the EU co-financed the IEA's 2012 Energy Policy Review of Ukraine. The review was published in October 2012; at the launch Ukraine acknowledged that the IEA recommendations would be taken into account in the revision of the Draft Energy Strategy of Ukraine to 2030.

The IEA review acknowledges that energy sector structural reform in Ukraine requires time to develop and take hold. It sets out expectations for desirable outcomes over three to four years, over five to eight years and within 15 years — a timeframe that is close to the Draft Energy Strategy of Ukraine to 2030.

The 16th EU-Ukraine Summit of 25 February 2013 saw Ukraine and the EU reaffirming their commitment to deeper political and trade ties. A joint statement highlighted plans to sign the association agreement later in 2013 and on 15 April 2013 the Cabinet of Ministers of Ukraine approved an action plan to give effect to the joint conclusions of the Seventh EU Ukraine Report under the MOU.

Energy Strategy

The current energy strategy of Ukraine dates from 2006 and is in the process of being updated after public consultation on the Draft Updated Energy Strategy to 2030 in mid-2012.

The Draft Updated Energy Strategy is explicit about the reasons for updating and asserts that the 2006 strategy did not take sufficient account of the following.

- Energy efficiency
- Competition for efficient resource utilisation
- Environmental protection.

The strategy update was also driven by changes in the domestic economy of Ukraine and the recognition that the 2006 strategy was not delivering the targeted level of power station and transmission system upgrades. Other important reasons given were the accession to the EnC, and the impact of the financial crisis on the economy and on energy demand and supply.

The stated aim of the Draft Updated Energy Strategy is to develop an integrated and effective framework with due regard to Ukraine's national legislation and its commitments under international treaties, including commitments to comply with European energy legislation, promote a competitive energy market, improve energy efficiency, increase the domestic production of energy resources, diversify the sources of imported energy, enable cost-reflective pricing and ensure attractive investment conditions for private investments.

As well as envisaging increases in electricity, gas and coal production, it sets out to end subsidies, improve the performance of energy utilities and implement a comprehensive programme of energy efficiency with the reduction of energy consumption in the economy of 30–35% by 2030. The strategy recognises that securing the necessary enabling FDI will require further reforms to prices, competition and law.

The need for training, progress review and post-review adjustment were all foreseen in several growth scenarios that may, in the light of developments since, appear to be too optimistic. For the purposes of this review the chapters dealing with the strategy on heat and alternative renewable energy are particularly important.

In June 2012, the working Draft Energy Strategy was shared with the EU, the IFIs and other bodies: the EU, the World Bank and the US Embassy jointly provided detailed comments in July 2012, seeking greater emphasis on demand-side measures, emphasising the need for a wider consultation of stakeholders and pointing to the importance of taking into account the commitments Ukraine entered into when joining the Energy Community in February 2011.

According to the joint report,[9] "Ukraine has confirmed that the EU Delegation/World Bank/US Embassy comments and the IEA's recommendations will be taken into consideration in the redrafting of the strategy".

Energy Sector Reform

Progress in energy sector reform has been recorded annually in the joint EU-Ukraine report "Implementation of the EU-Ukraine MOU". The seventh such report of 2012 describes the progress since 2011 and refers in the first instance to the strategy as detailed above and then under the five roadmaps that comprise the substance of the MOU.

[9] *EU-Ukraine Energy Cooperation: Seventh Joint EU-Ukraine Report, Brussels, 25 February 2013*

Ukraine's electricity sector operates through separate generation, transmission and wholesale market entities, with the distribution and retail operations bundled together in several regional electricity suppliers.

Unbundling and privatisation have been underway for 20 years and state-owned assets, such as the nuclear fleet and the bulk of the HPPs, were consolidated in state-controlled entities by 2004. Under the Programme of Economic Reforms for 2010–2014, thermal generating plants and supply businesses were to be privatised. Share sales are complete in many cases (of which there were eleven in 2012) — thus the process is well underway.

On the roadmap of the Integration of Electricity and Gas Markets, while a large measure of reform was reported in 2012, the report notes that a number of deadlines have been missed in the obligations attendant on Ukraine's membership of the Energy Community.

Other pressures are evident. For example, Ukraine is urged to expedite its internal procedures for the adoption and implementation of the rules of the third internal energy market package. Furthermore, as a result of the decisions of the 10th Energy Community Ministerial Council on 18 October 2012 to extend the Energy Community acquis to cover EU legislation on the promotion of renewable electricity, on statistics and on oil stocks, as well as Ukraine's agreement to adopt the "Energy Strategy of the Energy Community".

The report draws on the Energy Community Secretariat's 2012 annual report and notes the following.

- Further steps need to be taken to ensure that the NERC is independent and able to set full cost recovery tariffs.
- The draft law concerning state regulation in the energy sector is not in line with the acquis.

Thus important guidance and cooperative oversight are being provided through the Energy Community membership and annual review process.

Similar issues arise in the gas market, in which the pace of reform has accelerated following the joint declaration from the March 2009 Conference on the Modernisation of Ukraine's Gas Transit System (GTS). Provision is being made in law for the unbundling of the state gas company NJSC (Naftogas of Ukraine) and its subsidiaries, as well as for third party access to the network. According to an IMF Staff Working Paper, the following is the case.[10]

Heavily regulated tariffs and a lack of transparency make it difficult to unbundle and privatize NG, as is the government's objective. Legislation to "unbundle" NG was approved by Parliament in April 2012 and privatization of NG's business segments would increase their operational efficiency and enhance service quality. However, regulated tariffs and low or negative profitability of the majority of NG's business segments due to under-priced household gas and heating tariffs would deter investors.

The modernisation of the Ukrainian GTS remains an important priority for the EU, for Ukraine and for the international financial institutions (EIB, European Bank for Reconstruction and Development (EBRD) and World Bank). Support for the evaluation of enhanced gas storage and LNG importation facilities and for investment in compressor station upgrades are all part of a series of actions to improve the GTS, which is central to the interests of Ukraine, Russia and the EU.

[10] *Pritha Mitra and Ruben Atoyan, IMF working paper, WP/12/247*

The Master plan for the Development of the Ukrainian Coal Industry was developed in 2011. Its core elements deal with privatisation, mine closure, occupational health and safety, the environment and the mitigation of social impacts.

Implementation

The 16th EU-Ukraine Summit of 25 February 2013 saw Ukraine and the EU reaffirming their commitment to deeper political and trade ties. A joint statement highlighted plans to sign the association agreement later in 2013. The 27-nation EU, in an explicit show of support for Ukraine, also announced a €610 million loan to Kyiv for "macro-financial" assistance.

Targeting the implementation of the Order of the President of Ukraine No. 127 on the Decision of the National Defence and Security Council of Ukraine of 12 March 2013 "About urgent measures directed to ensure European integration of Ukraine", the MECI of Ukraine in synergy with the concerned central executive authorities and organisations elaborated the Action Plan on Activation of Cooperation between Ukraine and the EU in the energy area for 2013, which was approved at a session of the Cabinet of Ministers of Ukraine on 15 April 2013.

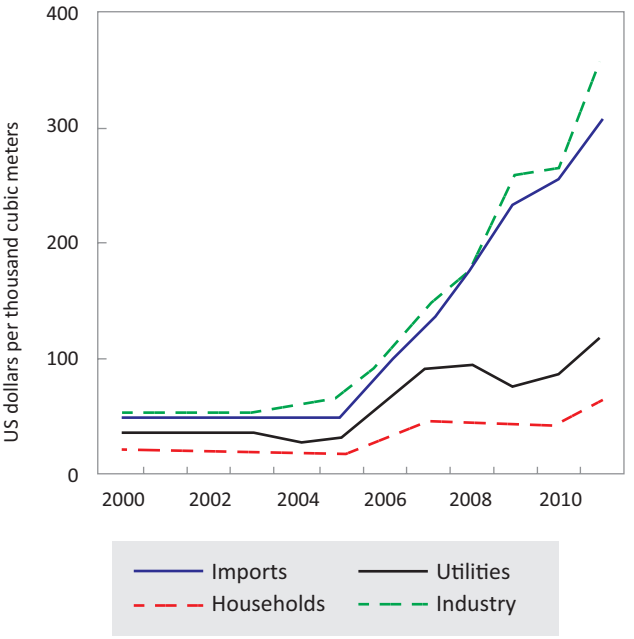
Energy Pricing Policy

The Government of Ukraine has on many occasions and in policy documents affirmed the need for energy price reform to eliminate subsidies and to move to competition-facilitated cost-reflective pricing. For example, "Tariffs for households brought to an economically viable level by the end of 2012" is one of the four key performance indicators of the Programme of Economic Reform 2010–2014.

The matter of making sure that tariffs are cost reflective and economically viable for service providers is not confined to households — it affects industry and municipalities and extends across electricity, gas and heat tariffs, all of which are subsidised to some degree with serious consequences for all and, not least, for the effectiveness of the energy system in supporting economic recovery.

Residential electricity prices are low in comparison with those of Western Europe and on a par with Belarus and Russia. The government increased prices in 2006 and 2007 and again in 2011. Cost recovery peaked at 60% in 2006 and then fell to 28% in 2011.

Figure 17 Gas prices in Ukraine 2000–2011



Source: Pritha Mitra and Ruben Atoyan, IMF working paper, WP/12/247

Industrial electricity prices are determined by the NERC and they are set monthly. The industry sector effectively subsidises the household sector at a penalty of prices that are 22% higher to meet the cost of the subsidy. It is through Ukraine's high reliance on state-owned nuclear power for 47% of its electricity and the fact that these plants are fully depreciated that it is possible to maintain subsidies.

However, it is in the heating sector where the crisis is most acute. The rise in energy prices and the earlier failure to pass though these costs has become manifest in a loss of competitiveness and an increased dependence on subsidies that the state and, more directly, Naftogaz can no longer afford.

According to the annual report of the EU Action Programme 2012 for Ukraine,the deficit of Naftogaz Ukrainy (NG) will most likely miss the target (0.7% of GDP) and is forecast to reach 2% of GDP this year. The company's finances continue to suffer from failure to raise domestic tariffs, as well as higher import costs and lower than expected payment compliance. Rather than increasing commodity[11] gas prices received by NG from households and heating utilities by 30% and 58%, respectively, in 2011, as agreed with IMF, the authorities reduced them by 20% and 6%. Domestic tariffs received by NG remain a small fraction of the actual cost of imported gas.

[11] *"Here, the reference goes not to the nominal tariffs per se but the price of gas as a commodity that is the part of the tariff which ends up with NG and has an impact on its cash receipts. The composition of the tariff is the following — (a) price of gas as a commodity, (b) transportation tariff for TransGas, (c) transportation tariff for oblgasi, and (d) surcharge (mark-up) on the gas price. For the period observed the nominal level of the tariff remained unaltered while the market regulator kept increasing (b) and (c) which eventually shrank the portion of NG's share of the pie."*

Investment by district heating providers has been postponed in an effort to contain costs in the face of low customer revenues and rising input, mainly gas prices. A pattern of normal wear and tear combined with reduced investment has resulted in a deterioration of assets, competitiveness and the erosion of profits into large losses on the supply side. The performance of the economy has limited many end-users' ability to pay. Thus consumers and suppliers alike are caught in an affordability trap, where the already high input costs are amplified in their impact by the inefficiency and high levels of wastage in the energy conversion, transmission and end-use system.

Access to capital for investment in modern technology, systems and remedial works is widely agreed to be essential for progress and several international finance institutions have committed to supporting Ukraine in reconstructing the energy sector. This support is, however, conditional on Ukraine putting in place a series of reforms to underpin the long-term economic, social and environmental sustainability of energy services in Ukraine.

Institutional Arrangements

The institutional framework for energy policy development and implementation has been reorganised in recent years with the Cabinet of Ministers of Ukraine designated as the ultimate decision-making body. The Cabinet of Ministers of Ukraine is responsible for policy coordination and oversight of state energy companies. Energy policy is high on its political agenda with Parliament and the president also involved in the decision making.

Government ministries with energy policy responsibilities include the following:

- The MECI is responsible for most energy supply policies and for coordinating energy policy across the government and providing advice to Parliament.
- The Ministry of Economy and Trade Development is the lead for energy efficiency policies; responsibilities for implementing energy efficiency policies are shared with several ministries and agencies.
- The Ministry of Ecology and Natural Resources is responsible for licensing and production sharing agreements for hydrocarbon development and for climate change policy.
- The Ministry of Regional Development, Construction and Housing and Communal Sector of Ukraine develops policy and programmes relevant at local levels.
- The Ministry of Finance is responsible for taxation relevant to the energy sector.

Budgetary Provision

The EU Action Programme 2012 in Ukraine's annual report concludes that "there is neither an overall medium term fiscal framework (MTFF) nor a medium term expenditure framework (MTEF) for the energy sector. The revised Draft Energy Strategy to 2030 provides the Ukrainian Government's estimate for financial and other resources needed to implement the reforms in the energy sector". There follows some extracts.

The state budget allocates funds to the MECI, NERC and the SAEE. In 2011 the budget for the SAEE was UAH 625 million (5.6%), including an allocation for the implementation of the state programme on energy efficiency with UAH 600 million. It was reduced to UAH 534 million (4.8%) in 2012 (see below).

In the budget for the fiscal year 2012, the total for the three executive authorities was UAH 11,071 million (ca. €1,100 million). Of this, the allocation for the ministry was UAH 10,502 million (or 94.86%), including state aid to the coal producing companies for the amount of UAH 7,802 million, for the SAEE UAH 534 million (4.8%), including an allocation for the implementation of the state programme on energy efficiency of UAH 502 million, and for the NERC of UAH 35 million (0.3 %). The budget for 2012 provided very significant — although compared to 2011 considerably reduced (from UAH 7,000 million (ca. €650 million)) — allocation for subsidies to offset the commercial impact of government fixed concessionary electricity, gas and heat tariffs, accounting for UAH 4,575 million (over €400 million)."

State Agency for Energy Efficiency and Energy Saving of Ukraine of Ukraine

The SAEE is a legal successor of the National Agency of Ukraine for Efficient Use of Energy Resources and the State Inspectorate for Energy Saving, a governmental body of state administration that acted within the National Agency of Ukraine for Efficient Use of Energy Resources. It was established by a presidential decree dated 13 April 2011 and amended on 22 February 2012.

The SAEE is a central executive authority directed and coordinated by the Cabinet of Ministers of Ukraine through the agency of the Minister of Economic Development and Trade of Ukraine. It is part of the executive authority system and is charged with the implementation of the state policy concerning efficient use of fuel and energy resources, energy saving, renewable energy sources and alternative fuels.

National Commission for Energy Regulation

The NERC was established in 1994 and has 432 staff members. There is provision for six commissioners to serve for a term of six years. Commissioners are appointed by the Cabinet of Ministers on the advice of the prime minister of Ukraine, and can be re-appointed for a second term not more than once.

The NERC is responsible for the following:

- Regulation of natural monopolies activities in the power sector, in the oil and gas complex and in the sphere of heat generation
- Protection of the rights of consumers of electricity, heat, gas, oil and oil products
- Issuance of licences to entrepreneurial entities operating in the energy sector
- Implementation of pricing policies in the power sector, in the oil and gas complex and in the sphere of heat generation
- Regulation of relations in the retail electricity market.

The NERC is financed from the national budget and its main responsibilities for regulation in the field of alternative energy are as follows.

- Participation in establishing and providing for the execution of the state national investment policy in the environmental protection sector area as well as the state policy in the field of the regulation of anthropogenic adverse negative impacts on climate change
- Execution of the provisions set in the United Nations Framework Convention on Climate Change (UNFCCC) (955_044) and implementation of the mechanisms of the Kyoto Protocol,

including the implementation of greenhouse gas (GHG) mitigation projects, attracting investments to the environmental protection

- Establishment of and ensuring the operation of the national system for the assessment of the GHG emissions and absorption.

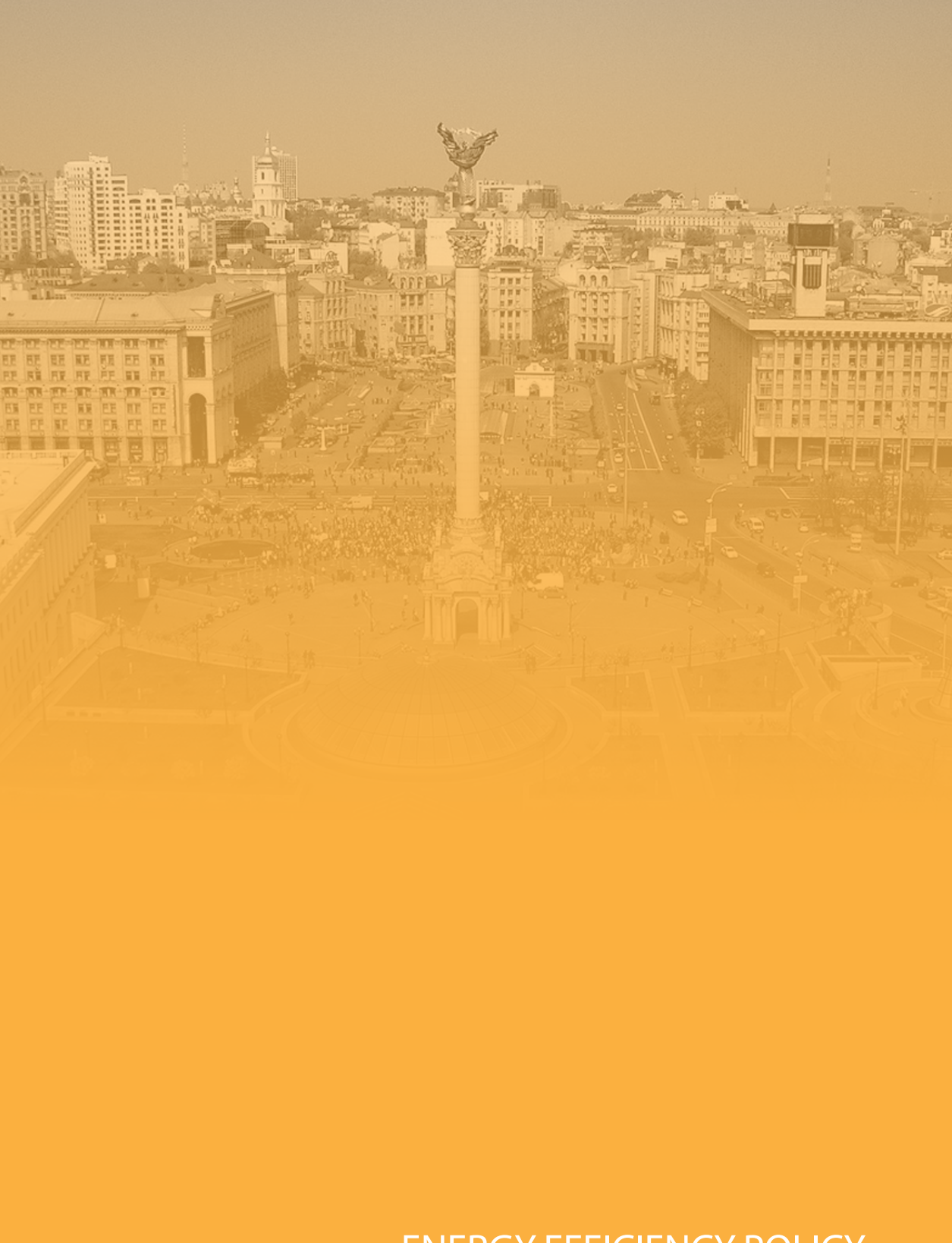
State Statistical Service of Ukraine (SSU)

The collection and collation of energy statistics in Ukraine has been evolving since 1991 through to 2001 under the responsibility of the SSU (Urkstat). In 2011 the energy balance of Ukraine in 2010 was completed according to approved methodological regulations for statistical surveys and energy balance building.

