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Policy Handbook

ATTRACTING INVESTMENT IN RENEWABLE ENERGY IN UKRAINE

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Key Contact:
Mr. Antonio Somma
Acting Head of Programme
OECD Eurasia Competitiveness Programme
antonio.somma@oecd.org

PRIVATE SECTOR DEVELOPMENT POLICY HANDBOOK

Attracting Investment in Renewable Energy in Ukraine

- SECTOR COMPETITIVENESS STRATEGY FOR UKRAINE PHASE II -

NOVEMBER 2012

The OECD Eastern Europe and South Caucasus Initiative

Launched in April 2009, the OECD Eastern Europe and South Caucasus Initiative is part of the OECD Eurasia Competitiveness Programme, which aims to contribute to economic growth in Armenia, Azerbaijan, Belarus, Georgia, Moldova, and Ukraine. Its objective is to share with the governments of the region the knowledge, experience and good practices of OECD countries to create a sound business climate for investment, enhance productivity and support entrepreneurship, develop the private sector, and build knowledge-based economies to render its sectors more competitive and attractive to foreign investment. Its approach comprises both a regional policy dimension, which entails peer dialogue and capacity building, and a country-specific aspect supporting the implementation of a number of prioritised reforms. A sector analysis is also included, covering the formulation of targeted policies and strategies requested at the industry level. Within the framework of the programme, public authorities, the private sector and civil society in these countries have been engaged in a dialogue and collaboration process to support policy actions and identify the key barriers to sectoral competitiveness.

The participation of all the stakeholders in the reform process, including foreign investors, is considered to be crucial for guaranteeing the effectiveness and transparency of the recommended policies.

Foreword

Since 2009, the OECD Eurasia Competitiveness Programme has supported the Government of Ukraine in advancing national economic reform through its "Sector Competitiveness Strategy for Ukraine" project. This handbook contains the conclusions of the second phase of the project. It addresses specific policy barriers to improve competitiveness in one of the sectors with high investment promotion potential identified in the first phase, namely renewable energies.

During phase II (2011-12) the OECD worked with the Government of Ukraine, the private sector, international organisations and civil society to advise on how to remove sector-specific policy barriers, exploiting its industry and policy expertise to focus on the most practical and effective measures.

The project is conducted in collaboration with the Government of Ukraine and financially supported by the Government of Sweden.

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Representatives of the administration of the President of Ukraine, the Verkhovna Rada of Ukraine, several Ministries, government agencies and private sector associations in Ukraine contributed to this report. These include:

- Iryna Akimova, First Deputy Head of the Administration of the President of Ukraine; Valeriy Khoroshkovsky, First Deputy Prime Minister of Ukraine; and Andriy Klyuyev, former First Deputy Prime Minister of Ukraine and former Minister of Economic Development and Trade.

- The Ministry of Economic Development and Trade: Petro Poroshenko, Minister of Economic Development and Trade; Anatoly Maksyuta, First Deputy Minister; Volodymyr Bandurov, Deputy Minister; Volodymyr Pavlenko, Deputy Minister; and Olena Kucherenko, Head of Department on International Co-operation and Foreign Technical Assistance.

- Representatives of the public sector participating in the Working Group on Energy-Efficiency and Renewables: Serhiy Dubovyk, Deputy Head of the State Agency on Energy Efficiency and Energy Saving and Working Group Chairman; Ruslana Boroshok, Chief of Unit on Energy and Resource Efficiency, Ministry of Economic Development and Trade; Vira Bozhok, Head of Unit on Statistics of Commodity Markets of the Trade Statistics Department, State Statistical Service; Vitaliy Chernenko, Chief Expert of the Market Research Department, Anti-Trust Committee; Svitlana Karpishina, Deputy Head of Division, Chief of Investment Policy Unit, State Agency on Energy Efficiency and Energy Saving; Yuriy Khomenko, Chief of the Agro-Energy and Renewable Energy Sources Unit, Ministry of Agrarian Policy and Food of Ukraine; Yuliya Kovaliv, Co-Ordinator on Reforms Implementation, Reforms Co-Ordination Centre; Yulia Lyovina, Chief Specialist of the Unit for Energy and Resource Saving, Department of Real Economy Development, Ministry of Economic Development and Trade; Rostyslav Maraykin, Biomass Energy Project Manager, State Agency on Investments and National Projects of Ukraine; Vira Oleynikova, Deputy Director of the Department on Project Management and Energy Efficiency Chief of Unit, Ministry of Regional Development, Construction and Housing, Oleksiy Orzhel, Deputy Head of Unit on Electricity Generation Companies, National Commission of Electricity Regulation; Oleksandr Rubel, Head of Unit of Coal Mining Equipment of the Ministry of Energy and Coal Industry; Leonid Shofarenko, Head of Unit on Co-operation and Investments of the State Aerospace Agency; Viktor Tymoshchuk, Chief Specialist of the Agro-Energy and Renewable Energy Sources Unit, Ministry of Agrarian Policy and Food

of Ukraine; I. Vecherya, Chief Specialist of the Ministry for Regional Policy, Construction and Housing; Volodymyr Vysotin, Deputy Head of the Market Research Department, Anti-Trust Committee; and Vleriy Yoldych, Head of Unit on Electricity Generation Companies, National Commission of Electricity Regulation.

- Representatives of the private sector and international organisations participating in the Energy-Efficiency and Renewables Working Group: Edward Klaeger, Chief Executive Officer, Alter Energy Group AG; Darya Revina, Vice President of the International Chamber of Commerce; Volodymyr Kukovalskyi, Director of SmilaEnergoPromTrans. Ltd.; Serhiy Osavolyuk, Project Manager, IFC; Olga Revina, Vice Chairwoman on Energy Efficiency, ICC; and Tetiana Zheliezna, Senior Researcher, Institute of Engineering Thermophysics, NASU.

- The Co-Chairs of the OECD Eastern Europe and South Caucasus Initiative: Sweden (His Excellency Anders Ahnlid, Ambassador and Permanent Representative of Sweden to the OECD) and Poland (His Excellency Paweł Wojciechowski, Ambassador and Permanent Representative of Poland to the OECD).

The handbook was written under the guidance of Carolyn Ervin, Director of the Directorate for Financial and Enterprise Affairs (DAF); Anthony O'Sullivan, Head of the Private Sector Development Division within DAF; Elena Miteva, Counsellor, Private Sector Development Division within DAF; and Antonio Somma, Acting Head of the Eurasia Competitiveness Programme.

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Acronyms and abbreviations

CMU	Cabinet of Ministers of Ukraine
EBRD	European Bank for Reconstruction and Development
EU	European Union
EUR	Euro
GW	Gigawatt
HPP	Hydroelectirc power plant
KWh	Kilowatt hour
IEA	International Energy Agency
IFC	International Finance Corporation
Mtce	Million Tons of Coal Equivalent
MW	Megawatt
MWh	Megawatt hour
NEFCO	Nordic Environment Finance Corporation
NERC	National Energy Regulatory Commission of Ukraine
OECD	Organisation for Economic Co-operation and Development
PLN	Polish Zloty
SAFE	State Agency for Energy Efficiency and Energy Saving of Ukraine
TWh	Terrawatt hour
UAH	Ukrainian Hryvna
US	United States of America
USD	United States dollar

Executive summary

Ukraine has significant potential for producing energy from renewable sources

Renewable sources of energy can play an important role in meeting Ukraine's energy needs and generating green growth. First, the country currently has a high level of energy intensity, almost three times the average of industrialised countries. Second, the natural gas price is expected to increase, therefore creating an incentive to switch to cheaper sources of energy.

The transition to renewable sources of energy production is supported by the fact that Ukraine has significant natural endowments in this field. Due to the country's rivers, hydroelectricity has been making an important contribution to Ukraine's energy consumption for a long time. Aside from its established energy sources, Ukraine has great potential to produce energy from innovative alternative energy sources such as biomass, wind and sun. Also, due to recent technological advances, the cost of energy production from renewable sources has decreased while commodity prices are expected to increase, further improving the attractiveness of renewable energy production. In particular, the country's abundant agricultural and forestry waste is a key asset for developing heat and power generation based on biomass.1 Ukraine's advantage in this sector is the availability of natural resources such as straw from grain crops and rapeseed, residues from the production of corn, wood residues, and peat. Secondly, energy production from new renewable sources could be cost competitive compared to most conventional and existing renewable energy sources. For example, under certain conditions energy production based on biomass could be one third of the cost of gas production. For these reasons, the production of energy based on biomass is the main case study analysed in this handbook.

Ukraine's energy production from renewable sources currently accounts for seven percent of total energy consumption, which is far below its potential. For instance, its share of energy from biomass is half of the share of the European Union (EU) and one third that of the United States (US). Ukraine's actual underutilisation of energy production from renewable sources is at odds with the country's desire to decrease its energy dependence and lower greenhouse gas emissions.

The environment for producing energy from renewable sources remains challenging

Ukraine's substantial potential for producing energy from renewable sources remains largely untapped. This is particularly true for electricity and heat production, the focus of this publication.

While established renewable energy sources, such as hydroelectricity, suffer from outdated technology that requires updating, the development of innovative renewable sources is hampered by administrative hurdles. The assessment of the investment policy environment in Ukraine's renewable energy value chain highlights some challenges and the need to improve current policies. These include the need to develop a vision and strategy for energy production from renewable sources with high-level political support, the requirement for more streamlined permitting procedures and the need to improve electricity market access for renewable producers.

The assessment conducted and summarised in this report shows that renewable energy targets are neither communicated clearly enough to stakeholders nor monitored sufficiently closely. Second, specific objectives for energy production have not been set up yet. Third, investors need to deal with six or more government agencies and institutions to comply with permitting procedures. Dealing with each of these agencies requires time, increases risk levels for businesses and raises the potential for corruption. All these elements contribute to increasing investment costs for domestic and foreign investors. Furthermore, producers are exposed to a high level of operational risk, since the decision to give players access to the electricity market and grant the green tariff is postponed until after the plant has been built.

Ukraine could leverage good international practices to design its non-financial investment policy in the renewable energy value chain

Ukraine could consider the successful examples of OECD countries such as Austria, Denmark, Germany and Poland in designing policy reforms for producing energy from renewable sources. To different extents, these four countries have adopted policies favourable to the production of renewable energy and the sector has grown in geographic and climate conditions similar to those of Ukraine. The successful policy elements analysed offer renewable energy growth potential without government subsidies.

Ukraine could build on the OECD experience by adopting the most suitable investment policy elements while avoiding identified weak spots. These weaknesses include problems in the development of a renewable energy vision and strategy or unfair attribution of electricity grid connection costs between the renewable energy producer and the network operator.

First, the OECD countries studied have all developed a renewable energy vision and strategy that is communicated clearly and monitored over time. They are all also co-authors of the European Commission's Renewable Energy Road Map and

have renewable energy targets for 2020 that aim for a share of between 15% and 34% of renewables in total energy consumption.

