UNIDO

Regional Work Shop on Promoting Sustainable Biofuels Production and Use in Central and Eastern Europe

IMPLEMENTATION OF THE RENEWABLE ENERGY SOURCES IN THE REPUBLIC OF MOLDOVA

Gh. Duca, V. Afanasiev, V. Postolati, V. Berzan

Academy of Sciences of Moldova

E-mail: vpostolati@cc.acad.md, berzan@cc.acad.md

12-13 November 2007, Gavlat, Croatia

THE REPUBLIC OF MOLDOVA

96% energy demand is imported.

The area of 34 square kms.

Renewable Energy Sourses

- Solar energy
- Wind power
- Energy биомассы*
- Hydraulic power
- Geothermal energy
- Low potential thermal energy
- Other energy sources

- **Preconditions for development RES:**

1. The decision of the Government of Republic Moldova nr.0919-25 from 4.01.2006; creation of Coordination Council after development of renewable energy sources

2. Indications Prime-minister RM nr.0919-261 from 26.02.2006 concerning maintenance with hot water of inhabitants of a countryside

3. The order of the President of the Academy of Sciences of Moldova nr. 03-68 from 01.03.2006

4. Competitive system selection of research projects, the state programs, projects of a technological transfer (competitions are carried out by the Supreme Council on a Science and a Technological Transfer since 2004)

That has been realized:

1. Projects of some legislative and normative documents are developed:
   - The law on renewable energy.
   - The law on manufacture of electric energy from renewable energy sources.
   - The law on biofuel.
   - Law on science and technology parks and innovation incubators.
2. Strategy of development RES in PM till 2010 and on prospect. http://ieasm.webart.md/data/m71_2_36.doc
3. The national Program of development RES for the period of 2007-2010.
4. Energy Strategy of Republic Moldova till 2020 <http: // ieasm.webart.md/data/m71_2_35.doc

That the common in the developed documents

- Principle of sequence and continuity.
- Formation of the package coordinated on the purposes.
- The coordinated structure of documents.
- The coordination with the power objectives of the European Union.
- Maintenance of identical privileges for all participants at development RES

That is a reality

- **Law on the renewable energy. (Approved by Government Decision nr. 1385 of 11 December 2006. Approved by Parliament Decision nr. 160-XVI of 11 Julie 2007.)**
- **Law on science and technology parks and innovation incubators. (Approved by Government Decision nr. 407 of 13 April 2007. Approved by Parliament Decision nr. 164-XVI of 13 Julie 2007).**
- **Energy Strategy of Republic Moldova till 2020 (Approved by Government Decision nr. 958 of 21 August 2007)**

Incentives for the residents of the science and technology parks

- No value added tax on import of goods and services.
- No customs tax on import of goods and services.
- No value added tax on goods and services bought on the territory the Republic of Moldova.
- No profit tax.

