AGRICULTURAL ACADEMY

BULGARIAN AGRICULTURAL POLICY IN RENEWABLE ENERGY SOURCES DEVELOPMENT

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Introduction

- **Important renewable energy sources for Bulgaria are grain and sugar beet production for bio ethanol and bio diesel obtaining, used for transport fuel, and animal production, garbage and agricultural residues for biogas obtaining. The last years the renewable energy sources based on the agricultural production made agriculture multifunctional and that is in context of the Common Agricultural Policy of European Union.**

Renewable Energy and Rural Development

Community Strategic Guidelines for Rural Development

Guideline 1 for Improving the competitiveness of the agricultural and forestry sector – "…. helping the development of renewable energy materials, improving the environmental performance of farms and forestry…"

Guideline 2 for Improving the environment and the countryside – "… combating climate change. Appropriate agricultural and forestry practices can contribute to the reduction in greenhouse gas emissions and preservation of the carbon sink effect and organic matter in soil composition."

Guideline 3 for Improving the quality of life in rural areas and encouraging diversification of the rural economy – "…developing the provision and innovative use of renewable energy sources, which can contribute to creating new outlets for agricultural and forestry products…".

Renewable Energy and Rural Development

- ***Guideline 4 for Building local capacity for employment and diversification – "…Integrated approaches involving farmers, foresters and other rural actors can enhance the use of renewable resources and energy".***
- ***Guideline 5 for Ensuring consistency in programming – "…synergy in the national strategy and taking on board other EU-level strategies such as commitments to increased use of renewable energy sources and the need to develop a medium- and long-term EU strategy to combat climate change".***

Renewable Energy and Rural Development

National Strategy Plan shall give:

- *A general overview of the situation on renewable energy (including biomass) with a link to the realisation of the EU objectives for increased use of renewable energy*
- *A reply to the question how will the strategy plan contribute to the implementation of the Biomass Action Plan.*
- *The unofficial draft Bulgarian NSP indicates that "Bulgaria has a big potential for production and use of biomass (waste biomass and energy crops)". It says that "in connection with the priorities of the EC Action plan for biomass and the EU Bio-fuel Strategy activities targeted at the production and usage of biomass will be supported seeking opportunities to increase employment in forestry and agriculture, as well as a responsible and sustainable use of natural resources".*

Vocational training and Advisory services

General description of the measures: *training, information, diffusion of knowledge activities to persons dealing with agriculture, food and forestry (vocational training); provision of advisory services to farmers and forest holders to increase their awareness and help them improve the overall performance of their holdings (advisory services).*

Examples of possible activities related to biomass:

1. *Organise training for farmers (e.g. courses, seminars, workshops) on opportunities for promotion of biomass; production techniques*
2. *Issue booklets and brochures on biomass*
3. *Provide advice to farmers on diversification into production/use of renewable energy sources - biomass*

Basic services for the economy and rural population

General description of the measure: *support for setting-up of basic services in a village or group of villages, and related small-scale infrastructure*

Examples of possible activities related to biomass:

1. *Installations for the production of electric power or heat for a municipality (schools, public buildings, hospitals, etc.)*
2. *Distribution network for biofuels or heat/electric power from biomass*

DIRECTIONS OF AGRICULTURAL PRODUCTION POLICY OF BULGARIAN GOVERNMENT AS SOURCE OF RENEWABLE ENERGY:

- *Increasing of energy crop growing lands*

	Wheat	Rape
2005	1 039 679 ha	10 993 ha
2008	over 1 500 000 ha	over 100 000 ha

Rape

- *Implementing of new high productivity varieties of energy crops.*
- *Active using of waste from animal farms for biogas production.*

BIOGAS INSTALATIONS

2008 No biogas instalations working in Bulgaria.

2010 Planning - Over 20

2008 An international project “Big-East”, for training of Bulgarian specialists and farmers

Grain production of Bulgarian agriculture

Crop	Harvested area(hectares)		Output(tons)	
	2004	2005	2004	2005
Wheat	1 039 679	1 101 507	3 961 178	3 478 061
Rye	8 521	8 782	16 976	13 617
Triticale	9 521	8 782	16 976	13 617
Barley	328 924	264 519	1 180 836	657 863
Oats	43 002	30 571	101 486	50 138
Grain corn	383 217	298 713	2 123 022	1 585 701
Rice	5 669	4 501	28 116	20 163

Source: Agrostatistics Directorate, MAFS, 2006.