This evolution is based on the law of Ukraine and a series of ordinances of the Cabinet of Ministers of Ukraine in 1999, 2007, 2008 and 2011, with the ultimate aim of achieving compliance with international rules and EU standards. Statistics are collected and reported monthly and annually. There are six key administrative sources of data on the primary energy sources as well as heat and electricity, with price data being supplied by the NERC.

Urkstat has been working closely with the IEA to develop and publish the energy balance for Ukraine in accordance with agency and international standards. Energy balances for 2010 and 2011 were recently completed and are available on the Urkstat website.[12]

[12] *http://ukrstat.gov.ua/*



ENERGY EFFICIENCY POLICY

Overview

The energy intensity of Ukraine's GDP is high compared with that of advanced countries of the world and is a significant factor in the competitiveness of the economy. According to figures supplied by the SAEE, at 0.4kg of oil equivalent per US$ of GDP Ukraine's energy intensity is comparable to that of Russia (0.42), twice that of the United States (0.19) and three times that of Japan and Germany (0.14).

Ukraine, like many more developed countries, has unrealised energy efficiency potential. The IEA's Ukraine 2012 puts it at 20-30% of the energy supply — a magnitude that should ensure that it is accorded a high priority in a sustainable energy policy.

With less than half the energy efficiency potential of Ukraine, the EU has set a target of a 20% improvement in energy efficiency by 2020 and member states have drawn up individual national energy efficiency action plans to secure, demonstrate and monitor progress with respect to the target. Against this background Ukraine has set energy saving targets of 30-50% in various timeframes, to 2015 and to 2030.

One of the stated reasons for the 2012 update of the National Energy Strategy of Ukraine to 2030 was to address and provide for the growing importance of energy efficiency. This was in the context of a world of rising oil and gas prices, where there is greater emphasis on security of supply and on the need to reduce emissions of GHG. It is precisely because of energy efficiency's direct and positive impact on the economic, social and environmental dimensions of energy systems that it is widely recognised by policy makers as the priority in achieving early and sustained progress on energy and climate goals.

Internationally, there is plenty of evidence to show that in captive markets, where effective regulation is lacking and especially where energy prices are subsidised, energy consumption increases with little or no commensurate increase in welfare or output. Waste is not merely tolerated; it is effectively encouraged. Furthermore, when energy prices rise, as they have in Ukraine, the response from consumers is often delayed, and delayed indefinitely where ability to pay is an issue.

The slow pace in which Ukraine is adjusting to its changed energy and economic circumstances has brought about a situation where the embedded inefficiencies of energy supply in utilities and the associated infrastructure are amplifying the increased costs of energy and other inputs. Competitiveness and affordability are now serious issues for large numbers of businesses and consumers alike. Utilities are financially stretched and the government's ability to maintain subsidies where needed is severely constrained.

The Government of Ukraine is well aware of the current situation and is appreciative of the need to establish and provide for the regulation of competitive markets to resolve the tensions in energy supply and demand while delivering quality services to consumers. At the present time the energy system, in addition to its underpinning role of service provision, is recognised as one of the principal axes of economic development and the economic fortunes of Ukraine are very much bound up with its successful reform.

Energy Efficiency Potential of Ukraine

The energy saving potential of Ukraine has been estimated at one quarter of the TPES or 27Mtoe equivalent by the IEA in its Ukraine 2012 review.

The Draft Updated Energy Strategy of Ukraine to 2030 (7 June 2012) provides for a comprehensive programme of energy efficiency with a reduction in energy consumption in the economy by 30-35% by 2030, with the intention of reducing the energy cost burden on the economy and increasing the energy independence and competitiveness of the economy. The strategy is subject to high, medium and low growth projections on the back of assumptions about the rate of economic growth in the main economic sectors of industry, services and agriculture.

The strategy gives an overview of the potential savings in heat supply, which is well developed by way of district heating systems in Ukraine. Most heat networks and heat sources have no automated consumption monitoring and control, with the result that accurate information is not available. Estimated losses are reported to be at least 30%, and may in fact be larger. There are also large heat losses in heat networks due to their poor physical condition. Most systems lack appropriate temperature controls for users. This leads to additional heat losses, which are estimated to be 10-15%. Finally, it notes that the large amount and proportion of unmetered heat that is subject to a flat rate charge ensures that there is little or no consumer incentive to conserve use.

The implementation of other energy saving measures for consumption in the built environment sector includes reducing its specific consumption by about 30% through the insulation of houses as well as the application of up-to-date norms and standards in construction work, primarily in the construction and renovation of residential and commercial building stock.

The strategy is clear about the role of prices in influencing consumer behaviour and also about the need to manage scarce public resources and target the vulnerable. It asserts the following.

Also an important factor in improving the efficiency of heat should be changing consumer behaviour due to the tariff and non-tariff incentives. Implementation of such projects requires an early abandonment of the practice of cross-subsidisation of the industry in the areas of gas, electricity and heat production subsidies, with the introduction of mechanisms for targeted subsidies to vulnerable populations.

The approach to estimating the potential for energy saving in heat supply is illustrated by the following extract from the updated strategy.

Under the baseline forecast total heat consumption by 2030 increases to 271 million Gcal, or slightly more than 15% compared to the base year. The greatest growth will occur in the commercial and public sector due to the expected three-fold increase in the specific area per person. Given that the efficiency of heat will improve by 30%, the consumption of these sectors will increase from 29 million to 53 million Gcal per year. Heat consumption industry will grow from 47 million to 57 million Gcal by virtue of industry growth (increase in the share of GDP doubled).

The updated strategy assumes that residential sector energy consumption will increase from 156 million Gcal/annum to 161 million Gcal/annum over the period. The main driver is an increase in the specific area per person from 23 m^2 at present to 38 m^2 in 2030. On the other hand, the impact of the higher efficiency of new buildings will be offset by the lower performance of existing buildings, resulting in an average reduction per head of population of not less than 20%.

The evidence suggests that there is wide agreement about the sources of inefficiencies and the current scale of energy losses in aggregate, and a good understanding of the remedial action required. It also suggests that there are wide gaps in terms of detail in the knowledge and

data, gaps that could lead to future revisions to programme estimates and projections, thereby running the risk of undermining the credibility of those programmes that are predicated on existing data.

The accession of Ukraine to the Energy Community and the associated requirement to adopt the European Community's aquis provided the impetus for the preparation of a national energy efficiency action plan that contains, as the principal element, a roadmap to energy savings. The roadmap should be predicated on a firm statistical base and quantify for each sector the saving that will result from actionable measures that are economically feasible and within the capability of the actors involved to deliver.

The Draft Updated Energy Strategy expresses it as "The major task in the field of energy efficiency of the economy of Ukraine due to technological leverage is to increase the energy efficiency of electricity, gas, heat and oil. To ensure the goals necessary to develop a comprehensive energy efficiency programme that includes a description of the specific measures to achieve these goals.

The government, through the "State target economic programme of energy efficiency and renewable energy sources 2010-2015", aims to create the right conditions to approximate the energy intensity of the GDP of Ukraine to the level of those of developed countries and EU standards. This is interpreted as reducing the energy intensity of the GDP within the period of the programme by 20% compared to in 2008 (annually by 3.3%), increasing the effective use of fuel and energy resources and improving the competitiveness of the national economy".

The programme also aims to achieve the following:

optimising the structure of the state energy balance, where the share of energy carriers obtained from renewable energy sources and alternative fuels will amount to at least 10% in 2015 due to reduction of the share of imported fossil organic energy resources, in particular natural gas, and their substitution via alternative energy resources, including the secondary ones, provided the Programme will be duly financed.

Policy Framework

As we have seen, the recent strengthening of the energy efficiency policy of Ukraine is reflected in the Updated Energy Strategy of Ukraine to 2030 for consultation in June 2012. This was a response to i) the poor performance of the strategy up to 2012, ii) changes in the external environment, where greater emphasis is placed on energy efficiency and GHG reduction, iii) perceptions about security of supply in Ukraine and, finally, iv) the demands of international finance organisations and donors with strong views on sustainable energy investments.

Policy is also adapting to the strategic choices made by Ukraine as it seeks to exploit growing external markets for agriculture, energy and industrial products while building an effective service economy at home. These strategic choices include its accession to the Energy Charter Treaty, the deepening of its relations with the EU and its membership of the Energy Community and the WTO. Thus energy efficiency policy formulation and delivery in Ukraine are being adapted to reflect these choices and the commitments entailed.

Arising from these choices is a need to demonstrate progress in the transposition and effective implementation of a range of EU directives that bear on the structuring of energy markets for competition and on their subsequent regulation. From an energy efficiency perspective this is a first requirement for giving a robust and very necessary true-cost price signal to energy users.

Other directives focus on energy efficiency and align with Ukraine's undertaking to achieve a reduction in energy demand of 9% by 2020. These include the following.

- Energy End-use Efficiency and Energy Services Directive (2006/32/EC)
- Energy Performance of Buildings Directive (2010/31/EC)
- Energy Labelling Directive (2010/30/EC).

The cooperation with the EU that has resulted in the conclusion of an agreement over five lines of action or roadmaps and the linking of these to financial and other support constitute an important step in maintaining discipline over a timeframe that extends beyond the electoral cycle.

Achieving the widely visible process that will enhance the capability to do more requires early strategic and accurate targeting of those issues that are capable of early resolution. Such early success can create confidence and augment the resource base on which further action can build.

The Draft Updated Energy Strategy of Ukraine to 2030 is a long and detailed document and not all of the supporting analysis was available for inspection. The strategy has a high level of awareness of what has to be achieved but it is less clear on how it will be achieved, that is, by whom, with what resources, in what order and at what pace. While the main responsibilities are delineated, the progress anticipated is tellingly acknowledged to be dependent on the availability of resources.

A draft Law on Energy Efficiency, which should replace the 1994 Law on Energy Conservation, which is unanimously recognised as obsolete, is still under preparation. Article 5 of this law provides for "Ensuring implementation of energy saving policies and measures for energy conservation in all sectors of the economy — industry, transport, construction, agriculture, etc., in social and everyday life, as well as in interstate and international cooperation".

With regard to the technical regulation of the building sector, the controls in force stem from the Resolution of the Cabinet of Ministers of Ukraine N1764 of 20 December 2006 on Approval of Technical Regulations for Construction Products, Buildings and Structures, which consider "The main requirement to buildings is to ensure energy conservation. In the course of designing, erection and equipment of a building it is necessary to ensure the efficient use of energy required for use, with due account to climatic conditions". In accordance with Article 11 of the Law of Ukraine on Construction Standards, use of building standards or their individual provisions is mandatory for all entities, regardless of their form of ownership, that are engaged in construction, urban planning and architectural activities and in the manufacturing of products for construction purposes.

The new draft Law on the Efficient Use of Energy Resources will determine the legal principles for promoting energy efficiency in Ukraine, with the aim of ensuring economic and organisational conditions for the efficient and economical use of fuel and energy. While this draft law includes a number of provisions in Directive 2001/31 on energy services, it does not provide for a national energy efficiency action plan, a national target and for energy efficiency criteria in public procurement.

With regard to buildings generally, the Law of Ukraine on the National Programme for Reform and Development of Housing and Communal Sector for 2009-2014 states "One of the main

objectives of the programme is technical rehabilitation, reduction of specific indicators of use of energy and material resources necessary for provision of housing and utility services, including establishment of an effective and transparent mechanism to encourage the use of alternative energy sources and fuels".

Positive developments in the legal and regulatory framework took place in 2012, with a Law on Energy Efficiency of Buildings adopted in a first reading, and the second reading expected early in 2013. It sets out and defines i) the basic principles of state policy in the sphere of energy efficiency of buildings, ii) the organisational and legal basis for the certification of the energy efficiency of buildings, iii) major energy efficiency measures in buildings and iv) general principles of professional and information support in the field of energy efficiency of buildings, rights and duties of the owners (co-owners) of buildings.

Thus this draft law reflects the main provisions of the Energy Performance in Buildings Directive as required by the EnC. The related secondary legislation is also reported to be under preparation by the Ministry of Regional Development, Construction and Municipal Economy.

The SAEE is charged with preparing policies in line with the EnC. These include a roadmap for the implementation of the Energy Community acquis and the national energy efficiency action plan, drafts of which were submitted to the Energy Community Secretariat in 2012. It is also preparing regulations to comply with the Directive on Energy Labelling.

Requirements for Coordination

The realisation of energy efficiency goals carries implications for other government departments and the policy goals to which they are committed. Aside from the Ministry of Economic Development and Trade, which has central responsibility for energy efficiency, those most affected in Ukraine are the Ministry of Energy, Ministry of Environment and Ministry of Regional Government and of course Ministry of Finance.

The implementing agencies or authorities of the same ministries have similar orientations and will have corresponding requirements to align their actions, if not in terms of synergy, then at least to avoid overlap and conflict.

Finally, with respect to public governance arrangements, while policies may be well formulated in ministries at the national level, responsibility and accountability for delivery have to be devolved and commensurate resources have to be allocated at regional and local levels for effective implementation. Thus the arrangements at local government and municipality levels must be such as to administratively support the balanced realisation of what is enshrined in national policy.

However, not all of the actors are within the public sector and indeed the policy thrust is to place more and more of the responsibility for service delivery on the private sector to achieve service delivery under market conditions. Thus there is a role for government to hold consultations and to ensure that there is, among other things, secondary legislation to establish standards of performance, adequate provision for training capacity and programmes of awareness to complement initiatives and accelerate the deployment of energy saving technologies. Many of these complementary activities are reflected in the detailed requirements laid out in EU directives. Thus, while the directives have compliance at their core, they also embody procedures that are proven to help delivery when diligently and sensitively employed.

In connection with the ongoing electricity market reform process the regulatory authorities across Europe and the US regularly post notices of intent and engage in consultative procedures to ensure that the principal actors are market ready and informed, and that their legitimate interests and insights are given adequate consideration in the evolution of market rules and arrangements. Thus the processes by which the regulatory system evolves under market consultation and scrutiny serve to coordinate and align the expectations of the players.

This commitment to transparency addresses many issues of coordination at the same time as addressing the transparency of the decision making and in doing so underpins the evolution of fit-for-purpose regulation. Common to all such effective consultations is a clear statement of intent coupled with the proposed arrangements.

If coordination is so important at the level of policy implementation it is clearly even more important at the policy design stage. The added importance is not simply a result of the high level at which national policy is determined, but rather it is because different kinds of outcome are sought, that is, economic impacts, environmental goals, rights to property and profits, etc. Thus there is the expressed desire for more public consultation on energy policy on the part of a range of Ukrainian and international bodies aware of the complexities and trade-offs involved in policy formulation and implementation.

Once again the requirements for coordination are acknowledged and foreseen by the Ukrainian authorities. At the highest level this is reflected in the elevation of the final responsibility for energy policy formulation and assigning to the Cabinet of Ministers of Ukraine. Such arrangements need a strong underpinning agreement and a commitment to collegiality in making the arrangements work.

Institutional Arrangements

The SAEE is mandated to provide policy proposals to the minister on efficient use of fuel and energy resources, energy saving, renewable energy sources and alternative fuels, as well as to ensure the implementation thereof. It has the authority to develop and approve the state, industrial and regional purpose-oriented programmes on the efficient use of energy resources, energy saving, renewable energy sources and alternative fuels. It is empowered to exercise control over the implementation of complementary state programmes.

The mandate of the SAEE extends to 19 other areas of responsibility, including facilitating appointments and the dismissal of directors of state enterprises in accordance with established procedures. Thus the SAEE has executive, policy, implementing and regulatory functions and sits within the Ministry of Economic Development and Trade.

State Target Economic Programme of energy efficiency and renewables RES 2010–2015

The state target economic programme of energy efficiency and development in the sphere of production of energy carriers produced from renewable energy sources and alternative types of fuel for the years 2010–2015 was approved by Resolution No. 243 of 1 March 2010 by the Cabinet of Ministers of Ukraine, most recently amended on 25 January 2012. The resolution provides for the following.

- The Ministry of Economic Development and Trade shall annually include programme specific objectives, measures and indicators on submission of the SAEE to sections of the draft of the state programme for the economic and social development of Ukraine for the relevant year.

- The Ministry of Finance, the SAEE shall include funds for performing the measures and tasks in the programme when drafting the state budget of Ukraine for the relevant year.
- The SAEE shall submit the annual report on the fulfilled programme results by 15 April of the year following the reporting period to the Cabinet of Ministers of Ukraine and the Ministry of Economic Development and Trade.

The programme envisages and lists a set of issues for which solutions are required in harmony with the implementation stages of the draft energy strategy of Ukraine and then proceeds to list the following main tasks of the programme, as follows.

- Improvement of the legal framework and the standards system in the field of energy efficiency, renewable energy and alternative fuels through two action lines
- Reduction of technological losses and non-productive losses of energy carriers due to the modernisation of equipment, introduction of modern energy efficient technologies, improvements in state governance and promotion of energy efficiency, in particular by means of seven capital-intensive lines of action
- Optimisation of the structure of the state energy balance, including the replacement of conventional energy sources by other types, including the ones derived from renewable energy sources and alternative fuels, and secondary energy resources, by means of 12 renewable, peat, gas and new technologies, including lines of research
- Rehabilitation of residential buildings, social sphere objects and building facilities that are fully funded from the state budget, which represent a complex set of technical measures aimed at their restoration and adjusting their thermal performance according to modern requirements, norms and standards, reducing energy and water losses and improving residence conditions for employees.

The execution of the programme will enable some 12 goals, including the following:

- to reduce the energy intensity of the GDP by 20% compared with 2008
- to optimise the structure of the state energy balance, where the share of energy carriers derived from renewable energy sources and alternative fuels will amount to at least 10% in 2015
- to ensure that, due to implementation of the programme, the substitution of the natural gas in the state energy balance amounts to at least 15 mlrd. m^3, starting from 2016, and 1 million tonnes of mineral oil
- to increase the level of heating supply to the population and to reduce the volume of natural gas for producing thermal energy required for heating the residential stock, by 60%, and for public buildings by 35%
- to reduce by 50% the state budget expenditures for financing public utility services for energy supply to public institutions
- to provide for a reduction in the consumption of imported natural gas by 25%.

The indicative financing of the programme amounts to 341.59 mlrd. UAH, including 7.58 mlrd. from the state budget, 15 mlrd. from local budgets and 319.01 mlrd. UAH from other sources. The scope of financing the programme is revised once a year when drafting the state and local

budgets for the relevant year within the framework of expenditures stipulated by the chief budget funds administrator.