Second, the four OECD countries offer a number of good practices for streamlining permitting procedures to facilitate investment in renewable energy plants. For biomass energy plants, for instance, Germany has halved the average duration of these procedures to seven months. Denmark and Germany each have a single interface for investors. This increases transparency and speed while decreasing costs and the risk of corruption. Austria and Germany offer pre-admission consultation meetings to increase the chances of successful and quick permitting procedures. Their application fees are limited to between EUR 500 and EUR 10 000.

Third, these countries generally offer favourable conditions for renewable electricity producers. For example, they provide all producers with free access to the electricity wholesale market. Producers may supply as much electricity as they wish at a set price that is guaranteed for 10 to 20 years.

Three main areas for improvement in the investment environment for renewable energy: renewable energy vision and strategy, permitting procedures, and access to the electricity market

In line with the successful good practices adopted in OECD countries, Ukraine could substantially improve the business environment for investors in the renewable value chain by acting on three elements: developing a renewable energy vision and strategy, streamlining permitting procedures and providing better access to the electricity market. The improvement levers identified could also be applied to other renewable energy sources.

Developing a renewable energy vision and strategy: A renewable energy vision and strategy should enhance the attractions of renewable energy and be followed by the development of specific targets for producing energy from renewable sources. These need to have political support and be publicly and repeatedly confirmed in order to boost confidence and attract more investment in the sector. The government should also monitor progress against defined objectives and react to changes in the market.

Permitting procedures: First, OECD recommends streamlining permitting procedures by offering fewer interfaces to investors. Second, the government should consider eliminating procedures or making them simultaneous. This would help to accelerate the investment process. Third, gaining admission to the electricity market and obtaining the green tariff should occur at the same time as the business license approval, i.e. before major investments are made. The decision criteria should also be made fully transparent.

Providing access to the electricity market for new renewable electricity plants: The conditions for accessing the electricity market could be improved by liberalising them for all renewable electricity producers with a business license, by imposing a legal right to free physical access to the power grid, and by enforcing the

right to supply greater volumes of renewable electricity when the energy producer grows. Finally, a feed-in tariff scheme should be developed reaching beyond 2030 to provide more planning security for renewable electricity producers and reducing operational risks.

Notes

[1] Biomass has been defined as "any organic material of plant and animal origin, derived from agricultural and forestry production and resulting by-products, and from industrial and urban wastes, used as feedstock for producing energy from biomass and other non-food applications" (OECD, 2010).

Introduction

As part of the OECD Eastern Europe and South Caucasus Initiative, a sector competitiveness review of the Republic of Ukraine was conducted as Phase I of a wider project to improve the country's sectoral competitiveness and investment framework. The project follows a three-phase approach lasting five years (2009-14): first, it develops a sector competitiveness strategy (Phase I); second, it advises on specific policy options to address existing constraints (Phase II); finally, it creates mechanisms to embed sustainable reforms (Phase III). The aim of Phase II, financed by the Government of Sweden, is to provide advice on specific policy recommendations that can be implemented to overcome the existing barriers to competitiveness.

This report constitutes the output of Phase II. Phase I (2009-11) identified the sector-specific sources of competitiveness for key sectors: agribusiness (with a focus on the grain and dairy value chains), energy-efficiency and renewable technologies, and machinery manufacturing and transport equipment (with a focus on the civilian aircraft value chain). The analysis identified existing challenges and suggested targeted policy recommendations in each sector. For example, access to finance and human capital development were identified as important barriers to competitiveness in the grain and dairy value chains, respectively. The findings of this part of the project are summarised in the Sector Competitiveness Strategy of Ukraine report, which was released in 2012. Phase II (2011-12) focuses on specific policy options, particularly on investment policy. The scope of this report is to summarise why this policy option could be effective for Ukraine and to provide a detailed implementation plan for policy makers. Phase III (2012-14) is then intended to put in place the mechanisms embedding sustainable reforms.

This study aims to give guidance for attracting investment in renewable energy in Ukraine by enhancing the country's investment policy. It first illustrates Ukraine's significant potential for energy from renewable sources and identifies the barriers hampering the sector's growth (Chapter 1). By focusing on administrative investment procedures as the main impediment to growth, this handbook first examines Ukraine's baseline situation. Analysis found that there is a need to develop a vision and a strategy for renewable energy that includes high-level political support, streamlined permitting procedures and improved electricity market access conditions for renewable energy producers (Chapter 2). After investigating international good practices in OECD countries in the three identified areas for improvement (Chapter 3), the report makes recommendations for enhancing investment policies for renewable energy investors (Chapter 4). Finally, this study outlines the suggested steps for implementation (Chapter 5).

Chapter 1

Unlocking the potential of energy production from renewable sources by focusing on investment policy

This chapter outlines Ukraine's substantial potential for producing energy from renewable energy sources. Focussing on energy production from biomass, it outlines the various hurdles that hamper the growth of this energy source in Ukraine.

The renewable energy sector in Ukraine has significant investment potential

With a combination of abundant resource potential and state-supported renewable energy promotion schemes, Ukraine is a very promising renewable energy market. Ukraine ranks 30th among the world's top 40 renewable energy markets, ahead of every other CIS country. This positioning is particularly significant given that, worldwide, renewable energy is one of the most dynamic sectors in terms of FDI, registering an 11% growth rate in 2011, the highest growth rate of any FDI sector (Ernst & Young, 2012; the fDiReport, 2012). However, only seven percent of Ukraine's energy consumption stems from renewable sources, and most of that is from water power (Hagemann, 2011).

Ukraine's renewable energy sector currently produces power at a much lower cost than other countries. For instance, producing one MWh of wind energy costs roughly USD 33,[1] compared with USD 145 in the Czech Republic, and USD 50 in China (Trypolska, 2012; IEA, 2010). The State Agency for Energy Efficiency and Energy Saving of Ukraine (SAEE) hopes to capitalise on this cost competitiveness and increase production from its current level of 400MW to 1GW by the end of 2012 (Ukraine Renewable Energy Forum, 2012).

The government has legally mandated fixed green tariffs that will pay renewable energy producers reliably, a move that has garnered praise from international investors. In addition, the European Bank for Reconstruction and Development (EBRD), the International Finance Corporation (IFC) and the Nordic Environment Finance Corporation (NEFCO) have all pledged significant sums to pay for new projects. In particular, the EBRD's Ukraine Sustainable Energy Lending Facility has EUR 70 million available to cover up to 70% of small and medium-sized renewable energy projects (IMEPOWER, 2012).

However, significant barriers still need to be overcome. There is a lack of experienced developers to implement these projects. Furthermore, Ukraine has to become more forthcoming about its plans to update its power grid capacity accordingly and may need to soften its local content requirement as it has impeded the development of some renewable energy projects. Finally, administrative procedures are a significant barrier to renewable energy growth (IMEPOWER, 2012). The main market segments inside the renewable sector are described below.

Hydroenergy has been historically strong, but technology needs upgrading

Ukraine's 22 400 rivers are a significant source of renewable energy capacity in the form of hydroelectric potential. However, because only 110 of these rivers are broader and longer than 100km, future hydroelectric growth will come from small hydroelectric installations. Ernst & Young estimates that Ukraine has 2.3 GW of small-scale hydroelectric potential, compared to its current installed capacity of 150 MW. The Ministry of Energy and Coal Industry is even more optimistic, estimating that hydroelectric capacity could reach 5.8 GW by 2030 (The Ministry of Energy and Coal Industry, 2012). According to data provided by the Renewable Energy Institute of the National Academy of Science of Ukraine, the hydroenergy potential could even reach 12.5 GW.

The first step towards improving electricity production from small hydroelectric plants may be refurbishing plants built during the Soviet era. In 2010, only 49 of Ukraine's 150 small and micro plants were actually operating. In 2008, an announcement was made concerning the construction of a number of new 24 MW plants; however, construction is not scheduled to begin until 2013. The government has recently proposed extending the green tariff to plants up to 20 MW in size to encourage the development of small hydroelectric capacity. However, when the green tariffs were first introduced in 2009, large plants that had previously provided electricity at market rates switched to the subsidised rate, indicating that incentives may have to be adjusted in order to spur the creation of new capacity (Trypolska, 2012).

Box 1. Renewing hydroelectric infrastructure in Ukraine

Ukraine's hydroelectric industry became world renowned in 1932 when the 650 MW Dnieper hydroelectric power plant (HPP) began production. At 800m long and 61m high, it was one of the largest hydroelectric dams in the Soviet Union. Because of its large generating capacity, and importance for transportation, the Dnieper power station became an important source of power for towns along the Dnieper and beyond. Hydropower continued to expand during the Soviet era. PJSC Ukryhydroenergo, Ukraine's largest hydroelectric company, now has nine hydroelectric plants on the Dnieper and Dniester rivers in Kyiv, Kaniv, Kremenchuk, and Dniprodzerzhynsk. It also runs the Kakhovka HPPs, the Kyiv Pumped Storage Plant and the existing Dniester HPP (Ukraine Energy, 2012). The company is under the control of the Ministry of Fuel and Energy of Ukraine.

Hydroelectricity has maintained a small but stable share of Ukraine's electricity generation. Between 1996 and 2005, it varied between 9 and 16 TWh, which represented between 5% and 9% of total electricity generation. Although hydroelectricity is valued for its ability to produce power during periods of excess demand and counteract other cyclical sources of renewable energy such as wind and solar, it remains subject to the weather. For instance, hydroelectricity production fell by 41% in January 2012 compared to the previous year because of low water levels in the Dnieper and Dniester rivers (Ukraine Energy, 2012). In order to counteract these vulnerabilities, the Ministry of Fuel and Energy of Ukraine is seeking to spread its hydropower capabilities over a larger geographical area (Tsarenko, 2007).

Because Ukraine's hydropower facilities were poorly maintained during the 1990s, they are in need of a considerable technical upgrade in order to achieve higher efficiency levels. International financial institutions, including the World Bank and the European Bank for Reconstruction and Development (EBRD), have devoted significant sums to rehabilitate Ukraine's hydroelectric facilities. The World Bank has given USD 374 million to the Hydropower Rehabilitation Project which will last until 2017 (World Bank). The EBRD signed an agreement in 2011 worth EUR 200 million over a period of 15 years to reconstruct 21 units at six of Ukrhydroenergo's hydropower plants by 2017. This initiative will not only boost capacity by over 80MW, it will also increase the equipment's lifespan by 30 to 40 years (Companies&Markets, 2011).

Many analysts also 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. Some experts estimate that small hydroelectric plants could generate up to 8.3 billion KWh per year. (Interfax, 2012).

The potential of solar energy and wind power is confined to specific regions

Solar energy production has garnered interest from investors within Ukraine and abroad. Experts estimate that Ukraine could derive over 5 billion kWh a year of energy from sunlight (Trypolska, 2012). The State Agency on Energy Efficiency and Energy Savings of Ukraine predicts an installed energy capacity of 4.6 GW by 2030 (The Ministry of Coal and Industry of Ukraine, 2012). Because the glut of solar panel products in the Asian and European markets has lowered prices over the past two years, foreign investors are looking to expand into new markets. This, combined with Ukraine's favourable feed-in tariffs, has made Ukraine's solar market its fastest growing renewable energy market over the past two years.

