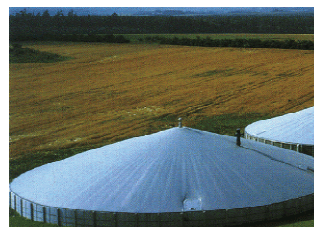


Biomass Action Plan for Ukraine



2009

Contents

INTRODUCTION	4
1. THE PURPOSE OF THE BIOMASS ACTION PLAN	6
2. POTENTIAL CONTRIBUTION OF BIOMASS TO ENERGY PRODUCTION	7
3. PROBLEMS AND ACTIONS	8
3.1. POLITICAL AND LEGISLATIVE ASPECTS	8
3.2. FINANCIAL AND ECONOMIC ASPECTS	13
3.3. TECHNOLOGICAL BARRIERS.....	17
3.4. SUPPLY AND AVAILABILITY OF BIOMASS	18
3.5. INFORMATION AND COMMUNICATION ASPECTS	19
4. IMPLEMENTATION AND MANAGEMENT ACTIONS	20
REFERENCES	21
LIST OF ABBREVIATIONS	22
APPENDIX 1: TIME FRAME FOR ACTIONS	23
APPENDIX 2: TERMS	24
APPENDIX 3: RESOLUTIONS OF THE CABINET OF MINISTERS OF UKRAINE	26

This Biomass Action Plan is drafted within the Dutch-Ukrainian Government to Government Project on Biomass and Biofuels (G2G07UA85) funded by The Agency for International Business and Cooperation (EVD) of the Ministry of Economic Affairs of the Netherlands and is implemented by the Ministry of Agricultural Policy of Ukraine and The SenterNovem Netherlands Agency for Sustainability and Innovation, an Agency of the Ministry of Economic Affairs of the Netherlands. It was assisted by SEC “Biomass” (Kyiv) who drafted the documents.

Introduction

The reduction of natural gas consumption, the development of energy conservation and solving urgent environmental problems are the main challenging problems which Ukraine is facing now. Energy security of the country depends strongly on diversification of the used energy carriers. “Natural gas” problem which arose at the end of 2008 once more demonstrated that it was urgently necessary to introduce the alternative and renewable energy sources and energy saving technologies. Among the national renewable energy sources, biomass can play the leading part in replacement of natural gas and other fossil fuels.

Biomass is a carbon containing organic matters of vegetable or animal origin (wood, straw, vegetable residues of agricultural production, manure, organic part of municipal solid waste and sometimes peat). For energy production, solid biomass is mostly used and liquid and gaseous fuels produced from it – biogas, biodiesel, bioethanol.

Besides solving energy problems, application of biomass and biofuels can contribute to mitigation of urgent environmental issues. First, it concerns the quality of ambient air heavily polluted by exhaust gases and flue gases. Second, it applies to high emission of greenhouse gases into the atmosphere – carbon dioxide, methane and others. Biomass is a renewable environmentally friendly fuel, provided that it is sustainably produced and used. As biomass is a CO₂-neutral fuel, its use with energy purposes does not contribute to the global greenhouse effect. The realization of bioenergy projects within the framework of Kyoto Protocol mechanisms is an effective way to reduce green house gases emission. Taking into account present energy and ecology situation, Ukraine has to start wide introduction of bioenergy technologies and the use of all kinds of biofuels (solid, liquid and gaseous) as soon as possible. It should be done paying serious attention to sustainability and biodiversity issues.

Today biomass fuel occupies the fourth place in the world by the volume of utilization. It gives about 1.5 bill toe of energy per year (in developing countries over 30%, in some cases up to 50-80%). Energy production from the renewable energy sources (RES) including biomass is developing dynamically in most European countries. Presently renewables cover 7% of the total energy consumption in the European Union (EU) including the contribution of biomass 4% that is more than a half of all the RES. In some countries biomass share in the total primary energy consumption significantly exceeds the average European level: Finland - 23% (world leader among the developed countries), Sweden - 19%, Denmark - 12%, Austria - 12%. According to the New EU Energy Plan approved by the European Parliament in 2007 [3], RES will cover 20% of the total energy consumption by 2020. At that contribution of renewables to heat production will rise to 20% (the share of biomass is to be 76% of all the RES), contribution of renewables to power production will rise to 34% (the share of biomass is to be 24% of all the RES). None of the developed countries and countries with emerging markets declared any plans to reduce energy production from biomass. On the contrary, national energy programs of the EU countries, Brazil, China, India, Malaysia, the USA and Canada are planning further significant increase of this energy sector. Of all types of biomass, solid biomass plays the leading part in energy production in the EU. In 2006, 62.4 mtoe was produced from solid biomass (including heat 58.5 mtoe, power 3.9 mtoe) that is 80% of all energy obtained from biomass. However there is now a

clear vision that further expansion of biomass needs to be done in a sustainable way and sustainability criteria need to be followed.

Ukraine has quite a big potential of biomass available for energy production. The economic potential of biomass is estimated at 27 mtce/yr. The main components of the potential are agricultural residues and energy crops. The utilization of the biomass potential for energy purposes can satisfy about 13% of the Ukraine's energy demand. The development of the bioenergy sector should be part of the fuel-energy complex of the country and should be based on a reasonable and consistent approach. That means that all the relevant issues should be taken into account – the feasibility, the impact on the national economy and the environment. That is why there is a need for a Biomass Action Plan; the document defines the general strategy for bioenergy development, identifies the main problems of the sector and suggests ways and approaches for their solution.

1. The purpose of the Biomass Action Plan

The main goal of the Biomass Action Plan (BAP) is to outline a general strategy for bioenergy development in Ukraine, to define existing bottlenecks and suggest ways to solve the problems. BAP also gives time frame for the suggested actions. The policy framework should be designed to give renewable energy sources a basic chance to expand on their own and increasingly become competitive and independent from public support.

The development and implementation of BAPs is quite a common practice in the EU, and Ukraine should also follow this pattern. For example, in 2005 the European Commission issued a Biomass Action Plan which outlines all the important bioenergy issues (potential of biomass, the use of biomass in transport, electricity and heating, relevant legislation, standards etc) and suggests concrete measures to overcome existing barriers. A number of European countries (Austria, Finland, Germany, the Netherlands, Sweden and many others) have their own national BAPs. A suitable example for Ukraine may be the Dutch BAP which presents quite a short informative document with clear definition of problems and suggestion of concrete actions. In its Renewable Energy Directive of June 2009 the European Commission requests from each Member State a Renewable Energy Action Plan [6].

The Biomass Action Plan takes into consideration Dutch experience as the Netherlands are successfully experienced in the energy transition to bioenergy. Draft BAP was discussed by members of the Working Group of the project at a number of meetings which were held at the Ministry of Agricultural Policy of Ukraine. Besides, some comments and remarks were obtained during personal interviews with representatives of Ukraine's Ministries and Agencies. All relevant remarks and suggestions are taken into account for improving draft BAP for Ukraine.

2. Potential contribution of biomass to energy production

Essential prerequisite for the use of biomass and biofuels for energy production is exact assessment of the available biomass potential. The utilization of biomass for energy purposes must be realized only in a sustainable way within really available resources. Otherwise there may be negative effects on the national economy and environment.

Ukraine has quite a big potential of biomass available for energy production. Expert estimation based on 2007 data shows that the theoretical potential of biomass in Ukraine is about 50 mtce, the technical potential comes to 36 mtce and the economic potential amounts to 27 mtce (Table 2.1).

Table 2.1. Potential of biomass and peat in Ukraine (2007)

Types of biomass	Energy potential, mtce		
	Theoretical	Technical	Economic
Straw of grain crops	10.39	5.21	1.34
Straw of rape	1.07	0.75	0.75
Residues of production of corn for grain (stalks, leaves, ears)	5.7	3.99	2.79
Residues of sunflower production (stalks, husks, heads)	4.27	2.86	2.86
Wood	2.13	1.66	1.48
Biodiesel	0.50	0.50	0.25
Bioethanol	2.33	2.33	0.86
Biogas from manure	3.27	2.45	0.76
Landfill gas	0.77	0.46	0.26
Sewage gas	0.21	0.13	0.09
Energy crops			
- poplar, miscanthus, acacia, alder, willow	14.58	12.39	12.39
- rape (straw)	1.65	1.15	1.15
- rape (biodiesel)	0.78	0.78	0.78
- corn (biogas)	1.59	1.11	1.11
Peat	0.77	0.46	0.40
TOTAL	50.01	36.23	27.27

Main components of the potential are agricultural residues and energy crops. Of the agricultural residues, the biggest economic potential falls on residues of sunflower production (stalks, husks, heads), then comes residues of production of corn for grain (stalks, leaves, ears); straw of grain crops and straw of rape occupy third and fourth place correspondingly. The economic potential of energy crops is even higher than that of agricultural residues. It includes not only biomass of the crops but in case of rape and corn is recalculated into biodiesel (plus straw) and biogas.

Coming from the present level of the total primary energy consumption (TPEC) in Ukraine (210.7 mtce in 2007 [1]), the economic potential of biomass can satisfy about 13% of Ukraine's energy demand.

3. Problems and actions

Bioenergy development in Ukraine is confronted with different bottlenecks which need to be solved. The bottlenecks identified for bioenergy development have been clustered into five problem areas: political and legislative aspects, financial and economic problems, technological barriers, biomass supply and availability issues and information and communication problems. Appropriate actions have been set out for each problem area. Appendix 1 contains a recommended time frame for them.

