Biogas in Latvia.

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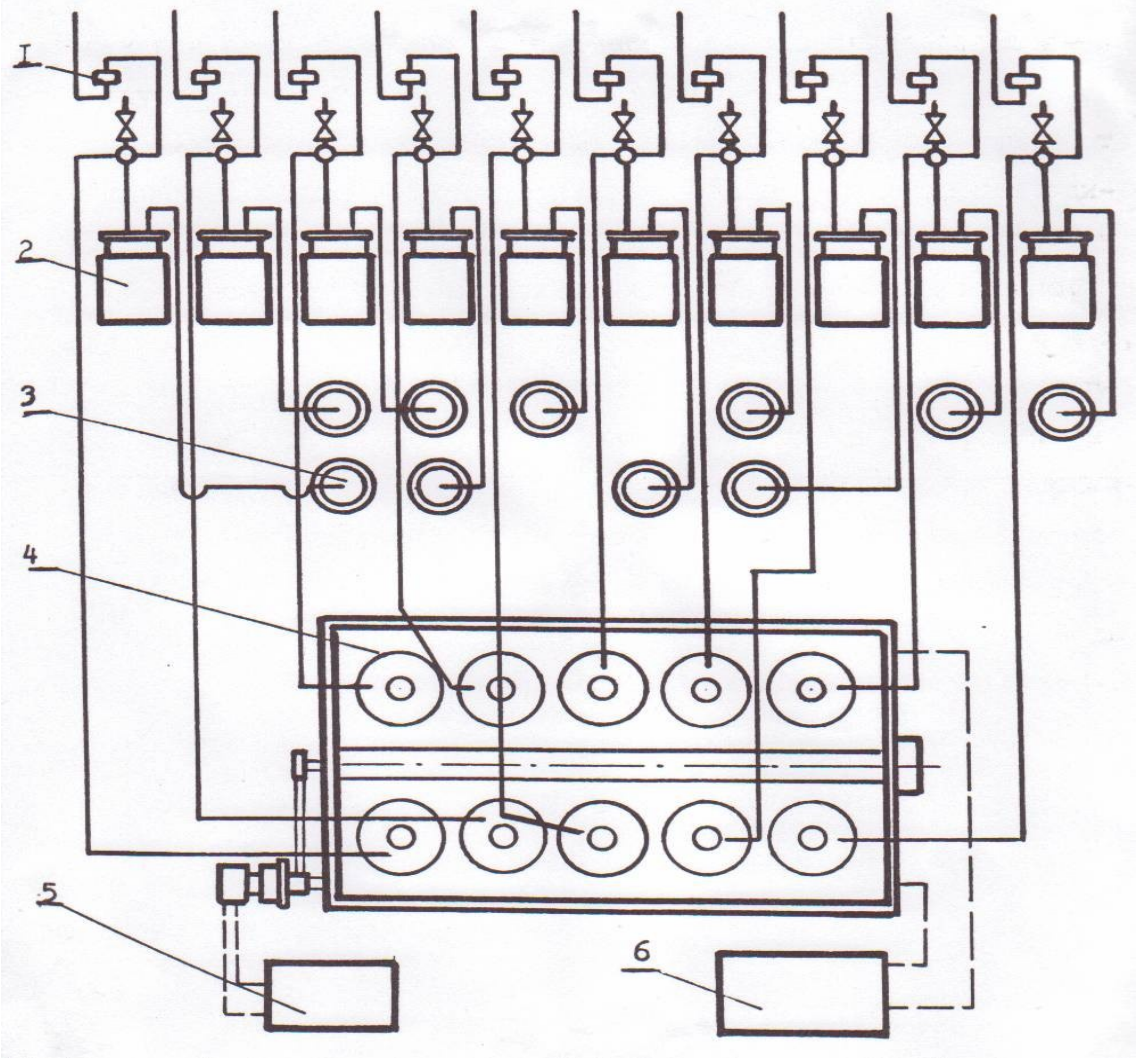