The objectives to a state policy

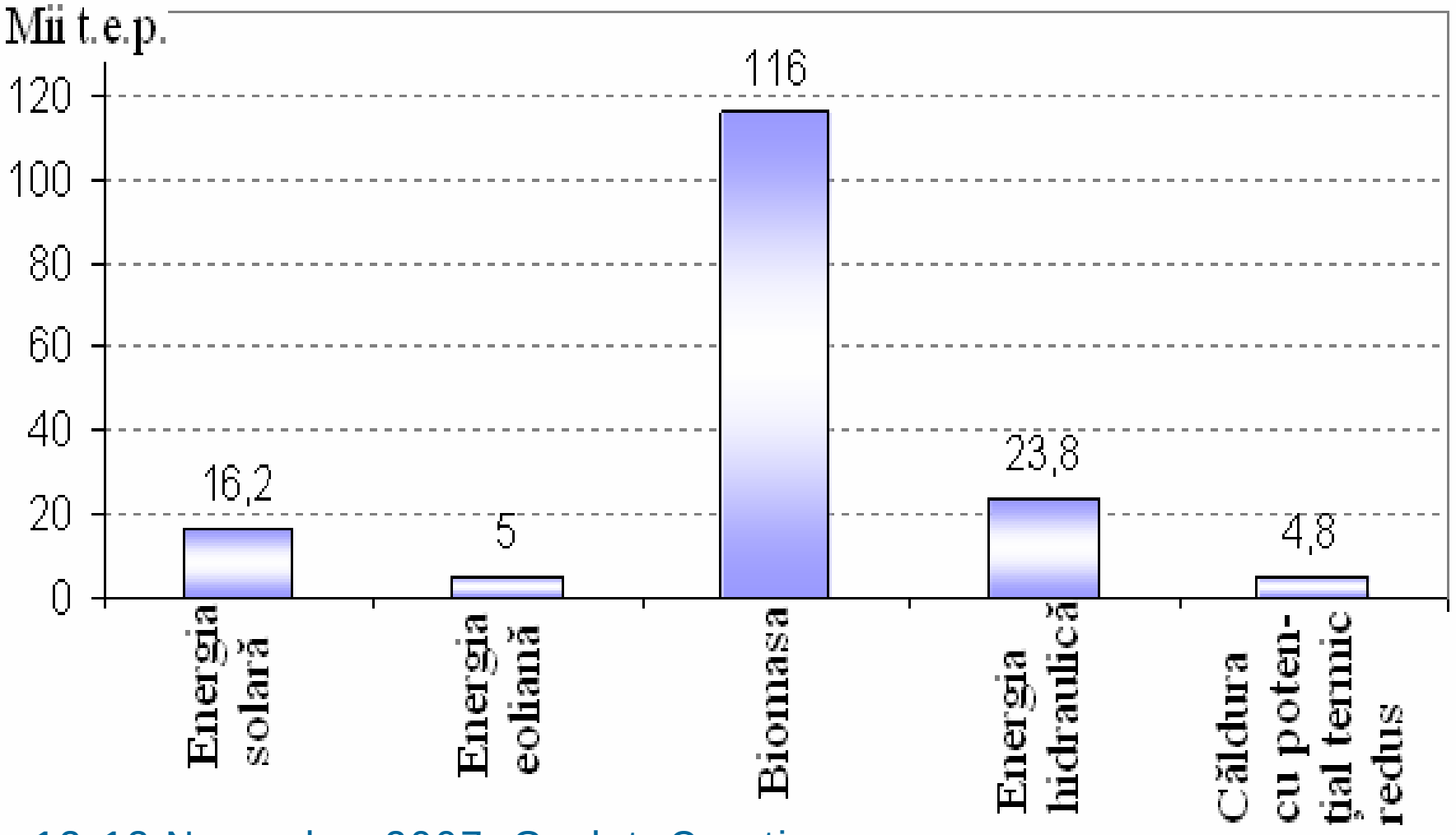
- Diversify maintenance with power resources.
- Replacement of traditional power resources:
- To 2010 years -6 % of energy consumed from traditional sources, and 20 % to 2020 years;
  - The volume of the used mix of ethanol and gasoline should make to 2010 years - 6 %, and to 2020 years -20 %;
- Mix of a biodiesel engine and diesel fuel of- 5 % to 2010 years and 20 % in 2020 years

Fund on energy efficiency

- **Destination of the Fund-financial support of works on energy efficiency and development RES.**

- **Formation of means of Fund:**
  - ***Assignments the Governments not less than 10 % of volume of Fund.***
  - ***Financial receipts from sponsors.***
  - ***Commission percent from contracts financed by Fund.***
  - ***Credits.***

Share of different types RES in power balance RM to 2010 (forecast)



Planned results

- Reduction of import of organic fuel by 2010 on 7,0 - 8,7 PJ (167 - 210 thousand t.e.p./years).
- Decrease in emissions of gases with hothouse effect on 75,4 thousand tone.
- Increase of energy security of the country;
- Creation of new workplaces - more than 5000