3.1. Political and legislative aspects

The bottlenecks connected with political and legislative aspects seem to be the most critical for Ukraine. The identified here problems are:

- for a long time clear state policy and political will were absent in Ukraine
- absence of clear and justified target on the share of biomass in the total primary energy consumption
- absence of working (not declarative) state program with the status of law
- gaps in the existing legislation regarding bioenergy

▪ **Absence of long-term State policy and political will**

For a long time clear state policy and political will regarding the bioenergy sector in fact were absent in Ukraine. Only after arising a “gas” problem and hard negotiations with Russia at the beginning of 2009, clear state will and policy came into existence. The positive signs of it are regular sittings of the Cabinet of Ministries of Ukraine on energy matters. By now there are a number of documents as results of these sittings:

- Resolution of the Cabinet of Ministries of Ukraine from 4.02.09 N 102-p “Measures concerning the use of the alternative energy sources”.
- Resolution of the Cabinet of Ministries of Ukraine from 11.02.09 N 159-p “Some issues of the state policy implementation in the field of efficient use of fuel-and-energy sources”.
- Resolution of the Cabinet of Ministries of Ukraine from 12.02.09 N 217-p «The issue of organization of production and the use of biogas”.
- Resolution of the Cabinet of Ministries of Ukraine from 12.02.09 N 276-p «On approval of conception of the state target scientific and technical program “Development of production and utilization of biological fuels”.
- Resolution of the Cabinet of Ministries of Ukraine from 19.02.09 N 126 «Special features regarding connection of the units producing power from the alternative energy sources to power grids”.
- Resolution of the Cabinet of Ministries of Ukraine from 19.02.09 N 256-p «First priority measures to reduce natural gas consumption during the period till 2010”.

At present the state policy and political will of Ukrainian Government regarding the bioenergy sector development is expressed in the two new laws which were passed recently:

- regarding the “green” tariff, the Law of Ukraine “On amendments to the Law of Ukraine “On Energy Industry” as for stimulation of the use of the alternative energy sources” (N 1220-VI from 01.04.2009);
 - regarding the biofuels and biomass, the Law of Ukraine “On amendments to some Laws of Ukraine as for support for production and the use of biofuels (N 1391-VI from 21.05.2009).
- **Absence of clear and justified target on the share of biomass in the total primary energy consumption**

Presently, the main regulatory document on Ukraine’s energy policy is the Energy Strategy of Ukraine till 2030 [2] (thereafter Energy Strategy or Strategy). Strong side of the Strategy is the fact that its objective is to reduce Ukraine’s dependence on natural gas and increase energy conservation. Weak point of the Strategy is that it lays special stress on the development of nuclear energy and increase of coal consumption on power plants. Regarding bioenergy, the Strategy envisages quite dynamic rise in biomass energy use – 9.2 mtce by 2030 (50% of all RES) that is about 9 times more than present volume of utilization. However, taking into account the expected contribution of biomass to TPEC of Ukraine (3% in 2030), the share of bioenergy already achieved in some European countries (Finland 23%, Sweden 19%, Austria 12%, Denmark 12%) and obligatory targets set in the Renewable Energy Road Map (2007) [3] (20% of RES by 2020), the targets on bioenergy fixed in the official Energy Strategy of Ukraine seem to be rather low. And with such low official targets, some responsible Ministries do not consider bioenergy to be priority for renewables, and a fortiori, energy sector development. Targets for bioenergy must be defined according to SMART method; hence they must be specific, measurable, realistic and linked to a certain timeframe.

Another weak point of the Strategy is its rather low official status. Energy Strategy of Ukraine till 2030 was approved by the Cabinet of Ministers of Ukraine (Directive N 145-2006-p from 15 March 2006) but it was not adopted by the Verkhovna Rada (the Ukrainian Parliament). That means that the Strategy is not a law which must be observed. Therefore, it is not clear whether the targets on bioenergy set in Energy Strategy will be reached.

Moreover, in Ukraine, there is rather strong confrontation between the major political parties. For any document to be adopted by the Ukrainian Parliament, concord and consensus of the political parties is needed. It applies to all bioenergy documents which will be submitted to the Verkhovna Rada for adoption. The right way is that the Government prepares a certain document, the Verkhovna Rada adopts it and President signs it. That is why, clear state policy and political will is very important for further bioenergy development.

- **Absence of the working (not declarative) state program**

During last decade, a number of programs and strategies regarding RES and certain types of biofuels in Ukraine were developed and adopted. For example, “Program for state support for non-traditional and renewable energy sources, and small hydro and thermal energy sector” (1997), Program “Ethanol” (2000), “Program for the development of biodiesel production” (2006), Energy Strategy of Ukraine for the period till 2030 which includes a chapter on non-traditional and RES (2006).

The first stage of “Program for the development of biodiesel production” (2007-2008) was successfully completed, and the second stage (2008-2010) is now under implementation. Unfortunately most other programs were not fully realized because of unclear sources of financing and gaps in the legislation.

- **Gaps in the existing legislation regarding bioenergy**

At present there are some gaps in Ukraine’s legislation regarding biomass and biofuels, and it slows down further development of this sector. Among the existing relevant laws, the following are important:

- The Law of Ukraine «On alternative types of liquid and gas fuel” (№ 1391-XIV from 14.01.2000);
- The Law of Ukraine “On the alternative energy sources” (№ 555-IV from 20.02.2003);
- The Law of Ukraine “On amendments to some Laws of Ukraine as for introduction of the “green” tariff” (№ 601-VI from 25.09.2008);
- corrections regarding the “green” tariff, the Law of Ukraine “On amendments to the Law of Ukraine “On Energy Industry” as for stimulation of the use of the alternative energy sources” (№ 1220-VI from 01.04.2009);
- regarding the biofuels and biomass, the Law of Ukraine “On amendments to some Laws of Ukraine as for support for the production and the use of biofuels (N 1391-VI from 21.05.2009).

The first two laws are of declarative nature and do not give any financial support to RES development. The law on the “green” tariff provides real support for power production from RES. But still there remain a lot of uncertainties as to the procedure for application of the “green” tariff to concrete renewable energy power plants. The law on biofuels adopted on 25.05.2009 gives a number of preferences to the producers and consumers of biofuels, but it does not cover all the relevant issues in the bioenergy sector.

➤ **Actions:**

- **Adoption of a political declaration**

The Government should adopt a political Declaration which sets clear target for energy production from biomass (approval by the Verkhovna Rada is strongly desirable). The following contribution of biomass to the total primary energy consumption till 2030 seems to be realistic:

2008	2010	2015	2020	2025	2030
1 mill tce (0.5%*)	2 mill tce (1%)	5 mill tce (2.5%)	10 mill tce (5%)	15 mill tce (7.5%)	20 mill tce (10%)

* % of the total primary energy consumption

including 10% target for the share of biofuels in transport by 2020. The latter is in line with the recent Renewable Energy Directive of the European Commission (2009/28/EC, June 2009).

The major political parties of Ukraine should join the Declaration so that to express their consensus regarding the targets for bioenergy development. That will be the basis for their

support of the relevant documents in the Verkhovna Rada. This would ensure continuing support for bioenergy development in Ukraine.

- **Assignment of a state agency responsible for all the aspects of bioenergy development**

The Government should appoint a single new or existing state body fully responsible for bioenergy issues in Ukraine. Theoretically this duty can be performed by one of the existing state institutions:

- Ministry of Agricultural Policy of Ukraine

- Ministry of Fuel and Energy of Ukraine

- National Agency of Ukraine for Effective Energy Use (NAER)

However, it may be also recommended to set up a new state agency attached to the Cabinet of Ministries of Ukraine for coordination of all the activity in the bioenergy sector. And this agency may be even more effective than the Ministry which has a lot of other responsibilities besides the bioenergy issues.

According to Resolution of the Cabinet of Ministries of Ukraine from 11.02.09 N 159-p “Some issues of state policy implementation in the field of efficient use of fuel-and-energy sources”, NAER obtained a number of important tasks and powers in the field of renewable energy including bioenergy. In particular, NAER together with other interested central bodies of executive power must consider an issue concerning the reasonability of creation of the state concern “Renewable energy of Ukraine” with further transfer, in the established order, of the budget assignments for financing of state programs in the field of renewable energy from the Ministry of Fuel and Energy, the Ministry of Coal Industry, the Ministry of Agricultural Policy, the National Space Agency of Ukraine to NAER.

In fact that means that by this Resolution the Government appointed NAER the coordinating agency for all the issues in the sector of renewable energy including bioenergy.

- **Development of a realistic state program with secures financing and outcomes**

It is necessary to develop a realistic state program which takes into account the targets defined in the above political declaration. The program must also define actions to achieve the set targets and financial sources to implement the actions. The responsible state agency should take care of the development and adoption of the program and then control and coordinate its realization.

The state program should have sufficiently high status because we count upon financial support from the state budget for bioenergy issues. Ukraine’s budget code has such rules that until the program is not approved by the Ukrainian Parliament, any financial incentives included in the program cannot be supported from the state budget.

State program for bioenergy development and Biomass Action Plan are the two different documents. Whereas, a BAP defines just general strategy for biomass/biofuels sector and outlines ways to achieve the set targets, State program is a more concrete document with detailed

elaboration. The program should include the list of concrete bioenergy projects with all required information: type of equipment, capacity of equipment, address of the implementation site.