Implementation

Programme implementation has been by way of the following.

- 15 sectoral programmes for energy efficiency improvement
- 27 regional programmes for energy efficiency improvement
- 45 programmes to reduce energy resource consumption by budget-funded institutions.

In the financial envelope for the programme the bulk (93.5%) of the estimated €34,600 million required was envisaged as coming from other sources leveraged by a state budget contribution of 2.2% and a local budget of 4.3%.

Considerable effort has been devoted to the establishment of normative standards for utilities and industrial processes.

According to a presentation by SAEE, in the housing and utility sector, water losses in 2012, at 33.41%, were running about 10% above the "normative water loss % of 29.96. The recorded thermal losses for 2012 in transportation by enterprises in Ukraine's housing and utility sector were presented as being 15.81% compared with "Approved normative thermal energy losses" of 15.13%.

The certification of specialised organisations is administered by the SAEE and since 2005 the total number of organisations certified has increased from 69 to 145 in 2013.

The development of technical regulations on energy labelling in 2012 to comply with EU law has focussed on amending the current technical regulation on the energy labelling of domestic appliances.

- Electric equipment, approved by the Resolution of the Cabinet of Ministers of Ukraine No. 5 of 6 January 2010
- Refrigerators, freezers and their combinations, approved by the Resolution of the Cabinet of Ministers of Ukraine No. 107 of 6 February 2011
- Washing machines approved by the Resolution of the Cabinet of Ministers of Ukraine No. 108 of 6 February 2011.

The National Action Plan for Energy Efficiency has progressed according to Directive 2006/32/EC on energy end-use efficiency and energy services. The main goal is to set out the measures to achieve the energy saving target of 9% for the average end-use domestic energy consumption by 2020. It is being prepared on the basis of the EU-supported "EMEEES" project template for the Energy Community member states and it considers the four economic activity areas of services, housing, industry and transport.

Energy Efficiency in Transport

In the context of the transport strategy of Ukraine to 2020 there is a state approved "Sector programme for the improvement of energy efficiency in the transport sector for 2010–2014", the goal of which is to reduce the transport energy consumption by the subordinate budget institutions of the ministry. The means employed are all-embracing and are organisational,

technical, institutional, legal, economic and financial activities implemented at the enterprises, institutions and establishments subordinate to the ministry.

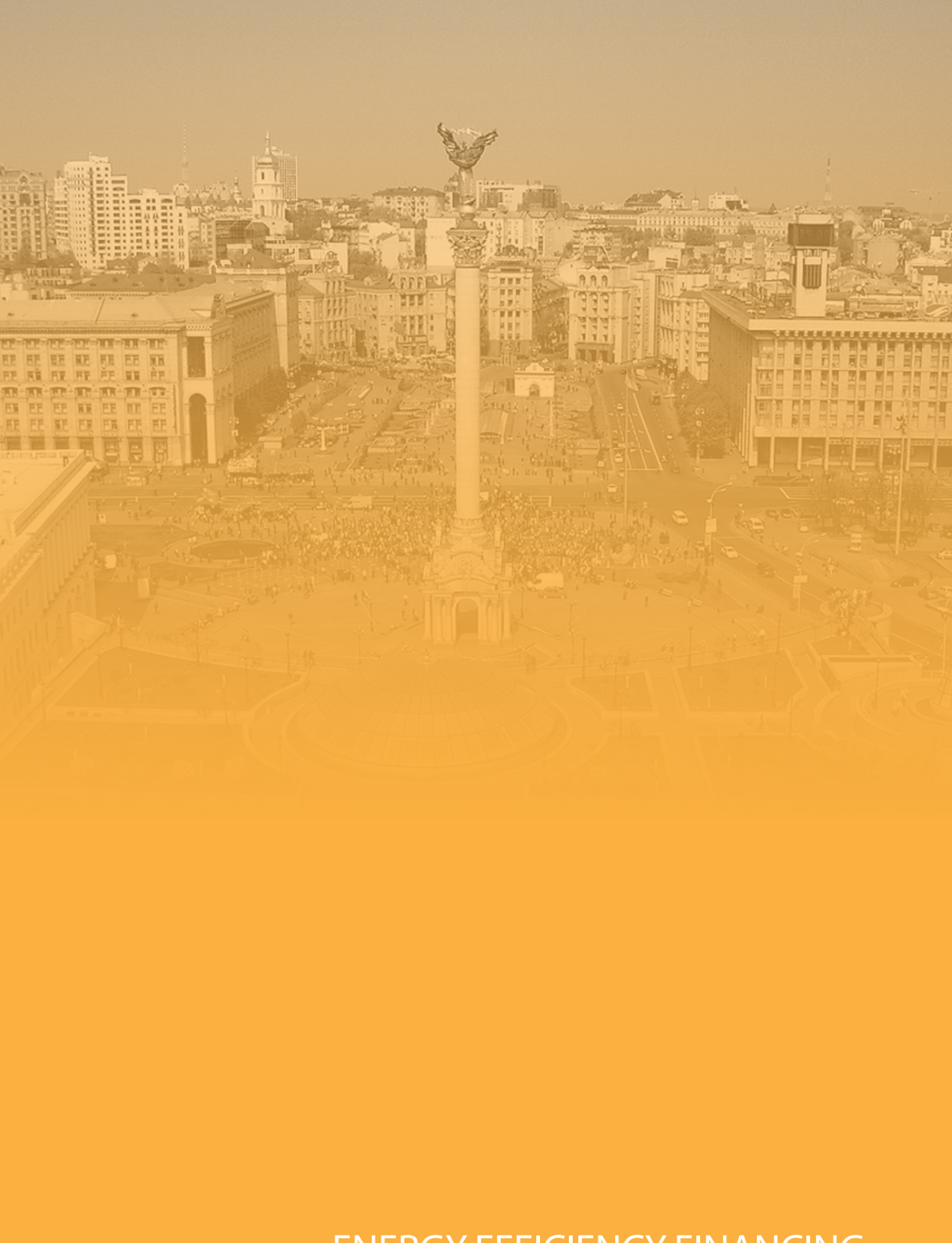
In describing the ways to achieve the programme goal the ministry set out six lines of action that accord with sound investment, management, optimisation and control principles.

The key indicators of programme implementation within the ministry and its subordinate organisations, which need to be achieved by 2014, are as follows.

- Reduction in the energy intensity of the work performed for at least 20% of the level of 2009
- Reduction in losses of fuel and energy resources in the performance of work for not less than 40% of the level of 2009
- Savings in allocations to the budgetary institutions for payment for the energy sources to the amount of 35-50% of the base year
- 100% use of energy efficient light bulbs in the premises of budgetary institutions.

At the sub-sector level the areas of common activities are grouped under railway transport, sea and river transport and road transport. In each case the high level options are enumerated.

What is not clear, however, is the actual level and quality of the financial and human resources committed to the task, whether there is any sense of priority or indeed whether there is any substance to the targets and indicators posited for the programme.



ENERGY EFFICIENCY FINANCING

Overview

It is clear from this and other analyses that the scope for energy efficiency improvements is immense, with opportunities across many sectors and involving a huge amount of intervention throughout Ukraine. The vast bulk of the initial improvements depend on modernising energy production, conversion, transmission and end-use equipment. This phase is capital intensive and the scale of investment up to 2030 is such that recourse to external sources, experience and know-how is essential for a good outcome and the future competitiveness of the economy of Ukraine.

The German International Cooperation with Ukraine (GIZ), GFA and SAEE of Ukraine with the Ministry of Regional Development, Building and Housing of Ukraine have produced an exemplary set of "Guidelines for Project Proposals" directed at municipalities and their public utilities. The aim is to assist medium sized towns in Ukraine to access additional funds for their infrastructure development.

The "State economic programme of energy efficiency and development of energy carriers produced from renewable energy sources and alternative types of fuel for years 2010-2015" envisages that in the financial envelope for the programme the bulk (93.5%) of the estimated €34,600 million required would be leveraged by a state budget contribution of 2.2% and a local budget of 4.3%. Thus the vast bulk of finance for energy efficiency must come from private sources, international sources of loan finance, donor contributions and FDI.

The public international lenders, as judged by their Ukraine strategy papers, have careful regard for the economic life of the assets for which they are invited to provide investment support. Some, like the World Bank and the EBRD, are bound by rules that have been set for them and invariably these are reflected in their lending strategies. This review draws on the experiences of these institutions as reflected in their formal strategies and regular appraisals.

The Cabinet of Ministers of Ukraine originally agreed on a "Procedure for the initiation, preparation and implementation of projects of economic and social development of Ukraine, supported by international financial institutions" in 2008 and this was most recently amended in April 2013. This effectively places the responsibility for coordination of such internationally assisted projects with the Ministry of Economic Development and Trade.

Notwithstanding the scarcity of public funds in Ukraine there are several new funding initiatives by the SAEE. The State Local Self-Governance Support Fund is designed to highlight and advance opportunities for energy efficiency consistent with the objectives of the "State Targeted Programme for Energy Efficiency etc., 2010–2015". For example "Pilot municipalities can be supported with respect to projects along any of four lines of action.

- Introduction co-generation technologies
- Application of heat pumps at state institutions
- Application of electric thermo-accumulative heating and hot water supply
- Modernisation and use for RE in social sector boilers.

The SAEE publishes and maintains an information base of scientific and technological development, energy efficiency technologies and projects. It is available as a web-based tool and can provide lists and details of the projects funded using a range of sort criteria. The emphasis on gas replacement, itself a reflection of current government policy, is evident

as most of the 2011–2012 project entries are in some way supportive of this objective. The thermal insulation of facades and renovation of buildings have been a feature of many of the projects listed for previous years.

According to the Ministry of Regional Development, Construction and Housing and Communal Sector of Ukraine about 52.5% of the population live in detached privately owned houses. About 93% of the balance of the population live in owner occupied apartments in one of 240,000 apartment blocks in the principal towns and cities of Ukraine.

Many of the problems in the housing sector are associated with the unsatisfactory condition of the fabric, poor energy performance of the building envelope and inefficient systems for the maintenance of buildings and adjacent areas. The situation is compounded by a lack of affordable long-term loan finance, unsatisfactory financing of upgrade measures from the state and local budgets and an absence of legal tools to encourage energy efficiency in buildings.

With donor assistance the ministry has partnered with the GIZ and others to develop pilot projects. These have included training programmes, feasibility studies for the renovation of residential areas and proposals for amendments to the current legislation on the regulation of ESCOs activities in Ukraine and the introduction of energy service contracts.

One example of the thermal upgrading of a residential building is in the city of Nizhyn in Chernihiv Oblast, where the project, managed by an ESCO, resulted in energy consumption being halved by doubling the energy performance of most of the building elements that comprised the 150-apartment block. The attractiveness for residents was cemented by a 3% discount for heating and hot water supply at the specified tariff. The payback period at the ruling tariff in 2011 was 10 years.

On a similar scale and with a similar impact was the thermal upgrading by means of the external insulation of a residential apartment building in the city of Lutsk, Volyn Oblast, where the management company took responsibility for the insulation of the building and the renovation of key elements such as windows and heating controls.

The economic evaluation of the thermal performance upgrading of nine residential buildings shows that for an outlay of €5-10 million the energy consumption of typical buildings can be reduced by 50% with paybacks between 6.5 and 7.7 years, depending on the options chosen.

The ministry believes that an ESCO model can deliver — provided the required conditions are in place that will allow for profits that are directly proportional to the reduction of thermal consumption. Issues of legal status, standard contracts, recognised procedures, regulations and responsibility to pay remain to be tackled.

There are plans to continue to promote the use of ESCO contracts in a further six neighbourhoods and to continue support for the draft Law on the Law on Energy Efficiency of Residential and Public Buildings (2012) and the draft Law on Introduction of Energy Service Contracts and ESCO Mechanisms (2013).

At the core of the strategy to address the renovation of the housing stock is the recognition of the scale of what has to be tackled: The cost has been estimated at UAH 400 billion and the current vision for a solution includes the following.

- Formation and support of effective homeowners
- Implementation of ESCO contract mechanism

- Economic incentives for energy efficiency measures, including the use of taxation tools
- Attraction of accessible long-term credit resources.

The plan for 2013 envisages capital repairs to 2,973 buildings at a cost of UAH 1.0 billion with a further UAH 1.5 billion for elevator repairs and UAH 0.3 billion of preferential crediting. Thus the annual projected spend is modest in the scale of what is required.

The EBRD continues to be the largest financial investor in Ukraine. As of 1 January 2013, the EBRD has committed more than €8.2 billion ($10.7 billion) to 318 projects. In 2012, the EBRD invested €934 million ($1.2 billion) in 35 projects in Ukraine. About 71% of the investment went into private companies and the balance to projects in the public sector.

In its strategy for Ukraine for 2011–2014 the EBRD sets out what it sees as some of the key transition challenges facing Ukraine.

- Strengthening energy efficiency and energy security
- Unlocking Ukraine's agricultural and industrial potential
- Providing good quality and reliable infrastructure
- Dealing with the legacy of the crisis in the financial sector.

In the energy sector the EBRD will, inter alia, support safety upgrades in the nuclear sector, electricity transmission networks, operations that will integrate Ukraine into the European energy market and operations that will increase the overall energy efficiency and decrease the carbon intensity of the sector.

In the enterprise sector the EBRD will support FDI and local enterprises to help diversify the economy and restructure old energy-intensive industries with a focus on improving their governance, transparency and energy efficiency. As part of its support for infrastructure, the EBRD will also support the "commercialisation" of municipal utilities through projects with large demonstration effects or energy efficiency gains.

The lending instruments supported by the EBRD focus on SMEs, financing energy efficiency improvements and trade facilitation with the use of appropriate technical assistance.

The success of the EBRD's ambitious operational strategy in Ukraine will, according to the EBRD, to a large extent depend on the implementation of reforms in all the main sectors. Slow reform progress will inevitably lead to a reduced investment by the EBRD, particularly in the public sector. In the coming years, the EBRD will be actively involved in policy dialogue with the authorities together with other IFIs. The recent experience of coordinating discussions in the gas and financial sectors sets a good precedent, which the EBRD will seek to emulate in other sectors.

With a view to both attracting credit and granting MFI funds in the areas of energy efficiency and energy conservation, in 2009 the agency held meetings with the representatives of the Embassy of the Kingdom of Sweden in Ukraine, the EBRD and experts from the Swedish International Development Agency and reached agreements on starting the Eastern Europe Energy Efficiency and Environmental Partnership (E5R). Thus in 2009, during the EU presidency of Sweden, the creation of the E5R was initiated.

The mission of the fund is to harmonise the effective provision of financial assistance through

providing non-repayable contributions by such institutions as the EBRD and others for the implementation and support of energy efficiency and environmental protection projects, which will result in improved energy efficiency and the reduction of CO_2 and GHG emissions.

The fund provides for direct investments in energy efficiency, including but not limited to the installation of central heating and generating capacity as well as the improvement of energy and heat supply systems. The E5R also provides for long-term commitments by Ukraine to reform the country's energy sector together with donors and international financial institutions.

Energy Efficiency Examples

The EBRD is lending €10 million to a district heating company in the Western Ukrainian city of Ternopil as part of its efforts to modernise the sector and unlock the country's enormous energy efficiency potential (EBRD press release 24 September 2012).

The loan to the municipal district-heating operator in Ternopil will support the utility's investment programme for improving energy efficiency, reducing gas and electricity consumption and raising the quality of the heating and hot water services it provides to the population of the city. This will be the first project under the EBRD's new Integrated Approach to Reform in the Ukrainian District Heating Sector, which aims to boost Ukraine's energy efficiency through increased energy and cost efficiency, improved financial sustainability and the regulatory reform of municipal utilities.

The EBRD loan will be complemented by a grant of up to €5 million from the Eastern Europe Energy Efficiency and Environment Partnership (E5P), a grant fund established by international donors to co-finance investments in the Ukrainian municipal sector with a focus on demand-side efficiency improvements. The contributors to the E5P are Denmark, Estonia, the EU, Finland, Iceland, Latvia, Lithuania, Norway, Poland, Sweden, Ukraine and the USA.

Once the project is fully implemented, it is expected to reduce gas consumption by around 12.7 million cubic metres per year (including gas savings from conversion to biofuel). It will also achieve heat savings of 32,400 Gcal per year and electricity savings of 2,540MWh per year and lead to a drop in CO_2 emissions in excess of 27,000t per year.

International Finance Corporation (IFC)

The IFC, a member of the World Bank Group, is the largest global development institution focussing exclusively on the private sector.

Ukraine became a member of the IFC in 1993. The IFC began operating in Ukraine by pioneering advisory projects in privatisation and land reform. This helped create a base for the private sector, with support from such governments as those of Canada, Japan, Norway, Sweden, the UK and the United States.

Through a combination of investment and advisory services the IFC continues to partner with clients in strategic sectors crucial for Ukraine's sustainable development, those that focus on agribusiness, infrastructure, energy efficiency, cleaner production and financial markets. It seeks new opportunities to partner with companies in these key sectors in order to achieve the maximum development impact on Ukraine's long-term economic growth.

In helping Ukrainian companies become market leaders and global players, IFC has invested over $2.3 billion, including $632 million in syndicated loans, in 70 projects across a variety of sectors. In the fiscal year 2012, IFC's commitments to Ukraine totalled $156 million.

USAID

USAID energy programmes are working to improve Ukraine's energy efficiency and reduce the country's heavy dependence on imported energy resources. USAID is supporting reform in Ukraine's municipal heating sector, a large consumer of energy, by strengthening the legal, regulatory and institutional frameworks necessary to improve heating services. USAID is also helping implement measures to provide an effective social safety net for supplying affordable heat to vulnerable populations.

A four-year, $18.5-million municipal heating reform project (MHRP) aims to create a viable municipal heating sector that delivers reliable and efficient services to residents, public institutions and local industries. The project is working closely with the Government of Ukraine to establish a legal and regulatory basis for heating sector reform at all levels. The project is also assisting 25 municipalities across Ukraine to improve their district heating and make energy more efficient and affordable for consumers by developing municipal energy plans, helping attract investment to implement energy efficiency measures and introducing energy efficient technologies.

By promoting and facilitating the creation of condominium and homeowner associations, the project seeks to improve collective condominium management and increase homeowners' financial responsibility. A comprehensive public awareness campaign encourages citizens to take an active personal role in energy saving and to contribute to the country's energy independence.

USAID is partnering with the Dnipropetrovsk Oblast and rayon councils, and the Donbas Fuel and Energy Company (DTEK), to develop a five-year strategy to save energy and reduce CO_2 emissions for manufacturing, agriculture and communal and housing sectors in Dnipropetrovsk Oblast. By developing demonstration actions, the project seeks to attract investments in energy efficiency and CO_2 reduction technologies and disseminate knowledge and best practices.

Listed among the programme's highlights are the following.