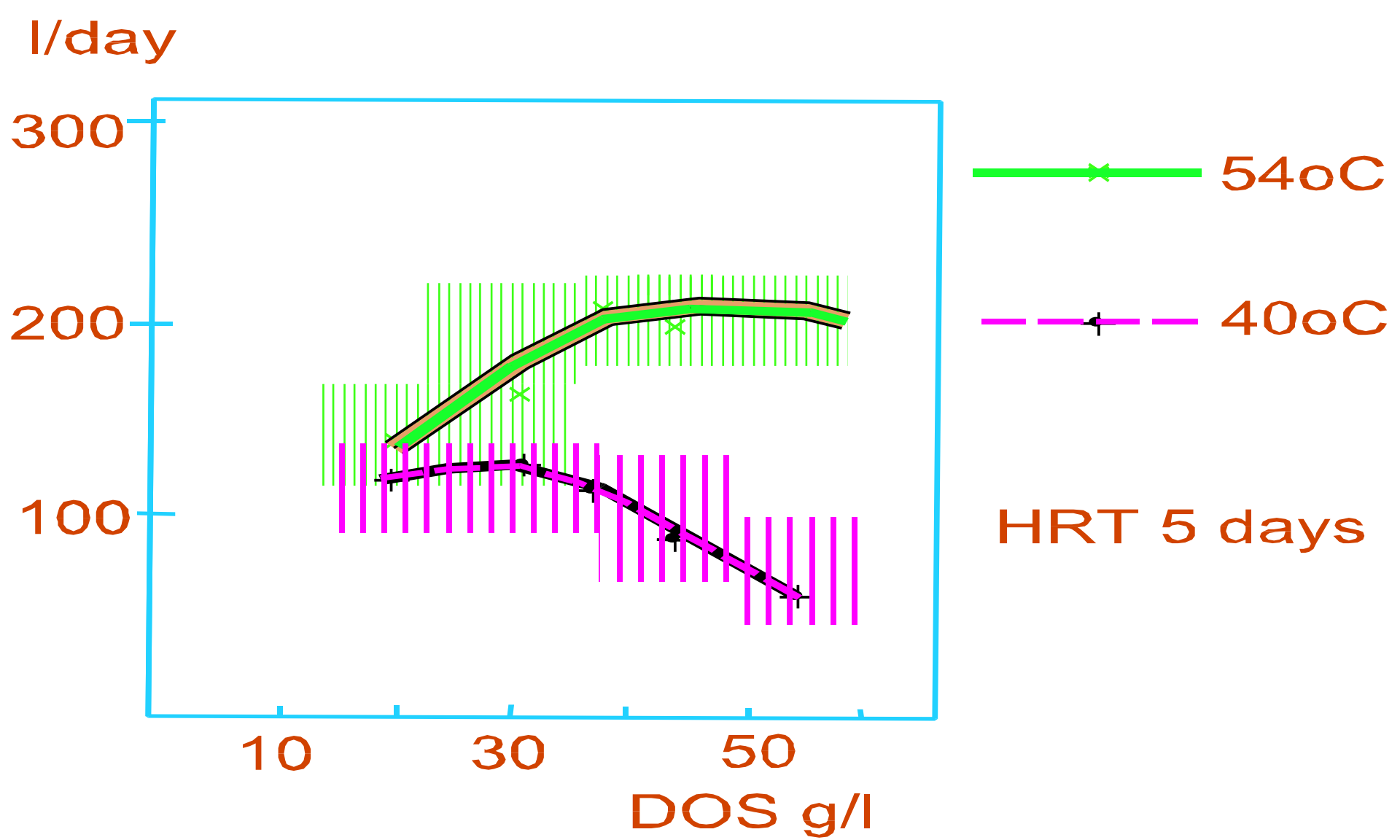
Laboratory at the pig complex.