The process of development of the state program will be very useful on its own account. Search of concrete bioenergy projects envisages close contacts with local authorities. That will lead to raising their awareness of bioenergy issues and may result in finding local support for bioenergy projects (local budgets or local interested investors).

First step for the elaboration of the state program is the development and adoption of its conception. NAER developed the Conception of the State Program for production and consumption of biofuels. The Conception was approved by the Cabinet of Ministers of Ukraine on 12.02.09 (Resolution N 276-p). According to this Resolution, NAER together with interested central bodies of executive power and the National Academy of Sciences of Ukraine should develop the corresponding State Program within 2 months and submit it to the Cabinet of Ministers of Ukraine for consideration. In due time the draft Program was developed and submitted to Ukraine's Ministries for the consideration. Results of the consideration are expected by the end of 2009.

- **Identifying required new legislations**

As Ukraine has serious intention to integrate into Europe, it should harmonize its legislation in accordance with European one. It applies also to legislation in the bioenergy sector. All responsible Ministries should be involved in the harmonization process.

Practically all the EU countries have legislative support for energy production from biomass. Thus, Ukraine should also create the legal basis for the use of all types of biofuels (solid, liquid and gaseous). It can be done in two ways:

- (1) to develop new laws or amend the existing ones;
- (2) to improve existing draft laws in the bioenergy sector according to the European legislation and adopt them.

- **Drawing up suggestions for new policies and regulations in the following areas:**

- a) Heat from biomass
- b) Power from biomass
- c) Liquid biofuels (biodiesel and bioethanol)

For heat production sector it is suggested to stimulate the use of biomass for district heating. For power sector it is recommended to encourage co-combustion of biomass with coal on power plants. This option may be very attractive taking into account the law on "green" tariff adopted in 2008 with amendments of 2009. Regarding liquid biofuels, the policy may lie in supporting biodiesel production for tractors and other agricultural machinery in rural areas and supporting bioethanol production for switching over buses and other vehicles in big cities from petrol to bioethanol.

3.2. Financial and economic aspects

The bioenergy sector requires a state support, including the financial incentives, especially during the period of its establishment. In Ukraine's conditions this period may last 5-10 years. It is supposed that during the supporting period the bioenergy sector will reach commercial level and will be able to develop further on a sustainable basis.

The bottlenecks connected with financial and economic aspects can be listed as:

- no financial stimuli for implementation of bioenergy projects
 - low financial capability of Ukrainian companies plus high interest rate for bank credits
 - no financial stimuli for the companies operating communal and state boiler installations to reduce the consumption of natural gas and switch over to biomass.
 - low financing of R&D
- **No financial stimuli for the implementation of bioenergy projects**

Due to the lack of national financial resources, most pilot and demonstration projects in Ukraine are implemented at the expense of foreign foundations and programs. Successful project should be replicated so that to demonstrate "learning effect" and expand the utilization of biomass and biofuels. At present, in Ukraine there is no support instrument for the implementation of new bioenergy projects or replication of successfully realized projects.

- **Low financial capability of Ukrainian companies plus high interest rate for bank credits**

Presently bioenergy equipment including the one of domestic manufacture is quite expensive for Ukrainian enterprises and companies. Bank conditions for a credit are rather strict especially in the period of financial crisis. So, many enterprises just are not able to buy modern bioenergy equipment. In some cases, they have to convert existing old boilers operating on coal or fuel oil into biomass boilers because they cannot purchase modern biomass boilers. Very often the enterprises perform the conversion by themselves, and as a result the boilers have low efficiency and high emission. For instance, such a situation is in Ukraine's forestry where more than 1000 converted wood fired boilers are in operation now.

- **No financial stimuli for the companies operating communal and state boiler installations to reduce the consumption of natural gas and switch over to biomass**

The companies operating communal and state boiler installations have annual budget for purchasing natural gas. Natural gas is quite expensive but easy to use fuel – it is enough just "to open a tap" on the pipeline. Biomass as a fuel is more complex – it is necessary to ensure reliable supply of biomass to the boiler, take care of its storage and pretreatment and so on. If a company replaces the boiler on fossil fuel by a biomass one, it will not be able to save money at the expense of passing on to less expensive fuel. According to the existing financing system, for next year the company just will get a reduced budget for purchasing fuel. So, it is not profitable for the company to switch over to a more complex fuel (biomass) and have no benefit from that.

- **Low financing of R&D**

Present amount of financing of R&D allows only investigating some particular questions. It is not enough to carry out large-scale thorough research leading to the development of new bioenergy technologies or new equipment.

- **Actions:**

- **To provide efficient support for the consumers of bioenergy equipment**

The support must be introduced at the stage of the formation of the bioenergy sector (5-10 years). It should include:

- 1. 20 % subsidy for the consumers of bioenergy equipment**

The implementation of the state subsidy is supposed to be an effective instrument to enlarge introduction of biomass boilers, biogas plants and other kinds of bioenergy equipment in Ukraine. The subsidy should be paid from the State energy conservation fund under control of NAER or other responsible state agency appointed by the Government. The subsidy should be given only in case if certain item of equipment meets fixed norms on efficiency and emission level. To check this, an authorized certification center must be established or appointed by the responsible state agency. In other words the subsidy is aimed to support only good quality equipment. Important note is that the subsidy does not apply to the equipment for power production from biomass because this sector is already supported by the new law on “green” tariffs passed on 01.04.2009 (N 1220-VI).

Suggested size of the state subsidy (20%) has been chosen by several reasons. First, it is common European practice. For example, in Denmark, the subsidy for purchasing biomass boilers below 200 kW is 10-30% of the cost; in Austria, the subsidy for purchasing/replacing biomass boilers is about 30% of the cost; in Germany, the subsidy for introduction of mini-CHP plants on biomass is 15-35% of the cost. Second, under present conditions payback period of biomass boilers is 2-4 years (or 3 years on average). Although this period is not long, yet it is not short enough to interest a really big number of potential consumers and investors and achieve marked expansion of biomass boilers in Ukraine. The subsidy less than 20% of the cost will not have noticeable effect upon economic indexes of bioenergy equipment. The 20% subsidy will make the introduction and use of biomass boilers really attractive for potential customers. The subsidy over 20% of the equipment cost seems to be too high taking into account present economic conditions in Ukraine and the fact that the subsidy is supposed to be paid from the state budget.

Regarding other types of bioenergy equipment, for instance, biogas plants, their payback period was up to 8 years before introduction of the “green” tariff (without taking into account the sale of digested manure as a fertilizer). With the “green” tariff, the payback period may be cut to 3-4 years. But the equipment for biogas production is very expensive, and realization of such a project requires high initial investments. So, for such kind of equipment, 20% state subsidy may be the crucial factor for implementation.

2. Biomass which is sold and used as a fuel or feedstock for biofuels production should be VAT-free

Biomass as a fuel is much more difficult in use than traditional fossil fuels. There may be need in new or additional equipment and facility for its collection, pre-treatment and storage. Besides, a new infrastructure is required. In the whole, market of biomass as a fuel in Ukraine is underdeveloped, in most cases enterprises use their own biomass residues and wastes for energy production. Development of the market is taking place but very slow.

A real incentive is required to push biomass into the fuel-energy complex of Ukraine. Value added tax exemption will reduce the cost of biomass by 20% and improve its competitiveness with fossil fuels. Introduction of the exemption for 5-10 years is an effective incentive to push biomass into the market of fuels and widely involve it in energy production.

3. Import of bioenergy equipment to Ukraine should be free of tax and custom duty

This measure is to be applied for 5-10 years for the equipment which is not produced in Ukraine and is imported from abroad. It may be an effective incentive for wide expansion of modern bioenergy installations in the country.

4. The state should facilitate the realization of bioenergy projects via JI mechanism of the Kyoto protocol

According to the rating carried out by company Point Carbon [4], Ukraine occupies the first place among JI host countries indicated in Annex B of the Kyoto Protocol. Ukraine is now in the process of transition from Track 2 to Track 1 regarding JI projects. Track 1 means that the country can perform determination and verification of the projects in accordance with its national procedure. The procedure includes also rules for bundling projects and for national registration. Bundling is making up a single portfolio of a number of small projects. It directly applies to biomass projects because very often they are rather small in terms of the volume of GHG emission reduction and need bundling.

National Environmental Investment Agency of Ukraine is responsible for the elaboration of national procedures for JI projects. The recommendation is that procedures should be favorable for RES projects and rules for bundling and registration of biomass projects should be reasonably easy. The implementation of bioenergy projects as JI projects is an effective way to obtain additional financing for the projects, to raise local capacities and increase modern technologies transfer to Ukraine.

- **Identifying the funding and financial resources required for developing national capacities for biomass production**

This activity must be performed by all below mentioned relevant stakeholders and coordinated by the responsible state agency or the Ministry of Agricultural Policy of Ukraine (if the agency is not assigned by the Government yet).

