COUNTRY REPORT: UKRAINE
Alternative Energy in Ukraine: Challenges, Prospects and Incentive Mechanisms

Svitlana Romanko*

Introduction

Concerns over the exhaustion and depletion of natural resources underpin the global policy priorities of reduced energy consumption and increased energy efficiency. These priorities are especially important for Ukraine because it is one of the biggest energy consumers in the world. Challenges to achieving the efficient use of traditional energy sources in Ukraine include outdated technology, resource depletion and the use of fixed assets with low fuel efficiency and high emission rates. Other challenges include resource losses during gas transportation and the distribution of electricity and heat, and constraints on local energy markets caused by increased dependency on energy imports. These factors make the development of alternative energy sources an urgent matter for Ukraine policy makers.

It is no secret that the Russian Federation is a major player in the Ukraine energy market. The Russian Federation uses this position to charge a high rate for its gas and impose onerous supply agreements on local energy retailers. The recent encroachment by Russia upon the territorial independence of Ukraine makes further cooperation with Russia untenable.This situation lends further support to calls for tough Ukraine policies that encourage energy efficiency and conservation, and the production and use of alternative energy sources.

Alternative Energy and Ukraine Law

The production of energy from non-traditional sources may help mitigate some of the problems with traditional energy sources, such as pollution and resource depletion. Ukraine has several potential alternative energy sources. One barrier to the exploitation of these sources is the lack of unified definition of ‘alternative energy’ in Ukraine law. Different laws

* Associate Professor of environmental law, Law Institute of Prykarparsky National University after Vasyl Stefanyk, Ukraine

contain different definitions. For example, the law *On alternative energy sources* defines alternative energy sources as renewable energy sources. Listed sources include solar, wind, geothermal, wave, tidal, hydro, biomass, organic waste gas, gas from sewage treatment plants and biogas. Listed secondary sources include blast-furnace and coking plant gas, methane gas from coal deposits and the transformation of industry waste into energy. The law *On alternative types of fuel* defines alternative energy sources as non-conventional energy sources, such as stock materials of plant origin, waste, hard combustibles and other natural and artificial sources. It also lists types of energy feedstocks, including oil, gas, oil and gas condensate, non-industrial deposits, heavy oil grades, original asphalt, gas-saturated waters and gas-hydrates. *The Ukraine Tax Code* defines renewable energy sources as solar, wind, geothermal, wave, tidal, hydro, biomass, organic waste gas, sewage treatment plant gas and biogas.

The law *on alternative types of fuel* aims to establish the legal, social, economic, ecological and organisational conditions necessary for expanding production and consumption of alternative types of liquid and gas fuel. It sets out key principles to help achieve this aim, including:

- supporting the development of a scientific and technical base for alternative fuel production;
- promoting scientific and technical achievements in alternative fuel production;
- developing international scientific and technical collaborations;
- using world science and technology to expand alternative fuel production; and
- supporting entrepreneurship and protecting business interests in alternative fuel production.

The implementation of the Ukraine legal framework for alternative energy sources has been constrained by extended political and economic crises. These have limited the governments' capacity to invest in alternative energy sources, with most new alternative energy plants constructed by private companies.

The Effects of Military Occupation

Protracted military actions in east Ukraine have worsened the energy situation in Ukraine. Hostile military operations by the Russian Federation are systematically destroying energy

supply infrastructure, depleting traditional natural resources and limiting Ukraine's capacity to develop alternative energy sources.

Adding to this is the complete depletion of Ukraine gas and coal reserves as of June 2014. According to the Independent Trade Union of Miners, the fuel shortage could lead to the destruction of the whole Ukraine energy system. In August 2014, the Ukraine Government introduced a state of emergency in the energy sector. Emergency actions included the restriction of coal exports and importation of fuel from South Africa. Anticipated actions include the importation of rare coal types from Australia and Vietnam.

The energy potential of alternative energy sources in Ukraine is about 63 million tons per year.[1] At the end of 2013, the share of total energy derived from alternative sources was about 0.8%. In accordance with the objectives of the *Energy strategy of Ukraine to 2030*, this share is at best likely to increase to 5.7%. Large scale investment in renewable energy sources would help reduce energy dependence, improve environmental protection outcomes and satisfy the conditions for accession to the European Union (EU). According to our estimates, concerted effort could achieve the 20/20/20 target set by the EU. At present, Ukrainian energy law does not fully correspond to European energy Directives.[2] Increased compliance may help Ukraine increase alternative energy production and meet EU accession conditions.