Acreage under sunflower and rape

Crop	Acreage (harvested hectares)			
	2004	2005	2006	2007
Sunflower	595 765	635 026	783 859	595 733
Rape	11250	10 993	16 545	84 060

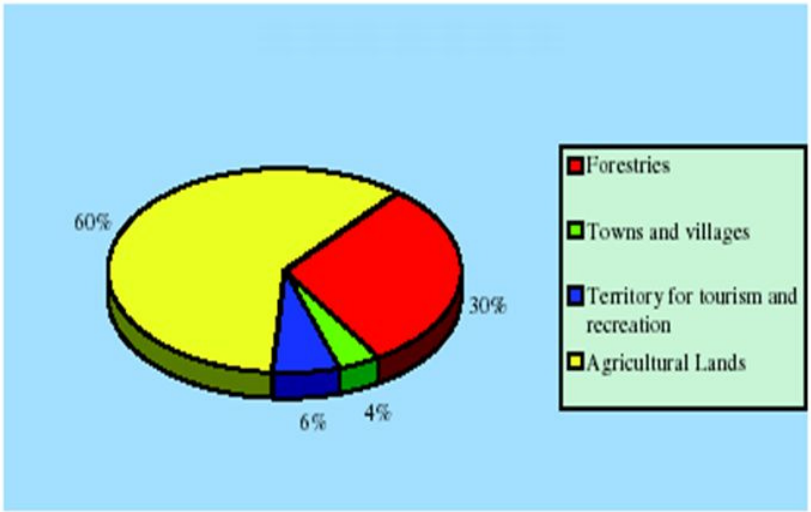
Source: Agrostatistics Directorate, MAFS, 2008.

Biomass availability in Bulgaria

- same time: Soil and climatic conditions in Bulgaria favour the development of agriculture.
- Animal and crop residues represent special interest, because their proceeding solves two problems at the
  - *it eliminate environmental pollution;*
  - *It is Renewable Energy Source.*

Biomass type	**Total yield**, *unites*	**Yield**, *u/1000 ha*
Primary production of crops, t	11 324 104 *t*	1 024, *t/1000 ha*
Livestock, *heads*:	*Number*	*Number/1000 ha*
- Cattle	676 500	61
- Poultry	15 324 000	1 386
- Pigs	1 616 500	146
Wood production		
- Firewood and charcoal	1 607 000 m^3	145 m^3/1000 ha *(according to data of FAO)*
- Wood residues	2000 m^3	0 m^3/1000 ha

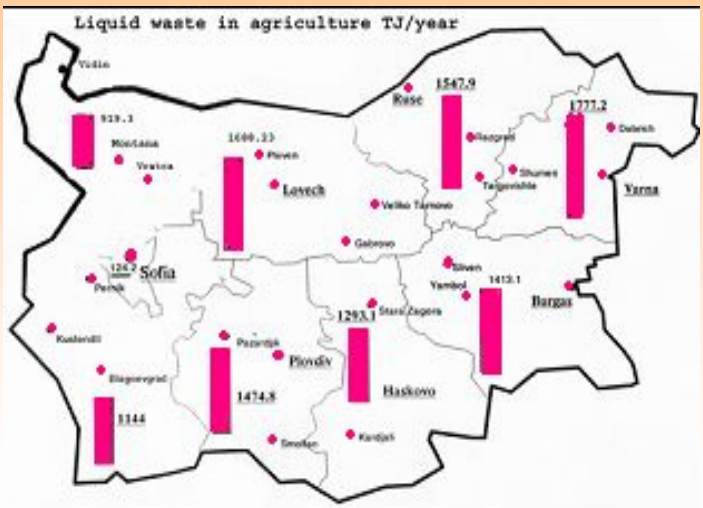
Present status of land resources in Bulgaria



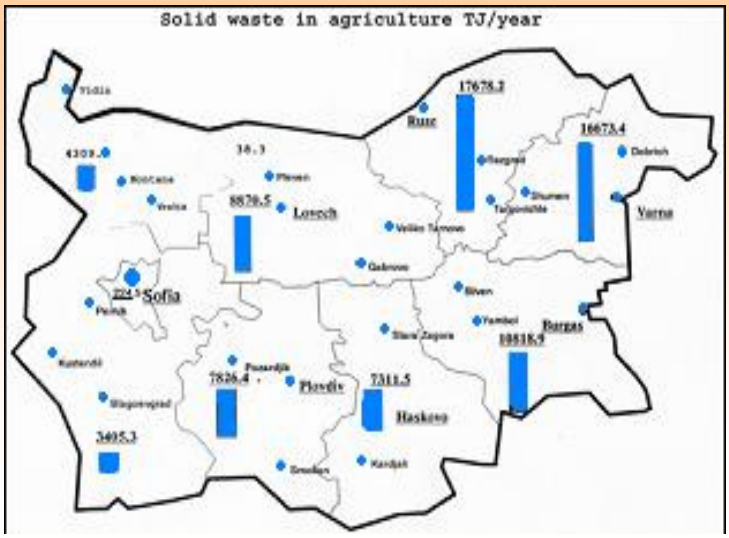
Agricultural and forest resources for biogas.