The following stakeholders should be responsible for identifying the funding and financial resources required for developing national capacities for biomass production in their sectors:

Ministry of Agricultural Policy of Ukraine	residues of agricultural production and animal husbandry; biogas; energy crops; biodiesel; bioethanol
State Forestry Committee of Ukraine	wood residues
Ministry of Housing and Communal Services of Ukraine	landfill gas, sewage gas

- **To give target support to R&D activity in the bioenergy sector**

Support to R&D activity in the bioenergy sector can include the following actions. First, it is necessary to identify a strategy to interlink Ukrainian universities with European universities and with European bioenergy networks. Then it is also crucial to create a national network on biomass and biofuels. The national network will contribute to information exchange on carried out, current and planned R&D work in the relevant fields. Besides, target financing should be provided for R&D projects aimed at the development of new technologies or considerable improvement of existing technologies for biomass/biofuels production and energy production from biomass. These dedicated projects should be selected and financed by:

- National Academy of Sciences of Ukraine
- Ministry of Education and Science of Ukraine
- Ministry of Agricultural Policy of Ukraine
- Ministry of Fuel and Energy of Ukraine
- National Agency of Ukraine for Effective Energy Use
- Ministry of Environmental Protection of Ukraine
- Ukrainian Academy of Agricultural Sciences

3.3. Technological barriers

The main technological problem is undeveloped market of domestic bioenergy equipment, namely:

- a) no domestic manufacture of biomass boilers $>1 \text{ MW}_{\text{th}}$ and steam boilers
- b) no domestic technology for biogas production from manure which is commercially proven.
- c) technological problems in the sector of liquid biofuels.

- **No domestic manufacture of biomass boilers $>1 \text{ MW}_{\text{th}}$ and steam boilers**

Presently there are up to 20 domestic manufacturers of wood fired boilers and one manufacture of straw fired boilers in Ukraine. They all produce hot water boilers below 1 MW and do not produce steam boilers at all.

The steam boilers are required for biomass power and CHP plants and also are necessary for industrial enterprises for process steam production. Biomass boilers over 1 MW suit for industrial boiler installations and district heating. Absence of biomass steam boilers and boilers over 1 MW of domestic production hampers the use of biomass in the mentioned sectors.

At present public corporation UTEM is the only manufacturer of straw fired boilers in Ukraine. In the future the number of manufacturers should increase so that a customer would have a sufficiently wide choice of the modern boilers by their design and price.

- **No domestic technology for biogas production from manure which is commercially proved**

The equipment for biogas plants of foreign manufacture is very expensive, and most Ukrainian agricultural enterprises and companies cannot afford its introduction. And no Ukrainian company offers turnkey biogas plant of domestic design. Despite the fact that there are some positive results, domestic technologies for biogas production from manure are just on research stage and none of the developed technologies was commercially proved or at least realized as a demonstration project. Such a situation hampers the development of biogas sector in the country.

- **Technological problems in the sector of liquid biofuels**

With regard to biodiesel and bioethanol, still some problems remain which relate to the quality and efficiency of production of these biofuels.

➤ **Actions:**

- **To give target support for R&D projects and demonstration projects directed at the creation and full-scale test of bioenergy equipment for further series manufacture in Ukraine**

This action is closely connected with “Target support to R&D activity in the bioenergy sector” described earlier. But here special attention must be paid that target financing should be granted to the projects which result in the creation of bioenergy equipment for further series manufacture in Ukraine. That applies to the equipment for all types of biofuels – solid, liquid and gaseous.

Important point is also financial support for demonstration projects which can show practical use and advantages of the developed technologies and equipment.

- **To carry out further R&D in the sector of liquid biofuels**

Further R&D should be aimed to improve the quality of biodiesel and bioethanol and to raise the efficiency of production of these biofuels. Another important area of R&D should be the production of biofuels of the second generation.

3.4. Supply and availability of biomass

The main problem connected with supply and availability of biomass is **undeveloped market of biomass as fuel**.

At the present time, most enterprises and companies which operate bioenergy installations (mostly biomass boilers) utilize their own biomass residues and wastes (for example, forestry and woodworking enterprises use their own wood residues in boilers for heat production). There are some cases (examples) of biomass trade but they do not have permanent ground, and there is no practice or experience in long-term biomass supply contracts. So, prices for straw, wood residues and other kinds of biomass are not clearly formed and may vary a lot at different sites and periods of time.

➤ **Actions:**

- Developing a clear and realistic scenario of land use for biomass production and setting targets for biomass use
- Identifying the amount of biomass needed for national use and export on the basis of balanced approach
- Consultations with agricultural and forestry sectors. Setting a realistic clear target and scenario for biomass production in Ukraine

These actions are closely connected with the action “Identifying the funding and financial resources required for developing national capacities for biomass production” described above. Ministry responsible for bioenergy development should develop a clear and realistic scenario of existing biomass potential, identify the amount of biomass needed for national use and export and develop a realistic and clear target and scenario for biomass production in Ukraine. This work must involve all the relevant stakeholders: Ministry of Fuel and Energy of Ukraine, Ministry of Agricultural Policy of Ukraine, State Forestry Committee of Ukraine, Ministry of Housing and Communal Services of Ukraine and others. Resulting document should also include some recommendations regarding the ways and logistic for biomass trade and supply for energy purposes. The mentioned issues are already partly addressed in the draft State Program for the production and consumption of biomass and biofuels elaborated by NAER.

3.5. Information and communication aspects

The problems arising from the information and communication aspects are:

- poor communication and information exchange between the Ministries, agencies, other institutions and companies involved in bioenergy field;
- poor awareness of potential consumers of biomass as fuel and bioenergy technologies;
- poor understanding of sustainability issues surrounding the production and use of biomass including biofuels.

➤ **Actions:**

- **Identifying new methods of communication**

The responsible Ministry should play the part of information and communication centre for the Ministries, agencies, other institutions and companies involved in bioenergy field. It must ensure effective communication and collaboration of all the involved experts because it is the basis for success of their mutual work. As the coordinator of all activity in biomass/biofuels sector, the ministry/agency should put obtained information and news on its website so that all the stakeholders can use it. Besides maintaining and updating the website, the responsible Ministry should also hold regular workshops, send out newsletters and organize visits of target groups to biomass demonstration plants.

There is an obvious need in Ukraine for creating information center and establishing bioenergy association. It is very important to involve actively different stakeholders in the process of the bioenergy sector development. Their participation is crucial for the implementation of BAP for Ukraine.

- **Identifying new methods for the dissemination of information and knowledge in the bioenergy field**

For raising awareness and level of knowledge regarding bioenergy issues, it may be recommended to conduct training courses for different groups of stakeholders. The courses may be attached to actually operating bioenergy installations and should be conducted by high qualified Ukrainian specialists in cooperation with international partners.

4. Implementation and management actions

The Working Group of experts (WG) under the Cabinet of Ministries of Ukraine is to be set up for implementing this Action Plan. The main goal of this Working Group is to monitor coherence between various actions, since many parties are involved and many economic, social, technical and administrative factors affect the success of this Action Plan.

All the relevant parties who support the Action Plan should be represented in the WG at a decision making level. The tasks of the WG include:

- To monitor the progress of implementation of the Action Plan
- To coordinate activities arising from the Action Plan
- To establish and evaluate if necessary the (interim) results achieved
- To monitor the progress of bio-energy realization, modifying and/or updating the Action Plan if necessary
- To monitor compliance of the agreements in the Action Plan
- To concretize, implement and monitor actions

The Time Frame in Appendix 1 shows when certain planned actions are to be started and when the action must be completed.

References

1. Statistic yearbook of Ukraine for 2007. State Statistics Committee of Ukraine, 2008, 571 p.
2. Energy Strategy of Ukraine till 2030. Website of the Ministry of Fuel and Energy of Ukraine <http://mpe.kmu.gov.ua/fuel/control/uk/doccatalog/list?currDir=50358>
3. Renewable Energy Road Map. COM (2006) 848 final, 10.01.2007.
4. Website of company Point Carbon <http://int.pointcarbon.com/category.php?categoryID=160>
5. The BAP Driver project <http://www.bapdriver.org/doku.php>
6. Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC.

List of abbreviations

BAP – Biomass Action Plan

CHP – combined heat and power

CMU – the Cabinet of Ministers of Ukraine

GHG – green house gas

JI – Joint Implementation

RES – renewable energy sources

TPEC – total primary energy consumption

Appendix 1: Time frame for actions

Actions	Start of Action	End of Action
To set up responsible bioenergy sub-group within the Working Group created under the Ministry of Fuel and Energy of Ukraine	2009	2009
Policy and legislation		
Adoption of a political declaration	2009	2009
Assignment of a Ministry responsible for all the aspects of bioenergy development	2009	2009
Development of a realistic state program with status of law	2009	2010
Identifying required new legislations	2009	2010
Drawing up suggestions for new policies and regulations in the sector of bio-heat, bio-power and liquid biofuels	2009	2010
Financing		
To provide efficient support for the consumers of bioenergy equipment	2009	2019
Identifying the funding and financial resources required for developing national capacities for biomass production	2009	2010
To give target support to R&D activity in the bioenergy sector	2009	2015
Technology		
To give target support for R&D projects and demonstration projects directed at the creation and full-scale test of bioenergy equipment for further series manufacture in Ukraine	2009	2015
Supply of biomass		
Developing a clear and realistic scenario of existing biomass potential and setting targets	2009	2010
Identifying the amount of biomass needed for national use and export	2009	2010
Consultations with agricultural and forestry sectors. Setting a realistic clear target and scenario for biomass production in Ukraine	2009	2010
Communication		
Identifying new methods of communication	2009	2010
Identifying new methods for dissemination of information and knowledge in bioenergy field	2009	2010

Appendix 2: Terms

All the terms are presented according to the Law of Ukraine “About Alteration to some Legislative Acts of Ukraine Concerning the Procurement of Biofuel Utilization and Production” (№ 1391-VI from 21.05.2009).