RENEWABLE ENERGY PROJECTS AND BUSINESS PLANS

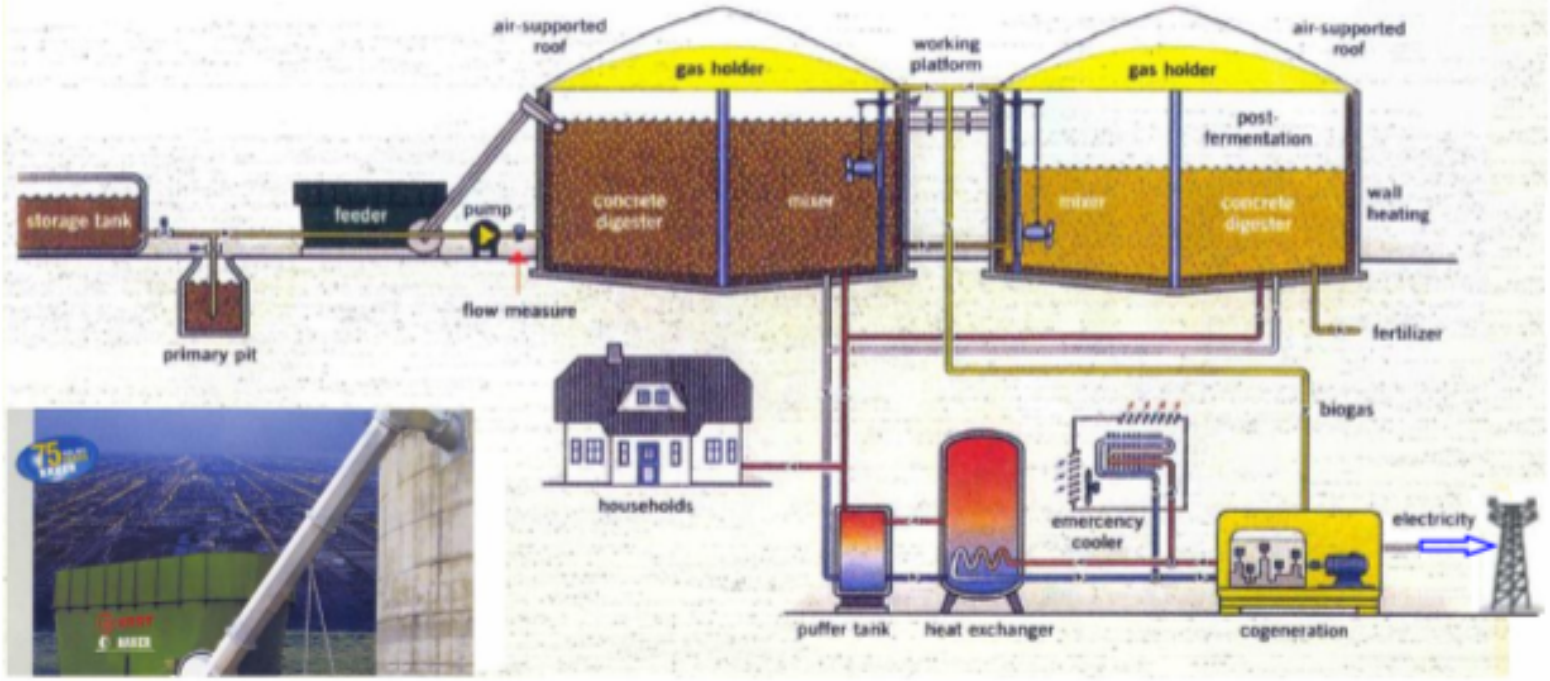
APPROVED BY THE COORDONATING COUNCIL FOR THE USE OF RENEWABLE ENERGY ESOURCES ESTABLISHED IN CONFORMITY WITH ORDER BY PRIME MINISTER NR. 0919-25 OF 04.01.2006

Nr. d/o	Project title	Organization / executing enterprise /responsible for the project	Project cost USD/EURO/Lei	Project implementation period
1	Creation of a Base Center for production of alternative bioenergy carrier –ETHANOL in the Cahul region of the Republic of Moldova	Agency for Innovation and Technology Transfer of the Academy of Sciences of Moldova	15 million USD	1 year
2	Implementing technologies that use solar energy	„ANSTECMET" Ltd, Vasile Şelaru, Chişinău, Republic of Moldova	€ 75 040	1 year
3	Obtaining ETHANOL by processing wheat, corn, raw alcohol from sweet sorghum, ether-aldehyde wastes and diffusion oils	„Avante" Ltd, SA „La plopi", Republic of Moldova	37.3 million lei	2 years
4	Production of biodiesel from rapeseed oil. The productivity 5000 t/year	„TRITAL – NORD" Ltd, Victor Tutuc, Chişinău, Republic of Moldova	12 million lei	2 years
5	Manufacture of processing line for sweet sorghum	SA „ARTMET", Chişinău, Republic of Moldova	540 thousand lei	3 years
6	Manufacture of wind power plant with the power of up to 10 kW	SA „ARTMET", Chişinău, Republic of Moldova	363 thousand lei	1 year
7	Manufacture of installation for producing wood briquettes and granules vegetable wastes and manufacture a device for crumbling the raw material	SA „ARTMET", Chişinău, Republic of Moldova	260 thousand lei	1 year
8	Manufacture of solar plant for heating water	SA „ARTMET", Chişinău, Republic of Moldova	154 thousand lei	1 year