Ukraine currently has 18 solar stations, but has several projects comprising an additional 290 MW of capacity due to come online in 2012 (IMEPOWER, 2012). ActivSolar, an Austrian photovoltaic cell producer, just completed an 80 MW project in Crimea, one of the largest in Eastern and Central Europe. Ukraine's strongest

solar energy potential is in the South and the North of the country and is subject to seasonal fluctuations (Ukraine Renewable Energy Forum, 2012).

Ukraine also has significant wind power potential. While the country currently produces 179.5 MWh of wind power (NERC, 2012), it has 3 GW worth of projects at some stage of production. The installed energy capacity of wind energy is forecast to be 3.5 GW by 2030 (Ministry of Coal and Industry, 2012). The average cost of producing electricity from wind farms is EUR 0.027 per kWh, significantly less than OECD countries (Trypolska, 2012). Furthermore, wind energy benefits from a EUR 0.066 per kWh feed-in tariff, which has made the sector very attractive to foreign investors.

Ukraine's wind power sector is growing at a brisk pace. Ukraine currently has twelve wind farms in operation. In 2011 alone, wind power production rose by 69.8 MW, representing an 80% increase. It is estimated that wind power could eventually cover between 20% and 30% of Ukraine's electricity consumption. Ukraine has areas with great wind potential, which include the areas near the Black Sea and the Azov Sea, the Carpathian, Transcarpathian and lower Carpathian areas, and elevated areas in the Donbass terrain and the Dnepropetrovsk Region (Ukraine Renewable Energy Forum, 2012; EBRD, 2010).

Box 2. Wind power in Ukraine has strong regional potential

Ernst & Young estimates that Ukraine has between 19 and 24 GW of wind energy potential on its territory, mainly located in the South of the country. Crimea, the Mikolayiv region, the Kherson region, the Zaporizhya region and the Donetsk region account for over 16 GW of potential. In 2010, there were only four operating wind farms on the Crimean peninsula, all of which had low capacity. However, at the same time, 15 projects representing EUR 7 billion worth of investments were in production. So far only projects with capacities under 1 000 MW are close to being licensed to supply the market, and only one, the Novoazovskiy Wind Farm, has moved into the construction phase (Ernst & Young 2012; Trypolska, 2012).

According to the Ukrainian Wind Energy Association, Novoazovskiy Wind Farm began constructing turbines in the Donetsk region near the Azov Sea coast in 2011. The project will eventually include 43 wind turbines with a capacity of 107.5 MW. The project started in 1997, and is expected to be completed by 2014 (Ukraine Wind Energy Association, 2012).

Although there is significant 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 have prevented projects from taking off (Trypolska, 2012). However, this situation may be beginning to turn around. In 2012, the EBRD provided a EUR 13.3 million financing package to Eco-Optima, a joint venture between Ukraine and Italy, to build a wind farm in Staryy Sambir in the Lyiv region. The farm will have a total capacity of 12.5 MW while producing 25.5 GWh annually, and should be commissioned in 2012 (IMEPOWER, 2012).

Biomass is the renewable energy source with the greatest potential across all regions of the country

Production of energy from biomass is a process defined as "any organic material of plant and animal origin, derived from agricultural and forestry production and resulting by-products, and from industrial and urban wastes, used as feedstock for producing energy and other non-food applications" (OECD, 2010).

Energy from biomass represents only 2.7% of Ukraine's current energy production, but its potential is significant. Because of the country's substantial agricultural output, some experts estimate that it represents two thirds of Ukraine's renewable energy potential (Ernst & Young, 2012). The sector also has the potential to develop across a wider geographical area than other types of renewable energy and is a more reliable energy source than other renewables because it offers a steady energy supply. This reliability decreases the need to build fossil energy plants to ensure a minimum energy supply. With a cost of EUR 0.057 per KWh, biomass is among the cheapest sources of renewable energy in Ukraine (Trypolska, 2012).

The substantial potential of energy production from biomass is directly related to the country's extensive agricultural output across all regions. Agricultural residues in Ukraine alone have profitable energy potential valued at 15.2 mtce, which corresponds to roughly 8% of Ukraine's total energy consumption in 2010 (Institute of Engineering Thermophysics, 2010).[2] This potential will increase as producing energy from biomass becomes more efficient.

Progressively moving energy production towards biomass will help offset the effects of rising gas prices. For instance, since 2010 the Russian natural gas price has increased by 116% (Index Mundi, 2012). This development has an impact on Ukraine because the country depends on gas as its primary energy source (Balmaceda, 2008). While reducing energy dependence from neighbouring countries, Ukraine could also consider exporting bioelectricity. The main focus should, however, be to satisfy domestic energy demand.

Using current technologies, producing energy from biomass is cost competitive compared to other energy sources. For instance, individual heating units with straw-based boilers are 67% less expensive to use than boilers that use natural gas (Kommunal'noe Khozjajstvo, 2007).[3] Also, electricity produced from other renewable energy sources in Ukraine generally has a similar cost or is more expensive than energy produced from biomass (Trypolska, 2012).[4]

Despite these benefits, the current share of biomass production in Ukraine's total energy consumption is still low. At 2.7%, it is around half of the share of energy production from biomass in the United States (5.1%) and a third of the share in the EU15 (7.9%) (Geletukha, 2011).

In light of the great potential for energy production from biomass, Phase I of the OECD Sector Competitiveness Review selected energy produced from biomass as the pilot sector in which to launch efforts to enhance sector competitiveness. The report affirmed the role that the government could have in fostering an investment policy climate to encourage growth in energy production from biomass (OECD, 2012). Therefore, this report will take the example of energy produced from biomass when elaborating suggestions to improve the investment environment for renewable energy in Ukraine.

Focus on investment policy: administrative hurdles as a key barrier to renewable energy production

Energy production from renewable sources has a number of barriers. For instance, there is no established wholesale market for biomass in Ukraine that would allow for long-term stable supply without large price fluctuations.

Administrative hurdles are barriers impacting all domestic renewable energy sources. These have therefore been identified as a priority area for improvement, with a focus on three key areas:

1. Developing a renewable energy vision and strategy.

2. Streamlining permitting procedures.

3. Improving the conditions for renewable electricity producers to access the electricity market from new plants.

Establishing and communicating a vision and a strategy including clear targets for renewable energy production is likely to lead to the development of more renewable-friendly investment policies in line with national priorities. It would also ensure that policy elements are adapted over time as market dynamics evolve and require investment policy changes. Additionally, investors in projects producing renewable energy can more easily be attracted if clear objectives for energy production are communicated. For instance, international investors will be better informed regarding the policy elements promoting renewable energy production if the government communicates energy targets. They will also be more confident in a long-term, renewable-friendly policy environment that is crucial for reducing investment risk.

Permitting procedures can substantially impact the completion time of a renewable energy production plant as well as its cost and transparency. Ultimately, this affects the investment's profitability and risk. Therefore, it is recommended that Ukraine streamline permitting procedures and make them less costly and more transparent for investors in renewable energy production. For instance, clear decision criteria for building permits and access to the energy wholesale market should be established.

Finally, the administrative requirements for renewable energy producers to access the wholesale electricity market determine the volumes of electricity sold as well as selling prices. Both variables have an immediate effect on the profitability of a renewable electricity plant and therefore impact investment decisions.

Notes

[1] This number does not, however, include building costs for wind farms. When including construction costs, the unit cost for wind power could be higher than in China or Czech Republic.

[2] The economic energy potential denotes the potential of energy that can be produced while covering costs and allowing for some profit margin. It contrasts with the theoretical and technical energy potential, which does not consider the cost of energy production.

[3] The calculation is based on a cost comparison between two 600 kWh boilers, one running on wheat-straw residue, the other on natural gas.

[4] This cost comparison considers the cost of electricity produced from biomass, water, geo-heat, sun and wind.

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Chapter 2

Baseline situation in Ukraine: the investment policy environment for producing renewable energy remains challenging

This chapter lays out the investment policy environment in Ukraine. First, it describes the relevant legislative actors for investment policy concerning the production of renewable energy. The legal framework for producing energy from renewable sources is also outlined. This includes the relevant government bodies shaping investment policy. It describes a vision and a strategy for energy production from renewable sources, the administrative procedures and the conditions for access to the power grid in Ukraine.

To analyse the baseline situation in Ukraine, this chapter will focus mainly on the administrative procedures to set up energy production from biomass.

A complex institutional and legislative framework for renewable energy investment and production is in place

Multiple government bodies are responsible for the legislative framework regulating renewable energy production

The Ministry of Energy and Coal Industry is responsible for Ukraine's overall energy policy, including nuclear energy as well as energy from coal, oil, natural gas and biomass. The ministry is not directly involved in developing policy for the renewable energy sector but it defines the energy strategy and priorities. Finally, it is also responsible for managing electricity grid operations.[1]

The second main government body impacting policies connected to energy production from renewable sources is the State Agency on Energy Efficiency and Energy Saving of Ukraine (SAEE). It shapes investment policy that impacts energy efficiency and energy savings as well as renewable sources including, for instance, energy production from biomass.

The Cabinet of Ministers co-ordinates the SAEE through the Ministry of Economic Development and Trade. Prior to the 2011 administrative reform, the SAEE drafted laws and supplied them directly to the Cabinet of Ministers. Since its legal initiatives are now first assessed by the Ministry of Economic Development, the SAEE's role has become less pertinent.

The National Energy Regulatory Commission of Ukraine (NERC) sets the rules for granting business licenses to investors to generate electricity from renewable sources and defines the conditions for allowing access to the *Energorynok* (wholesale electricity market). Finally, the local *Oblenergos* (regional energy companies) define the conditions that biomass energy producers need to fulfil to be connected to the national power grid.

Finally, the State Commission on Housing Utilities and Market Regulation participates in the drafting and implementation of heating policy. This also encompasses heating from biomass. The State Commission's tasks include market interactions with bioheat producers and setting heating tariffs for households and businesses.

Several investment policy elements from various legislative sources are relevant to renewable energy producers

The government bodies described above have developed a complex legislative framework which determines the administrative procedures related to establishing plants for renewable energy production as well as the conditions for access to the electricity wholesale market.

The relevant policy elements include the Cabinet of Ministers of Ukraine (CMU) Decree on the Programme of State Support for Alternative and Renewable Energy and Small Hydro and Thermal Power, the Law on Alternative Sources of Energy, the *Energy Strategy of Ukraine 2030*, the CMU Decree on Approval of the Granting of Preferential Loans for Investment Projects on Energy Saving Technologies for Production of Alternative Energy Sources and the Law on Electricity.

The Law on Alternative Fuels and the Law on Alternative Sources of Energy set a general legislative framework that is favourable to producing energy from renewable sources. However, the two laws are only of a declarative nature, stating the objective of promoting renewable energy production in Ukraine. They do not provide financial support or specific mechanisms for the development of energy production from renewable sources.

For energy production from biomass, in contrast, laws such as the Law on Regulation of Urban Development, the Law on Fire and the Law on Licensing in Connection to Economic Activity have a direct effect on the administrative procedures for energy production from biomass as well as the terms of market access.