Alternative fuel types – solid, liquid or gaseous fuel, which is an alternative (substitution) to the appropriate traditional fuel types and which is produced (extracted) from the non-traditional sources and types of energy primary resources;

Biological fuel types (biofuel) – solid, liquid or gaseous fuel, which is produced from biologically renewable resources (biomass) and could be used as a fuel or as a component to another fuel types;

Biological component – biofuel, which is utilized as a component to another fuel types.

Biomass – biologically renewable organic origin resource, which undergo the biological decomposition (waste residues from agricultural sector (essentially from crop production and livestock farming), forestry and relevant industrial fields) as well as the organic share of industrial and domestic waste;

Bioethanol – dry ethyl alcohol, produced from biomass or primary ethyl alcohol, which will be used as a biofuel;

Biobutanol – butyl alcohol, produced from biomass, which is used as a biofuel or as biological component to another fuel types;

Diesel biofuel (biodiesel) – methyl ethers and/or ethyl ethers of highest organic acids, obtained from vegetable oil or animal fat, which are used as a biofuel;

Biogas – gas, obtained from biomass, which is used as a fuel;

Biohydrogen – hydrogen, obtained from biomass and is one of biogas types;

Biofuel manufacturer – subject of economical activity, which directly produces biofuels from biomass;

Admixtures on bioethanol basis – biological components of engine fuel, obtained by the synthesis using bioethanol or by mixture of bioethanol with the organic compounds and fuel, obtained from oil, with the share of bioethanol in those components more than 30 %-mass and which are relevant to biofuels;

Liquid biomass fuel – diesel, bioethanol, biobutanol biofuel, pure oil and other synthetic fuel, obtained from biomass;

Synthetic biofuel – synthetic hydrocarbons and mixtures of synthetic hydrocarbons, obtained from biomass;

Engine mixture fuel – fuel types, obtained by mixture of fuel from crude oil with bioethanol and admixtures on the basis of bioethanol, biodiesel or other biological components with the share less than 30 %-mass;

Solid biofuel – solid biomass, which is utilized as a boiler-furnace fuel, including wood chips, sawdust, straw and other agricultural residues, pellets and briquettes, produced from biomass, charcoal and carbonaceous substance;

Alternative liquid fuel types – alcohols (bioethanol, biobutanol) and their synthetic mixtures (admixtures on the basis of bioethanol and biobutanol), oils and other liquid fuel types from biomass (including biodiesel);

Alternative gaseous fuel types – biogas, landfill gas, producer gas, biohydrogen and other gaseous fuel, obtained from biomass;

Alternative solid fuel types:

Products and residues of agriculture (essentially from crop production and livestock farming), forestry and relevant industrial fields, as well as pellets and briquettes, charcoal and carbonaceous substance, obtained from these products and residues, which are used as a fuel;

The organic share of industrial and domestic waste as well as pellets and briquettes, obtained from this organic share;

Peat as well as pellets and briquettes, obtained from it.

Producers of alternative fuels – subjects of economical activity of any patterns of ownership, which produce solid, liquid and gaseous fuel from non-traditional sources and types of energy primary resources.

Appendix 3: Resolutions of the Cabinet of Ministers of Ukraine

THE CABINET OF MINISTERS OF UKRAINE**RESOLUTION**

from 4th of February 2009 № 102-p

Kyiv

Measures concerning the use of the alternative energy sources

With purpose of reduction of the natural gas consumption by means of substitution of the traditional energy resources by the alternative energy sources and on the basis of project aimed on utilization and production of the local renewable fuel types in Sumy oblast:

1. NERC, the Ministry of Housing and Communal Services, the Ministry of Fuel and Energy, the Ministry of Economy, the Ministry of Finance, Sumy State Regional Administration shall define an order of usage and amount of costs, which will be directed to the physical persons and legal entities as compensation for re-equipment (purchasing) of the solid renewable fuel boilers in houses, as well as directed to the reduction in price of a long-term credits, which will be attracted to purchase the equipment for fuel production from the agricultural residues (essentially wood and straw) by the costs, stipulated in paragraphs 1 and 4 of Article 76 of the Law of Ukraine "About the State Budget of Ukraine in 2009".
2. The Ministry of Industrial Policy, the Ministry of Economy shall consider in 1 (one) month an issue regarding the manufacturing at the state enterprises the equipment for collection, processing and briquetting of the crops and wood as well as appropriate energy equipment for heat generating companies for common and individual use and to prepare the recommendations to the local executive bodies regarding the involvement of the production capabilities for realization of the investment projects with utilization of the alternative fuel types.
3. NAER, the Ministry of Housing and Communal Services, the Ministry of Fuel and Energy, the Ministry of Industrial Policy, the Ministry of Agricultural Policy, the Ministry of Economy shall prepare the recommendations for the local executive bodies concerning the utilization of the alternative energy sources, such as wood, straw and other local renewable fuel types, as well as application of boilers for combustion of this fuel types with the maximum possible efficiency.
4. The Ministry of Economy, the Ministry of Environmental Protection, the National Environmental Investment Agency shall develop an issue concerning the possibility of the alternative energy sources projects financing in the frames of Kyoto Protocol mechanisms realization and by the credit lines of EC and EBRD.
5. To the Ministry of Regional Development and Construction, the Ministry of Housing and Communal Services, the Ministry of Emergency Situations, the Ministry of Health, the State Committee of Ukraine for Regulatory Policy and Entrepreneurship, Sumy State Regional Administration together with the Council of Entrepreneurs by the Cabinet of Ministers of Ukraine to develop in 1 (one) week an issue concerning the implementation of simplified order of the permission procedures performance, associated with the realization of the alternative energy sources utilization projects and to submit in established order the appropriate draft decisions.
6. To the Ministry of Economy, the Ministry of Industrial Policy together with NAER to make a careful study of world experience concerning the application of modern technologies for the utilization of energy raw materials, such as straw, timber and other local renewable fuel types as

well as manufacturing of the appropriate energy equipment and to study an issue regarding creation of the Joint Ventures.

7. To the Ministry of Finance to prepare the draft application for the Cabinet of Ministers of Ukraine to the National Bank of Ukraine concerning the reduction of the reserve norms under the credits, which would be provided by banks to the enterprises, involved in the utilization of the alternative energy sources.

8. To the Ministry of Industrial Policy to make a careful study of an issue concerning purchasing of the licenses for utilization of the alternative energy sources application technologies and for boiler houses re-equipment.

9. The Ministry of Economy together with the State Committee of Ukraine for Regulatory Policy and Entrepreneurship shall make a careful study concerning the postponement of the taxation payments, which are charged according to the Law of Ukraine "About the Value-Added Tax" if the equipment for the alternative energy sources production is imported, by means of provision of a bill to the custom supervision body with a time to run of 180 calendar days from the date of provision, and submit to the Cabinet of Ministers the appropriate proposals.

10. The Ministry of Fuel and Energy, the Ministry of Economy, the Ministry of Finance, the Ministry of Housing and Communal Services, the Ministry of Regional Development and Construction, NAER together with the Institute of Engineering Thermophysics of the National Academy of Science of Ukraine shall prepare and approve for 5 years term the methodology of the regional programs development for the traditional energy resources consumption reduction by means of enhancing of utilization of the alternative energy sources and fuel types, mentioning the sources of such programs financing.

11. The Ministry of Finance, the Ministry of Economy, the Ministry of Fuel and Energy, the Ministry of Justice, the State Committee of Ukraine for Regulatory Policy and Entrepreneurship, NAER together with other interested bodies of executive power shall prepare and submit to the Cabinet of Ministers the draft Law of Ukraine concerning the absolute discharge of enterprises from VAT and from income tax for the activities, associated with the production and utilization of the alternative energy sources and fuel types for the term of 10 (ten) years.

The Prime Minister of Ukraine

Yu. Tymoshenko

THE CABINET OF MINISTERS OF UKRAINE**RESOLUTION**

from 11th of February 2009 № 159-p

Kyiv

Some issues of the state policy implementation in the field of efficient use of fuel-and-energy sources

1. To determine:

The Ministry of Fuel and Energy as the central body of executive power to coordinate the implementation of measures, connected with the reduction of natural gas consumption by enterprises of all fields of national economy;

The Ministry of Housing and Communal Services as the central body of executive power to coordinate the implementation of measures, connected with the actions for settlements switching to electricity heating, and also replacement of gas cookers at residential buildings by electric ones.

2. To the Ministry of Fuel and Energy, NAER, the Ministry of Industrial Policy, the Ministry of Housing and Communal Services and other interested central bodies of executive power, NJSC “Naftogas Ukraine” according to the results of analysis of the gas consumption balance in 2008 to submit in the period of 1 (one) week the propositions regarding sufficient reduction (in percents) of the natural gas utilization in the sectors of industrial activities, particularly with natural gas substitution by the alternative energy sources and fuels.

3. To entrust heads of central and local bodies of executive power, NJSC “Naftogas Ukraine” by the personal liability to assume during 2009 the comprehensive measures regarding the sufficient natural gas consumption reduction, enhancing of the share of the alternative energy sources utilization, implementation of the energy efficient technologies and equipment.

4. NAER have to accelerate in 2009 the development of national standards on energy saving and energy efficiency, with top priority in establishment of norms for specific consumption of fuel and energy sources per unit of manufactured product.