- The National Heating Strategy and National Action Plan for Energy Efficiency approved by the Government of Ukraine
- Five key sector laws approved by Parliament, including a National Commission of Communal Services Market Regulation (NCCSMR)
- Over 400 energy audits of public and residential buildings conducted to identify energy efficiency potential in 25 project partner cities
- 25 district heating company energy audits conducted to identify the energy efficiency potentials of heating systems (including Kyiv and Dnipropetrovsk)
- 25 municipal energy plans developed of which 22 have been approved by city councils and three are awaiting approval
- 25 partner cities formed energy management units and city advisory committees on energy savings
- Ten cities received approval from international financial institutions for financing energy efficiency projects in public buildings
- $175 million of public and private funds leveraged for energy efficiency projects, including funding from IFIs, municipal and state budgets, commercial banks and private partners

- 38 demonstration energy efficiency projects initiated, 34 implemented and 30 completed to date on co-financing principles, leveraging about $4.3 million of private and municipal funds in 13 Ukrainian cities; the projects include heat metering and heat control systems installation in 40 residential and public buildings
- 11 home owner association advisory centres established to promote condominiums and residential energy efficiency; demonstration projects implemented in 24 residential buildings
- 135 energy efficiency-related public events organised with mass media participation; about 1,800 news articles published or broadcasted in printed, electronic, TV and radio outlets. Advertisements on energy efficiency awareness placed on more than 1,400 billboards in five MHRP partner cities
- 24 secondary schools actively participated in MHRPs
- Energy Efficient Schools Programme. The programme was recognised by the Ministry of Education and Science and approved as a part of the nation-wide public education curriculum; six universities involved in the Energy Efficient Campuses Programme
- Eight demo projects implemented in Dnipropetrovsk Oblast. These included the installation of LED street lighting, installation of solar panels to heat water for a kindergarten swimming pool, introduction of basic energy efficiency measures such as roof and wall insulation and windows and door replacement to improve comfort and save resources in various kindergartens. Nine other demo projects initiated targeting biomass fuel and introduction of energy efficient technologies in street lighting.

Investment Projects

Promoting Energy Efficiency in Ukraine's Residential Housing

The IFC Ukraine Residential Energy Efficiency Project is designed to create an effective legal and institutional platform to support Ukrainian homeowner associations and housing management companies in obtaining access to finance for the energy-efficient refurbishment of multi-family buildings. Through the project, IFC aims to facilitate energy efficiency investments in Ukraine's residential sector.

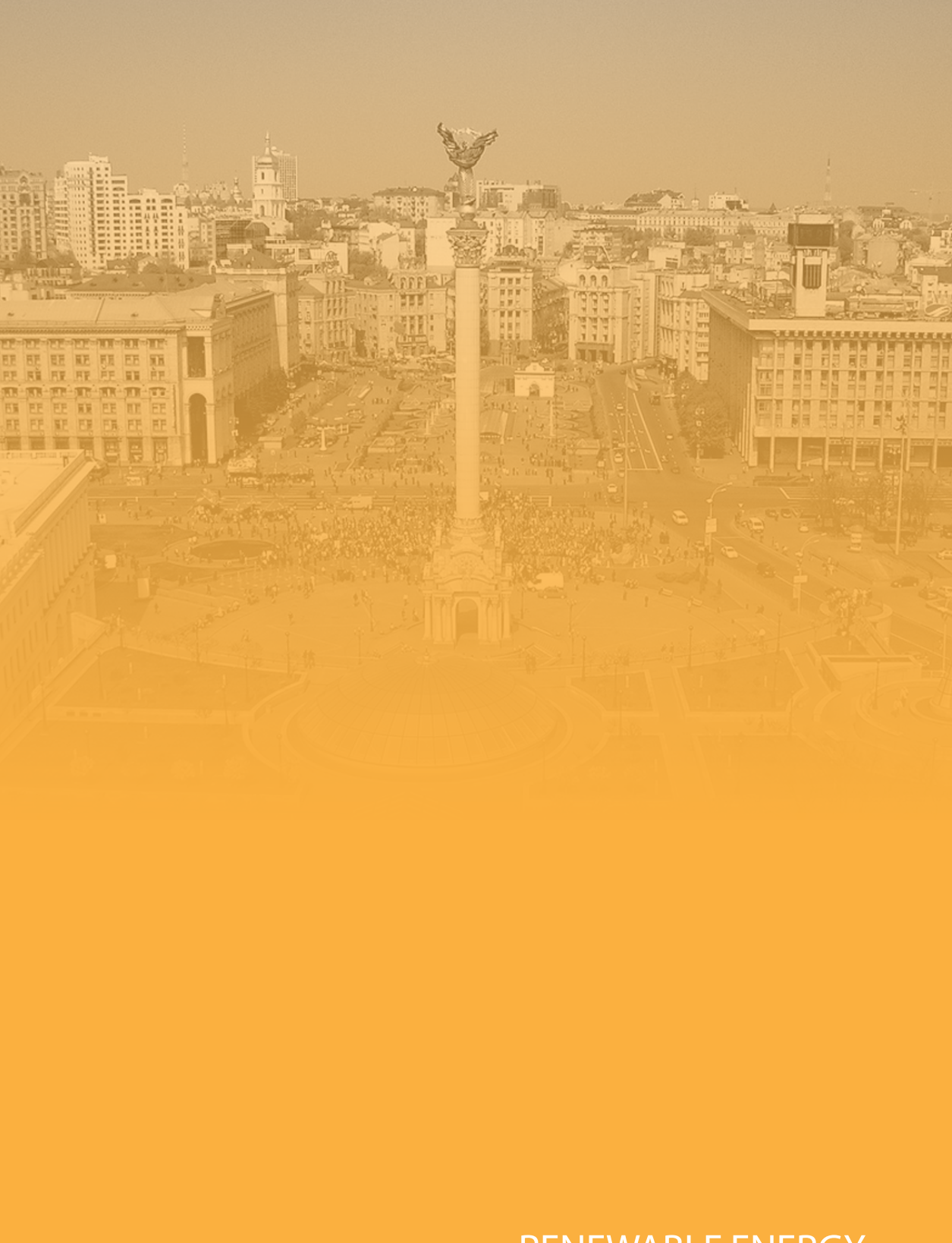
The residential housing sector represents one of the best opportunities for achieving energy savings and thus reducing GHG emissions. Investments with simple payback terms can result in heat energy savings of 30% to 40%, and a reduction in gas consumption by 25% to 30%.

Some of the principal barriers to residential energy efficiency in Ukraine relate to the undeveloped status of homeowner associations, absence of targeted state support and lack of control over energy use. Other issues include regulated energy prices, the inability of financial institutions to lend to the sector because of contradictions in legislation concerning homeowner associations and a lack of knowledge about the benefits of residential energy efficiency.

The IFC approach is to:

- develop legislation in close cooperation with government agencies to enable local homeowner associations and housing management companies to access finance to improve energy efficiency in residential buildings

- increase awareness about residential energy efficiency among key market stakeholders by relationship building and the development of information campaigns
- work with Ukrainian banks to develop and market financially viable energy efficient housing loan products targeted at homeowner associations and housing management companies for the purpose of energy efficiency renovations to multifamily buildings.



RENEWABLE ENERGY

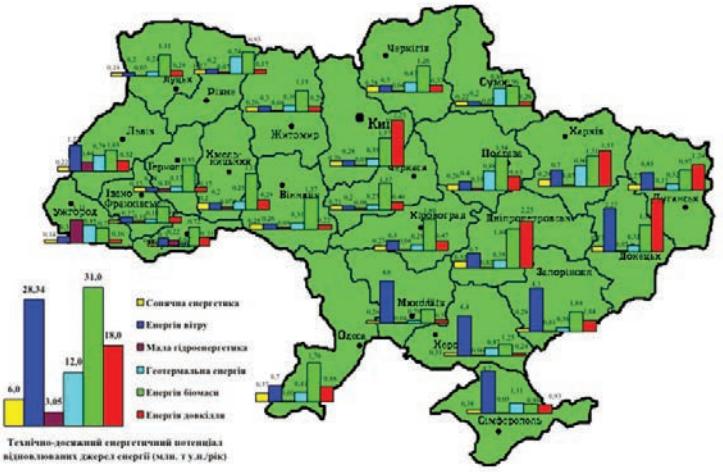
Ukraine has mainly contributed to renewable energy sources made by Ukraine in the following ways: i) hydropower for electricity generation and ii) fuel-wood for domestic heating and biomass for process heating in the wood industry and power production in CHP plants. According to the national energy balance for 2011, the share of renewable energy resources in TPES in Ukraine was 1.95% in 2011.

The contribution of renewable energy sources to electricity supply in 2011 was 8%, according to the Urkstat, and principally from hydropower that is closely integrated with water management along the Dnieper and Dniester rivers. Many of the hydroelectric dams are close to populated areas and their robustness under flood conditions is a key driver for their ongoing assessment and refurbishment.

There is strong international and donor support for the necessary refurbishment to improve efficiency, mitigate environmental impact and increase the power yield. According to ministerial sources, the expectation is that, by 2015, the completion of a third turbine installation, the Dniester PSP, on its upper reservoir will provide an additional 972MW of hydropower-generation capacity.

There is a wide body of opinion, research and anecdotal evidence to show that the renewable energy potential of Ukraine is greatly underexploited. It is a priority area for economic development that could be attractive to, and greatly benefit from, FDI. Aside from wind and solar power, both of which are most suited to specific areas, additional focus on biomass and biogas has been recommended by the IEA and others.

Figure 18 Total technical energy potential of renewable energy sources in Ukraine



Source: SAEE, 2013

According to data presented[13] by the NERC, "The total annual technically attainable energy potential of the principal renewable energy sources in Ukraine is about 81Mtoe, or 70 billion cubic metres (bcm) of natural gas, which equates to 40% of Ukraine's annual energy needs; the volume of its development in 2030 may reach 50%".

[13] *Presentation (June 2013) to Review Team of doc 00/00/2013, by the NERC*

This data and other Ukrainian reports and international assessments point to the scale of the renewable resources and the scope for energy from wind, solar and geothermal power as well as biomass, in the form of wood and wood wastes, including agricultural wastes, to make a substantial contribution to energy supply. The abundance of fertile land and energy crops, such as oilseed rape for biodiesel production, are believed to have the potential to contribute to the sustainability of transport in Ukraine.

The SAEE has presented estimates of the technically feasible annual potential for a range of renewable energy sources. After wind and bioenergy, which together account for 60% of the potential, geothermal (10%) and solar (6%) power have the next highest potential.

The Government of Ukraine recognises the potential for new and existing renewable energy to contribute to energy security, reduce dependence on imported oil and gas, contribute to economic development and create sustainable employment in Ukraine. Accordingly, it has put in place a package of incentives and enabling measures to promote the development of Ukraine's renewable energy resources.

Following its accession to the EnC, the Government of Ukraine has committed to increase until 2020 the share of renewable energy in total energy supply up to 11%. This is an ambitious target and with target attainment in mind it provides a useful axis around which to design and deliver renewable energy policy.

Renewable Energy Status

This section will present the background and current status of the principal renewable energy sources in Ukraine, beginning with the longest established source of renewable electricity, hydropower.

Hydropower

Ukraine's hydroelectric industry became world renowned in 1932 when the 650MW Dnieper hydropower plant began production. In recent times, for example, between 1996 and 2005, annual output varied between 9 and 16TWh and accounted for between 5% and 9% of electricity generation.

Ukraine's hydropower facilities are ageing and have suffered from neglect through the 1990s. They are benefitting and will benefit further from technical upgrade programmes carried out to achieve higher efficiency, safety and environmental performance. International financial institutions, including the World Bank and the EBRD, are committing significant sums to rehabilitate and extend hydroelectric facilities.

- The World Bank has given $374 million to the Hydropower Rehabilitation Project to run to 2017.
- In a separate arrangement the EBRD signed an agreement in 2011 worth €200 million over a period of 15 years to reconstruct 21 units at six of UHE's HPPs by 2017. This initiative will not only boost capacity by over 80MW, it will also extend the equipment's lifespan.

UHE is Ukraine's largest producer of hydropower and has nine HPPs on the Dnieper and Dniester rivers in Kyiv, Kaniv, Kremenchuk, and Dniprodzerzhynsk. It also runs the Kakhovka HPPs, the Kyiv PSP and the existing Dniester HPP.

Some analysts see significant potential for small hydroelectric plants in Ukraine. In 1970, roughly 1,000 small hydroelectric plants were in operation in Ukraine, compared to 84 today. The SAEE has suggested that the technically feasible annual electricity generating potential is about 10% that of wind and a similar proportion of that of biomass.

As of May 2013 the NERC "Register of electric power sector facilities using alternative energy sources" includes 86 entities availing of the green tariff and using the energy of small rivers to generate electricity.

Wind Power

Wind power is new to Ukraine; its contribution to energy supply is for the time being small and the industry is in its infancy. However, under the stimulus of attractive feed-in tariffs it is growing rapidly from a low base.

Figure 19 Wind energy potential of Ukraine

Потенціал енергії вітру вУкраїні

Source: SAEE, 2013

According to the Draft Updated Energy Strategy, Ukraine has significant potential for wind energy development. The most promising in terms of its development is the southern and south-eastern regions of the country, where the average wind speed exceeds 5 m per second (see the brown and red shaded areas in Figure 16 above).

According to the Ukrainian Wind Energy Association's (UWEA's) annual report, Kyiv, 2013, Ukraine had 12 state wind power plants with a total installed capacity of 85.6MW and 65.5MW of new wind capacity installed with 100% private capital at the end of 2011. Thus in two years the private sector delivered 75% of the capacity delivered by the state in the previous ten years.

The UWEA reports that the construction of Novoazovskiy Wind Farm in the Donetsk region near the Azov Sea coast began in 2011. The project will eventually include 43 wind turbines with a capacity of 107.5MW.

According to the SAEE, the installed wind capacity in Ukraine was rated at about 193.8MW at the end of 2012, having doubled in 2011 from a base of 76.6MW in 2010.

However, "although there is international interest in investing in Ukraine's wind power sector, particularly because the new green tariffs for electricity production make it very attractive, regulatory barriers relating to planning and permitting as well as local content rules have prevented some projects from taking off" (Annual Report of the UWE).

The EBRD announced its first ever investment (25 April 2012) into wind power generation in Ukraine by organising a €13.3 million financing package for Eco-Optima, a Ukrainian-Italian joint venture company, which will operate a wind farm in the Staryy Sambir region of Western Ukraine. The loan will consist of two parallel tranches: a 10-year EBRD loan of €9.5 million and a 15-year loan of €3.8 million from the Clean Technology Fund (CTF). The loan proceeds will be used to construct and operate a wind farm with a total capacity of 12.5MW. It will consist of five wind turbines and is expected to generate at least 25.5GWh every year.

As of May 2013 the NERC "Register of electric power sector facilities using alternative energy sources" includes 14 entities availing of the green tariff to generate electricity.

Solar Power

The Draft Updated Energy Strategy of Ukraine asserts that it will be "Taking into account the experience of the implementation of SES European countries with similar levels of solar radiation, as well as the cost reduction of solar power stations (SES) as a result of technological development, the target level of installed capacity SES in Ukraine in 2030 will be 1.5-2.5GW, and their level (rate) of development to 2-3.3TWh per year" — subject to a significant drop in the cost of construction.

Ukraine 2012 reported that 188.22MW of solar power was installed at the end of 2011. There are reports of several projects with an additional 290MW of capacity due to come online in 2012. ActivSolar, an Austrian photovoltaic cell producer, completed an 80MW project in Crimea, one of the largest in Eastern and Central Europe.

The IEA Ukraine 2012 country review notes the significant potential for solar energy production in the south of Ukraine where solar irradiation reaches 1,450 kWh per square metre per year (kWh/m^2/annum) compared with about 800kWh/m^2/annum in the north. The technical potential is 28.8TWh/annum, based on estimates from the Institute of Renewable Energy of the National Academy of Sciences of Ukraine.

As of 29 May 2013, the NERC "Register of electric power sector facilities using alternative energy sources" includes 40 entities availing of the green tariff and generating electricity from solar energy.

Biomass

The IEA Ukraine 2012 country review reports that biomass and waste are used for heat production in private households and public buildings in rural areas, as well as for heating and processes in the wood products industry. Reliable data is said to be hard to come by and there are suggestions that its contribution to meeting heat demand may be underestimated. According to the Ministry of Agriculture, boilers for the combustion of straw and other types of biomass are installed in 19 villages in the Vinnytsia, Kyiv, Rivne, Volyn and Cherkasy regions.

Ukraine produces wood products such as sawdust briquettes, pellets, fuel wood chips, charcoal and firewood. The SAEE has issued certificates of affiliation to 109 manufacturers of solid fuel with an annual production of 542,000tn in 2012. The vast bulk of this production has been supplied to export markets.

According to figures by the SAEE,[14] the technically attainable thermal energy potential of biomass is about 15Mtoe/annum. About 84% of this potential is from four sources: straw (43%), energy crops (30%), wood wastes (6%) and biogas from animal manure and bird droppings (5%). The balance is accounted for by bioethanol, biodiesel, biogas from landfill, sunflower husks, peat and biogas from sewage water.

According to the handbook *Attracting Investment in Renewable Energy in Ukraine* biomass has the greatest renewable energy potential across all regions of the country.

In light of the great potential for energy production from biomass, Phase I of the OECD Sector Competitiveness Review selects energy produced from biomass as the pilot sector in which to launch efforts to enhance sector competitiveness. The report affirms the role that the government could have in fostering an investment policy climate to encourage growth in energy production from biomass (OECD, 2012).

Citing the same source the IEA notes that the technical potential of forest biomass was 2.1Mtoe and that of agricultural waste is 12Mtoe based on the 2008 data. Agricultural biomass is concentrated in the central, south-eastern and southern regions while the potential for forest biomass is in the northern and western parts of the country.

Biofuels

According to Ukraine 2012, Ukraine produces liquid biofuels with about 100,000 tonnes/annum (t/a) of bio-diesel at small installations. The SAEE "Registry of Alternative Fuels" includes 52 manufacturers of bio-ethanol-based liquid fuels, accounting for 47,000t/a in 2012. According to the IEA about 50,000t/a of bioethanol is produced at six small plants and one large plant produces between 120,000 and 150,000 tonnes annually.

The NERC maintained register of electric power sector facilities using alternative energy sources includes one entity using biofuel residue oil to generate electricity.

Biogas

The IEA country review claims the following.

Ukraine's agriculture sector generates significant agricultural waste. The Biomass Centre estimates that it could be used to produce enough biogas to replace 2.6 bcm of natural gas per annum. With agricultural expansion, biogas potential could grow to the equivalent of 7.7bcm of natural gas. It is estimated that organic matter from livestock could support 4,000 biogas installations.

According to the NERC register of electric power sector facilities using alternative energy sources there are seven entities using biogas to generate electricity.

[14] *SAEE Presentation to Review Team, June 2013*

Renewable Energy Goals

The Draft Updated Energy Strategy of Ukraine to 2030 asserts that the development of alternative renewable energy sources (RES) is an important factor in:

- reducing the use of fossil fuel resources for power generation and improving energy security
- improving the environmental situation in Ukraine
- developing Ukrainian industry.

The draft strategy proposes a combined alternative and renewable energy target of 10% of installed electricity generation capacity or 7.5GWh. Complementing the draft energy strategy, which is the energy sector's guiding policy document, Ukraine has more specific sector programmes, to one of which we now turn.