---

[1] Atlas of the energy potential of renewable energy Ukraine, Institute of Renewable Energy of the National Academy of Ukraine. 2013.

[2] In particular the Law of Ukraine "On Oil and Gas" is partially complies with Directive 73/283 / EEC, the Law of Ukraine "On Pipeline Transport" partly complies with Directive 94/63 / EC. Rather high is the level of adaptation in the sphere of renewable energy (Law of Ukraine "On Amendments to Certain Legislative Acts of Ukraine on the Promotion of Wind Energy Development in Ukraine" Law of Ukraine «On Introducing Changes Into Some Acts of Legislation of Ukraine with Objective of Energy Saving Measures Incentives»complies with Directive 2001/77 / EC, the Cabinet of Ministers of Ukraine "On approval of concessional loans for investment projects realization on energy saving technologies and technologies of alternative fuel sources "is generally consistent with Directive 2003/30 / EC partially comply with the Directive 2003/30 / EC and Directive 2001/77 / EC laws of Ukraine" On alternative Energy Sources "and the" alternative Liquid and gaseous fuels. "Also, the Law of Ukraine" On Electricity "partially complies with Directive 2003/54 / EC, the Cabinet of Ministers of Ukraine" On strengthening control over the mode of heat consumption "and" On approval of the state supervision in the electricity sector "in generally consistent the Directive 2003/54 / EC and Directive 2005/89 / EC.

Increasing renewable energy use to just 50% of total capacity would enable a 30 billion cubic metre reduction in the use of natural gas. This would allow the Ukraine to completely dispense with Russian gas.[3] However, this does not take into account the Russian annexation of Ukraine territory to the Autonomous Republic of Crimea in 2013 and the subsequent cessation of relations between Ukranian energy markets and Crimean alternative energy sources in April 2014. These actions are significant because the majority of Ukraine solar energy plants are in the Crimea, and the annexation resulted in a loss of Ukraine access to natural gas in the Black and Azov Seas. This gas was the single source of fuel for Ukraine's main thermal power plant. Although the European Union may direct the reversal of these political events, this is unlikely to occur within the next few years.The Ukraine Government is trying to implement alternative energy policies to avoid total energy system collapse.

The Regulatory Framework for Alternative Energy

The Ukraine government is trying to avoid an energy crisis by implementing measures that stimulate alternative energy production. The Ukraine Government acknowledged the need to develop alternative energy sources in the *Energy Strategy of Ukraine* of 2006. This Strategy led to the adoption of numerous alternative energy laws, including *About alternative energy sources, On alternative types of fuel*, *On electricity*, *On energy saving* and *On combined generation of heat and electricity and use of waste energy potential*.[4] This complex legal mosaic arises from the absence of a single law for the energy sector. Moreover, the general language of these laws leaves the determination of regulatory norms to hundreds of different by-laws. The lack of legal unification also leads to an uncoordinated mass of agencies administering different laws and programs.

---

[3] M. Benmenni, M.P. Kuznetsov, V.A. Hilko,. Proposals to strengthen the energy security of Ukraine // Institute of Renewable Energy of the National Academy of Science of Ukraine, Kyiv, 2014. – Access mode: http://ua-energy.org/upload/files/%D0%A9%D0%BE%D0%B4%D0%BE_%D0%B7%D0%BC%D1%96%D1%86%D0%BD%D0%B5.pdf

[4] See also Decree of CMU of February 3, 1997, No. 137 "On Comprehensive Program for Construction of Wind Power Plants"; Decree of CMU of February 5, 1997, No. 148 "On Comprehensive State Energy Saving Program of Ukraine"; Decree of CMU of December 31, 1997, No. 1505 "On the Program of State Support to Development of Alternative and Renewable Energy Sources and Small Hydro and Thermal Energy"; Decree of SR of Ukraine of May 15, 1996, No. 191/96-BPBP "On National Energy Program of Ukraine until 2010"

There is some support for alternative energy in general Ukraine environmental policy. Supported activities include:

- the identification and financing of alternative energy sources;
- permissions to connect private energy sources to the national grid;
- the creation of statistical databases on alternative energy resources;
- assessments of the conformity of energy generating facilities to the objects of alternative energy policy;
- the introduction of a goal that alternative energy supplies 20% of total energy demand by 2020;
- the introduction of green tariffs; and
- tax exemptions for enterprises generating electricity from renewable energy sources, biofuel producers, coal bed methane extractors, the sale of energy-saving equipment and the implementation of energy-saving projects.