To the Ministry of Finance to decide according to the established procedure an issue on increase in expenditure on development of mentioned standards at the expense of budget program “Scientific research and development under state target programs and government order in the field of energy efficiency and energy saving”.

5. To the Ministry of Fuel and Energy and NJSC “Naftogas Ukraine” to develop the program concerning electricity use for technological needs of the gas transportation system of Ukraine for the natural gas transportation.

6. To NAER together with the Ministry of Fuel and Energy, the Ministry of Housing and Communal Services, the Ministry of Regional Development and Construction, the Ministry of Industrial Policy, the Ministry of Agricultural Policy, the Ministry of Coal Industry, the Ministry of Transport and Communication, the Ministry of Economy, the Ministry of Finance, NJSC “Naftogas Ukraine”, the National Academy of Science of Ukraine, Institute of Engineering Thermophysics of the National Academy of Science of Ukraine to develop and to submit in 1 (one) month term to the consideration of the Cabinet of Ministers of Ukraine the draft plans of

measures concerning the reduction of natural gas utilization and its substitution by the alternative energy sources and fuels during 2009-2010, particularly:

- to use the alternative energy sources and fuels for boiler houses and CHP-s, to increase the volumes of heavy oil, coal, bio- and synthetic gas, gas of coal fields and other types of fuel instead of the natural gas;
- to introduce the heat pumps, termers, energy accumulation systems, and also to increase the electricity utilization for heating and hot water supply.

7. To the Ministry of Housing and Communal Services, the Ministry of Fuel and Energy and NERC together with local bodies of executive power to determine the list of CHP-s, where it is reasonable and technologically feasible to implement the energy accumulation electric heating and hot water supply systems and prepare the appropriate projects with implementation within 2009-2010.

8. To the Ministry of Economy, the Ministry of Finance, the Ministry of Fuel and Energy and NAER:

to analyze the experience of developed foreign countries subject to the formation of economic incentives to the economic players and physical persons, which implement energy efficient technologies and use the alternative energy sources, aimed at natural gas consumption reduction, as well as measurements, aimed at reduction of energy resources consumption while overcoming effects of world financial crisis. Summarized conclusions and proposals have to be submitted to the Cabinet of Ministers of Ukraine;

together with the interested bodies of executive power to submit the proposals concerning the legislative implementation of the tax remissions to economic players, which use the alternative energy sources and fuels, particularly to give them tax vacation.

9. To the Ministry of Regional Development and Construction, the Ministry of Finance, the Ministry of Housing and Communal Services, the Ministry of Fuel and Energy, NAER, the National Academy of Science of Ukraine, the Council of Ministers of AR of the Crimea, Regional State Administrations, Kyiv and Sevastopol City State Administrations to provide the development and implementation of the progressive state building standards and type designs for construction of residential buildings with utilization of energy accumulation electric heating and hot water supply systems, the alternative energy sources, heat pumps, energy saving construction materials and technologies.

10. To the Council of Ministers of AR of the Crimea, Regional State Administrations, Kyiv and Sevastopol City State Administrations together with the Ministry of Housing and Communal Services, the Ministry of Fuel and Energy, the Ministry of Finance, the Ministry of Economy, NAER to determine by the 1st of March 2009 a list of objects where it is reasonable and technologically feasible to implement the energy accumulation electric heating and hot water supply systems and to prepare the relevant projects to be implemented in 2009-2010 with the determination of funding sources.

11. To the Ministry of Environmental Protection, the Ministry of Fuel and Energy, the Ministry of Industrial Policy, the Ministry of Agricultural Policy, the Ministry of Housing and Communal Services, the Ministry of Regional Development and Construction, the Ministry of Economy, the State Agency of Investments and Innovations, the National Environmental Investment Agency, NAER to prepare by the 15th of March 2009 proposals regarding the attraction of investments by means of the Kyoto Protocol mechanisms realization, particularly using the Joint Implementation mechanism, for the implementation of the energy efficient projects and the alternative energy sources utilization projects.

12. To the Ministries and other central bodies of executive power together with NAER to stipulate the implementation of the energy accumulation electric heating and hot water supply systems and technologies using the alternative energy sources and fuels during the development of the sectoral energy efficiency programs and programs for energy resources consumption reduction by the budget institutions for 2010-2014.

13. To the Ministry of Economy, the Ministry of Finance, the Ministry of Fuel and Energy, the Ministry of Housing and Communal Services and NAER to prepare by the 10th of March 2009 the proposals regarding the determination of funding sources and the order of the interest rate compensation of physical persons credits, aimed at the stimulation of energy efficient technologies implementation and utilization of the alternative energy sources in living spaces for the natural gas consumption reduction.

14. To the Ministry of Finance, the Ministry of Economy, the Ministry of Fuel and Energy and NAER:

during the development of the proposals concerning amendments to the Law of Ukraine “On State budget of Ukraine for the year 2009” to take into consideration by the end of the 1st quarter of 2009 the proposals of the Ministry of Fuel and Energy and NAER subject to financing of the top priority measures and conduction of R&D activities in the field of energy efficiency and energy saving;

to decide in established order an issue on amendments to budget program “State support for energy saving measures through the mechanism of credit reduction in price” (KPKV 6361040), providing the possibility of financing the measures for renewable energy development, scientific research and development activities in the field of energy efficiency, energy saving and use of the alternative energy sources.

15. To NAER together with other interested central bodies of executive power to consider an issue concerning the reasonability of creation of the state concern “Biofuel of Ukraine”, the transfer to the management of NAER of distilleries, entitled to produce bioethanol, list of which was approved by the Decree of the CMU from the December 5, 2007 #1375 (Official bulletin of Ukraine, 2007, #93, article 3402), and the state concern “Renewable energy of Ukraine” with further transfer, in the established order, of the budget assignments for financing of state programs in the field of renewable energy from the Ministry of Fuel and Energy, the Ministry of Coal Industry, the Ministry of Agricultural Policy, the National Space Agency of Ukraine to NAER.

16. To the Ministries, other central bodies of executive power, the Council of Ministers of AR of the Crimea, Regional State Administrations, Kyiv and Sevastopol City State Administrations to prepare schedules of step-by-step transfer by the end of 2009 (starting from the 2nd quarter of 2009) of enterprises and their institutions, to make payments for consumed energy resources and water exclusively on the ground of meters readings.

The Ministry of Finance during the development of proposals concerning amendments to the Law of Ukraine “On State budget of Ukraine for the year 2009” have to take into consideration expenses to implement measures of purchasing and installation of the abovementioned meters.

17. To the Ministry of Fuel and Energy, the Ministry of Agricultural Policy, the Ministry of Coal Industry, the National Space Agency of Ukraine, NAER and the Ministry of Finance to decide by the end of the 2nd quarter an issue concerning transfer, in the established order, of the budget assignments for financing of state programs in the field of renewable energy from the Ministry of Fuel and Energy, the Ministry of Coal Industry, the Ministry of Agricultural Policy, the National Space Agency of Ukraine to NAER.

NAER have to submit to the Cabinet of Ministers of Ukraine proposals concerning the creation of the state concern “Renewable Energy of Ukraine”, the main task of which is determined to provide implementation of the mentioned programs.

18. To NAER together with the National Academy of Sciences of Ukraine, central bodies of executive power to provide by the 1st of March 2009 creation of the Intersectoral scientific and technical council on effective use of fuel and energy resources and the alternative energy sources for determination of the top priority scientific and technical developments and projects in the field of energy efficiency, energy saving and use of the alternative energy sources.

19. To the Ministry of Fuel and Energy, NERC and NJSC “Naftogas Ukraine” urgently to create working groups for deciding an issue of expenses minimization of energy generating, gas producing, energy and gas supply enterprises on production activity, to introduce system monitoring of prices for purchasing of materials, work and services.

20. To the Ministry of Finance, the Ministry of Economy and NAER urgently to prepare and submit to the Cabinet of Ministers of Ukraine draft documents on approval the procedure of the priority financing (crediting) of measures concerning provision of rational use and economy of fuel and energy resources, use of the alternative energy sources and fuels and procedure of issuance of state subsidies and implementation of non-repayable provisions.

21. To the Ministry of Finance, the Ministry of Economy, the Ministry of Fuel and Energy, the Ministry of Housing and Communal Service, the Ministry of Industrial Policy and NAER urgently to determine a list of types of energy saving equipment, to which enhanced amortization norms are applied, and to submit it to the Cabinet of Ministers of Ukraine.

22. To NAER together with the Ministry of Finance and the Ministry of Economy to submit by the 25th of February this year for approval to the Cabinet of Ministers of Ukraine the draft document on procedure of 2009 funds utilization, provided in the state budget for state support of energy saving measures through the mechanism of credit reduction in price.

23. To the Ministry of Fuel and Energy, the Ministry of Economy, NERC and NJSC “Naftogas Ukraine” to analyze efficiency of utilization of graduated prices on natural gas for population subject to the amounts consumed. The summary and agreed proposals should be submitted to the Cabinet of Ministers of Ukraine.

The Prime Minister of Ukraine

Yu. Tymoshenko

**CABINET OF MINISTERS OF UKRAINE
RESOLUTION**

from 12 February 2009 N 276-p
Kyiv

On Approval of Conception of the State target scientific and technical program
“Development of production and utilization of biological fuels”

1. To approve Conception of the State target scientific and technical program “Development of production and utilization of biological fuels” that is attached.

To assign NAER the state customer of the Program.