Supply sector	Type	Example
Forestry	Dedicated forestry	Short rotation plantations (e.g. willow, poplar, eucalyptus)
	Forestry by-products	Wood blocks, wood chips from thinnings
Agriculture	Dry lignocellulosic energy crops	Herbaceous crops (e.g. miscanthus, reed canarygrass, giant reed)
	Oil, sugar and starch energy crops	Oil seeds for methylesters (e.g. rape seed, sunflower)
		Sugar crops for ethanol (e.g. sugar cane, sweet sorghum)
		Starch crops for ethanol (e.g. maize, wheat)
	Agricultural residues	Straw, prunings from vineyards and fruit trees
	Livestock waste	Wet and dry manure

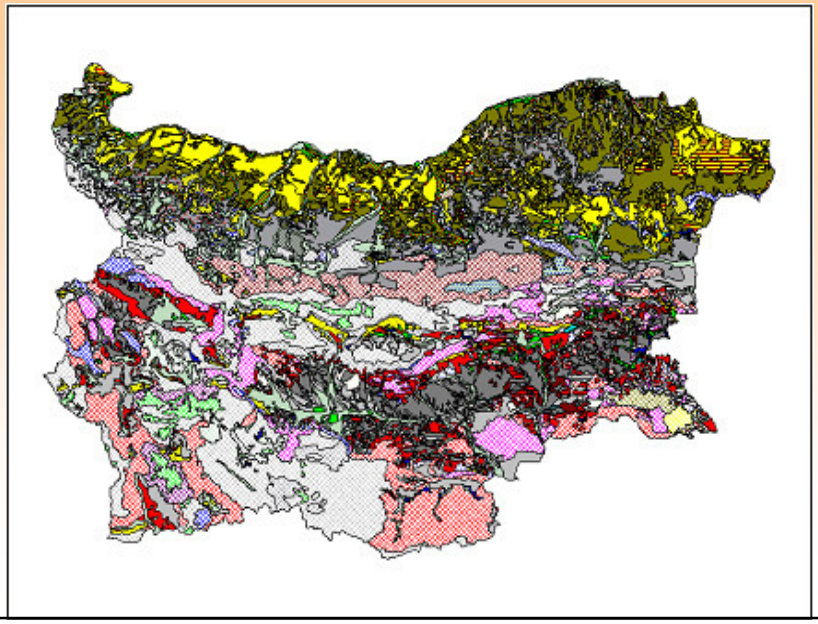
Bulgarian liquid waste map (Source: Energoproject, 2007)



Bulgarian solid waste map (Source: Energoproject, 2007)



A digitalized soil map of Bulgaria in scale 1:400 000 (Koinov et al, 1973)



From the geographical and ecologicapoints of view, the territory of the country can be divided into three large soil areas:

1. North Bulgaria soil area, which includes the soils distributed on the Danube plane and the Northern Balkan territories. Chernozems and Grey forest soils are widely presented there.
2. South Bulgaria soil area, which includes the soils distributed on the territoty of Southern Bulgaria. Cinnamonic forest soils, Smolnitza and Pseudopodzolic soils are presented there.
3. Mountainous soil area, which includes three main soil groups. Brown forest soils, Mountainous dark soils and Mountainous meaddow soils are mainly presented there.

Problems:

- Restoration of the private ownership over agricultural lands after 1990 – over 15 millions small land parcels
- Destroyment of block structure of agricultural lands
- Destroyment of irrigation systems
- No scientific survey of farmers
- No sufficient nutrition of agricultural crops
- Appearance of non cultivated agricultural lands
- Destroyment of supporting systems – supply, market, management

Non cultivated agricultural lands as source of renewable energy crop production

- 2006 – More than 800 000 ha non cultivated lands in Bulgaria from 4 630 000 ha agricultural lands

(Agrostatistics of MAF, 2006).

Main crops as renewable sources:

Wheat, barley, maize, sunflower, rape, soybeen, cotton

Prices of wheat:

2006 - 102 EURO per tone

2008 - 260 EURO per tone up to now.

LAND CONSOLIDATION MANAGEMENT AS SOURCE FOR AN INTENCIFICATION OF AGRICULTURAL PRODUCTION

The land consolidation in Bulgaria is based on a system for land evaluation developed by the Institute of Soil Science in aspects: general principles, evaluation procedure, collection of necessary information, tables for evaluation *sensu stricto*, calculations with real database. It began with active land market, farming co-operatives and with land renting for a category of pluriactive people, who have the desire to become associated and, implicitly, to consolidate their land and to establish really productive associations.

From the beginning of the 2006 the Ministry of Agriculture and Foods has a concept for consolidation based on organization of a land bank as a governmental and private company, which will bay and sell agricultural and forest lands, forming consolidated blocks convenient for mechanization and high productivity.

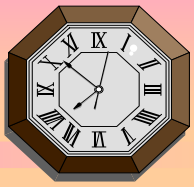
The concept includes a development and passing a law for land consolidation.

Conclusions[1]

- There is biogas production potential in Bulgaria
- There are no existing biogas installations at the moment.
- Analysis of the driving forces and the current state of renewable energy sources in Bulgaria shows that agro ecological potential of agricultural lands is enough for covering the indicative purpose of Bulgarian government to increase his efforts and to help farmers and specialists for biogas production , based on using of biomas production from agricultural lands and liquid and solid waste.

Conclusions[2]

- Development of national and regional programs for introduction and stimulation of environmental agricultural practice will result in rapid growth of renewable energy agricultural resources and land productivity potential.
- The authors note that there are good governmental policy and agro ecological and climatic conditions for expanding of energy crop production and biogas sources and submit ways for their realization.



Thank you for your attention!