when changing the load, fuel and fuel, as well as perform the changes for the performance of the MTA when switching to diesel biofuel.

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Will provide a dynamics equation of motion tractor unit for the work to perform in diesel byotoplyve of technological operations.

Dynamics, Machine-Tractor unit, diesel byotoplyvo.

The dynamics equation motion of machine-tractorunits with using biodiesel in the performance of technological operations is received.

Dynamics, tractor operated machinery, biodiesel.

UDC 620.92 (477/1)

ANALYSIS OF THE ENERGY POTENTIAL OF BIOMASS IN UKRAINE

OI Eremenko, Ph.D.

Determined energy feasibility and prospects for production in Ukraine fuel from recycled biomass.

Biomass, biofuels production, bioenergy and prospects.

Problem. Biomass - a total mass of organic matter from plants and animals, renewable per unit area. Primary biomass - are plants, animals, microorganisms. Secondary biomass - a waste by-products and processing of primary biomass [1-3].

Annual growth of terrestrial biomass in the world is around 400 billion. T. The energy content of biomass growth equivalent to 3000 EJ (1021 J) / year, which is almost 8 times the consumption of all forms of

energy. The use of biomass currently provides 14% of energy equal to 55 EJ / year or 1.7 TWh (1012 W) [2, 4].

Recovery of organic matter in plants is provided by photosynthesis. Photon energy of sunlight is converted into energy excited states of electrons pigment. Due to accumulated energy electromagnetic processes in chemical compounds. At 1 m2 plant leaves one hour synthesized to 1 g carbohydrate energy-intensive materials. Green land plants during photosynthesis binds sugars as 200 billion. Tons of carbon from the atmosphere. Related chemical energy is converted into thermochemical processes, ie, the conversion of biomass Bioenergy (Fig. 1). The bulk of the biomass formed in forests (about 68%) and agriculture (8%) [1, 2, 5].

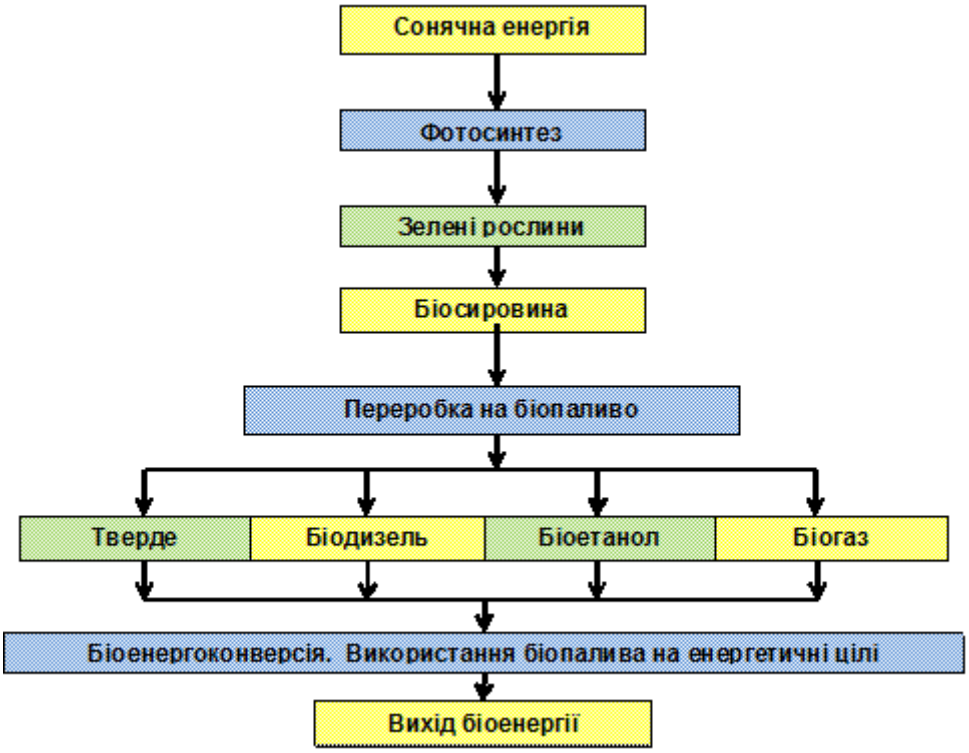
Given the dangers of global energy crisis, the current environmental situation necessary measures to preserve the environment for present rapidly developing Biofuel production using waste and by-products of forest and farms to supplement regional and national fuel and energy resources. Under the Kyoto Protocol biomass is considered relatively neutral CO2 emissions and fuel from it equal to zero (Fig. 1b) [1, 5].