The National Targeted Programme on Energy Efficiency and Renewable and Unconventional Energy for the period 2010–2015 was adopted by the Cabinet of Ministers of Ukraine (Decree No. 243, March 2010). It sets out a target to increase the share of renewable and alternative energy in primary energy supply to 10% by 2015 and replace 14Mtoe of traditional fuels.

Ukraine, as part of its accession to the EnC, is expected to develop, on a voluntary basis, plans to implement EU directives on the promotion of electricity from renewable sources (2001/77/EC) and biofuels or other renewable fuels for transport (2003/30/EC). In August 2011, the Cabinet of Ministers of Ukraine signed a resolution on the planned measures to meet Ukraine's obligations regarding the Energy Community Treaty and tasked the SAEE with the development of proposed measures to comply with the directives.

The primary objective of the Government of Ukraine in the area of renewable energy is the fulfilment of its commitments taken under the EnC. The Ministerial Council of the Energy Community, held in Budva on 18 October 2012, approved the decision regarding the implementation of Directive 2009/28/EC and amended Article 20 of the EnC. Directive 2009/28/EC determines the minimum share of energy produced from renewable sources in final energy consumption to the amount of 11% in 2020.

Legal Framework

The primary legislation in the sphere of alternative energy includes the following five laws of Ukraine and other statutory instruments.

- On Alternative Energy Sources
- On Alternative Fuels
- On Electric Power Industry
- On Energy Conservation
- On the combined heat and power production and use of waste.

The state energy-production strategies and programmes setting long-term goals include the following.

- Draft Energy Strategy to 2030
- State Target Economic Programme of Energy Efficiency and Development of Sphere of Production of Energy Carriers Produced from Renewable Energy Sources and Alternative Types of Fuel for Years 2010–2015 (of the Cabinet of Ministers of Ukraine from 1 March 2010 No. 243, dated 1 March 2010).

On 20 November 2012 the Verkhova Rada of Ukraine adopted the Law of Ukraine No. 5485-VI on Amendments to the Law of Ukraine on Electric Power Industry (regarding the promotion of the production of electricity from alternative energy sources). The law envisages the following.

- Reduction of the green tariff coefficients for solar power plants
- Granting of green tariffs for facilities that use biogas
- Differentiation of green tariff coefficients for small hydropower plants, depending on their installed capacity
- Granting of green tariffs for generating units in households (beginning on 1 January 2014)
- Changes in the local content principle.

According to the Ukrainian Wind Energy Association Law No. 5485-VI established the definitions of a wind power plant and also resolved uncertainty concerning what power capacity should be considered for calculating the green tariff rate by fixing the green tariff to the unit capacity of a wind power installation (turbine).

Support Measures

Among the effective measures for the development of the alternative energy sector by the National Commission in Charge of State Regulation in the Energy Sector as presented to the review team are the following.

- Setting of a "green" (preferential) tariff on electricity generated from alternative energy sources
- Obligating the Wholesale Electricity Market of Ukraine (WEM) to purchase the entire volume of electricity produced from alternative energy sources
- Formation of the State fund for Energy Conservation
- Tax and customs exemptions
- Concessional lending
- State subsidies.

There are a number of tax-related fiscal incentives for enterprises producing renewable energy sources that are designed to enhance profits by reducing the burden of taxation on inputs and profits; several of these are time bound to 2019 and 2020.

The principal support measure is the feed-in tariff for electricity from renewable energy sources. Wind, solar, biomass and small hydropower plants qualify subject to certain capacity stipulations and are paid a minimum price of €0.05385/kWh subject to an adjustment upwards by the application of a co-efficient for all qualifying categories save for small HPPs (less than 10MW capacity). Solar plants and small HPPs benefit from an addition peak time co-efficient of 1.8, which incentivises and rewards the delivery of power within a certain window.

With its Decree No. 365, dated 1 April 2013, the NERC established a fixed minimum size for the "green" tariff (equivalent in the local currency) for the facilities commissioned from 1 April 2013 to 31 December 2014; the applicable tariffs by technology are shown in Table 5 below.

Table 5 Fixed minimum green tariff for RE installations from 1 April 2013 to 31 December 2013

RE Source	Description	Fixed minimum tariff cop./kWh
Wind	Up to 600kW	70.15
Wind	600-2,000kW	81.84
Wind	Over 2,000kW	122.77
Biomass		134.46
Biogas		134.46
Solar	Roof mounted	388.82 - 389.34
Solar	Ground-based	368.30

Source: NERC, 2013

In the same Decree No. 365, dated 1 April 2013, the NERC set different prices for electricity generated from solar facilities commissioned prior to 31 March 2013, whereby the fixed minimum solar tariff applied to ground-based solar facilities was 505.09 cop./kWh and the range for roof-mounted installations was 463.00–484.05 cop./kWh. The fixed minimum green tariff for small HPPs was 126.27 cop./kWh.

While the tariffs for solar and wind power are high by EU standards they are subject to a progressive decline, that is, by 10% after 2014, by 20% after 2020 and by 30% after 2024 for new plants or plants that are significantly upgraded.

An unusual feature of the support system is that green tariffs can only be obtained after the completion of a power plant, approved by the NERC on a case-by-case basis.

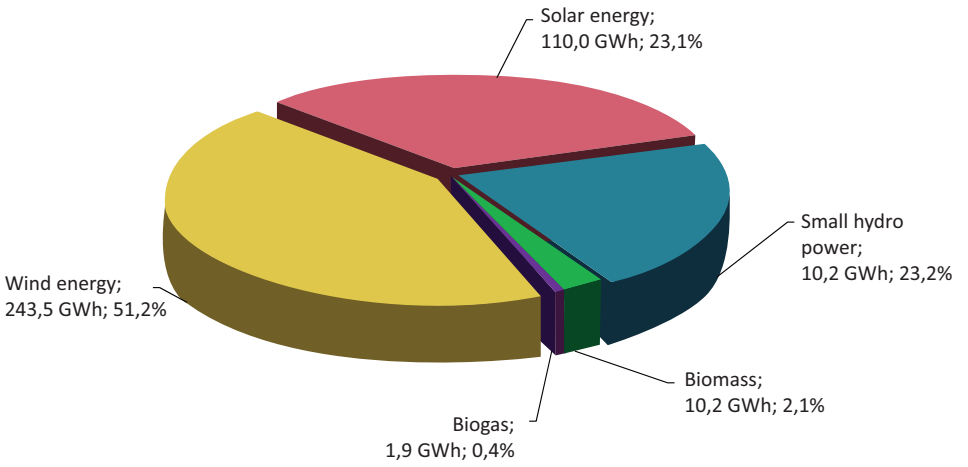
In November 2012 the Parliament adopted the Law (No. 5485-VI) on Amendments to the Law on Electric Power Industry (in its section on stimulating electricity generation from alternative sources), which envisages the introduction of green tariffs for electricity produced from biogas as well as industrial and municipal waste. It also reduces (without retrospection) the coefficients for solar energy and introduces differentiated coefficients according to the installed capacity for electricity produced at small hydropower stations.

The law provides that, as from 2012, to be eligible for green tariffs renewable energy generating facilities must comply with local content requirements. By 2014, the share of Ukrainian materials, equipment, services and works cannot be less than 50% of the total construction costs. The NERC has been tasked with developing an appropriate procedure.

All electricity produced by eligible renewable energy power plants and not sold under direct contracts must be purchased at green tariff rates on the WEM. In anticipation of further market reforms and to provide certainty to investors, the Law on Power Industry stipulates that the state's obligation to purchase renewable energy at green tariff rates will survive the reform.

According to the SAEE, the contribution of renewable energy sources to electricity generation in 2010 was as follows.

Figure 20 Contribution of renewable energy sources to electricity supply 2010



Source: SAEE, 2013

Renewable energy generators are subject to direction by the system operator, who has no obligation to provide priority dispatch for generation from renewable energy sources.

While electricity network companies are obliged to connect power produced from renewable energy sources to the grid, the grid code makes no special provision for renewable sources; arrangements for wind are in place but are reported to be location specific.

A concern has been expressed that there is no standardised procedure for renewable energy.

Legislation as of 2012 deals with the connection fees chargeable by network monopolies as of 2013. However, the procedures for reimbursing the qualifying costs for connecting are not standardised.

Planning and permitting can be time consuming and at least ten steps taking over two years are identified by the IFC in its publication "How to Obtain Feed-in Tariff", with the existence of gaps in the process intensifying the risk.

The ERRA[15] has published an "Overview of RES-E Promotion Systems", which reports that the most debated current issue — from a regulatory point of view — is the over-subsidisation problem in the rapidly developing PV segment and this includes possible solutions to limit its impact on consumer prices.

Over-subsidisation of PV technology —meaning to provide a higher level of subsidies than economic rationality would suggest — has several negative effects on any RES-E promotion system.

- It reduces the efficiency of the promotion systems, through spending money on costly technology
- It could crowd out cheaper and more resource-efficient technologies, if a budgetary limit exists on the overall RES-E promotion

[15] *See ERRA Website - Publications*

- In cases where there is no such an explicit budgetary limit, it increases end-user electricity prices, which can reach socially and politically unacceptable high levels (for example, it already exceeds 10% of the overall consumer price in some EU countries).

Renewable Heat

В проекте стратегии не предусмотрено никаких мер по поддержке использования The draft strategy does not provide for any measures to support the use of renewable energy in the heat sector. While it recognises the potential, it takes the view that the currently unfavourable economics of renewable energy deployment in the heating sector will improve technological developments over time.

Draft Law No 1083, while aimed at electricity production from biomass, may be expected to assist the economics and facilitate the co-production of heat for district heating.

Renewable Energy Sources and Alternative Energy in Transport

The Government of Ukraine envisages introducing labelling motor fuels under environmental classes and also bio-component content. The Law on Amendment of Some Laws Concerning the Production and Use of Biological Types of Fuel No. 1391-VI of 21 May 2009 with Amendment of 2010 is dedicated to stimulating the production and usage of biofuel and developing a national fuel market based on the application of biomass as a renewable raw resource for the production of biological types of fuel. In particular, the law foresees a partial release from customs duties and excise duties on equipment and vehicles propelled by biofuel.

The Law on Amendment of Some Laws of Ukraine on the Production and Use of Motor Fuels Containing Biological Components No. 4970-VI of 19 June 2012 introduces requirements for the mandatory content of bioethanol for all the petrol produced and sold in the country in:

- 2013 – Recommended content of bioethanol not less than 5% (vol.)
- 2014–2015 – Obligatory content of bioethanol not less than 5% (vol.)
- 2016 – Obligatory content of bioethanol not less than 7% (vol.).

The Ministry of Infrastructure of Ukraine remarks, "about two thirds of the Ukrainian fleet is not designed and not adapted to use petrol with more than 5% of bioethanol content".

Among the other measures are two resolutions of the Cabinet of Ministers of Ukraine.

- No. 1307 of 5 October 2004 Issuing of Certificates for Approving Alternative Fuels
- No. 581 of 18 May 2011 Importing Equipment etc., for Biological Fuel Production and Use.

The ministry is also committed to the development of the market for gaseous fuels and has presided over an expansion of the usage and the growth in the number of outlets retailing gaseous fuels. Refuelling stations for CNG have doubled in number between 2004 and 2008. The ministry within its own system has created a network of about 100 enterprises that have converted vehicles for usage of gaseous fuels such as CNG and LPG.

Conclusion

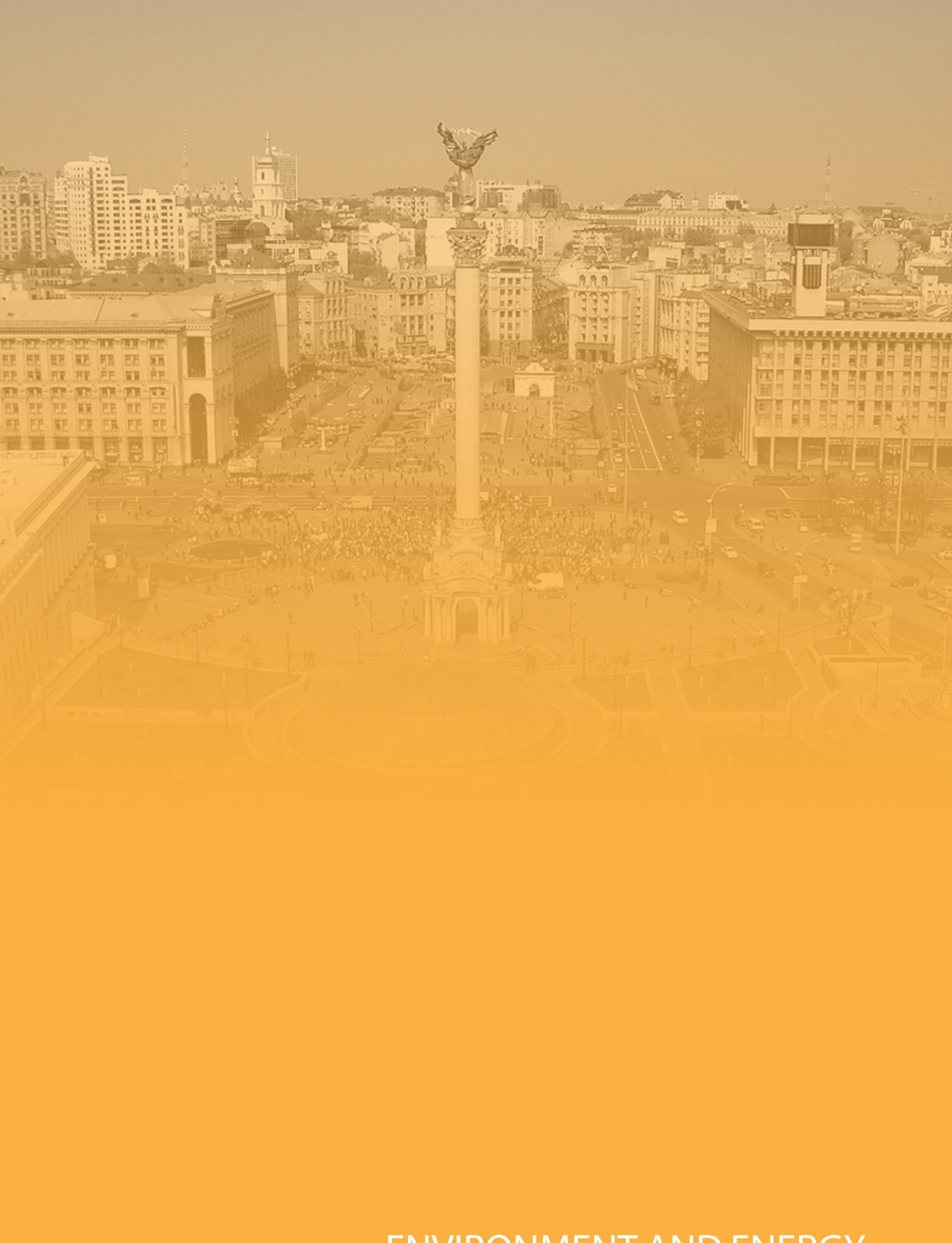
The centrality of the energy sector in facilitating economic growth is widely appreciated in both Ukraine and among the international community and within that understanding there is a consensus that renewable energy is an important growth vector.

There is strong but conditional financial support from the international community and the EU, as well as from their associated development and financial institutions, for the redevelopment of the energy sector and renewable energy. The Government of Ukraine recognises that FDI is important for the accelerated development of Ukraine's renewable energy sources and this is reflected in a commitment to a business friendly policy.

However, there is a desire to capture as much as possible of such investment for Ukrainian manufacturing and supply and, by doing so, further enhance the pace of economic development. Administrative requirements to achieve a minimum Ukrainian component of new renewable projects have had mixed results in promoting additional investment. The opening up of the RES-E market to private investment has stimulated the recent growth in renewable energy supply and the establishment of manufacturing facilities in Ukraine.

Thus there are early lessons in the delivery of policy measures that point to the need to carefully consider the costs, risks and unintended consequences at the policy design stage. In recent work undertaken under the auspices of an OECD team there is emphasis on drawing from experience elsewhere but with caveats to exercise caution in their direct replication under Ukrainian conditions.

Nevertheless, the short-term potential for renewable sources, relative to their current state of utilisation, is enormous; the electricity generation structure of Ukraine is, according to figures for 2012 supplied by the SAEE, dominated by thermal energy (48.6%), nuclear power energy (45.5%) and hydropower energy (5.6%) with new renewables included in the balance of 0.3%. Notwithstanding the RES-E potential, the low-carbon sources of nuclear and hydropower together account for more than 505 of the electricity supply.



ENVIRONMENT AND ENERGY

International Agreements

The Government of Ukraine signed the convention in the Earth Summit of Rio de Janeiro in June 1992. It was ratified in May 1997 and came into force in August 1997.

Ukraine signed the Kyoto Protocol in March 1999 and ratified it in April 2004; the Protocol entered into force in February 2005, after the Russian Federation's ratification in November 2004.

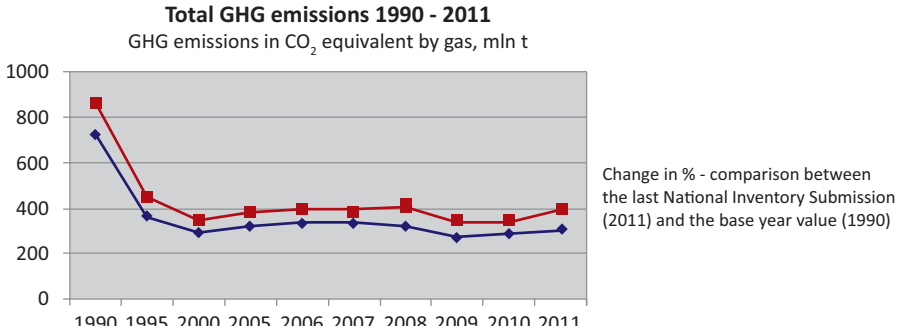
To comply with its "Annex I countries commitments" under the convention, Ukraine sent its First National Communication on Climate Change to the UNFCCC in February 1998. The second communication was sent in June 2006 and is available only in Russian. The third and fourth communications were subsumed into the fifth communication, delivered in December 2009.

In the report on the in-depth review of the fifth national communication of Ukraine by the compliance committee the UNFCC provides an overview of the climate policy of Ukraine on the date of its preparation, April 2011. Information on more recent developments in the national climate policy was provided during the in-country review and a summary of GHG emissions for Ukraine covering 1990, 2000 and 2010 is available on the UNFCC website.

UNFCCC Review

The sharp decline in CO_2 emissions between 1990 and 1996 reflects the decline in energy production and demand in the early stages of the economy's transition. Non-CO_2 emissions halved over the period and, in contrast to CO_2, have not increased since 2000. Emissions of CO_2 fell again in 2009 and 2010 as a result of the recession induced by the financial crisis.