Article 31 of the Law on Regulation of Urban Development stipulates that all construction projects with a IV or V degree of complexity are subject to a mandatory examination for compliance with the Law on the Sanitary and Epidemiological Welfare of the Population. They are also subject to regulations on construction safety, environment, health, fire, emergency planning, durability and reliability. Plants producing energy from biomass usually fall into one of these degrees of complexity.

The Central Executive Authority on Construction and Architecture examines the construction safety of plants that produce energy from biomass. The details of the fire safety examination are stipulated in Article 10 and 11 of the Law on Fire: a fire safety examination done as part of the permitting procedures needs to review machinery, equipment and products.

The details of the sanitary and epidemiological examinations are stated in Article 10 of the Law on the Sanitary and Epidemiological Welfare of the Population. Accordingly, the project blueprint and the technical specifications of a plant producing energy from biomass need to be examined for compliance with the defined sanitary and epidemiological standards.

According to the Law on Licensing in Connection to Economic Activity, a business permit is required to produce electricity, heat and mechanical energy from alternative energy sources or to transfer and deliver renewable energy. However, according to Article 13 of the Law on Electricity, this only applies to plants producing energy from biomass with a capacity greater than 5 MW. Article 6 of the Law on Alternative Sources of Energy states that the government issues this permit.

On 1 January 2012, Amendment Nr. 3204-VI was made to the Law on Licensing in Connection to Economic Activity. It re-organised the interaction between government entities and companies producing energy from biomass and aimed at issuing permits at the regional level. An additional objective was to establish a single interface for the applicant and, thus, speed up the application process. However, no changes to the energy sector were made.

The Law on Electricity sets the conditions for granting a tariff to promote and encourage renewable energy producers of all types to sell in the wholesale market. The procedures for granting this green tariff are stipulated in Resolution Nr. 32 on the Approval of the Procedure for the Setting, the Re-Setting and the Repealing of the green tariff for Business Entities elaborated by NERC on 22 January 2009.

Beyond the scope of national law, Ukraine is also increasingly adopting EU directives developed for member countries. In a bid to meet the requirements for accession to the Energy Community Treaty, Ukraine intends to adopt EU Directive 2001/77/EEC on the promotion of electricity from renewable energy sources. An appropriate resolution has been drafted by the SAEE.

In 2011, the CMU adopted a resolution to meet the country's obligations that resulted from the Energy Community Treaty. SAEE has developed a proposal of measures to comply with the named directive. SAEE also aims at developing an updated National Renewable Energy Action Plan by the end of 2012. This plan is intended to meet the EU directive's requirements.

Finally, SAEE will also prepare a draft National Plan for Energy Efficiency of Ukraine.

However, no clear objectives for renewable energy production have been set

Within the defined legislative framework, the previously described government bodies have determined a set of renewable energy targets that are specified in the *Energy Strategy of Ukraine 2030*. This strategy was set in 2006 and was slightly amended in 2009 (IEA, 2012).

The Energy Strategy defines its objective as developing unconventional and renewable energy in order to increase energy security in Ukraine and reduce the man-made impact on the environment, including climate (145-p, 15 March 15 2006).

The 2006 Energy Strategy aims to have 19% of energy consumption come from unconventional and renewable sources by 2030 and this goal has been updated to specify that 10% of existing electricity generating capacity should come from renewable energy (CMU Resolution Nr. 243, 01 March 2010). A draft of the updated Energy Strategy is currently being processed by the Ministry of Energy and Coal and the SAEE. This draft aims at reaching a 10% share of renewable energy in total energy consumption by 2015. However, given the slow pace of renewable energy growth, doubts remain over whether these objectives can be reached. The defined targets imply investment of UAH 190 billion from 2011 to 2030, with the bulk of it needed between 2020 and 2030.[2] Besides increasing energy production from renewable sources, the Energy Strategy also aims to limit energy consumption by increasing energy efficiency (145-p, 15 March 2006).

While it has defined overall renewable energy targets and detailed the implications for investment, Ukraine has yet to develop detailed plans for producing energy from specific sources, e.g. from biomass. However, the Energy Strategy of Ukraine 2030 includes projections of the future share of energy production from renewable sources. The updated plan will be presented by SAEE by the end of 2012.

Permitting procedures to set up plants for renewable energy production in Ukraine are relatively burdensome: the energy production from biomass example

The permitting procedures for setting up a plant for producing energy from biomass in Ukraine take ten to sixteen months on average. This duration corresponds roughly to that in Austria, Denmark and Germany.[3] However, the sequencing of the permitting procedure steps in Ukraine is different from the practices observed in the OECD comparison countries and also involves higher risk for investors.[4]

The permitting procedures usually start with an optional information consultation meeting followed by the application submission. The application is assessed and must pass a preliminary approval process. If the future plant is located within the premises of a town or village, the public must be involved in the decision process after which the building permit is accepted or rejected.

Unlike the EU member countries analyzed later, the building permit neither automatically includes the right to supply energy produced from biomass to the wholesale electricity market or a green tariff grant. Therefore, the investor needs to apply for those permits in two subsequent steps. However, those application steps may only occur after the plant has been built and commissioned.

An informal consultation meeting with the commune is voluntary and spells out the main requirements of a successful application as well as many of the decision criteria used to assess it. Furthermore, the commune gives an indication of the suitability of the location chosen for the project as well as an overview of the permitting procedures and identifies the typical pitfalls in the process.

The application forms required include the technical description of the plant, an illustration of the feedstock concept and specifications on emissions and noise. The specific documents must be submitted to different government bodies, *e.g.* the

commune and the regional council, which has multiple interfaces for the investor to deal with.

The County Agency, the Environmental Agency, the Local Department of State Investment Expertise and the Building Agency are all in direct contact with the applicant. They are in charge of a number of examinations, including adherence to health and safety standards, static and fire safety as well as environmental impact. If no urban land plan exists, the Land Resource Administration needs to develop it. This process takes an average of two to three weeks and may, therefore, extend the application process.

Since larger plants producing energy from biomass tend to be built outside inhabited areas, only a few biomass projects require public participation. When the public needs to get involved, a civic hearing takes place after a declaration of the intention to build the plant is published in a local newspaper. Objections voiced at the hearings are evaluated and the decision is conveyed in writing. Depending on the speed of the administrative procedures, the involvement of the public and the existence of an urban land plan, obtaining a building permit takes between six and ten months.

For bioelectricity producers, obtaining the building permit is followed by a decision on access to the energy grid and to the wholesale electricity market as well as the provision of a green tariff. These steps can only occur once the biomass plant has been built. For the actual link to the power grid, the bioelectricity investor applies to *OblenErgo*, the national grid operator.

The investor then needs to apply to the State Agency *Energorynok* (which administers Ukraine's energy wholesale market) for access to the wholesale market. For biomass energy producers supplying heat, admission to the local heating network is also examined.

International investors have complained that the criteria for admittance to the wholesale electricity market are not clearly stated. Cases have been reported where approval has been revoked for reasons that were unclear to the investor and only granted after months of negotiations (Biomass Investor, 2012).

As the final step, NERC assesses the possibility of granting a green tariff (Trypolska, 2012).

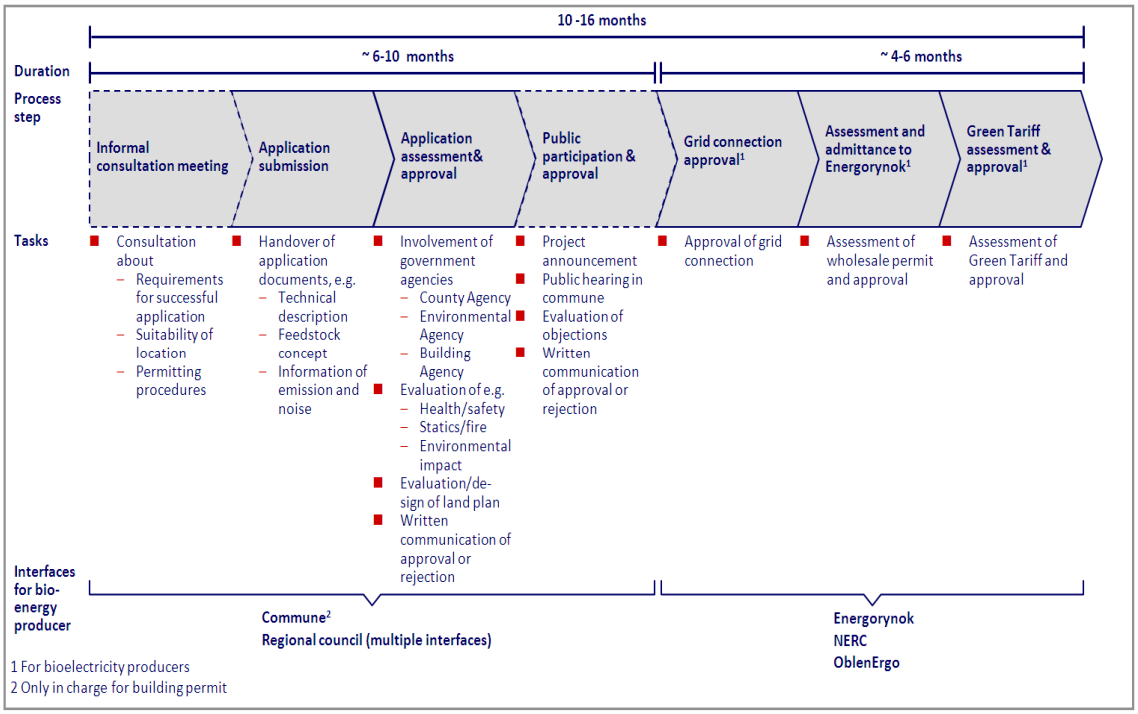
The three final steps, the approval of a physical power grid connection, admittance to the wholesale electricity market and the provision of a green tariff, take four to six months on average.

In sum, investors in energy production from biomass need to deal with at least six interfaces. The total cost of the fees paid for the assessments usually falls within a range of between 0.06% and 0.6% of the total plant construction costs, excluding equipment. These fees do not include any potential cost linked to corruption.

Since the decision on admittance to the wholesale electricity market and the green tariff only occurs after the plant has been built, the risk of not recovering investment costs increases substantially.

Figure 2.1 gives an overview of the permitting procedures in Ukraine including their principal steps.

Figure 2.1 **Permitting procedures in Ukraine**



Source: AEG (2012); ICC (2012); SAEE (2012).

Box 3. The Green Tariff

The green tariff, introduced by the Law on Electric Energy, is a special tariff designed to increase the share of electricity from renewable energy sources. Since renewable energy is generally less cost competitive than energy produced from fossil sources, the electricity network operators are bound to purchase energy from renewable energy sources at a fixed rate set individually for each renewable energy source. This rate covers the average cost to energy producers for each renewable energy source and allows for a profit margin. As a result, more renewable energy is demanded at a higher price than in an unregulated market. Consequently, more renewable energy is produced and consumed.

Ukrainian law stipulates that all electricity produced from renewable energy and not sold in direct contracts has to be purchased by the wholesale electricity market at the green tariff rate. Therefore, Ukraine prioritises renewable energy over conventional energy in the market. This rule applies to all renewable energy producers admitted to the wholesale electricity market and receiving the green tariff.