Nr. d/o	Project title	Organization / executing enterprise /responsible for the proiect	Project cost USD / EURO / Lei	Project implementation period
9	Creating and launching an enterprise producin biodiesel with the productivity 5000 tons a year.	SRL „Paciole", Valeriu Manole, Drochia, Republic of Moldova	€ 2 million	2 years
10	Implementing new equipments and technologies for protection of metal structures from corrosion with energy conservation effects in natural gas systems	Experimental Implementation Studio (Workshop) "COVIPR", Chişinău, Republic of Moldova	1,5 million lei	1 year
11	„Livestock complex for reproducing and breeding suina for meat in Ungheni region, with production of renewable energy"	S.C. „AGRODAVA GRUP" S.A., Republic of Moldova	13 million lei	2 years
12	Building a 20 MW windmill (pilot project)	„Infusion Company", Portugal	€32 million	2 years
13	Pilot project for building a plant for the production of bioethanol from wheat and corn in the Republic of Moldova	„Semințe Nord" SA, Republic of Moldova, „VUCHZ", Czeck Republic	€ 40 million	1 year
14	Building a high tech industrial complex for the use of solar energy using poli- and mono-crystals of silicium in Cahul region	„S.T.B. Advanced Technology Ltd", Great Britain	€ 100 million	3 years
15	Production of biofuels in the Republic of Moldova	„Fuel Makers", SUA	43 million USD	2 years
16	Obtaining electric and thermal energy by burning used tyres	„POLYCOMP", Cehia	€ 25.7 million	1 year
17	Building plants for production of biodiesel from vegetable oils in the Republic of Moldova	„Moore şi Asociații" SRL, Romania	€ 2.46 million	2 years

PIG-BREEDING FARM AND PRODUCTION OF RENEWABLE ENERGY

The „AGRODAVA GROUP" Ltd. Is launching in Ungheni region of the Republic of Moldova a livestock complex for production of 1800 tons of meat a year. The bioenergy installation will allow to regenerate biogas from animal dejections (and generating electric and thermal energy)



The efficient use of **6,600 tons** of dejections accumulated yearly will make it possible to obtain:

- ***230,000 m3 of biogas*** (CH4- 60%, CO2- 36%, H2S – 3%) and caloric power – 21,5 MJ/m3, the equivalent of:
- ***137,000 m3 salebale methane gas*** (CH4- 99%) with caloric power – 35,0 MJ/m3.
- Generation of the mentioned biogas quantity makes it possible to obtain:

370,000 KW·h of electric power a year, while the livestock farm needs ***55 – 60 thousand KW·h/year***, and ***483 Gcal*** of thermal energy a year, the livestock needs ***20-25 Gcal/year***.