Figure 21 Total GHG emissions 1990-2011 Ukraine



Source: "National Inventory Report of GHG and Removals for 1990-2011"

Total GHG emissions decreased by 53.9% between 1990 and 2008. The reduction in emissions was driven by changes that stem from the transition from a centrally planned to a market-driven economy and structural changes in industry and the economy, together with an increase in the share of services and an associated decrease in energy consumption, as well as by changes in the structure of primary energy use (reduced use of coal and increased use of natural gas). The effects of these drivers were amplified by improvements in energy efficiency and related programmes.

Ukraine's emissions are far below its target under the Kyoto Protocol. Therefore, Ukraine does not, for UNPCC purposes, urgently need an overarching national GHG emission reduction (ER) strategy. Climate change policy and measures are driven by the goals of economic efficiency and the development and security of energy supply.

The report observes that there is a little evidence from monitoring and evaluation that policies and measures promoting energy efficiency have resulted in sizeable energy and GHG emission savings. Regulatory instruments (laws, regulations and standards) play a key role in Ukraine's climate change related policy.

Ukraine has made GHG emission projections for the period 2010–2020, including three scenarios: baseline "without measures", "with measures" and "with additional measures". The projected GHG ERs in 2020 in relation to the base year levels under the "without measures", "with measures" and "with additional measures" scenarios are lower by 18.0%, 30.7%, and 35.8%, respectively.

Thus the projections indicate that Ukraine expects to meet its Kyoto Protocol target (which is the stabilisation of GHG emissions at the base year levels) under the "without measures" scenario. GHG emissions are not expected to exceed the country's base year level, even by 2020.

Moreover, according to the projections, Ukraine can meet its target under the Copenhagen Accord — ER by 20% by 2020 compared with the base year level — with domestic measures only. This is with the backdrop of an expected increase by 2020 in the share of coal instead of natural gas in the structure of the primary energy supply.[16]

Ukraine does not intend to make use of the Kyoto Protocol mechanisms to meet its target for the first commitment period (CP) of the Kyoto Protocol.

Ukraine benefits from JI projects and many of them focus on energy efficiency improvements in industry. Ukraine participates in international emission trading through the Green Investment Scheme (GIS), the aim of which is to use the revenue from emissions trading for funding mostly small-scale energy efficiency projects in public buildings and landfill gas recovery for energy use.

The National Adaptation Action Plan, which is under preparation, will set the basis for the adaptation actions for various sectors. As the National Adaptation Action Plan has not yet been approved, the scope, time frame and level of its implementation remain uncertain.

The Expert Review Team (ERT) commended Ukraine's continuous efforts to cooperate with developing country parties on training about climate change. With regard to research and systematic observation, Ukraine maintains a network of hydro-meteorological stations and contributes to the work of the IPCC on climate change.

The ERT notes in the conclusion of the annual review report (ARR 2010) under the UN Framework Convention on Climate Change that Ukraine's national system is not performing its required functions as set out in Decision 19/CMP.1 and that at the time of the preparation and publication of this report the question of the implementation of the national system of Ukraine identified in the ARR 2010 remained unresolved.

[16] *See FCCC/IDR.5/UKR*

The ERT concludes that the national registry continues to perform the functions set out in the annex to Decision 13/CMP.1 and the annex to Decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with the relevant decisions of the Conference of the Parties serving as the meeting of the parties to the Kyoto Protocol. The ERT notes "updates of databases, applications, security measures, and changes to the national registry software, are documented on a regular basis by nominated responsible persons".

The ERT encourages Ukraine to undertake a number of improvements regarding the transparency and completeness of its reporting. The most important of these relate to information on the effects of individual policies and measures and their costs, and in the building sector, in particular, and also those measures that increase GHG emissions.

JI

The basic principles of JI are defined in Article 6 of the Kyoto Protocol. Project participants and Annex 1 parties may jointly implement an emissions-reducing project in the territory of an Annex 1 party, and count the resulting emission reduction units (ERUs), which goes towards meeting their Kyoto target.

The large scale and urgency of the need to restructure and modernise the power and heavy industry sectors of Ukraine, combined with the contraction of the economy, have created conditions and incentives for the earning of ERU units on the back of much needed investment in these sectors. Investors from the Netherlands, the UK, Germany, Ireland and Japan have availed of the opportunity to pursue JI projects in Ukraine. They are an important source of investment capital and, in many cases, of technological advancement and contribute to the competitiveness and sustainability of the economy of Ukraine.

The implementation of JI projects in Ukraine is governed by the "Procedure for Preparation, Examination, Approval and Registration of Projects Aimed at Reduction of Volumes of Anthropogenic Emissions of Greenhouse Gases", approved by Resolution of the Cabinet of Ministers of Ukraine No. 206, dated 22 February 2006.

The procedure is administered by the State Environmental Investment Agency (SEIA) and includes the following steps.

- Application for support for the SEIA, which is completed upon issuance of a letter of endorsement by the SEIA
- Submission of a detailed description of the JI project along with a determination report to the SEIA. This stage is completed when the SEIA issues a letter of approval and registers the JI project
- Implementation of the JI project; submission of a monitoring report of the JI project to the SEIA for registration
- Transfer of ERUs to the account of the JI project owner held with the national carbon register. Furthermore, the ERUs may be transferred to the account of any foreign entity held with a foreign carbon register.

In August 2012 a public consultation on proposed revisions to the regulatory impact of Resolution 206 was ongoing. The Joint Implementation Action Group (JIAG) represents developers of JI projects and in its submission it welcomed the inclusion of regulations for

programmes of activities and the bundling of JI projects to facilitate smaller projects. The same submission stressed the need to observe timelines for the processing of applications and for greater transparency, which go towards providing a level playing field for applications.

State Support

Environmental projects may benefit from state support, such as financial support (through direct funding, provision of state guarantees and interest reduction under loans attracted from commercial banks) as well as preferential regulation incentivising environmental and energy efficiency projects.

The principal mechanisms for the provision of state financial support are i) state support of public private partnerships and ii) financing under various state task programmes. The former mechanism was introduced in 2010 with the adoption of the Law of Ukraine on Public Private Partnership. It provides companies acting as private partners in the framework of public private partnership (through a concession agreement, joint activities agreement or otherwise) with an opportunity to seek funding from the budget or to apply for state guaranties. Although the mechanism is not fully effective yet, the Government of Ukraine is taking a proactive stance in its implementation.

Further state support may be acquired through specific state support mechanisms, such as the task programme for energy efficiency and the development of renewable energy resources for 2010–2015 and the mechanism of reimbursement of interest under loans attracted for projects in the sphere of energy efficiency.

In addition to direct financial support from the government, environmental projects may benefit from preferential regulation. For instance, the importing of energy efficiency materials and equipment is exempt from customs duties and VAT.

Carbon Market Initiatives

In 2010, Ukraine started negotiations with the EU on a bilateral agreement to recognise ERUs generated in Ukraine in the European Union Emissions Trading Scheme (ETS). For the time being, there has been little progress, which is largely due to differences between both parties as to the level of emission reduction commitments that Ukraine should assume. It is also possible that the EU will impose eligibility criteria for Ukrainian JI projects before ERUs generated under these projects can be admitted into the European system.

The EBRD in close collaboration with the Ukraine's NEIA is developing a carbon market facilitation programme for Ukraine. The project was to run to July 2011 and aimed to help Ukraine to develop a legal, financial and institutional framework for the identification, assessment, designation and trade of Kyoto units and to increase the capacity to address carbon markets. It was delivered with the support of the Government of Spain and the resulting handbook *Guidelines for the Development of JI Projects in Ukraine* provides valuable clarity for potential "Object Owners".

JI Project Achievements and Accreditation

Achievements

Ukraine is one of the most active countries in the JI market, accounting for over 40% of global ERUs in June 2012. Projects are dispersed over the industrially developed eastern, central and

southern regions of Ukraine. The largest quanta of ERUs are from the capture of methane and its utilisation in coal mines, industrial processes, co-generation and use in the gas transport system. The refurbishment of central heating systems is another important source.

On 18 March 2009, the New Energy and Industrial Technology Development Organization of Japan (NEDO) and SEIA, formerly NEIA, concluded an AAU purchase agreement for 30 million (CO_2 equivalent). Through this GIS agreement, NEDO's AAU purchase funds are to be applied to GHG ER and other environmental projects.

In 2012 the NEDO and SEIA announced that they had agreed (press release of 24 April 2012) to implement 319 energy conservation projects, based on the GIS) concluded through the GIS agreement.

These projects will aim to reduce GHG emissions and improve the insulation of the window frames, walls and roofs of schools and hospitals (319 facilities) in various regions in Ukraine. The majority of the public facilities in Ukraine, including schools and hospitals, have become dilapidated and have poor insulation, and are in need of renovation works. Improving the insulation of these facilities as GIS projects will address Ukraine's social needs and will also help to increase the awareness of energy conservation in various regions. Expectations from these projects are, therefore, very high throughout Ukraine. This agreement includes amendments (change of projects, etc.) to the agreement on the social project announced on 19 January 2011.

Accreditation

According to the National Ecological Centre of Ukraine (NECU), the experience of JI in the first commitment period (CP1) shows that the mechanism has helped to reduce the compliance costs, both under the Kyoto Protocol and EU ETS.

JI has initiated an industry-lead bottom-up approach in ER efforts and resulted in a number of worthy ER initiatives. In some cases JI has facilitated the transfer of knowledge and ER technologies.

However, the centre believes that the application of the mechanism at international and national levels has shown flaws that should be addressed for the second Kyoto period to secure its environmental integrity and to ensure the continuation of JI as an ER tool.

The NECU concludes with an observation and a plea to all of those involved.

Without a deep transformation JI will not be an effective tool of mitigating climate change and may eventually come to an end. The Parties to the Kyoto Protocol together with the JI Supervisory Committee and, possibly, the Governing Body should address the issues of the mechanism as soon as possible. It should be also realised by all stakeholders involved in JI, such as project developers and owners, ERU purchasers and traders, AIEs and host country DFPs, that it is in their interest to restore the environmental integrity and credibility of JI, and stop considering it purely as a source of cash.

A desk review and the analysis of publicly available information on Ukrainian JI projects resulted in its raising issues on baselines, consistency, retrospection, additionality and due diligence. On the other hand, projects with high levels of additionality but with accompanying risk were overlooked in the early stages. Examples of landfill gas and coal bed methane were cited.

At the time of writing the uncertainty of the CP2 framework prevents ER projects from

seriously relying on CP2 ERUs in their implementation. Even though most of the registered and operational projects are set to claim ERUs beyond 2012, the need for further crediting can be questioned. Nonetheless, some projects may indeed rely on JI for their future operation or implementation if they are not yet completed.

Based on these findings, the NECU proposed several changes in the operational model of JI in CP2, which are called to address the highlighted issues.

(1) Considering the uneven quality and questions about the environmental integrity of currently registered projects, their baselines and additionality will have to be reviewed before they are allowed to receive ERUs in CP2. Only those implemented projects the future operation of which depends on ERU incomes should continue receiving JI support. Otherwise, the next Kyoto period will suffer from the outlined problems and the enormous supply of low-quality ERUs will continue.

(2) The problem of the ambiguity over ways to demonstrate additionality should be addressed.

(3) Baseline setting should also become more clear and transparent as the approach of the "most likely scenario" leaves a great deal of space for manipulation.

(4) JI should operate in a single track with international oversight versus existing JI Track 1 and Track 2. The governing body should be able to step into the project cycle both at the registration and ERU issuance stages.

(5) Special attention should be paid to the elimination of the conflict of interests of accredited independent entities in performing the determination of JI projects and verification of resulting GHG reductions.

(6) Potential incomes from ERUs should be increased, so that JI can enable ER projects that otherwise would not be implemented. Therefore, the crediting period should be maximised for projects with long payback periods; this can be achieved so that CP2 lasts eight years instead of five. Measures to support the price of credits should be taken, such as filtering out non-additional projects as suggested above, and increasing the level of ambition of countries' QELROs.

EU Ukraine Relations

In the field of climate change, Ukraine has taken further steps to prepare legislation on emission trading, in line with its long-term objective to link with the EU emission trading system.

Some 34 new JI projects were registered at the UN level, bringing the number of registered projects to 82.

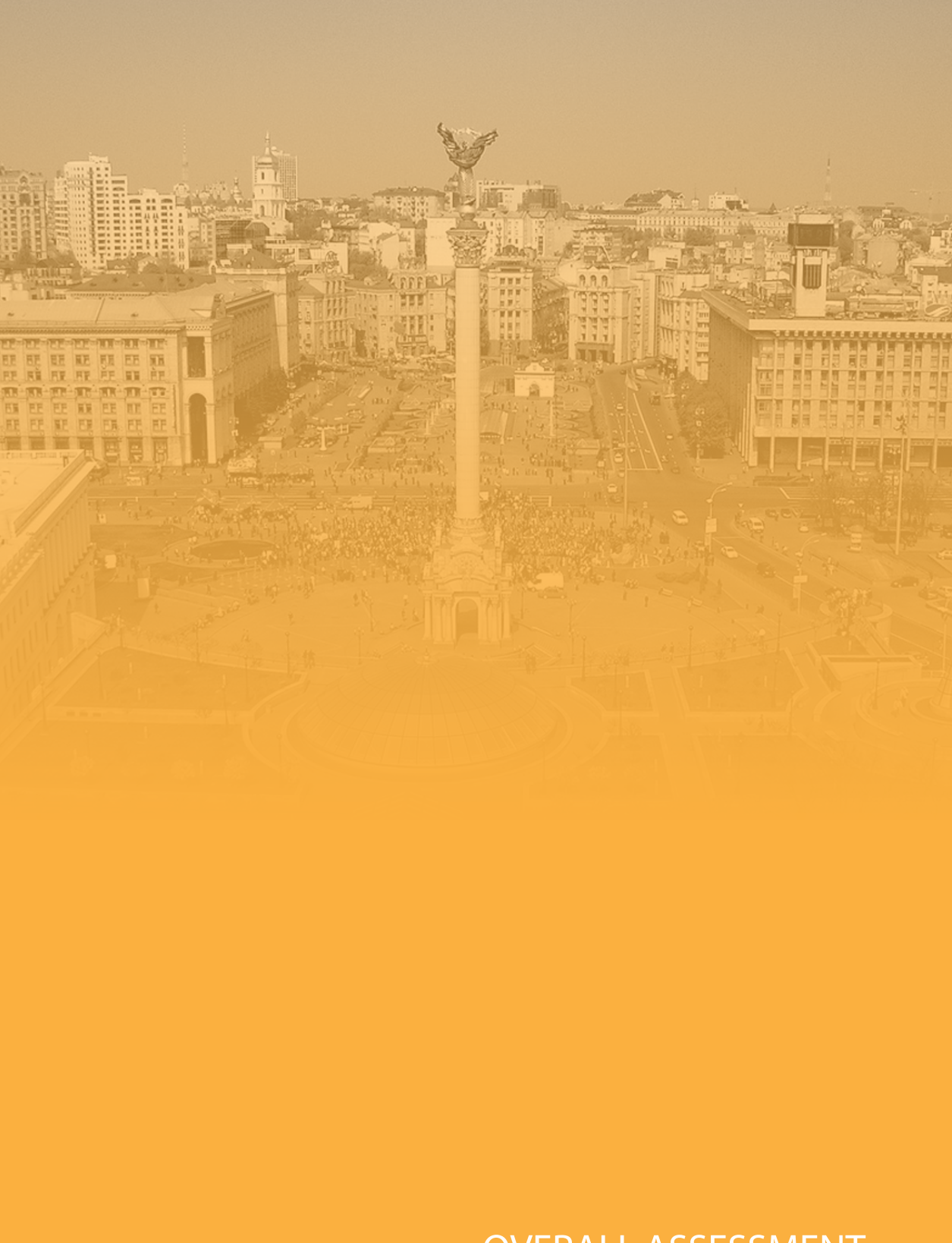
In October, the UNFCCC Kyoto Protocol compliance committee suspended Ukraine from trading emissions units pending the resolution of questions relating, in particular, to the transparency of emission data. Ukraine is encouraged to build capacity and engage in the new carbon market mechanism to be developed following the UNFCCC (UNFCCC COP 17).

Ukraine is also encouraged to fully implement the Cancun and Durban agreements and, in particular, devise a low-carbon development strategy, including update information on targets or actions that it will implement.

The EU has launched two projects to study the potential implementation of low-carbon technologies and carbon sequestrations with Ukrainian partners.

Ukraine has adopted a national environment action plan for 2011–2015 to implement its environmental strategy. A decree setting out the procedure for public participation with regard to decisions that can affect the environment has also been approved. New legislation regulating urban development activities has raised concerns about the procedure for environmental assessments, including possibilities for public participation, and will need to be reviewed.

Ukraine has faced problems with implementing several agreements it has already ratified. In June and July, respectively, the fifth Meeting of the Parties of the Espoo Convention and the fourth Meeting of the Parties of the Aarhus Convention issued cautions against Ukraine for non-compliance. The EU launched a sector policy support programme in the field of environmental protection (EUR 35 million). A follow-up project to continue support for Ukraine's implementation of the Espoo and Aarhus conventions was also launched.



OVERALL ASSESSMENT

Overall Assessment of the Progress

The being carried forward by the Committee on Economic Reforms under the president of Ukraine is impressive in its scope, level of detail and effort to timetable the progress, outcomes and progress indicators. The programme aims are reflected in the programme's title: "Prosperous Society, Competitive Economy, Effective State".

The reform of the energy sector, as detailed in the chapter on "Modernisation of Infrastructure and Primary Sectors", analyses the challenges, aims and objectives and necessary steps before laying out and timetabling three stages of reform to 2014. It closes with a set of four success indicators.

- Tariffs for households brought to an economically viable level by the end of 2012
- Privatisation of the power supply and thermal power generation completely by the end of 2014
- New market model up and running from late 2014
- Specific energy efficiency of the economy improved by at least 20% by the end of 2014.

These indicators, and the extent to which the necessary steps envisaged in the PER are achieved, as conceived in the outcomes in Stage I (by the end of 2010) and in Stage II (by the end of 2012), provide a valid basis for an overall assessment and review of the progress.

Ukraine is at a crossroads and there are many dimensions to the choices and options available. Geopolitical considerations figure highly in traditional markets, such as those for steel, food and energy. Inward investment is a priority for the modernisation of the economy and the reconstruction of the energy system. There are no quick and easy answers to Ukraine's dependence on external energy resources, the cost of which is increasingly unaffordable. The concentration of power and influence in a small group with vested interests has created issues for the perceived independence of the administration and trust in government and its institutions.

Against this background, which is reinforced by international statistical comparisons of the energy intensity of GDP in Ukraine, it is not surprising that Ukrainian policy makers feel free to set high and ambitious targets for energy efficiency. While it is right and proper to have ambitious goals, the effort to achieve energy efficiency goals is enormous, not least because of the scale of investment required, the breath of issues to be addressed and the number and range of actors involved.

The principal responsibility for energy efficiency policy rests with the Ministry of Economy and Trade. However, energy efficiency policy delivery will have a direct impact on plans and projections for energy supply and GHG emissions and it needs to be sympathetically received and accounted for in the Ministry of Coal and Energy and in the Ministry of Environment. Ultimately, it is to the Ministry of Finance that energy efficiency programmes must look for their funding and ongoing support.