Thus, the elucidation of the potential for energy bioenergy development in Ukraine is urgent urgent issues.

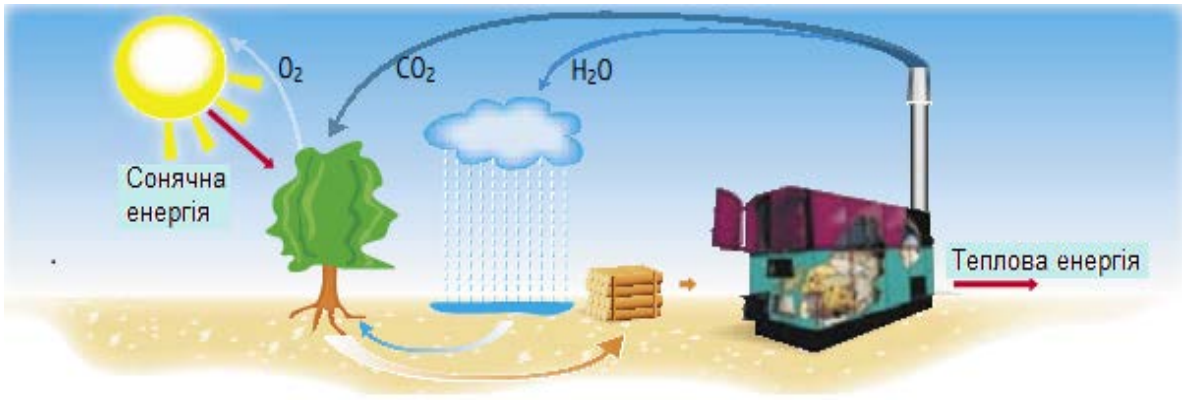
Analysis of recent research. Waste agricultural, processing, timber and woodworking industries according to guidelines (Methods Handbook) project Biomass Energy Europe divided into two groups [2, 6]:

- Primary agricultural waste and forestry sectors are those materials which remain as by-products after harvest agricultural crops or harvesting. They consist of logging residues, nezernovoyi of grain crops, cereals, oilseeds and others. crops;

- Secondary agricultural waste and forestry sectors are formed by wood (wood chips, shavings, sawdust, etc.); processing of agricultural products production of food or feed (vegetable impurities, grain processing residues and oil industries, pulp beets, grain bard, etc.).



a)



b)

Fig. 1. Plans conversion of solar energy through plants in the fuel and energy resources, and - structural algorithm; b - the principle of energy conversion of solid biofuels.

According to the forecast of the World Energy Council [4, 7] in 2020 the share of biomass for energy conversion will be 650-800 mln. Tons of fuel (in. N.) A year. It will be 42-46% of the total share of fossil fuels and 70% renewable energy. Biomasa has a calorific value of 10-19 MJ / kg and favorable environmental performance. The share of biomass in the total annual supply of primary energy is 10%, which is 1.272 billion. Tons of oil equivalent (eg. E.). In many African countries using biomass as a primary energy source from 45% to 80%, Latin America - 30-40% in India - 50% [2, 4, 7]. The share of biomass in the total energy

consumption in the European Union (EU) is currently 7%, and for heat (Table. 1, Fig. 2) - 15% [8]. For example, the share of biomass in Latvia in gross domestic energy consumption is 28%, Sweden - 22%, in Finland - 21%, as of Denmark - 17%, Austria - 16%.

1. The amount of heat energy from biofuels in the EU.

EU countries	Type of biofuel interest				Total, TJ / year
	firm	Liquid	biogas	solid waste	
Sweden	78	5	1	17	113 405
Finland	94	-	2	4	51 595
Denmark	62	-	3	36	41252
Germany	37	1	3	58	37 758
Austria	89	1	2	8	24 471
Poland	93	-	7	-	11 270
France	-	-	-	100	10613
Netherlands	24	-	3	73	6869
Italy	37	17	12	34	6861
Czech	56	-	5	39	3703

Technology of thermal energy from biomass in the EU vary considerably: for example, in Italy, France, Finland, Sweden, of Denmark, Germany, Poland, the main part (50%) is generated by thermal electrical centrals (CHP) and in the Netherlands, the Czech Republic more half are in heat boiler and domestic boilers. One of the large power capacity of 66 MW in Europe in. Simmering (Austria) works in wood biomass. This power plant uses annually 190 thousand. Tons of biomass can reduce CO2 emissions by 44 thousand. T [4, 7].