NERC is responsible for approving the green tariff case by case while considering the type of renewable energy source used to generate energy and the specifics of the power plant. Currently 65 bioelectricity producers get the green tariff.

With the planned privatisation of the Ukrainian electricity wholesale market, a marketplace with bilateral contracts between private companies is likely to replace the state-run *Energorynok*. In this changed environment, it is expected that the Ukrainian state will continue ensuring that renewable energy producers have access to the wholesale market and that their electricity is purchased at a green tariff rate.

The green tariff is set by the Law on Electricity and calculated based on the electricity retail price for second-class consumers as of 1 January 2009, multiplied by a fixed coefficient established in Article 17-1. Since a fixed EUR/UAH exchange rate is used, renewable energy producers are protected from currency fluctuations against the euro. However, inflation risks, leading to higher input costs for renewable energy producers, are not taken into account.

The level of the green tariff will decrease over time. It will be reduced by 10% by 2014, 20% by 2019 and 30% by 2024. Currently, the green tariff is planned to fully expire in 2030.

Accessing the power network from new renewable plants is difficult in practice

Any renewable electricity producer with a business license is entitled to have preferential access to the wholesale electricity market.[5] Furthermore those granted a green tariff right may supply electricity at the green tariff rate (See Box 3). The *Energorynok* has the final word in granting investors market access. According to some investors, *Energorynok*'s criteria are not fully transparent (Biomass Investor, 2012).

Market access is also enforced in practice by obliging the power network operators to connect renewable energy producers to the networks (IAE, 2012). But electricity suppliers need to pay for their physical connection to the electricity grid. This may be a costly investment.

Renewable electricity producers may demand that network capacity be increased when necessary to supply the desired volume of electricity to the wholesale electricity market. However, in practice, this right is not enforced. For that reason, producers often finance the grid expansion (IAE, 2012).

Notes

[1] For this and the following paragraphs see chapter by IEA (2012), p. 6.

[2] Of the UAH 190 billion, UAH 130 billion will be needed to develop generating capacity of renewable energy other than hydropower plants and an additional UAH 60 billion for the construction or modernisation of hydropower plants.

[3] See next chapter. The State Service on Regulatory Policy and Entrepreneurship and the Ministry of Economic Development and Trade are currently aiming to shorten permitting procedures. As part of this effort, 70% of the documents required in the permitting process will be cut.

[4] For more details on the contents of this and the following paragraphs see AEG (2012); ICC (2012); SAEE (2012).

[5] Preferential access means that the bioelectricity producer may sell its entire production to the electricity wholesale market at the rate stated in the green tariff scheme.

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Chapter 3

Investment policy for renewable energy production – international good practices

This chapter analyses good investment policy practices for producing renewable energy. It analyses several policies from OECD member countries selected for their favourable policy environments. This chapter begins by describing country-specific energy visions, strategies and objectives for renewable energy. It then examines the administrative procedures required to set up renewable energy production, using the example of energy from biomass. Finally, it describes the conditions for access to the power grid. For each of the three elements, the chapter evaluates shortcomings in the practices examined and identifies limitations on their applicability to Ukraine.

International good practices have been used as a reference for the recommendations on improving investment policy for the production of renewable energy in Ukraine. Ukrainian administrative procedures were compared with those in OECD member countries (Austria, Denmark, Germany and Poland) that have adopted good administrative practices.

Austria, Denmark and Germany all have a general policy environment that promotes renewable energy production as well as country-specific good practices. This is also the case for biomass: in all three countries, the share of energy production from biomass of total domestic energy consumption is above the EU27 average of 6.1%; it is currently at 15.5% in Austria, 13.6% in Denmark and 6.5% in Germany (Eurostat, 2011). As central European countries with extensive agricultural sectors (Nation Master, 2012), the selected countries have a geographical and climatic context that is similar to that of Ukraine. In Poland, energy production from biomass makes up 6.2% of total energy consumption, only slightly above the EU27 average (Eurostat, 2011). Poland has relatively complex administrative procedures and less favourable conditions for access to the electricity network than the other comparison countries. However, Poland has a successful track record with regards to the definition of targets for renewable energy and energy production from biomass. Furthermore, several effective policy measures promote these targets. Finally, Poland's country context is very similar to Ukraine's: both countries have extensive agricultural output,1 have large territories, are located in central-eastern Europe, have similar climates and have defined strategic objectives to reduce their dependence on oil and gas while limiting their carbon emissions.2 Although the context for Poland is different because its EU membership gives it increased access to financial and technological resources (Guerin, 2011), Poland still provides a possible roadmap for the evolution of biomass policy in Ukraine.

A renewable energy vision and strategy is important to promote renewable energy growth

Ukraine could consider the EU approach when developing a renewable energy vision and strategy and communicating clear targets for producing renewable energy, including that from biomass. Setting and communicating clear targets would help potential investors assess the size of the renewable energy market, and the risk associated with investments in the sector.

Austria, Denmark, Germany and Poland include the EU's renewable energy directives in their target setting. For example, the 20-20-20-Energy Strategy stipulates the following objectives for the EU (Europa, 2011):

- Improving the EU's energy efficiency by 20% by 2020;
- Increasing the share of renewable energy to 20% by 2020.

The increase of renewable energy's share is detailed in the European Commission's *Renewable Energy Road Map* that sets each individual country's target share of renewable energy consumption to be achieved by 2020. Austria's renewable energy is required to reach a share of 34% of total energy consumption, Denmark's 30% (50% for electric energy), Germany's 18% and Poland's 15% (ECN, 2011).

Though the national objectives defined by the EU do not specify which renewable energies need to be used, the member states have for the most part defined targets by renewable energy source within the National Renewable Energy Action Plans each EU Member State had to develop by the end of 2010. Austria, for example, aims for a share of energy production from biomass in total domestic energy consumption of 14% by 2020 (Austrian Biomass Association, 2011). The Austrian government has also defined some more intermediate targets for energy production from biomass: the Green Energy Act 2008 stipulates that additional bioelectricity installations with a capacity of 100 MW each and a total capacity of 600 GW should be installed between 2008 and 2015 (BGBI. I Nr. 114/2008). For that purpose, Austria has increased its target for the number of heaters using biomass by 2020 to 800 000, a 300 000 unit increase from 2010 (Policy Department Economic and Scientific Policy, 2010). Even prior to the Green Energy Act, biomass projects were being promoted: from 2005 to 2007, 1 987 biomass heating systems were partially funded by the government. In total, EUR 121.7 million was spent on biomass-related projects from 2005 to 2007 (IWES, 2010).

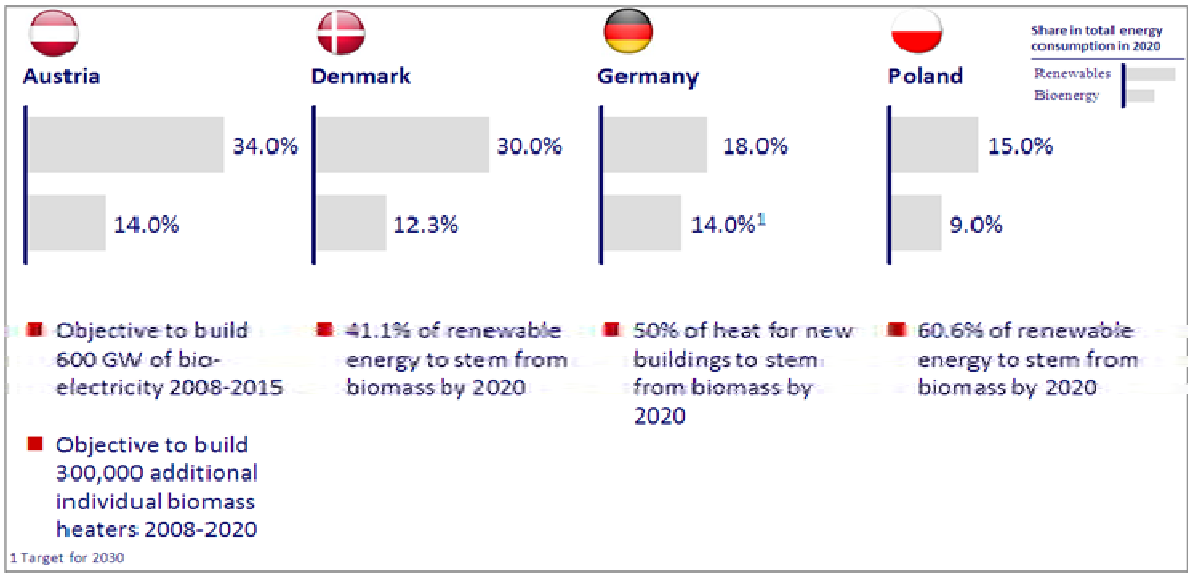
Germany is aiming to satisfy 14% of its total energy consumption with energy production from biomass by 2030. It has also stipulated that 6% of electricity and 11% of heating should come from biomass by 2020 (Federal Ministry for the Environment, 2009). Furthermore, at least 50% of the heat for newly constructed buildings must be produced from biomass by 2020.

Denmark is seeking to source 41% of its renewable energy production from biomass by 2020 (Weise, 2010), meaning that 12% of its total energy consumption is to come from energy produced from biomass.

Poland aims at producing over 60% of its renewable energy from biomass by 2020 (IFRE, 2010), which means that 9% of its total energy consumption will be covered by biomass.

Figure 3.1 summarises the principal elements of the energy action plans of Austria, Denmark, Germany and Poland.

Figure 3.1 **Overview of national renewable energy and energy production from biomass targets**



Source: Austrian Biomass Association, 2011; BEE, 2009; EREC, 2010; Federal Ministry for the Environment, 2009; IFRE, 2010; Policy Department Economic and Scientific Policy, 2010; Polish Economic Chamber of Renewable Energy, 2010; Weise, 2010.

Previous studies have stressed the importance of clearly defined objectives for maximizing impact in various policy areas. This has also been demonstrated more specifically when defining renewable energy targets aimed at mitigating climate change (Verhaegen, 2007). Generally, effective targets need to be motivating, but also achievable, specific and measurable. They need to be communicated clearly and have a timeline for achieving the defined objectives. Otherwise, misinterpretations are likely to undermine the set targets. It is important to say that the national targets defined are generally non-binding for individual households and companies. However, they foster investment in renewable energy production as investors expect a more favourable long-term policy environment.

Some shortcomings in EU practices should be avoided and Ukraine's specific country context needs to be taken into account

Nevertheless, there has been some criticism of the objectives for renewable energy in the OECD member countries. The targets have been criticised as not taking sufficient account of country-specific contexts. Furthermore, they do not give enough guidance on how the energy targets should be reached (Euractiv, 2012). Critics have

also stated that targets are based on assumptions (*e.g.*, logistics mix, travel behaviour and price developments) that are questionable. Finally, industry associations fear that the defined renewable energy objectives will make energy more costly and, thus, industrial production more expensive (Siegloch, 2008).