One year after the adoption of the PER, the EBRD observed "that the past three years had been challenging for Ukraine. In its view the announced structural reforms, if implemented fairly, should contribute towards increasing the country's long-term growth potential and help mitigate the post-crisis macroeconomic vulnerabilities".

The recent competition for petroleum exploration and production licences is an example

of a prioritised and material action that has the potential with FDI, through natural resource development, to address the security of the energy supply, industrial development and employment creation and generate new government revenues.

Policy and Measures to Promote Energy Efficiency

The "State Targeted Economic Programme for Energy Efficiency and Development of the Sphere of Energy Generation from Renewable and Alternative Energy Sources for the Period 2010–2015" was developed and approved by the Cabinet of Ministers of Ukraine on 1 March 2010.

The programme defines the priorities in terms of energy efficiency for the period 2010–2015. By 2015, compared with a reference year of 2008, the objectives are for a 15% decrease in emissions and a 50% reduction in heat losses in the housing sector as a result of their rehabilitation. In 2011, the state budget foreseen for this programme was UAH 910 million (about €90 million). On 29 June 2011, the Cabinet of Ministers of Ukraine decided to finance six power lines, using the funds allocated to the programme.

Under the EU-Ukraine Energy Cooperation the key progress reported since October 2011 included the following observation.

During 2011 and 2012 Ukraine worked on updating its Energy Strategy to 2030 that was originally adopted in 2006. The stated aim of the draft Updated Energy Strategy is to develop an integrated and effective framework that has due regard to Ukraine's national legislation and its commitments under international treaties, including commitments to comply with European energy legislation, to promote a competitive energy market, improve energy efficiency, increase the domestic production of energy resources, diversify the sources of imported energy, cost-reflective pricing and ensuring attractive investment conditions for private investments.

In June 2012, the working draft of the Updated Energy Strategy to 2030 was shared with the EU, the IFIs and other bodies. The EU, World bank and US Embassy jointly provided detailed comments in July 2012 seeking greater emphasis on demand-side measures, the need for a wider consultation of stakeholders and the importance of taking into account the commitments Ukraine entered into when joining the Energy Community in February 2011 as well as the recommendations of the IEA in-depth review of Ukraine published in 2012. According to the joint report "Ukraine has confirmed that the EU Delegation/World Bank/US Embassy comments and the IEA's recommendations will be taken into consideration.

While the Updated Energy Strategy of Ukraine to 2030 is to be the main vehicle for future proofing and establishing the continuity of policy, implementation and delivery take place in a shorter timeframe ranging between 2014 and 2020, depending on the area under consideration. Thus, for example, the Ministry of Infrastructure, being responsible for transport policy, is working to a 2020 vision, incorporating energy efficiency goals in support of sustainability objectives.

A draft law on energy efficiency, which should replace the 1994 Law on Energy Conservation, which is unanimously recognised as obsolete, is still under preparation. The new draft Law on the Efficient Use of Energy Resources will determine the legal principles for promoting energy efficiency in Ukraine, with the aim of ensuring economic and organisational conditions for the efficient and economical use of fuel and energy.

Positive developments in the legal and regulatory framework took place in 20l2, with the Law on Energy Efficiency of Buildings adopted in the first reading, and the second reading is expected early in 2013. This law should reflect the main provisions of the Energy Performance in Buildings Directive as required by the EnC Treaty. The related secondary legislation is also reported to be under preparation by the Ministry of Regional Development, Construction and Municipal Economy.

The SAEE is currently preparing policies in line with the EnC, such as a roadmap on the implementation of the Energy Community acquis and the national energy efficiency action plan, which were submitted to the Energy Community Secretariat in 2012. According to the Energy Community this requires improvements and the relevant work is now ongoing. The SAEE is also preparing regulations to comply with the Directive on Energy Labelling.

According to a USAID factsheet of January 2013, Ukraine's energy sector problems — low energy efficiency, high vulnerability to price fluctuations and dependence on imports — are especially evident in the municipal heating sector. Recognising that the municipal heating sector requires fundamental reforms to save energy and provide quality services to the Ukrainian population, public institutions and local industries, USAID, with the cooperation of the Ukrainian Authorities, has launched an MHRP. The objective is to assist the Government of Ukraine and local governments to create a viable municipal heating sector that is able to deliver quality services to residents, public institutions and local industries. Experts estimate that up to 60% of energy is wasted within the municipal heating chain — and that the largest losses occur at end-user facilities.

The Ministry of Regional Development, Construction and Housing has demonstrated in a series of donor co-financed residential apartment renovations that savings of 50% are attainable with a payback period of seven to ten years, depending on the energy price and the options chosen.

The Cabinet of Ministers of Ukraine approved in July 2012 the action plan "for the Regulatory Support to the Implementation of the Energy Efficient Heat Consumption Policy and Modernisation of the Heat Supply Sector". This plan was warmly welcomed and expectations for its swift implementation were high. The plan also addresses some of the provisions of the Energy Services Directive, in particular those related to energy performance contracting.

Financing Energy Efficiency

The funds for energy efficiency are limited by, amongst other things, i) the state of government finances and ii) the current policy of low energy prices for consumers. However, according to the IFC, finance is available for those businesses with the potential for competitive advantage while operating under free market conditions.

Where state funds have been provided they have sought to leverage private and international sources of finance and the government has sought to assist this process by coordinating donor finance and directing it to priority projects and leveraging the capacity of ESCOs to finance necessary investments.

IFIs are firmly fixed on providing finance for the reconstruction of the energy sector of Ukraine and the modernisation of existing industry. Several large projects are underway to improve the energy efficiency of electricity generation and transmission, and also in the steel industry. Each will make a significant contribution to reducing the cost and environmental impact of steelmaking while building experience to assist wider replication.

On the acquisition of funds for public utilities, the GIZ, GFA and SAEE of Ukraine with the Ministry of Regional Development, Building and Housing of Ukraine have produced an exemplary set of "Guidelines for Project Proposals" directed at municipalities and their public utilities. This is an important initiative in reaching out to medium sized towns to suitably structure projects to attract funding.

The lending to several priority industrial sectors for investment by the IFIs is in many cases conditional on sustainable energy practices and choices. Thus energy efficiency is a formally recognised component of business and sustainable development. Clearly, cost-reflective energy prices will support and reinforce such choices for all new investment in industry and services where the market arrangements allow for a sufficient return.

SMEs and private consumers have limited access to affordable finance and in many cases are extremely limited in their ability to pay. Special arrangements by way of low cost finance can assist but inevitably the high costs of administration and losses increase the margins that local banks apply. Take-up rates are modest and other solutions are necessary for a scaled-up response. Utilities may have a role in both service delivery and finance as the government formulates and finalises its national energy efficiency action plan.

The EBRD, in its "Strategy for Ukraine 2011–2014", has opined that "it will be necessary to significantly improve the business environment and reduce the perceptions of endemic corruption in order to attract large scale quality investments that would, over time, help to reduce Ukraine's dependence on several low value added and energy-intensive export sectors". The EBRD has prioritised its lending to strengthening energy efficiency and energy security and made future lending conditional on the pursuit of a comprehensive and credible reform agenda. It would appear from the choice of language that the credibility of reform programmes is an issue.

Institutional Arrangements

The most recent re-structuring of energy efficiency delivery was the creation of the State Agency for Energy Efficiency and Energy Saving of Ukraine (SAEEE) as the legal successor of the National Agency of Ukraine for Efficient Use of Energy Resources and the State Inspectorate for Energy Saving, a governmental state administration body that acted within the National Agency for Efficient Use of Energy Resources. It was established by Presidential Decree dated 13 April 2011 and amended 22 February 2012.

The NERC was established in 1994, is financed from the national budget and as of now has 432 staff members responsible for the following: regulation of natural monopoly activities in the power sector, in the oil and gas complex and in the sphere of heat generation; consumer rights protection; issuance of licences; implementation of pricing policies in the power sector, and in the sphere of heat generation; and regulation of relations in the retail electricity market. Further legislation is required to allow the regulator the independence of action that is mandatory under the EU acquis.

The privatisation process in the electricity sector has been on-going since 2011 and a set of generation and distribution assets has already been privatised. In parallel, the privatisation of the combined heat and power plants and the gas distribution services has been launched in 2012.

In the light of the importance of the energy sector and of energy efficiency in particular it is not clear that the SAEE is adequately resourced, structured, positioned and empowered to drive the

scale of change required. In the first instance there is a gap between the ambition of the policy and the resources allocated. The proliferation of targets, all ambitious, is suggestive of an energy policy that is declamatory rather than focussed on the practical steps necessary to achieve more modest but nevertheless real and durable progress. This creates difficulties by fostering cynicism and a sense of disempowerment.

Any accelerated move to full and widespread application of cost-reflective pricing will create intolerable pressures for some already hard-pressed consumers and this reality, along with the general sense of entitlement of the population to cheap energy, go some way to explaining the government's lack of progress. However, the economic and institutional pressures for reform continue to grow and the room for manoeuvre though further procrastination is being steadily eroded by the precariousness of the economy. It is against this background that the government must ensure that subsidies are directed to where they are actually needed and it would be appropriate for an agency to assume the responsibility for monitoring the situation and recommending policy action.

It is clear from the results of pilot projects undertaken in the residential sector that the implementation of the Energy Efficient Heat Consumption Policy and Modernisation of the Heat Supply Sector Plan or its equivalent will require the creation of new institutions and further development of existing institutions to drive the change, regulate the behaviour of market participants and allow sufficient rates of return on capital to attract new market entrants and entities with strong and ample resources, sector knowledge and a desire to establish sustainable business in meeting heat supply needs. If ESCOs are to play a leading role in delivery the existing legal and market deficits in the framework for delivery will have to be addressed.

The SSU continues to develop energy statistics activity. It has concentrated on data verification checks and correction procedures and has benefited from international support and mentoring, of which the completion of the IEA questionnaires with software worked out by IEA is a key part. Analyses are now available showing the structure of energy consumption by industry and, for example, the power intensity of GDP as it continues to fall, reflecting the changing structure of GDP and energy efficiency gains.

Energy Pricing and Taxation

There is evidence to suggest that the proportion of energy end-use consumer costs that are recovered by revenues has declined to an all-time low in recent years. Such inertia and slippage do not auger well for the achievement of full cost recovery by 2014, as foreseen in the national programme.

The challenge for the government is to establish the climate within which energy prices can migrate upwards to cost-reflective levels. The elements of such a climate are both rational and emotional. Thus it has to be approached with great sensitivity to equity, clarity of purpose and resolve to see it through. The key point is that cost-reflective pricing is a means to an end; the end is to value and husband scarce resources for the common good.

In the context of the roadmap on the integration of the electricity and gas market it has been observed that further steps need to be taken to ensure the NERC has the ability to set full cost recovery tariffs.

From an investor perspective the acid test of the sustainability of any investment is the return of a stream of revenue over time that exceeds or, at a minimum, matches the cost of capital. Where there is a doubt about the customer's ability to pay or willingness to meet the cost

of the service it will be reflected in a risk premium. In some circumstances borrowers will be dissuaded and in others investors will be unwilling to put their funds at risk. In both cases the opportunity for investment is lost.

Thus in formulating a basic strategy it will be important to identify attainable outcomes that will engender confidence and thereby strengthen subsequent efforts.

An IMF staff working paper[17] concluded "Government savings from higher household tariffs can be channelled into a higher quality of life for all households. Overall, under-pricing gas and heating utilities provides a 5% of GDP subsidy to households. The analysis suggests that even with just a 20% tariff increase the government will gain almost 0.3% of GDP. The associated increase in social assistance costs will be minimal and more than offset by the elimination of benefits to the wealthy. Government savings should first be used to finance energy-saving infrastructure investment, helping to reduce the burden of tariff increases on households. Investment of additional savings arising from gradual tariff increases in domestic gas exploration and development as well as growth-enhancing activities will eventually provide greater financial gains for all households than under-priced gas and heating tariffs.

Energy Efficiency and the Environment

Ukraine is party to all of the important international GHG emission and control protocols and treaties. Its record on the timely submission of reports is patchy; for example, in reporting to the UNFCCC and to comply with its "Annex I countries' commitments" under the convention, Ukraine sent its First National Communication on Climate Change to the UNFCCC in February 1998.

The second communication was sent in June 2006 and is available only in Russian. The third and fourth communications were subsumed into the fifth communication, delivered in December 2009.

However, according to the NECU the experience of JI in CP1 shows that the mechanism has helped to reduce the compliance costs, both under the Kyoto Protocol and EU ETS.

In October, the UNFCCC Kyoto Protocol compliance committee suspended Ukraine from trading emissions units pending the resolution of questions relating, in particular, to the transparency of the emission data. Ukraine is encouraged to build capacity and engage in the new carbon market mechanism to be developed following the UNFCCC COP 17.

According to the EU, Ukraine adopted a national environment action plan for 2011–2015 to implement its environment strategy. A decree setting out the procedure for public participation with regard to decisions that can affect the environment was also approved. New legislation regulating urban development activities has raised concerns about the procedure of environmental assessments, including possibilities for public participation, and will need to be reviewed.

The evidence for high aspirations is reflected in the number and scope of international agreements, protocols and treaties concluded. The ambition to achieve good outcomes is reflected in the early arrangements for JI projects, in which Ukraine appeared to excel. However, there are indications of a weakness in the achievement of the necessary compliance and verification arrangements.

[17] *Pritha Mitra and Ruben Atoyan, IMF working paper, WP/12/247*

Nevertheless, action is proceeding on a broad front and the basic building blocks of setting goals and targets and establishing the necessary institutions and procedures for holding them accountable. A huge amount of work remains to be carried out in terms of establishing the conditions for direct investment in where it can be most effective. There are formidable coordination challenges ahead.

Renewable Energy

The rapid development of solar and wind power in Ukraine is attributable to the stimulus of the feed-in tariff. In the absence of a similar stimulus the development of biomass has been modest by comparison.

The Verkhovna Rada has addressed the biomass and the unrecognised biogas potential by providing for a green tariff to enable these additional renewable sources to contribute to electricity production. This broadening of the base of renewable supply is a welcome step towards a more balanced development of the available renewable energy sources.

Furthermore, the projected adjustments to green tariffs are appropriate to ensure the future cost effective development of renewable energy. Going forward it will be important to monitor carefully the impacts of the local supply conditions with a view to ensuring value for money for the electricity consumer and for sustainable industrial development.

In parallel and in response to external demand for alternative fuels there has been a growth in the output of the biomass fuel processing industry in Ukraine, to where initially the vast bulk of the production of pellets and similar products was exported.

This nascent industry results from entrepreneurial activity that has responded to developments in neighbouring markets and has not materially benefitted from state support. However, it augurs well for the future development of a renewable heat supply in Ukraine and, where appropriate, for high efficiency biomass fired cogeneration plants to meet the needs of municipalities.

On 18 October 2012, the Energy Community Ministerial Council agreed on the implementation of EU Directive 2009/28/EC and amendments to Article 20 of the Energy Community Treaty. Ukraine's share of energy derived from renewable sources was set at 11% for 2020.

The NERC is sensitive to the consumer cost issues raised by renewable energy development in other (EU) markets and recognises that the costs of an alternative energy policy may reach a critical level of affordability. According to the NERC, this raises the issue of determining the optimal contribution from alternative energy sources in the energy sector of the country.

Other issues identified by the NERC are as follows.

- Integration of the alternative energy facilities into the power-generation system
- Balancing intermittent (for solar and wind generation) power-generating facilities
- Management of the priority connection of the alternative energy facilities
- Compensations for the connection costs
- Formation of correct and timely price signals for the alternative energy sphere
- Certification and verification of electrical energy produced from alternative energy sources.

Having committed to a target of 11% according to the relevant directive, Ukraine should develop and submit to the Energy Community Secretariat its national renewable energy action plan by 30 June 2013 and ensure the entry into force of the laws, the secondary regulations and administrative provisions to implement Directive 2009/28/EC by 1 January 2014. For example, without priority despatch it is not clear how renewables would fare in a market context where so much of the electricity consumed is dispatched at a very low marginal cost.

With the Government of Ukraine settled on its high level renewable energy 2020 targets this ambition must be reflected in the Draft Energy Strategy to 2030. Therefore, the targets and the concerns of the regulator must now find full expression in the National Renewable Energy Action Plan of Ukraine.

Conclusion

There is a high level of awareness of the need for a robust energy strategy and indeed of the key issues to be addressed.

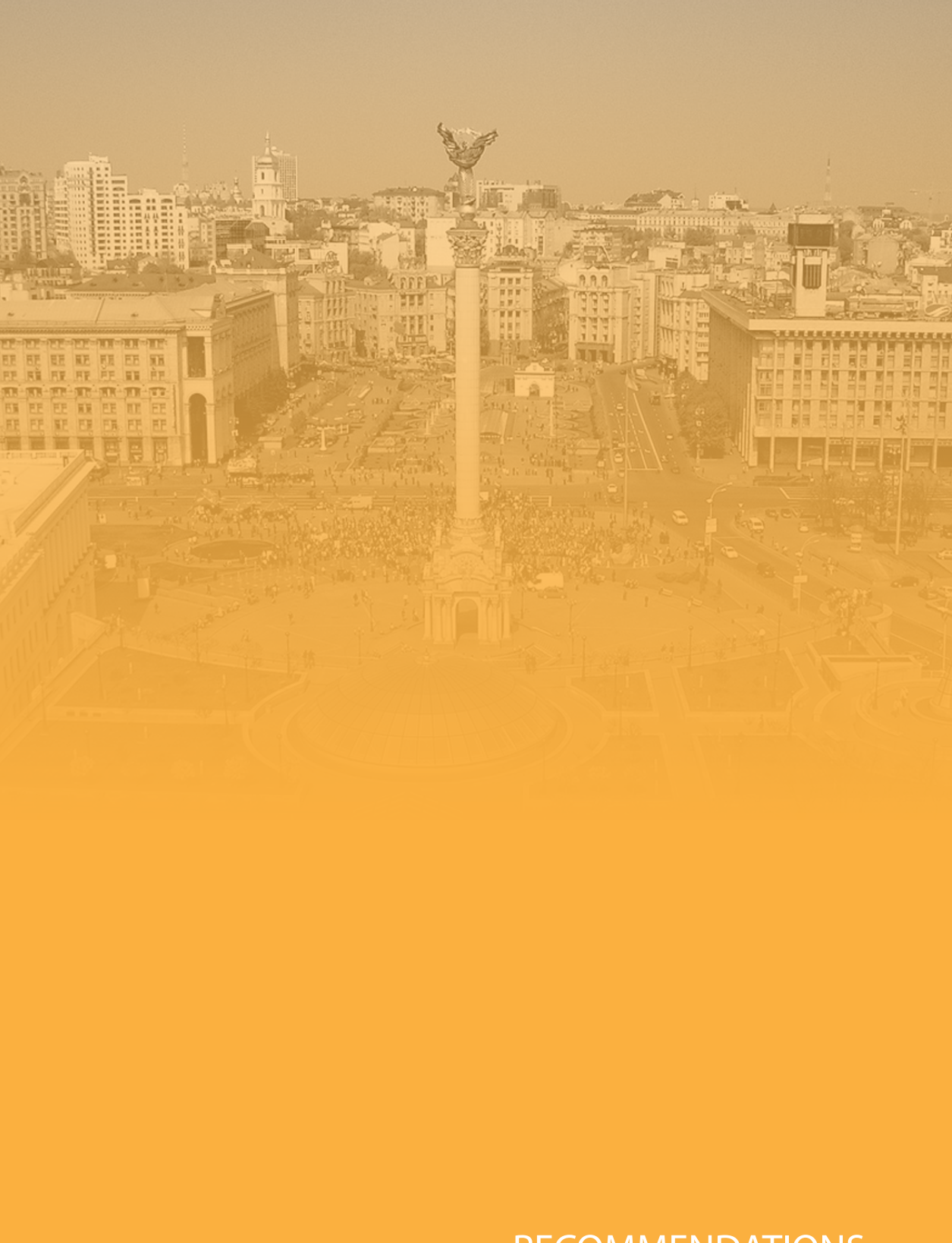
The most pressing issues have benefited from considerable scrutiny and debate and the high level goals are not in dispute. It is probably the case that the delay in finalising the energy strategy centres on the need to articulate a robust approach that is acceptable to the principal stakeholders. In this context, the identification of win-win solutions can be a potent enabler, for example meeting the heating service needs of apartment owners while contributing to the viability of the service.