2. NAER along with the interested central bodies of executive power and the National Academy of Sciences of Ukraine within two months must develop the draft State target scientific and technical program “Development of production and utilization of biological fuels” and submit it to the Cabinet of Ministers of Ukraine for consideration.

The Prime Minister of Ukraine

Yu. Tymoshenko

APPROVED

by the Resolution of the Cabinet of Ministers of Ukraine
from 12 February 2009 N 276-p

**Conception of
the State target scientific and technical program
“Development of production and utilization of biological fuels”**

Definition of the problem (which is to be solved by the program)

Environmental consequences of fuel and energy complexes extensive development constitute a menace to mankind. Today 48 economically developed countries of the world on legislative level support development of renewable energy sources (RES), looking for an alternative to the traditional fuel. One of the alternatives is biological fuel (hereinafter - biofuel, received with application of biomass and biogas technologies, bioethanol and biodiesel fuels).

In Ukraine according to the state regional administrations biofuel potential is used at the level of 0,8%. At the same time state import of energy resources amounts about 50%.

Possible negative impacts of this status are monopolistic price increase or introduction of limitations on their supply in case of worsening of interstate relations with the exporting country; reduction of delivery volumes of energy sources owing to production decline; long-continued irregularities in energy resources supply in case of major accidents oil-, gas-main pipelines.

Problem, which solution the Program is aimed at, lies in necessity to solve the critical dependence of energy sector and economy from import of energy sources, reduce anthropogenic load on the environment of Ukraine.

Solving of this problem meets the priorities of the state policy, determined by the Laws of Ukraine “On energy saving”, “On alternative sources of energy” and on “Alternative types of liquid and gaseous fuel” and state programs, namely: Program “Ethanol”, approved by the Resolution of the CMU from 04.07.2000 #1044 and Program of biodiesel production development, approved by the Resolution of CMU from 22.12.2006 #1774.

Analysis of factors, which caused the problem, and explanation of the necessity to solve it by program-based approach

Structure of production and technical basis, formed in Ukraine, starting from soviet times have been primarily based on the then low internal prices on oil and gas. Cheap energy sources, which were received by the economic complex of Ukrainian SSR, didn't stimulate their efficient utilization.

Today's energy intensity of Ukrainian GDP in 2,5-3 times exceeds the mean level of GDP energy intensity in countries of the world and is the result of present industrial production structure with majority of energy intensive sectors (iron industry and chemical industry), depreciation of basic production assets, low rates of energy efficiency technologies introduction.

The main reason of crisis effects in the economy (and at the same time - their result) is low energy efficiency.

Comparative assessment of energy consumption, energy intensity and ecological compatibility on national production in Ukraine and in the world proves that one of the most effective possibilities of diversification of energy sources supply is change of fuel and energy balance structure, in particular, at the expense of alternative energy sources on terms of their efficient utilization and subject to boosting environmental protection.

For the purpose of creation of favorable conditions for production of additives on the basis of bioethanol and implementation of package of measures, connected with production and consumption of biodiesel, provision of agricultural sector of economy and transport sector with biofuel, Ukrainian Government has approved:

1. Program “Bioethanol” (Resolution of the CMU from 04.07.2000 #1044). Implementation term of the Program: 2000 - 2010.

To implement measures, provided by the Program “Ethanol”, production of bioethanol was organized at state distilleries of concern “Ukrspirt” and a number of standard-technical documents on mixed motor fuels with bioethanol were developed. Bioethanol has passed full cycle of development and operation testing and in established order was accepted for utilization in Ukraine. In 1998-2004 distilleries produced about 54 thousand t of bioethanol. But, because of absence of legislative adjustment of obligatory use of bioethanol for production of mixed motor fuels, significant rise in raw material (molasses) price, and because significant amount of imitations has entered the market, bioethanol production has been stopped since 1st of January 2005.

2. Program of biodiesel production development (Resolution of CMU from 22.12.2006 #1774). Implementation period for the program: 2007 - 2010. At present, according to the Program the following activities are performed in agrarian sector

1. Scientific research has been conducted concerning practicing technologies of growing rape for different climatic zones of Ukraine.
2. Draft state standards, harmonized with EU ones, concerning production and utilization of biodiesel have been prepared.
3. Research pipelines on biodiesel production have been made and tested.

4. Areas under rape and other oil cultures are being broadened, and new technologies of their growing are being introduced.

In the majority of regions organizational work has been started concerning construction of manufacturing entities of biodiesel production.

Mentioned programs aren't sufficiently effective because of absence of target budget financing and mechanisms of state support on production and utilization of biofuel.

Main measures for solving the problem. Implementation of the task is possible through development and implementation of State target scientific and technical program "Development of production and utilization of biological fuels" (hereinafter - Program).

Objective of the Program

Objective of the Program is to raise state economic and national safety, to reduce consumption of natural gas and oil products at the expense of biofuels, based on energy efficiency and ecological technologies, to raise level of environmental protection.

Determination of the optimal alternative solution for the problem on the basis of comparative analysis of possible alternatives

In Ukraine development of production and utilization of biological fuels are compared with the following choices:

1. Development of coal sector. Assured resources of coal in Ukraine amount nearly 52,6 bill t - completely sufficient to supply demands of the country for hundreds of years. But, annual production of coal is constantly dropping (from 165 mln t in 1990 to 75 mln t in 2007). Besides, industrial enterprises, which utilize coal, have low level of environmental safety.

2. Development of oil and gas production sectors. More sustained performance of these sectors, compared to other ones, create an illusion of their welfare, taking into account that effect from investments, made to these sectors before, is being exhausted and as a result of retirement of old assets a real danger of significant oil and gas production drop in the nearest future appears.

Production of hydrocarbons in Ukraine is characterized by sharp raw materials base degradation - both qualitative (increase of share of difficult production stocks), and quantitative (reduction of production). Intensive maintenance of gas-transport system has led to situation that a significant number of gas-main pipelines need rehabilitation. The majority of gas-compressor units installed at compressor stations are obsolescent, as a result gas transport system utilizes up to 7% of transported gas for own needs (as a fuel). Level of oil processing at Ukrainian refineries still remains low (in average 55-60%). Besides, reduction of oil processing at refineries takes place together with constant price increase of main gasoline (A-95) and diesel.

3. Development of nuclear energy sector. Ukraine has no own closed cycle of nuclear fuel production and doesn't have technologies and capacities for processing/burial of spent fuel and radioactive waste. All fuel assemblies are supplied from Russia.

Technological barrier for use of electric heating at expense of power, produced at NPP, is necessity of cardinal rehabilitation of power networks. Transition to large-scale electric heating requires rising of throughput capacity of power networks more than by three times.

Another problem is an existing operational imbalance of Ukrainian UPS (United Power System). At present the installed capacity of Thermal power plants (TPP) is nearly twice higher than installed capacity of NPPs, but in power production structure NPPs produce almost half of power energy in total power production of Ukrainian UPS, which has negative influence at regulation of daily load curve. Non-project unload of energy units and removal into reserve,

caused by the necessity to regulate Ukrainian UPS, leads to significant increase of specific consumption of reference fuel for production of 1 kWh of electric power at TPPs, which today amount 380-440 g c.e. (coal equivalent) and significantly exceed similar parameters of energy equipment in operation in industrially developed countries.

4. Development of biofuel technologies. World experience shows that alternative energy sources have their own natural inexhaustibility and exclusive environmental purity. Their utilization doesn't change ecological balance of the world.

One of the most perspective paths of RES development in Ukraine is bioenergy, which economically viable potential is assessed in amount of 24 mln tce/yr. The following types of biofuel have industrial application in energy sector: biomass, combusted directly in boilers; biogas from manure, MSW landfills and anaerobic digestion, and also bioethanol and biodiesel.

Solid biofuels. Analysis of economic indices of operation of boilers, which combust wood and are switched to district heating indicates that this path is profitable.

Biogas. Profitability of biogas production grows at complex approach to animal waste treatment. Complex approach envisages profit not only from biogas, but also from organic fertilizer.

Significant amounts of biogas can be obtained at MSW landfills. Pay-back period of mini-CHP combusting biogas from the landfills is 3-4 years.

Bioethanol and biodiesel. To answer the demand of Ukrainian market in petrol (about 5.5 mln t) and biodiesel (about 6.5 mln t) Ukraine has powerful agricultural potential.

Bioethanol can be used as petrol additive in amount up to 6% and for diesel fuel in amount 10-12%. In this case annual demand in bioethanol will amount 1 mln t.

Paths and methods to solve the problem, term of the Program implementation

For the purpose of successful implementation of the Program the following issues should be solved during its development: creation of normative-legislative, financial, scientific, organizational provision and monitoring system.

Optimum alternative of problem solving is implementation of the following main tasks of the Program:

1. Improvement of legislation concerning biofuels production and use on basis of economic and financial incentives.
2. Development of the label system for bioethanol and biodiesel united with EU countries, which will help to conduct import-export transactions.
3. Provision, subject to development of heat networks of settlements and feasibility studies, for replacement of boilers, which combust natural gas, mazut and coal, for energy efficiency boilers and heat-generators that combust biofuels.
4. Provision for utilization of biogas potential from MSW landfills and from animal waste by installation of biogas units.
5. Assessment of resource potential for biofuels production in Ukraine and development of raw materials sources.
6. Improvement of technologies for production ethyl tertiary butyl ether (ETBE) and provision for its production with simultaneous remove from production methyl tertiary butyl ether (MTBE).
7. Improvement of technologies for bioethanol and biodiesel production.
8. Assistance in construction of sites for production of biogas, biodiesel, bioethanol and also change the line of business of some enterprises in food and processing industry for biofuel production.