Ukraine needs to take these criticisms into account when designing targets for renewable energy. It needs to critically evaluate suitable energy targets and reasonable assumptions for developing such targets. Target development should take into account the specific Ukrainian country context. Finally, Ukraine should not impose renewable energy targets on households and producers that lead to higher energy costs. The aim should be to use clearly stated energy targets as a starting point to create more friendly investment policies for the production of energy from biomass in order to attract international investment.

Box 4. Spain's cautionary tale for developing a renewable energy vision and strategy

The benefits of setting clearly defined energy goals can be nullified if these goals are overly ambitious and supported by excessive subsidies. Overly ambitious targets that put too much pressure on public finances are not sustainable and may end up eroding the public's and investors' trust in renewable energy's attractiveness in difficult financial situations.

Spain is among the countries whose plan proved to be too ambitious. A renewable energy plan signed in 2005 aimed for 12.1% of Spain's electricity to come from renewable energy sources by 2010. To achieve these goals, the plan aimed to collect EUR 23.6 billion in renewable energy investments, of which only EUR 681 million would be government contributions. (Renewable Energy World, 2005)

As a result of this favourable policy, the Spanish renewable energy industry grew exponentially. By 2010, 23% of Spain's electricity came from renewable sources. At its peak in 2008, the industry directly sustained 75 446 jobs. As a consequence, some of the world's largest solar farm manufacturers, such as T-Solar and Gamesa Corporation, operate out of Spain and use the revenue from their Spanish sales to sponsor their activities in other parts of the world (Bloomberg, 2012).

In reality, the Spanish government had to pay out much more than it had originally planned. Because the scheme was set up in such a way as not to pass on costs to the consumer, the government shouldered the majority of the cost of subsidising the new industry (New York Times, 2010). By 2010, the government was subsidising USD 6 billion in energy feed-in tariffs annually. To save money and trim its fiscal deficit, the government announced a series of cuts, culminating in an announcement in January 2012 that new renewable energy projects would no longer receive government subsidies. (Ernst & Young 2011)

By 2012 the renewable energy workforce had shrunk by 27% from its peak, representing the loss of about 20 000 jobs. Experts fear that if the subsidy ban lasts more than 18 months, the entire Spanish renewable energy industry could collapse. (Ernst & Young, 2011).

The boom and bust of the Spanish renewable energy industry clearly illustrates that setting ambitious renewable energy targets without properly accounting for the cost responsibility for such schemes can result in failure. Therefore, proper and realistic target setting is important for the long-term success of any renewable energy scheme.

Streamlined administrative procedures can facilitate investment in renewable energy production

The duration, cost and transparency of the administrative procedures needed to set up a plant for producing renewable energy have a considerable impact on investments in alternative energy. Investors commit considerable amounts of money to planning plants for producing energy. Therefore, the duration of permitting procedures will have an immediate effect on a project's profitability. A project's returns are also impacted by the cost of the permitting procedures, which can be affected either by the fees paid to government bodies or by the work required to provide documents and interact with the various government interfaces involved.

Finally, the lack of clear decision criteria and defined process steps for obtaining a permit also increase the business risk for investors. Opaque permitting procedures also tend to increase corruption problems.

Austria, Denmark and Germany show good practices for streamlining procedures for setting up renewable energy plants, but the transferability of practices needs to be examined critically

In the case of energy production from biomass, Austria, Denmark and Germany can be considered as benchmarks for quick permitting procedures and easy access to the electricity grid. Granting plant building licenses, access to the electricity wholesale market and the green tariff occurs simultaneously. Small energy producers from biomass generally have a more accelerated application process. The benchmark countries have also reduced the number of interfaces for investors and contained their application costs. Transparency in the application process is increased by clearly stating decision criteria and providing additional guidance by means of consultation meetings. A summary of the situation in the three benchmark countries is provided below.

The good practices in administrative procedures adopted in other countries need to be examined critically to establish whether they can be easily transferred to the Ukrainian context. For instance, while it is advisable to reduce the number of interfaces for bioenergy producers, it may not be best to reduce their number to a single interface. Chapter 4 will illustrate the ways in which streamlined administrative procedures need to take into account the country-specific context of Ukraine.

Austria, Denmark and Germany simultaneously grant a building permit, the green tariff and access to the energy grid in accelerated procedures

While Ukraine first grants a business license for investors wanting to produce energy from biomass and gives access to the wholesale energy market and the green tariff only afterwards, these three steps occur simultaneously in Austria, Denmark and Germany. As a result, procedures for firms setting up plants producing energy from biomass in Austria take six to eight months on average, about twelve months in Denmark and seven months in Germany.[3]

In Austria and Germany, the permitting procedures start with an initial consultation meeting after which the investor submits an application to build the plant.

This clearly outlines the requirements for a successful application as well as the decision criteria used to assess it. Additionally, the government body evaluates the chosen location, identifies the typical pitfalls in the permitting procedures and ways to accelerate the process. The consultation meeting decreases the duration and the costs of the permitting procedures and increases transparency.

Furthermore, in Austria and Germany, public participation is only mandatory for energy production from biomass plants with a capacity beyond a certain threshold: at least 10 000 tons of biomass per year in Austria and 1 MW capacity for wood biomass plants and 100 kW for other biomass sources in Germany. For smaller plants, this shortens the permitting procedures by two months in Austria and three months in Germany. In Denmark, for smaller biomass energy production plants that process up to 30 tons of biomass a day,[4] only a fire safety assessment by the fire authority is required.

Fewer interfaces increase application speed and transparency

In order to simplify administrative procedures and increase their speed and transparency, the OECD benchmark countries have reduced the number of interfaces for investors.

In Austria, investors deal with two interfaces: the commune is responsible for assigning land to the investor and the *Bezirkshauptmannschaft* (greater commune) is in charge of all other assessments and co-ordinating with other government bodies involved in the assessment process.

Denmark has established a single interface for renewable energy investors: the municipality is the sole interface for interaction, information provision and receiving forms and is also in charge of managing the remaining permitting procedure steps and involving the necessary actors.

In Germany, during the entire process, the county administration is the single interface for interacting with investors and co-ordinating with other government agencies. Depending on the land (state), the interface can also be another government body.

In Austria and Germany, the application costs are low in comparison to total investment costs

Austria and Germany have both maintained application costs at a level that lowers the market-entry barrier for investors.

The total cost of the fees paid to government bodies in Austria is between EUR 4 000 and EUR 10 000, depending on the specifics of the biomass plant and the land in which the application is made. Generally, the fee for waste evaluation (part of the assessment of the environmental impact), the electricity concept evaluation and the business permission can cost up to EUR 4 000 each. The building agency also demands a EUR 4 000 fee.

In Germany, the total cost of the application fee lies between EUR 500 and EUR 5 000, depending on the number of assessments required after the public objections have been made. It can be substantially higher if the public objections result in a large number of further examinations.

Box 5. Oversimplifying permitting procedures has increased consumer electricity prices in Germany

Germany has long held a pre-eminent position in the European renewable energy market. Its renewable energy policies are among the most developed in Europe and include simplifying and accelerating its permitting procedures for renewable energy producers while granting them simultaneous access to wholesale markets and to the power grid. Germany has also developed an important green tariff scheme that has been copied in other European nations, including Spain and the Czech Republic.

As a result of these policies, Germany's energy production from renewable sources has increased significantly. In 2011, renewable energy had a 20% share of total energy production, up from 17% in 2010 and 6% in 2000. Growth in the industry looks set to continue. For instance, by 2020, Schleswig-Holstein is to increase its wind capacity to a level three times higher than its current energy consumption (Fichtner, 2012).

However, such a progressive energy policy also entails a number of consequences for the energy market and its consumers. Because it is more expensive to produce most types of renewable energy than conventional sources of energy, the costs associated with making renewable energy competitive must be passed on. This cost difference is paid for by the entire wholesale market, which means that part of it eventually gets passed on to the consumer. This cost premium is anywhere from 28.6% for energy produced from biomass to 85.3% for energy produced from solar panels. It is estimated that in 2010 alone, EUR 12 million of the EUR 16.7 million consumers paid for renewable energy in Germany went towards paying for this cost difference (IW, 2012).

Better conditions for accessing the electricity grid can further enhance the business environment for renewable energy producers

Ease of access to the power grid has a substantial impact on the business case for projects producing electricity from renewable sources and the risks linked to them. The following section analyses the policy measures in place in Austria, Denmark, Germany and Poland, and focuses on the conditions required to access the power grid.

All OECD countries examined offer favourable conditions for renewable electricity producers to access the power grid. Among those countries, Germany has the most advantageous conditions and Poland the least beneficial ones. All four countries grant access to the power grid together with the business license and have given renewable electricity suppliers a legal right to preferential grid connection. In three countries, it is free of charge. Three countries offer a legal right to grid expansion if required to accommodate an increase in power supply from renewable producers. The feed-in tariff guarantee varies between 10 and 20 years.

However, the very favourable terms for renewable energy producers in these countries come at the expense of the network operators, which are obliged to pay for the physical grid connection and any subsequent expansion. Those costs are then passed on to consumers. In addition, the feed-in tariff guarantees may increase electricity costs for businesses and households. Therefore, the Ukrainian government needs to critically evaluate which of these elements should be introduced and what their composition should be.

Austria provides renewable energy producers with financially attractive conditions for access to the electricity grid

Austria has implemented a number of favourable policies for renewable electricity producers to improve their market access, their access to the grid, the potential to grow their energy supply to the grid and potential feed-in tariffs.[5]

Any entity with a business license has the right to supply renewable electricity to the market. There is no incremental step needed to ensure access to the electricity wholesale market. In addition, the connection to the grid is provided free of charge, further enhancing the business environment for renewable electricity producers. Suppliers have a legal right to preferential grid connection. This means that companies can supply all of their renewable electricity to grid operators independently of capacity constraints or the level of energy demand.

Renewable electricity suppliers that want to increase their electricity supply can ask the network operator to increase grid capacity to match their full capacity. This significantly increases the incentive to expand supply and reduces the business risk linked to capacity expansion projects.

Finally, the policies in place also guarantee the tariffs paid for renewable electricity. The feed-in tariff paid for a unit of renewable electricity is guaranteed for 13 years. However, this tariff decreases with the total volume of renewable electricity supplied. For instance, it is between EUR 0.13 and EUR 0.185 per kWh for bioelectricity producers. This provides a renewable electricity producer with long-term planning security with regard to revenue.

Access for renewable energy producers to the electricity grid in Denmark is granted easily

Denmark also has very favourable conditions for access to the electricity grid, although not as favourable as Austria's.[6]

Like Austria, Denmark has liberalised market access for renewable electricity producers. Moreover, there are no additional procedural steps to obtain this access after the permit procedure is completed.

Renewable electricity producers have a legal right to connect to the grid, and connections are provided free of charge. However, if capacity constraints are proven, the network operator is not obliged to expand capacity or to grant full or even partial grid access to the renewable electricity producer. If a supplier wants to increase supply in a network that already has capacity constraints, he has no legal right to do so. However, if no capacity constraints exist, the renewable electricity producer can raise supply to the grid at full and growing capacity.

Finally, Denmark provides a long-term feed-in tariff guarantee. This feed-in tariff includes a fixed bonus on the market price. Currently, the feed-in bonus for electricity producers from biomass is around EUR 0.10 per kWh. In Denmark, the feed-in tariff is guaranteed over 10 years.