Considering that, in the first half of 2013, it is already evident that less than three years into a four year programme, 2010–2014, the first of the four key energy efficiency targets, "Tariffs for households brought to an economically viable level by the end of 2012", has not been met and it may not be possible to measure the fourth, "Specific energy efficiency of the economy improved by at least 20% by end 2014".

Thus there is doubt over the level of understanding, commitment and ability to formulate, resource and deliver certain energy policy goals. Such doubts cannot be confined to a review as they are likely to be more widely held in Ukraine and understood and more deeply felt and justified in the policy-making system. Thus the risk of cynically serving whatever the moment requires is likely to continue until such time as such behaviours are sanctioned or better behaviours rewarded.

Recognising that energy not wasted is intangible, and in so far as it is a cost that has not arisen, the monitoring of progress and the justification of continuing expenditure require careful attention in policy delivery and review. This is especially the case where funds are scarce and there is strong competition between competing demands on government. Thus there is a strategically important internal government dimension to the successful formulation and delivery of energy efficiency policy.

The evidence points to the need for in-depth reforms of the policy-making process, which can be assisted by transparency in decision making and the establishing of responsibility and accountability. The organisation and coordination of efforts within a robust strategy are fundamental to achieving measurable progress.



RECOMMENDATIONS

General

- The Government of Ukraine should meet legitimate expectations for a recast energy strategy based on well-founded assumptions, realistic projections and the acknowledged potential for huge energy efficiency gains according to the needs of various stakeholders. The finalisation of the strategy should be expedited.
- The Government of Ukraine should accelerate all necessary and desirable reforms so as to radically improve i) the prospects for investment and ii) perceptions of Ukraine as measured by the metrics of reputable international bodies.
- The Government of Ukraine should ensure that its published policy intent is backed up by solid programmes of action that are subject to periodic evaluation, review and adjustment according to clearly stated principles.
- The Government of Ukraine, in the spirit of the PER, should take steps to formulate its energy policies to ensure that it can benefit from the work of public and private institutions and interested NGOs.
- The Government of Ukraine should continue to support measures aimed at raising awareness of energy efficiency and educating public officials and the wider population on local, regional and national levels.

Institutional Framework

- The Government of Ukraine should, with recourse to appropriate institutions and to public consultation, ensure that high standards of governance are obtained in the formulation of energy and energy efficiency policy and in its implementation through energy market liberalisation, utility privatisation and the regulation of competition.
- The Government of Ukraine should, as a matter of urgency, take steps to ensure that it has the institutional capacity appropriately structured to effectively formulate, monitor, analyse and review energy and energy efficiency policies and their implementation and enforcement.
- The Government of Ukraine should provide for the development of institutions for the promotion of sustainable energy, including energy efficiency, renewable energy and JI opportunities.
- The Government of Ukraine should improve the status of the SAEE and establish it as a separate structure within the government.
- The Government of Ukraine should ensure that sufficient human and financial resources are allocated to the Agency of Energy Efficiency as the leading agency, as well as to all units within ministries and regional administrations responsible for the development and implementation of energy efficiency programmes.
- The Government of Ukraine should ensure that supporting educational institutes and professional bodies concerned with educational formation and skills development are well informed about energy efficiency goals, targets and programmes.
- The Government of Ukraine must enable, resource and underpin the impartiality and independence of the energy regulator with legislation.

Energy Market and Pricing

- The Government of Ukraine should evidence the strength of its commitment to cost-reflective energy pricing. It needs to provide for an integrated approach to individual metering, end-use efficiency, comfort and other benefits in tandem with price rises. It should proceed at an appropriate pace of reform in a secure market and policy framework.
- The Government of Ukraine should ensure that energy affordability is closely monitored and that remedial action to alleviate hardship is promoted through an expert body.
- The Government of Ukraine should ensure that its guidance for the regulator is transparent, rooted in energy policy and thought through to avoid unintended consequences.
- The Government of Ukraine should make adequate provision for the effective regulation of monopolies and competition in the electricity, natural gas and heat distribution markets.
- The Government of Ukraine should ensure that the reform of district heating is in the long-term interests of consumers and sensitive to their short-term needs. The Government of Ukraine should make sure that the framework conditions for heating service provision are conducive to securing new investment to improve energy efficiency and service delivery.

Energy Efficiency Funding

- The Government of Ukraine should, on the basis of robust energy projections and economic analysis, budget sufficient expenditure to leverage the huge energy efficiency potential of the economy to improve welfare, competitiveness and environmental impact.
- The Government of Ukraine should ensure that the available funding and budget allocations are multi-annual and balanced between institutions and their programmes.
- The Government of Ukraine should allow for multi-annual municipal budgeting and for the retention of savings resulting from investment in energy efficiency, so as to provide appropriate incentives for municipal actions.
- The Government of Ukraine should consider an energy efficiency obligation as a condition of any energy utility supply licence.
- The Government of Ukraine should give careful consideration to the nature and flexibility of any energy efficiency obligation to ensure that it is economically effective and capable of delivering the desired outcome in the interests of consumers.
- The Government of Ukraine should draw on the experience of IFIs in framing tax policies and allowances for energy efficiency and renewable energy so as to maximise the effectiveness of any such concessions.

Energy Efficiency Programmes and Measures

- The Government of Ukraine should ensure that all energy efficiency programmes are material in relation to their desired outcomes.
- The Government of Ukraine should complete the introduction of cost effective administrative measures such as energy efficiency labels for household appliances. In addition, it should analyse and consider the introduction of well-proven energy performance standards for different categories of energy using products on a voluntary basis.

- The Government of Ukraine should ensure that the reform of the district heating sector proceeds at a pace and in a sequence that will provide early returns and minimise the risks of either underinvestment or the standing of valuable assets.
- The Government of Ukraine should ensure that retrofit programmes are legally facilitated with regard to compulsory participation of homeowners, appropriate standards and quality assurance.
- In the process of finalising the Law on Energy Efficiency in Residential and Public Buildings, the Government of Ukraine should adopt a strategic approach to the implementation of the EU Directive on the Energy Performance of Buildings to maximise benefits and minimise compliance costs.
- The Government of Ukraine should adopt and deliver a national energy efficiency action plan preparatory to the launch of new measures in pursuit of its 2020 targets.
- The Government of Ukraine should promote the adoption of ISO 50 001 standards to large industrial enterprises incorporating a standardised approach to energy auditing.
- The Government of Ukraine should encourage the SAEE to develop best available technology programmes of interest to donors and IFIs.

Renewable Energy Sources and CHP

- The Government of Ukraine should place the economic analysis, technical assessments and environmental impacts of its renewable energy deployment projections in the public domain.
- The Government of Ukraine should focus on the cost and sufficiency of incentives and the removal of barriers to the deployment of renewable energy rather than, for example, creating barriers to competition.
- The Government of Ukraine should consult on, finalise and commit to the implementation of its renewable energy action plan, preparatory to the launch of new measures to support the deployment of renewable energy in pursuit of the 11% 2020 target.
- In the light of the strong advocacy for biomass by international and Ukrainian commentators the Government of Ukraine should commit to a number of regional pilots to validate the potential of straw and wood biomass to avail of a "learning by doing" approach.
- The Government of Ukraine should ensure that CHP is an integral part of the renewable energy action plan as the technical, market, regulatory and environmental challenges are all of a piece in terms of delivering a robust solution.
- High efficiency cogeneration should continue to be promoted in the interests of making the best use of the available gas.

Data Collection and Monitoring

- The Government of Ukraine should continue to promote the collection, collation and timely publication of energy supply and demand statistics by placing the onus to provide on primary sources of information, and publication on the national statistics service.

- The accuracy of the energy balance is important for public and private planning. The Government of Ukraine should ensure that users have access to accurate aggregate sector-specific data for energy supply and use.

ANNEX I
GENERAL ECONOMICS AND ENERGY DATA

General economics and energy data [18]

Table 6 Energy balance ktoe

Indicators	2005	2006	2007	2008	2009	2010	2011
Total Primary Energy Production	80977	83008	81600	81289	76433	78087	85185
Net imports	59742	56197	59612	59263	41381	42169	47664
TPES	143260	137332	137342	136050	112364	131194	126351
TFC	83405	82345	82256	78585	69011	73787	75836

Table 7 TPES structure ktoe

Products	2005	2006	2007	2008	2009	2010	2011
Coal and coal products	37318	40093	40608	40783	34041	37154	41490
Crude, NGL and feedstocks	19809	15485	14889	11360	11320	11476	9031
Petroleum products	5052	1029	645	3200	2355	1682	3344
Natural gas	67445	58235	56144	55990	40789	55229	46841
Nuclear	23130	23513	24117	23413	21764	23387	23672
Hydro	1063	1108	872	979	1026	1131	941
Geothermal	-	-	-	-	-	-	-
Solar/wind/other	3	3	4	4	4	8	10
Combustible renewables and waste	262	821	851	900	1432	1476	1563
Electricity	-718	-898	-789	-579	-367	-349	-541
Total Primary Energy Supply	155369	137332	137342	136050	112364	131194	126351

[18] *State Statistics Service of Ukraine and the IEA*

Table 8 TFC ktoe

Products	2005	2006	2007	2008	2009	2010	2011
Coal and coal products	11970	12274	12947	11680	7976	8258	9339
Petroleum products	13283	13237	14261	13399	11576	12292	12284
Natural gas	34757	33929	32735	31838	25603	28396	29188
Combustible renewables and waste	223	543	521	540	1041	1005	1040
Electricity	10587	11149	11613	11598	10067	11526	12023
Heat	12563	11194	10160	9531	12736	12299	11951
Total Final Consumption	83405	82345	82256	78585	69011	73787	75836

Table 9 Electricity generation GWh

Products	2005	2006	2007	2008	2009	2010	2011
Coal and coal products	50013	64942	67101	70629	65195	69516	74494
Petroleum products	586	695	759	982	1694	822	555
Natural gas	34157	24450	25545	19313	11688	15703	18451
Nuclear	88756	90225	92542	89841	82924	89152	90248
Hydro	12363	12886	10143	11512	11936	13152	10946
Solar/wind/other	38	35	45	45	43	51	119
Combustible renewables and waste	185913	193233	196135	192586	173619	188584	194947
Total electricity generation	50013	64942	67101	70629	65195	69516	74494

Table 10 Heat production TJ

Products	2005	2006	2007	2008	2009	2010	2011
Coal and coal products	292.921	327.577	378.905	2043.589	2187.709	2119.041	1841.144
Petroleum products	0	0	0	5.446	5.087	4.777	4.753
Natural gas	9.53	6.306	7.237	217.756	712.716	191.745	129.001
Nuclear	16599.36	14794.88	13283.92	12197.36	10334.53	12193.66	12187.71
Hydro	0	0	0	167.574	189.93	201.204	216.562
Solar/wind/other	16901.81	15128.76	13670.06	14784.63	13583.12	14863.6	14532.1
Combustible renewables and waste							
Total heat production	707645	630549	572338	536868	559847	622309	608430

ANNEX II
SELECTED END-USE DATA TABLES

Table 11 TFC by sector ktoe

Sectors	2005	2006	2007	2008	2009	2010	2011
Residential	24231	25363	23033	23376	17653	25218	23604
Industry Sector	33205	32771	33893	30757	18236	25799	26246
Commercial and Public Services	2182	2695	2752	2834	2721	3485	4838
Transport Sector	12148	11674	12364	12505	11733	11640	12561
Agriculture/Forestry	2626	1816	1828	1738	1641	1777	2241
Non-energy Use	8805	8023	8369	7371	4272	5561	6008
Non-specific (Other)	208	3	17	4	12755	307	338
Total Final Consumption	83405	82345	82256	78585	69011	73787	75836

Table 12 Final energy consumption of the residential sector ktoe

Energy products	2005	2006	2007	2008	2009	2010	2011
Coal and Coal Products	1288	1847	1443	1407	567	481	708
Electricity	2242	2380	2430	2674	2886	3160	3308
Natural Gas	14344	14880	13361	13822	13213	14063	14060
Heat	5803	5171	4693	4403	-	6529	4507
Petroleum Products	536	673	713	649	51	60	84
Combustible Renewables and Waste	-	411	392	422	935	926	937
Total Residential Sector	24231	25363	23033	23376	17653	25218	23604

Table 13 Final energy consumption of the service sector ktoe

Energy products	2005	2006	2007	2008	2009	2010	2011
Electricity	1596	1733	1839	1956	2721	1644	1821
Heat	-	-	-	-	-	-	2228
Oil Products	51	51	56	63	710	775	157
Natural Gas	536	532	535	545	297	348	423
Coal and Coal Products	-	328	277	228	165	174	167
Combustible Renewables and Waste	-	50	44	41	42	6	42
Total Services Sector	2182	2695	2752	2834	2721	3485	4838

Table 14 Final energy consumption of the industry sector ktoe

Energy products	2005	2006	2007	2008	2009	2010	2011
Coal and Coal products	8366	8911	9957	8839	6810	7089	7865
Petroleum Products	1388	1585	1600	1492	1166	1391	1465
Natural Gas	11034	10291	10651	9470	5597	6437	6572
Combustible Renewables and Waste	-	50	64	54	46	55	44
Electricity	5651	5906	6154	5774	4610	5668	5409
Heat	6759	6023	5467	5128	-	5155	4880
Total Industry Sector	33205	32771	33893	30757	18236	25799	26246

Table 15 Energy consumption of the industry sector by subsector ktoe

Subsectors	2005	2006	2007	2008	2009	2010	2011
Iron and Steel	16341	15858	16888	14665	11546	13973	14099
Chemical and Petrochemical	1225	1199	1318	1125	697	2103	2683
Non-Metallic Minerals	239	901	913	934	1448	1753	2008
Non-Ferrous Metals	2887	2989	3247	3220	205	656	669
Food and Tobacco	890	979	945	909	793	1885	1969
Mining and Quarrying	1684	1838	1917	1736	1364	2019	1686
Machinery	824	774	822	747	501	757	829
Construction	494	554	678	617	398	492	510
Textile and Leather	57	58	54	52	40	75	75
Paper, Pulp and Printing	126	132	138	141	127	272	293
Non-specified/Other	8438	7489	6973	6611	1117	1814	1425

ANNEX III
ORGANISATIONS THAT HAVE MET IN UKRAINE

Governmental Stakeholders

- State Agency for Energy Efficiency and Energy Saving of Ukraine (SAEE)
- Ministry of Energy and Coal Industry (MECI)
- Ministry of Regional Development, Construction and Housing and Communal Sector
- Ministry of Economic Development and Trade
- Ministry of Finance
- Ministry of Ecology and Natural Resources of Ukraine
- Ministry of Infrastructure (former Ministry of Transport and Communications)
- National Commission for State Regulation in the Energy Sector
- National Commission for Regulation of Municipal Services
- State Statistical Service
- State Agency of Environmental Investments
- State Agency of Forest Resources
- State Road Transport Research Institute

IFI and Non-Governmental Stakeholders

- EU Delegation
- EBRD
- GIZ
- UNDP
- WB
- IFC
- EU-Ukraine Energy Agency
- Dixi Group
- Energy Efficient Cities of Ukraine
- Ukraine Wind Energy Association

ANNEX IV
ABBREVIATIONS

AAU	Assigned Amount Units
ARR	Annual Review Report under the UNFCCC
CIFs	Climate Investment Funds
CTF	Clean Technology Fund
DCFTA	Deep and Comprehensive Free Trade Area
EBRD	European Bank for Reconstruction and Development
EECU	Energy Efficient Cities of Ukraine
EnC	Energy Community (Treaty)
ERRA	Energy Regulators Regional Association
ERT	Expert Review Team under the UNFCC
ERU	Emission Reduction Unit
E5P	Eastern Europe Energy Efficiency and Environment Partnership
ETS	European Union Emissions Trading Scheme
EU	European Union
EUR	Euro
GIS	Green Investment Scheme
GIZ	German International Cooperation
GW	Giga-watt
HPP	Hydroelectric power plant
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
IFC	International Finance Corporation
JI	Joint Implementation
JIAG	Joint Implementation Action Group
MEPU	Ministry of Environmental Protection of Ukraine
MFEU	Ministry of Fuel and Energy of Ukraine
MRDBH	Ministry of Regional Development, Building and Housing of Ukraine
MTU	Ministry of Infrastructure of Ukraine
Mtoe	Million tonnes of oil equivalent
NECU	National Ecological Centre of Ukraine
NEDO	New Energy and Industrial Technology Development Organisation
NEFCO	Nordic Environment Finance Corporation

NEIAU	National Environmental Investment Agency of Ukraine
NERC	National Energy Regulatory Commission of Ukraine
OECD	Organisation for Economic Cooperation and Development
SAEE	State Agency on Energy Efficiency and Energy Saving of Ukraine
SSU	State Statistics Service of Ukraine
UAH	Ukrainian Hryvna
UHE	Ukrgydroenergo or UrkHydroEnergo
UKEEP	Ukraine Energy Efficiency Programme of EBRD
UNFCCC	United Nation Framework Convention on Climate Change
WB	World Bank
WEF	World Economic Forum
WEM	Wholesale Electricity Market of Ukraine

ANNEX V
SOURCES OF INFORMATION AND TEXT REFERENCES

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In-Depth Review of the
Energy Efficiency Policy
of UKRAINE

Ukraine ratified the Energy Charter Treaty (ECT) and the Protocol on Energy Efficiency and Related Environmental Aspects (PEEREA) in 1998. By ratifying PEEREA, countries commit themselves to formulating and implementing policies for improving energy efficiency (EE) and reducing the negative environmental impacts of the energy cycle (Art.5). The guiding principle of PEEREA is that contracting parties shall co-operate and, as appropriate, assist each other in developing and implementing EE policies, laws and regulations (Art.3).

An In-depth review of energy efficiency policies of Ukraine was carried out in 2013. This report was discussed by the PEEREA working group and the recommendations were endorsed by the Energy Charter Conference.

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