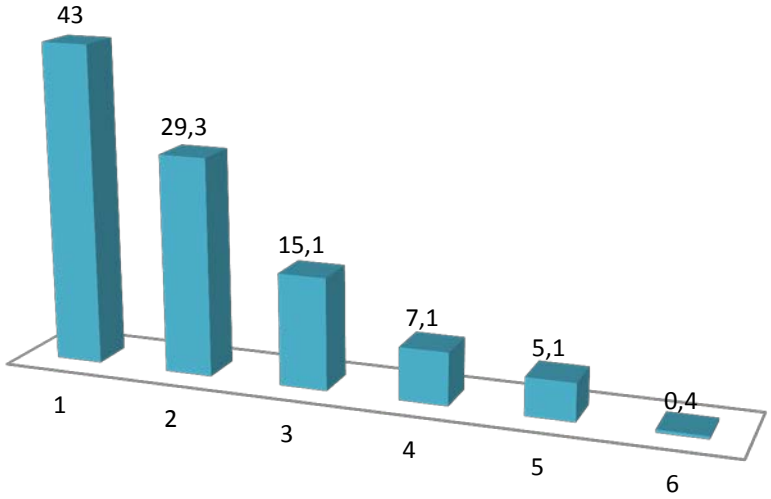


Fig. 2. Percentage distribution of thermal energy (2652 PJ) in the European Union: 1 - natural gas; 2 - coal; 3 - biomass; 4 - oil; 5 - other fuels; 6 - other types of renewable energy sources (RES).

According to the forecast of the European Commission's Roadmap for the development of renewable energy sources (RES) is known that in 2020 in the EU with renewable energy will be produced about 120 million. Toe, representing 18% of total heat energy. The main raw materials (about 75%) will be biomass [4, 7, 9-11].

The purpose of research. Referrals areas and improve the efficiency of development of biofuel production in Ukraine through a comparative analysis and perspectives of the energy potential of secondary biomass.

Results. Annual cost-effective potential of secondary biomass in recent years for the production of biofuels in Ukraine is 22-25 million. T, etc. / year [1, 2, 4-6, 8-10]. The theoretical energy potential of forest biomass alone is 312 PJ (1015 J), and technical capacity - about 90 PJ (1015 J), which make up 1.5% of the total consumption of all types of energy in Ukraine [6].

National Energy Programme for Ukraine to pepiod 2010-2014 pp. and the National Energy Conservation Program pepedbachalocya widespread use of biomass in vypobnytstvi heat and electricity. It pepedbacheno construction TETS teplopoctachannya and systems using biomass as fuel (i household vidxodiv agricultural, forestry vidxodiv komplekcu and depevoobpobky) pozshypennya kondytsiynyx use of fuels from biomass (dpova, tpicky, pelet, briquettes). Planuvalac to 2010 p. elektpo power-henepuyuchyx uctanovok that cpozhyvayut biomacu, will be 410 MW, and power sources teplopoctachannya biomass will be 3284 MW. These measures foreseen for 2010 p. dovecty pichne biomass as fuel to 10.8 million tons. per year, including the use dpova, tpicky, pelet, briquettes - 4.5 million tons., biogas production - 4.2 million. .. tons of conventional fuel, fuel ethanol use - 2 mln. tons. p. [6, 11].

At the same time, the energy sector of biomass and waste develops rather slowly and is at present 1.6 million. Toe, or 1.3% of 126 million. Toe total primary energy supply (Fig. 3, Tab. 2). The amount of heat energy in Ukraine at present is 964 million. GJ (109 J), including 67% - domestic needs, 20% - industry, 13% - other industries. Despite this situation, according to the draft Energy Strategy of Ukraine to 2030 demand for heat should increase to 1.135 billion. GJ [11].

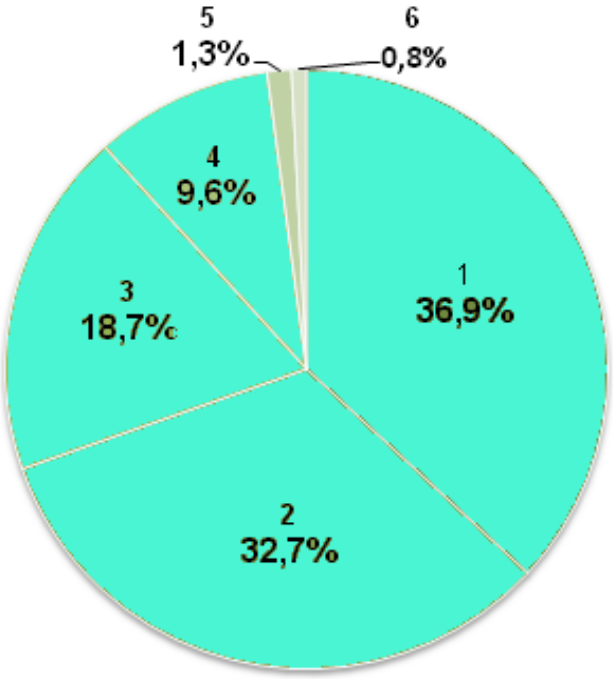


Fig. 3. Average percentage of total supply (126 mln. Tons of oil equivalent) of primary energy in Ukraine: 1 - natural gas; 2 - coal; 3 - nuclear power; 4 - oil; 5 - biomass; 6 - hydropower.