Costs of access to the electricity grid in Germany are paid for by the network operator

The conditions for access to the power grid in Germany are comparable to the ones in Austria and have similarly favourable terms.[7]

Germany provides liberalised market access to potential renewable electricity suppliers. The necessary license to supply renewable electricity is provided at the end of the permit procedure.

There is a legal right for any renewable electricity supplier of preferential grid connection at full capacity that comes free of charge and that is independent of potential supply-side capacity constraints. In addition, the legal right to grid expansion facilitates growth. The ways in which both mechanisms foster the business environment for renewable electricity producers is detailed in the Austrian best-practice example.

Finally, Germany imposes a feed-in tariff guarantee for 20 years for renewable energy producers, the longest guarantee in the examined countries. The feed-in tariff for electricity producers from biomass is between EUR 0.1167 and EUR 0.25 per kWh and depends on the capacity supplied (Bioenergy site, 2011).

Box 6. Automatic grid connection for solar power plants in Czech Republic comes at the expense of customers

In 2005, the Czech Republic signed the Act On The Promotion of Electricity Production From Renewable Energy Sources, putting it at the forefront of the European Union's movement towards increasing renewable energy production (BBC, 2010). The Act meant that renewable energy producers were guaranteed a connection to the electricity grid and implemented an incentive scheme in the form of a generous feed-in tariff. As a consequence, any solar electricity producer had the legal right to grid access completely free of charge (Renewable Energy World, 2010).This resulted in solar energy production expanding from virtually nothing in 2009 to 1 GW in 2010 (iSupply Energy Research, 2011).

However, the boom ended quickly. The national grid operator was unable to handle the capacity, so automatic grid connections were reversed. (Law-now Czech Republic, 2010) Due to the generous green tariff scheme and the building of a large solar energy capacity, customers had to pay an incremental cost of USD 2.8 billion for their electricity consumption, a cost increase of 18%. As a result, the Czech government reversed the feed-in tariffs in 2010, and in 2012 announced that it would begin to retroactively tax solar operations that opened in 2009 and 2010 to recoup some of the green tariffs paid (Renewable Energy World, 2010).

Poland compensates for its less favourable conditions for access to the electricity grid with policy measures to promote renewable energy production

While the conditions for grid access in Poland are generally less favourable for investors than those in Austria, Denmark and Germany, Poland has developed some additional policy measures to promote electricity production from renewable sources.[8]

As in Austria, Denmark and Germany, any entity owning a business license may supply renewable electricity to the market. Access to the electricity network must be provided to all renewable electricity producers within 180 days. However, this

obligation does not hold if providing access to the power grid is considered to be technically unfeasible, *e.g.* because of an electricity producer's very remote location.

More problematic for renewable electricity producers are the rules about upfront payments to the network operator, the lack of a right to grid expansion to account for capacity increases and the lack of feed-in tariff guarantees. The network connection requires an upfront payment of PLN 30 000 (about EUR 7 200) that is partially reimbursed if it is greater than the actual connection costs. Only renewable electricity producers with a capacity below 5 MW can access the grid free of charge. Furthermore, renewable electricity producers have no legal right to demand network expansion if they increase their capacity, which limits potential growth. Poland also has no guaranteed feed-in tariffs for renewable electricity.

However, there are additional policy measures to promote energy production from renewable sources in Poland that are very advantageous for suppliers. First, there are feed-in ordinances stipulating the obligation of municipalities to increase the share of renewable energy in the total energy mix in line with national targets. Accordingly, the share of renewable energy in the total energy mix should be 15% by 2020 and 20% by 2030. However, this obligation is currently not enforced.

Second, renewable energy producers in Poland are tax exempt. Finally, small and medium-sized renewable energy providers have access to preferred loans with lower interest rates.

Figure 3.2 provides an overview of the standard conditions for electricity network access and further policy measures to promote renewable electricity in Austria, Denmark, Germany and Poland.

Figure 3.2 **Conditions for access to the electricity network**

	Austria	Denmark	Germany	Poland
Liberalised market access for producers with business license	✓	✓	✓	✓
Preferential electricity supply	✓	✗	✓	✗
Right for physical grid connection free of charge	✓	~ [1]	✓	~ [2]
Right for capacity expansion	✓	~ [1]	✓	✗
Feed-in-tariff guarantee (years)	13	10	20	✗

1 Depending on free capacity
2 Depending on technical feasibility; cost covered by investor

Source: IWES (2010); RES (2012a); RES (2012b): RES (2012c); RES (2012d); interview with the Austrian Federal Ministry for Transport, Innovation and Technology; interview with the German Fachagentur Nachwachsende Rohstoffe e.V. (Expert Agency on Renewable Basic Materials); interview with the Polish Ministry of Economy.

Notes

[1] With 32.5 and 12.1 million hectares of agricultural land, Ukraine and Poland are among the five European countries with the most extensive farmlands (Nation Master, 2012).

[2] See below for Poland and chapter three for Ukraine.

[3] Sources for this section: IWES, 2010; RES, 2012a; RES, 2012c. Some of the information included results from interviews held in February 2012 with Mr. Huebner from the Austrian Federal Ministry for Transport, Innovation and Technology, with Mr. Hansen from the German Fachagentur Nachwachsende Rohstoffe e.V. (Expert Agency on Renewable Basic Materials).

[4] This equals a capacity of roughly 3 MW.

[5] For more details on this and the following paragraphs see IWES (2010) and RES (2012a). Some of the information included results from an interview conducted in February 2012 with Mr. Huebner from the Austrian Federal Ministry for Transport, Innovation and Technology.

[6] For more details on this and the following paragraphs see IWES (2010) and RES (2012b).

[7] For more details on this and the following paragraphs see IWES (2010) and RES (2012c). Some of the information included results from an interview held in February 2012 with Mr. Hansen from the German *Fachagentur Nachwachsende Rohstoffe e.V.* (Expert Agency on Renewable Basic Materials).

[8] For more details on this and the following paragraphs see RES (2012d). Some of the information included results from an interview conducted in February 2012 with Ms Wasniewska from the Polish Ministry of Economy.

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Chapter 4

Policy recommendations for fostering renewable energy growth

This chapter presents recommendations for enhancing investment policy and streamlining administrative procedures and covers three areas: 1) developing a renewable energy vision and strategy, 2) streamlining permitting procedures and 3) improving the conditions for access to the electricity grid. Most of those recommendations will also benefit growth of other renewable energy sources.

A vision and strategy for producing renewable energy are needed

As illustrated in EU countries, the setting and monitoring of alternative energy objectives has proven to be an effective instrument. Specific nationally adapted targets have been defined. Furthermore, some countries have established specific energy production objectives from specific renewable sources, e.g. biomass (BMWFI, 2010).

Ukraine does not regularly review its renewable energy strategy targets defined in the *Energy Strategy of Ukraine 2030*. However, some efforts are currently being made to revise those targets. The objectives are less ambitious than the EU renewable energy targets. As a consequence, potential investors in renewable energy may question Ukraine's commitment to developing and maintaining alternative energy-friendly investment policies in the long run. Moreover, the feasibility of achieving this objective remains in question given the slow growth pace of renewable energies in Ukraine.[1]

Additionally, no energy production targets by renewable source have been defined for Ukraine beyond the growth prognoses within the scope of the *Energy Strategy of Ukraine 2030*. Again, this stands in contrast to the OECD good practices analysed, where biomass energy production objectives include target rates for specific years and where the progress against objectives is measured and reported (Trypolska, 2012).

Setting challenging renewable energy production objectives, announcing them and tracking the energy production share against the set targets would help Ukraine promote renewable energy production and attract national and international investors into renewable energy production. It is advisable to publish objectives clearly and communicate them directly to the appropriate stakeholders, e.g. potential biomass energy production investors. The setting of renewable energy targets should be done by a single government body.

However, the role of those renewable energy targets is to communicate alternative energy as a national priority. The aim is not to set company-specific targets that would undermine competition in the market and make energy more costly or to subsidise renewable energy with public funds as happened in the Spanish example. Based on the experience in the OECD countries examined, the targets in Ukraine need to take into account the specific country context and detail the instruments to be employed to help reach the objectives.

Ukraine finds itself in a similar geographic context to Poland, which is successfully implementing its renewable energy production action plan that includes clear renewable energy production objectives.2 Ukraine could, therefore, develop its own renewable energy objectives based on the Polish example.

This report recommends promoting renewable energy production objectives. For instance, the Ministries of Economic Development and Trade, of Ecology and Natural Resources, of Energy and Coal Industry and of Agriculture, as well as NERC, the SAEE and the State Forestry Agency should consider communicating the decision on objectives as well as regularly reporting progress towards reaching the defined targets.

Streamlining the administrative procedures would speed up the process for setting up plants that produce renewable energy, increase transparency and reduce costs

In Ukraine, administrative procedures to set up renewable energy production are relatively cumbersome. For energy production plants from biomass, these procedures include the permitting procedures for building plants, access conditions to the national electricity wholesale market and obtaining the green tariff. Those conditions should be improved following the good practice investment policy elements observed in the OECD countries examined.

However, as the country-specific context and the administrative structure need to be taken into account, not all policy elements should be transferred to Ukraine. For instance, it may be advisable to establish three “windows” for investors rather than a single contact point until the administrative structure allows for it. Furthermore, the German example has shown that overly simplifying market access in connection with generous feed-in tariffs may be costly to consumers.

The suggestions for streamlining permitting procedures for energy production from biomass can be transferred to permitting procedures for setting up other alternative energy plants. For instance, creating fewer interfaces for renewable energy producers and eliminating and performing process steps in parallel will make the application process less cumbersome. As a result, investments in the production of alternative energy as a whole will also increase in Ukraine.

Creating fewer interfaces would decrease the time and costs needed for obtaining a permit

In contrast to Germany’s and Austria’s “single window” for biomass plant permitting procedures, Ukraine has six or more interfaces for investors to deal with, each adding complexity, lead time and increasing the risk of corruption. A further

disparity lies in the lengthy procedures in Ukraine for gaining admittance to the energy wholesale market and obtaining the green tariff. These shortcomings should be addressed in order to streamline the administrative procedures for renewable energy producers.

The Ukrainian government should consider establishing fewer interfaces for renewable energy investors to interact with during the entire permitting process including the admittance to the wholesale electricity market and the approval of the green tariff. The decision of which government bodies to put in charge of these activities should be made based on the current responsibilities and the skill set available. The involvement of all additional actors in the permitting procedures should be co-ordinated by the defined "windows".

The interaction process with renewable energy plant investors needs to take into account the administrative structure's constraints. Given these constraints, downsizing to three interfaces may be a more viable option than directly establishing a "single window". However, further reducing the interfaces should remain a long-term objective.

The Oblast Rada (the Regional Council) should remain in charge of land allocation to biomass energy investors. Where necessary, it needs to involve the local authorities, for example to evaluate alternative land allocations.

The Ministry of Regional Policy, Construction and Housing could be responsible for evaluating project feasibility and project proposals and for establishing the technical specifications for the construction of the plant and its connection to the power grid. For the latter, *Oblenergo* and *Ukrenergo* would need to be involved.