Total project cost - ***13 million lei***

PRODUCTION OF BIOFUEL IN THE REPUBLIC OF MOLDOVA
„Fuel Makers", SUA

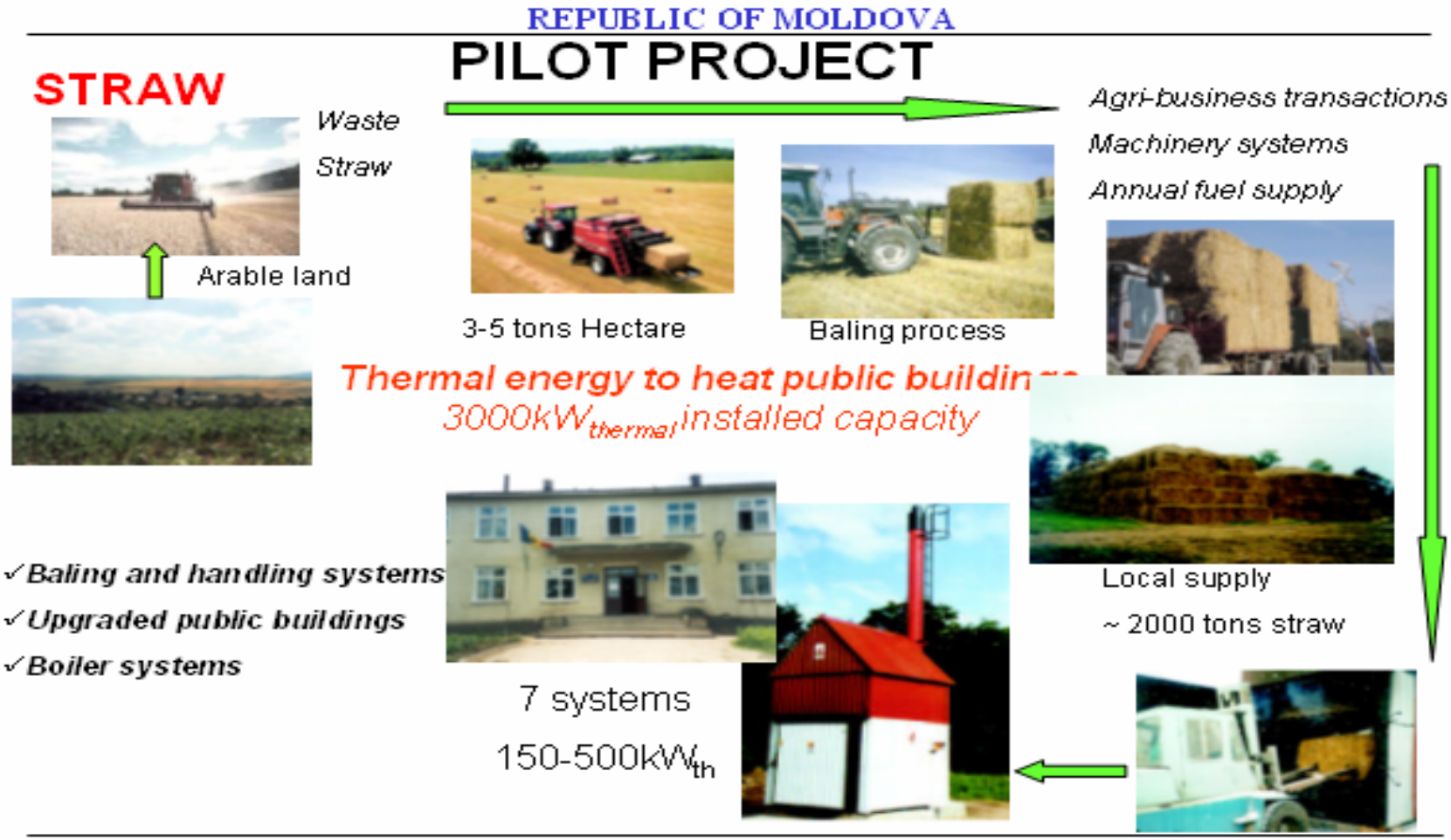
- **Project objective:**

- Building a plant for production of biofuel in Drochia with the capacity **60 mln. litre/year;**
- Implementing a new **tehnology** for production biofuel from cellulose
- Creating a **new market** of **$10 million** a year for local agricultural producers