9. Development of up-to-date technologies and introduction of innovation technologies for production of 2nd generation biofuels.

Implementation term of the Program: 2010 - 2014.

Property rights on technologies and their components, created in frames of the Program, belong to the country. Technology transfer by the country to users will be performed on the basis of agreements, which determine the country as the owner of the technology and users of technologies, terms of payment and amount of remuneration for transfer and use of technologies, according to provisions of the Law of Ukraine "On state regulation of activities in the field of technology transfer".

Expected results of the Program implementation, determination of its efficiency

Implementation of the program provides achievement of the following main economic, social and ecological indicators:

- 72 160 units of modern energy efficient boilers with total thermal capacity of 9 180 MW will be installed and up to 5 bill m³/ yr of natural gas will be replaced.
- Volumes of utilization for biogas from manure will amount about 130 mln m³.
- Construction of new biofuel plants, reconstruction and/or modernization of operating distilleries considers attraction of the majority of social production.
- Reduction of CO₂ emissions by 9,81 mln t/yr.
- Reduction of methane emissions will amount about 3,26 mln t/ yr.
- Use of biodiesel as motor fuel reduce emission of carbohydrates by 56%, solid particles - by 55%, carbon dioxide - by 43%, nitric oxide - by 5-10%, carbon black - by 60%.
- Bioethanol use as motor fuel has ecological benefits at the expense of reduction of carbon monoxide emissions from 4,05 to 1,58 g/km, carbohydrates - from 0,95 to 0,65 g/km.

Assessment of financial, material & technical, human resources, necessary for implementation of the Program

Program will be financed at expense of the state budget, local budgets, investments, assets of enterprises and other customers. Indicative amount of costs for implementation of the Program is 7478,19 mln UAH.

**CABINET OF MINISTERS OF UKRAINE
RESOLUTION**

from 19 February 2009 N 126
Kyiv

Special features regarding connection of the units producing power from the alternative energy sources to the power grids

The Cabinet of Ministers of Ukraine resolves:

1. A licensee who performs transmission of electrical energy by local grids is responsible for the technical-organizational arrangements aimed to create conditions for power transmission from a connection point to local grids according to a contract on connection. The connection point means a connection point of a unit below 10 MW which produce power from the alternative energy sources (hereafter a power unit).

The National Electricity Regulatory Commission of Ukraine approves a model contract on the connection of a power unit to the power grids;
connection point is a boundary of the ground area of a power unit owner or, with his consent, a part of the ground area allotted for the location of the unit.

2. A power unit owner can sell surplus of the produced electricity in the wholesale power market, or can sell it to a power supply company at a regulated tariff, or can directly sell it to consumers according to a procedure determined by existing legislation on the basis of power sale contract.

The National Electricity Regulatory Commission of Ukraine approves the model sale contract.

3. It is recommended to the National Electricity Regulatory Commission of Ukraine:

- to provide for reimbursement of
 - all the expenditures of a licensee on transmission of electrical energy by local grids; the expenditures mean costs of implementation of the technical-organizational arrangements aimed to connect power units to the power grids;
 - losses arising from the purchase of electricity at a “green” tariff directly from a “green” power generating company.

The reimbursement should be provided for by means of including these expenditures into power transmission tariff.

- to determine that a power unit owner can produce power without a corresponding license.

4. Ministry of Fuel and Energy of Ukraine, from the institutions which are under its control, must determine those that develop construction documents on the basis of technical requirements which are issued for connection of power units to the power grids.

5. It is recommended to the local authorities to allot ground areas for construction of power units so that to ensure connection of the power units to the power grids within the shortest period of time.

THE CABINET OF MINISTERS OF UKRAINE

RESOLUTION

from 19th of February 2009 № 256-p

Kyiv

First priority measures to reduce natural gas consumption during the period till 2010

1. To the Ministry of Fuel and Energy:

To ensure till 2010 the reduction of natural gas consumption by thermal power plants and CHP plants which belong to its management not less than 30% in comparison with 2008 where it is possible to replace natural gas by the alternative energy sources and fuels first of all by coal and fuel oil in the shortest term.

2. To the Ministry of Industrial Policy:

To develop and to submit in a month term for the consideration of the Cabinet of Ministers of Ukraine the propositions regarding reduction in 2009-2010 not less than 15% of the natural gas consumption in the sectors of industrial activities, particularly by means of natural gas substitution by the alternative energy sources and fuels

3. To the Ministry of Housing and Communal Services:

To approve in a week term the methodology for the development of regional programs to modernize municipal heat-power sector of Ukraine.

To the Council of Ministers of AR of the Crimea, Regional State Administrations, Kyiv and Sevastopol City State Administrations:

After approval of methodology by the Ministry of Housing and Communal Services, to develop and to approve in a month term the regional programs of modernization of municipal heat-power sector in which it is necessary to foresee until 2010 the reduction of natural gas consumption not less than 25% in comparison with 2008 with definition of finance sources and to submit it to the Ministry of Housing and Communal Services.

4. To the Ministry of Housing and Communal Services, the Ministry of Economy and the Ministry of Finance:

To prepare and submit in a month term to the Cabinet of Ministers of Ukraine the draft Conception of the State target program of the modernization of municipal heat-power sector in which it is necessary to foresee the re-equipment of the boilers of municipal heat-power sector with the aim of substitution of the natural gas consumption by the alternative energy sources and fuels.

To the Ministry of Housing and Communal Services, the Ministry of Fuel and Energy, the Ministry of Industrial Policy, NAER, the Ministry of Coal Industry, the Ministry of Agricultural Policy, the Ministry of Economy, the Ministry of Finance, the Ministry of Regional Development and Construction, the State Forestry Committee, the Institute of Engineering Thermophysics of the National Academy of Science of Ukraine:

On the basis of approved Conception of the State target program and approved regional programs of the modernization of municipal heat-power sector, to develop and to submit till 1

June 2009 to the Cabinet of Ministers of Ukraine the draft State target program of the modernization of municipal heat-power sector.

5. To the Ministry of Housing and Communal Services, the Ministry of Regional Development and Construction, the Ministry of Fuel and Energy and NERC:

When developing terms of references for district heating objects construction and reconstruction (modernization) of heating units, to provide for the requirements to use only the alternative energy sources and fuels, and the use of natural gas utilization only as a reserve fuel in case of emergency.

6. To NAER, the Ministry of Finance, the Ministry of Economy, the Ministry of Housing and Communal Services, the Ministry of Fuel and Energy and NERC:

To draft and submit in a week term:

a legislative act regarding the path to the State Fund of Energy Saving the fees on oil realization at the territory of Ukraine and fees as a target bonus for approved price of natural gas for consumers of all patterns of ownership except volumes of natural gas which are used as fuels by chemical enterprises;

a Resolution of the Cabinet of Ministers of Ukraine regarding the procedure of allocation of the State Energy Conservation Fund.

To NAER, the Ministry of Finance and the Ministry of Economy:

When drafting Regulations concerning the State Energy Conservation Fund, to insure that specialists of the Ministry of Fuel and Energy and the Ministry of Communal Services will be included to the Fund management.

7. To the Ministry of Housing and Communal Services, the Ministry of Regional Development and Construction, the Ministry of Finance, the Ministry of Economy, the Ministry of Justice:

To draft a Resolution of the Cabinet of Ministers of Ukraine as for the costs of the Stabilization Fund to be included in the Use Order in 2009 for the implementation of investment projects aimed at social and economic development of the regions. The Use Order of the costs in 2009 was approved by the CMU's Resolution N47 from 28.01.2009. The draft Resolution should introduce amendments to the procedure of endorsing the expenditure lines "implementation of energy conservation measures" and "implementation of the State program "Ukraine's potable water" by the Ministry of Communal Services. The draft Resolution should be submitted to the Cabinet of Ministers of Ukraine.

8. To the Ministry of Housing and Communal Services:

To liven up the work aimed to involve finances of international financial institutions in the implementation of projects on introducing individual heat points and converting heat supply installations to alternative energy sources and fuels.

9. To the Ministry of Housing and Communal Services, the Ministry of Finance, NTKU and NAER:

Within two weeks, to identify the sources and amount of financing of the measures aimed to enhance the population's awareness regarding energy conservation issues; to ensure implementation of the measures.

10. To approve anticipated volume of natural gas consumption in the period till 2010 according to the Annex.

The Prime Minister of Ukraine

Yu. Tymoshenko

Annex
To the Resolution of the Cabinet of Ministers of Ukraine
N 256-p from 19 February 2009

Anticipated consumption of natural gas in 2010

Consumer type	Consumption, mill m ³		
	2008	2010	reduction
All the Ukraine's consumers	60 181.2	52 053.6	8 127.6
Including:			
population	17 553.3	17 553.3	
budgetary institutions	939.1	704.3	234.8
enterprises of thermal-communal energy companies, particularly CHP plants (for heat production)	10 128	7 596	2 532
enterprises of the energy complex (TPPs and CHP plants for power production)	4 177.6	2 924.3	1 253.3
consumption by the gas distribution enterprises	1 044.6	887.9	156.7
industrial consumers	26 338.6	22 387.8	3 950.8