NERC could be in charge of granting the physical connection to the electricity grid, providing access to the wholesale market and issuing the license for a green tariff. To do this, NERC would need to interact with *Oblenergo*, *Ukrenergo* and the *Energorynok*.

Eliminating and performing process steps in parallel would make the application process more efficient

To speed up the application process, it is advisable to eliminate process steps. The government should consider revisiting all approval procedures and carefully defining the number of approval steps necessary.

The process steps will not necessarily be the same as in the OECD countries examined. Procedures will depend on the number of interfaces established and the examinations required by law. An optimised process sequence thus needs to be designed following thorough analysis of country-specific requirements.

Criteria for admittance to the wholesale electricity market or for obtaining the green tariff should be made more transparent. For instance, the definition of *vegetable biomass* would need to be sharpened.

The permitting procedures can be streamlined further by performing some assessment tasks in parallel. As described above, the fact that the approval for admittance to the wholesale electricity market and the provision of the green tariff happen after the plant has been built lengthens the lead time and increases business

and corruption risk. Evaluating the approval for both decisions during the general application procedure for the construction permit is recommended.

Improving conditions for access to the wholesale electricity market and granting the green tariff to new plants would enhance the investment attractiveness of renewable energy

The second administrative hurdle that needs to be lowered is the conditions for access to the wholesale electricity market. These conditions are essential for determining the profitability of the energy production project.

Again, the practices examined in the OECD countries may not be fully suitable to the country-context in Ukraine. For instance, decisions need to be taken on the allocation of grid connection costs between the network operator and the producer and on what the green tariff scheme should be. Also general admittance to the wholesale market, the legal right to grid access and the feed-in tariff scheme could be improved.

General access to the electricity market needs to be improved

Ukraine has liberalised the renewable electricity market by allowing any entity with a business license to produce renewable energy and sell it to the market. However, in practice, this rule only applies to renewable electricity producers with a capacity of more than 5 MW (Trypolska, 2012). It seems advisable that general market access for any entity with a business license should also be granted in the future. But additionally, access to the wholesale electricity market should automatically come with the building permit.

Legal right to physical grid access needs to be granted

This report recommends introducing a legal right for renewable electricity producers to obtain preferential network access which could come free of charge for the investor. Therefore, the grid operators would be obliged to grant physical access to any renewable electricity producer with a business license for its desired supply level independent from existing capacity constraints. It would give priority to renewable energy suppliers, including biomass energy producers, over providers of electricity from fossil sources and, thus, systematically increase the share of electricity produced from renewable sources.

In order to facilitate growth of electricity production from alternative sources, enforcing the legal right to a network capacity expansion if demanded by alternative electricity producers is recommended. While such a right should facilitate alternative electricity production growth, its exact conditions need to be pragmatic and should not impose an excessive burden on network operators. While German network operators need to immediately start planning an increase in network capacity (RES, 2012e), Ukrainian network operators have a few months before they have to start planning. The exact timeline should be defined in accordance with country-specific factors.

The feed-in tariff scheme should be improved

While the feed-in-tariff guarantee period is between 10 and 20 years in Austria, Denmark and Germany following the start of operations of an electricity production plant, the feed-in-tariff guarantee for new projects in Ukraine ends in 2030. The tariff scheme for the period following this timeline still needs to be developed. It does not necessarily need to be the same as in OECD countries and should take into account renewable electricity cost structures and those of other energy sources. Given the long-term planning horizons when building renewable electricity production plants, the lack of a feed-in tariff scheme beyond 2030 significantly increases the business risk for planned renewable electricity production plants.

The feed-in tariff for renewable electricity producers in Ukraine will decrease over time.[3] Furthermore, the feed-in tariff is subject to inflation and currency risks.[4] The Ukrainian government should therefore consider a feed-in tariff that compensates for input cost increases rather than automatically decreasing them over time.[5]

Notes

1 The share of renewable energy in total energy consumption is still 2.7% in Ukraine.

2 For instance, Poland doubled the electricity generated from biomass from 2006 to 2008, increasing it to 3 267 GWh.

3 Legislation foresees a decrease in the feed-in tariff by 10% in 2014, by a total of 20% in 2019 and by a total of 30% in 2024, see chapter three.

4 In contrast to solar or wind power energy plants, where initial investments in equipment represent the larger share of costs, the larger share of costs for a biomass plant stems from ongoing operations (*e.g.* labour, transportation), see AEG (2012).

5 For simplicity, the feed-in tariff could be increased by the long-term average of inflation.

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Chapter 5

The way forward

This chapter suggests the steps for implementation grouped into three work streams: setting suitable renewable energy targets broken down by renewable energy source, streamlining permitting procedures and improving access to the power grid.

Suggested steps for implementation: designing a process for improving the administrative conditions for renewable energy producers

- ***Setting suitable renewable energy targets broken down by renewable energy source***

For the establishment and communication of suitable renewable energy targets, appropriate renewable energy targets should be defined in the first work stream. From those, specific objectives for energy production from various renewable sources should be derived. Both sets of objectives should meet the requirements described above and lead to clearly set targets for both renewable energy and energy production from each renewable source.

After the renewable energy targets are defined, they should be clearly communicated. First, the targets should be adopted formally by the government. Second, formal communication should be launched officially. In addition to the standard procedure for communicating government decisions, a press communiqué should be released to make the decision known to all relevant stakeholders.

The share of renewable energy should be measured regularly against the defined targets and the results reported on an ongoing basis.

- ***Streamlining of permitting procedures***

The second work process for streamlining the permitting procedures should seek to optimise the procedural flow of permitting activities. For this purpose, all procedural steps in the permitting process should be analysed to see if they can be eliminated or if they can be taken simultaneously with other activities. Linked to this effort, there is a need to optimise admittance to the energy grid and approval of the green tariff for investors in renewable energy production. Optimising process flows should be the aim. The outcome would be a process plan. The project team can then use this plan to assign the responsibilities of all stakeholders involved in the process.

It is important to clearly convey the new division of responsibilities to the stakeholders involved and make any required modifications based on the feedback received. This process should result in an agreed activity plan stating the responsibilities of all stakeholders. When necessary, further guidelines on how to complete tasks should be provided to the stakeholders by the project team in order to facilitate a smooth transition.

The final steps in streamlining permitting procedures are implementation and official communication. Changes need to be planned and implemented in detail by all stakeholders. Changes should be communicated openly and the government bodies involved should improve the implementation of streamlined processes based on key findings.

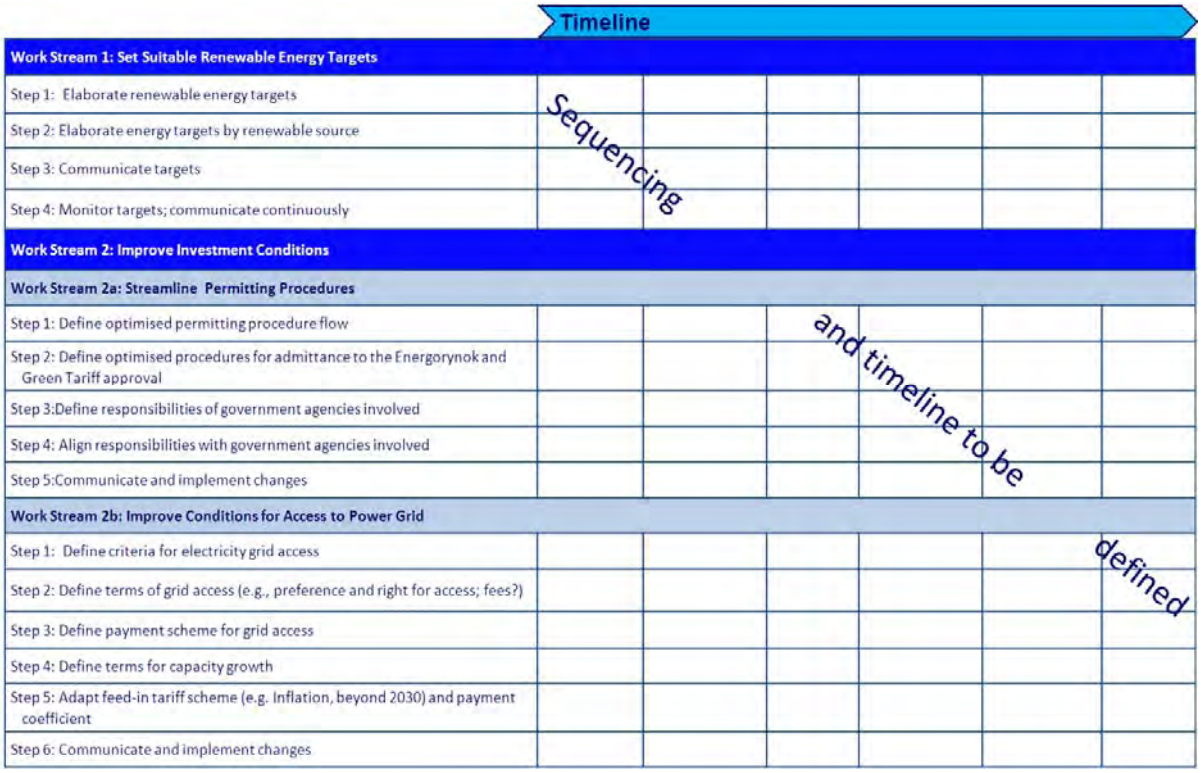
- ***Improving access to the power grid***

Within the work stream of improving the conditions for access to the power grid, the project team should first define the criteria for simplified grid access. In this step, the project team should decide which actors should be able to provide electricity to the power market. For instance, it is advisable to grant market access to bioelectricity producers with a capacity smaller than 5 MW. Defining the exact threshold needs to take into account the physical network-linkage cost in Ukraine.

Simultaneously, the terms for grid access should be clearly defined. As part of this effort, the project team should prepare the criteria determining whether there will be a legal right for access to the power grid; whether preference will be given to electricity generated from renewable sources; and whether fees for the power grid connection should be paid to the network operator. Furthermore, the project team should decide on the terms of capacity growth for electricity producers from renewable sources as well as any associated changes in the feed-in tariff scheme. This scheme should let alternative electricity suppliers cover their costs and allow for a small profit margin. For instance, average costs for producing one KWh of bioelectricity in Ukraine are estimated at EUR 0.057, while the current green tariff for bioelectricity is EUR 0.127 per KWh (Trypolska, 2012). The future feed-in tariff could lie within this range. The final step is officially communicating the changes and the steps for their implementation.

The suggested process for improving the administrative conditions for renewable energy producers, including the work streams and the activities to perform, is summarised in Figure 5.1. This plan needs to be carried out by sequencing the activities, defining their milestones and by assigning responsibilities for the work streams and the action steps.

Figure 5.1 **Suggested steps for implementation**



Source: OECD (2012), "Ukraine Sector Competitiveness Strategy, Energy-Efficiency and Renewables Working Group", internal working document, OECD, Paris.

Moving forward, the OECD will continue working in collaboration with the Government of Ukraine to support actions to improve the administrative conditions for renewable energy producers.