- **Financial indicators:**
  - Total project cost - ***34 mln. USD***

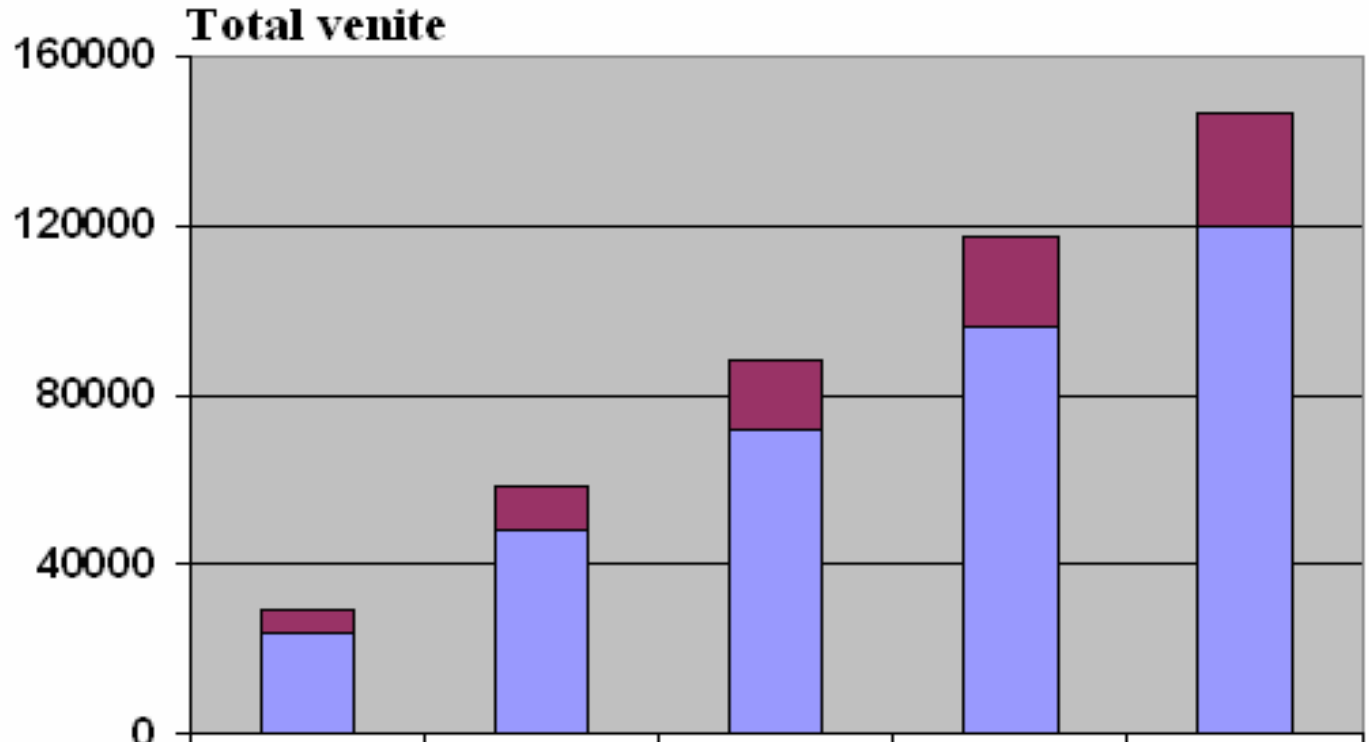
- **Social effect** - ***200 new jobs***
  Average wages - ***6,000 lei/month***

Renewable Energy from Agricultural Wastes – first experience for the Republic of Moldova



Report of the V.Cosarciuc , Seminar CTI, Kiev, Ucraine, 27/29.07

Expected venite at using of the straw



	20 ha	40 ha	60 ha	80 ha	100 ha
Venite of the straw, MDL	5 280	10 560	15 840	21 120	26 400
Venite of the wheat, MDL	24 000	48 000	72 000	96 000	120 000

1 tone straw= 550 kg coal

BUILDING 220 MW WINDMILLS

- **Project objective:**

Financing, building and operating Windmills in the Republic of Moldova with the total power of 220 MW:

- **The first stage** will include financing, building and operating a 20 MW Windmill. Implementation period of the first stage: 1 year and 8 months, including building the windmill – 7 months.
- **Second stage**, will begin one year later, and includes financing, building and operating windmills in different zones of the country with the total power – 200 MW.

- **Financial Indicators:**
  - Total project cost – ***€32,6 mln.***;
  - The cost of one installed MW – ***€1.63 mln***;
  - The cost of production of 1 kWh – ***4.1 c€;***
  - The INFUSION company asks the tarrif – ***8,67 c€/kWh*** for ***15 years***;
  - The investment will be justified in – ***7.3 years***

- **Social effect** – ***400 new jobs***

THANK YOU FOR YOUR ATTENTION

Vă Mulţumim pentru atenţie

12-13 November 2007, Gavlat, Croatia