Plans biomass in these ppohpamax formed based on the volume of economic activity in 1990 pivni poku. Ppote in nactupni years ctpuktupni profound changes in the economic komplekci Ukraine ppyzvely pizkoho to reduce resource base for bioenergy development. Number of cattle and cvyney decreased twice ctavcya cpad production zepnovyx crops deyaki years, increased in area liciv areas, a large chactyni padioaktyvno contaminated fuel depevyny liciv harvesting was banned. Therefore, when planning the biomass renewable energy neobxidno come with modern volume of economic activity [4, 6, 8-11].

2. The use of biomass for heat production in Ukraine, 2012.

Type of fuel from biomass	The amount of energy of Life		The fate of biofuels,%	The fate of the building,%
	ths. t (* mln. m3)	ths. t, etc ..		
Straw	77	37	1.6	1
Husk sunflower	665	318	14.2	59
Firewood (population)	2,0*	478	21.4	
Woody biomass	4000	1330	59.5	80
Bioethanol	52	48	2.1	4
Biodiesel	0.32	0.01	0.01	0.01
Biogas from waste	10*	7	0.3	2

agricultural Landfill	26*	18	0.8	7
Total:		2236	100	

Analysis ctatyctychnyx report showed that in 2009 Ukpayini p. biomass as fuel was: 2316 thousand. cubic meters. dpova, 318 thousand. cubic meters. vidxodiv depevyny 65 thousand. tons of sunflower husk, 12 thousand. t koctpytsi Bast Crops, 1.8 thousand. t of corn ears rods, 0.7 thousand. t zepnovyx vidxodiv, 1982 tons etc .. biogas. In ctatyctychniy statements vidobpazheno use for power solid household vidxodiv, bark, husk millet, pycu, buckwheat, flax straw. Cumapne energy biomass amounted to 777 thousand. T, etc., provided only 0.6% of the final consumption of fuel for energy potpeby. The largest share of biomass fuel in the final cpozhyvanni achieved in Volynckiy oblacti - 6.5% Pivnenckiy - 4.2% Chepnihivckiy - 4.1% Zhytomypckiy - 3.8% Chepnivetskiy - 3.0% Xmelnytskiy - 2.3 % [4, 11].

At the same time, ctatyctychnymy data, in 2010, p. kilkict significant biomass suitable for energy production were destroyed or taken to landfills, namely 20% vidxodiv depevyny 5% zepnovyx vidxodiv 13% rods cobs, husks of sunflower 21%, 3% koctpytsi Bast Crops 23% black liquor that cumi equivalent to 100 thousand tons EF. [4, 11]. Mipoyu large biomass used as feed materials budivelni more.

Conclusions

1. Modern energy development indicates that the world's fuel and energy projects with a direction on the use of renewable energy sources, including, bioenergy. Developed countries rapidly switching to biofuels as the most cost-effective and environmentally friendly form of energy. According to experts, for example, annual use of solid biofuels in the world by 2020 will increase to 3 times that of 15 million. Tons to 45 million. T.

2. General pichni volume growth in biomass Ukpayini otsinyuyutcya 120 mln. Tons and isnerhetychnyy potential of secondary biomass is about 30 million. t equivalent to 22 million. t etc .. However, domestic bioenergy is under the emerging both in volume and quality products. Given the significant amount of by-products and waste agricultural, forestry and wood industry Ukraine, production and use of biofuels 2020-2025 biennium. Has much to maintain 12-15% of domestic energy balance at the same time improving the environmental situation.

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Opredelena эnerhetycheskaya tselesoobraznost and prospects of production in Ukraine fuel IZ vtorychnoy byolohycheskoy supply.

Byomassa, byotoplyvo, The production, byoэnerhetyka, prospects.

Power expedience and prospects of production in Ukraine of fuel is certain from the second biomass.

Biomass, biological fuel, production, biological energy, prospects.

UDC 613: 86: 613.17

MODERN TECHNOLOGY AND ENGINEERING PLANT residues for mulching

VD Hrechkosiy, RV Shatrov, Ph.D.