Economic Measures to Improve Energy Outcomes

One of the main barriers to alternative energy development in Ukraine is the cost of constructing alternative energy generators. Costs arise from the need to import expensive components, such as solar equipment and sailboat engines. Private sector investment is low because of the time it takes to recover costs (3-5 years). Incentives introduced to try and redress these barriers include the termination of green tariffs, state energy subsidies, taxes and customs benefits, and a legal obligation on the state to buy the whole volume of electricity generated from alternative energy sources.

Green Tariff Regulatory Framework

In 2013, the National Electricity Regulatory Commission adopted a resolution that effectively terminated the 'green' tariff for most business entities licensed to produce electricity using alternative energy sources,[5] provided those entities complied with 'local content' prescribed by law. 'Local content' refers to the percentage of plant equipment that must be made in

[5] Resolution 14.03.2013 № 251.

Ukraine.[6] At present, this share must not be less than 50%. Although patriotic, in practice the necessary equipment is either not made in Ukraine or is much more expensive than foreign equipment. For example, although the frames for windturbines are produced in Ukraine, the engines are likely to be foreign. It may be prudent to repeal the local content rule if the genuine aim of the scheme is to incentivise alternative energy production. As long as the rule stands, non-compliant alternative energy producers must continue to pay one of the highest green tariffs in Europe.

Subsidies, Taxes and Customs Benefits

The land tax for plots used to produce electricity from alternative energy sources has been reduced to 25% of the applicable land tax. Annual lease payments for communal or state land leased for production of electricity from alternative energy sources must not exceed 3% of the normative value of the leased land. 80% of profits from the sale of renewable energy and energy efficient equipment and materials by Ukraine companies within the Ukraine are exempt from tax.[7] This credit operates for the first five years of receiving the profit. Equipment that runs on renewable energy, energy-efficient equipment and materials, equipment that contributes to the operation of renewable energy sources, and equipment and materials used in the production of renewable energy are expempt from tax, VAT, and customs duties if identical products with similar characteristics are not available in Ukraine.[8]

Grid Access and Mandatory Power Purchase

Electricity producers that produce energy from alternative energy sources have the statutory right to request connection to the national grid. Ukraine guarantees the purchase of all energy produced from alternative energy sources.

The above measures may incentivise businesses to produce and use alternative energy sources, but they do not promote the widespread use of alternative energy sources by all sectors of the population. A complement to these measures may be the implementation of an asset modernisation program to make traditional energy production more efficient. Modernisations may include:

---

[6] The definition and regulation in relation to local content was provided after the initial resolution; see Resolution of National Electricity Regulatory Commission of Ukraine On approval of determining the amount of local content for energy facilities, 27.06.2013 № 744.

[7] P. 158.1 Art. 158 of the Tax Code of Ukraine

[8] § 197.16 of Article 197 of the Tax Code of Ukraine and p. P. 14, 16, ch. 1, Art. 282 of the Customs Code of Ukraine.

- upgrades of all thermal power plants and stations;
- extensions to the nuclear operation;
- upgrades of distribution networks and facilities; and
- replacement or reconstruction of power grids and transformer substations.

Analysis of the latest Ministry of Finance data (2012) suggests the cost of implementing the *Energy Strategy of Ukraine* is in the hundreds of billions (USD). Constant scarcity in the State budget makes full implementation unlikely in the new few years. A combination of asset modernisation and economic incentives may help Ukraine move towards full implementation of the Strategy and avoid the power deficit anticipated by 2020.

Industry Measures to Improve Alternative Energy Outcomes

We now report on measures to stimulate the development of certain types of alternative energy sources.

Wind Energy

The successful development of the Ukrainian wind energy sector continued into 2013, with a 56% increase in capacity from 2012.[9] Ukrainian legislation provides tax incentives for the development of wind energy projects. These include exemptions from import VAT and customs duties, a 75% reduction in land tax for renewable energy power plants and exemptions from corporate profit tax until 2021 for companies who only produce electricity from renewable energy sources. Legislative incentives include the ability to impose a green tariff on electricity produced at power stations using, in particular, wind energy.[10]

[9] According to a survey by the Ukrainian Wind Energy Association, 95.3MW of new wind energy capacity was commissioned between 1 January and 31 December 2013. As a result, the power capacity of the Ukrainian wind energy sector totalled 371.2MW.

[10] At the moment the only real incentive for wind energy projects in Ukraine is GT. The effective feed-in tariff or GT scheme for wind energy in Ukraine entered into force on 22 April 2009. According to Article 17-1 of the Ukrainian Power Industry Law of the 16 October 1997 (the 'Power Industry Law'), a GT is approved by the National Energy Regulatory Commission of Ukraine (the NERC).

Solar Energy

At present, Ukraine has one of the highest green tariffs for solar power in Europe.[11] The government purchases electricity derived from alternative sources at approximately $1USD per KW then sells it to consumers at a uniform rate of approximately 30 cents per KW. This current rate of government subsidisation is under attack, with legislation pending to reduce the rate by about 40%.[12] This creates a great deal of uncertainty for private investors, and is likely to negatively impact the development and production of alternative energy in Ukraine. The move compares unfavourably to the continued government support and subsidisation of outdated thermal power plants at the behest of powerful industry groups. Power imbalances like these present major obstacles to the development of alternative energy in Ukraine.

Biomass and Biofuels

Almost a third of the worlds population still use wood biomass as a primary fuel source. In some regions, including developed countries, biomass meets 90% of fuel needs. Biomass is an affordable, renewable and cheap source of energy for many rural people. Biomass is conventionally divided into three main types of biofuels: solid (wood chips, pellets, briquettes), liquid (biodiesel, ethanol) and gaseous (biogas). Biofuels are made entirely from renewable biological raw materials, such as the waste products of agriculture and industry. They can be used directly as a fuel, or as components in the production of other fuels.[13]

The main policy directions regarding biomass and biogas in Ukraine concern the production of electric and thermal energy. For example, second generation oilseed rape and biofuel plants use biomass for thermal power production. Although Ukraine currently produces less than 0.5% of its energy from biomass, estimates suggest it could produce more than 10 times the current amount.[14] This makes biomass an important energy component. However, a lack of clarity on when the 'local content' rules applies, and the imposition of the 'local content' rule, constrain growth of the biomass market. A temporary measure to incentivise

---

[11] 7, 35 UAH per kilowatt.

[12] On June 18, 2014 The Cabinet of Ministers of Ukraine issued a Decree № 589-p "On improving the payment system for electricity from alternative energy sources". This Decree removes one coefficient that was used in the calculation of the green tariff for solar power.

[13] In the proportions set out in accordance with state standards (Law of Ukraine "On the development of production and consumption of biofuels" of the 24 of May 2012)

[14] It is provided for in the Law of Ukraine "On the development of production and consumption of biofuels" of the 24 of May, 2012.

production is an income tax exemption for biofuel producers until 2020.[15] There are also moves to introduce laws to stimulate biodiesel production, specifically though a stage-by-stage increase in the obligatory use of biofuel and mixed motor fuel.[16]

Conclusions

The development of alternative energy sources comes with both advantages and disadvantages. On the one hand, renewable energy resources can help minimise pollution, conserve non-renewable resources, and promote the growth of energy infrastructure and the development of new technologies. On the other hand, the technologies involved are expensive, as is construction of alternative energy plants. Constraints on the development of new technology include network remoteness and legal obstacles. Other hurdles to the development of alternative energy sources include the high cost of producing alternative energy in comparison to traditional energy, and the immaturity of domestic markets. In this regard, certain alternative energy products are produced solely for export because they might not sell on the domestic market. These factors may partially explain the relatively low use of renewables in Ukraine.

Overall, the development of alternative energy industry in Ukraine is in its early stages. Constraints upon industry development include the inadequacy of financial incentives, inconsistency in legal requirements and legal uncertainty, bureaucratic red-tape, corrupt practices, poor funding for research and development, insufficient consumer information and inefficient and outdated technology. An independent and systematic review of the current legal framework may assist industry development. The review may also help highlight more efficient and effective practices for stimulating the production of alternative energy. The review can take into account current financial and political constraints, and ensure recommendations are practical, well-targeted, strategic and cost-effective. Recommendations may include streamlined regulatory procedures, transparent tax preferences, preferential loans, direct consumer subsidies and the collation of information on the best available technologies. Information gathering may help facilitate the cheaper and quicker implementation of alternative energy productions. Consumer education programs may help increase the use of renewable energy in Ukraine. One thing is certain; the energy crisis in Ukraine makes inaction not an option.

---

[15] In accordance to the amendments to the Tax Code of Ukraine made in 2013, as a temporary measure, until January 1, 2020

[16] Law of Ukraine “On Amendments to Certain Laws of Ukraine as to Support of Biofuel Production and Use” № 1391-VI on 21th of May, 2009