- There were 21 selfmade digester 3l-1m3 volume and many technical devices.
- From 1981-1990 many experiments were done. We estimated the biogas yield for many biomass (manure, residue e.t.c.)
- By equipment B4 we made investigations for biogas yield, when temperature range within 28oC with step 2oC.
- Help by two units digesters of 75 l volume we investigated factors that have influence on biogas generation.

Laboratory equipment B10

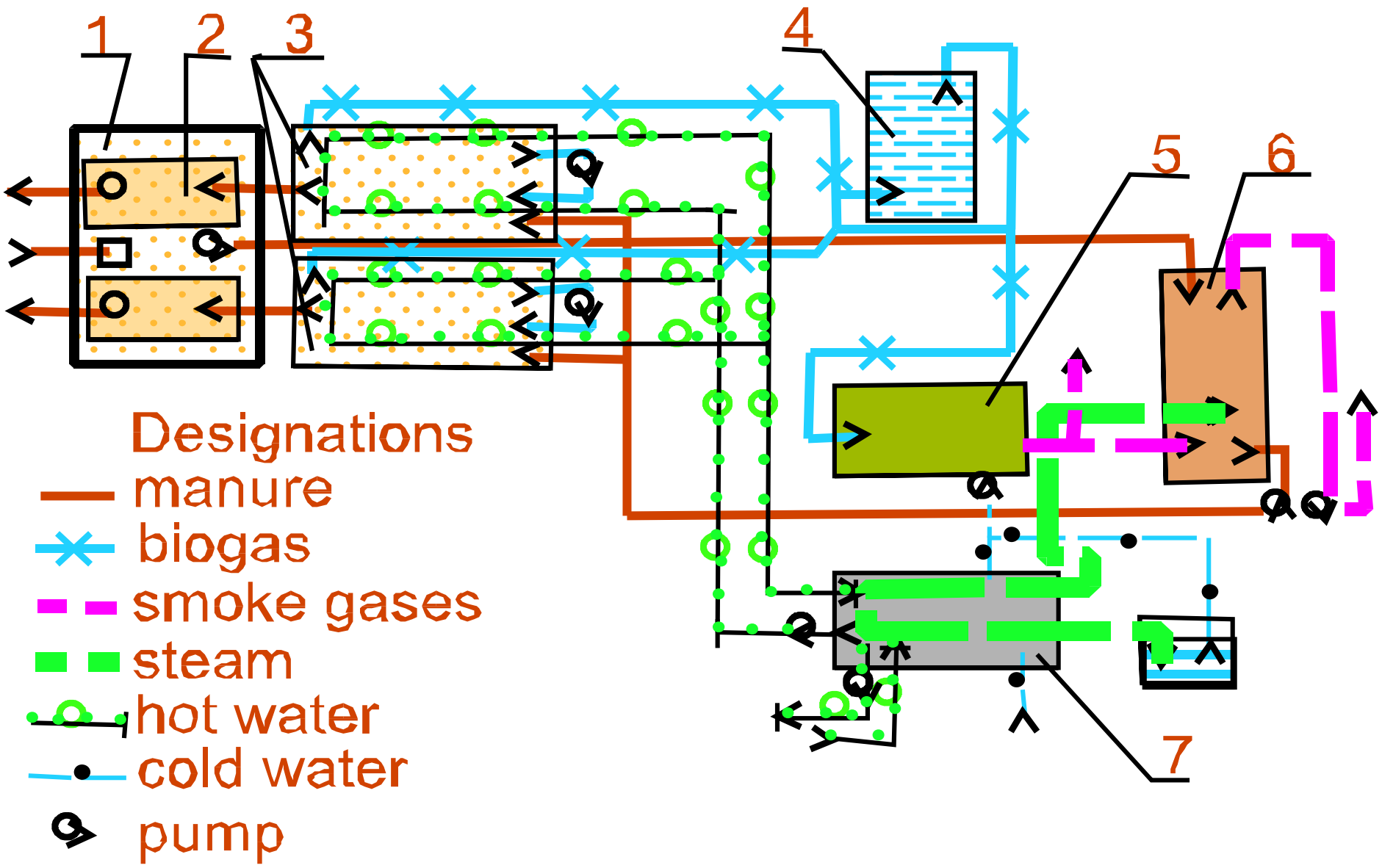


Laboratory equipment B10 for investigation of anaerobic digestion.
1-manometer; 2-gasholder; 3-vessel for water; 4- heated room with 10 digesters;
5-devices for automatical mixing; 6- devices for automatical heating.



Loading rate according to temperature.

Biogas plant for manure produced by 3000 pigs.



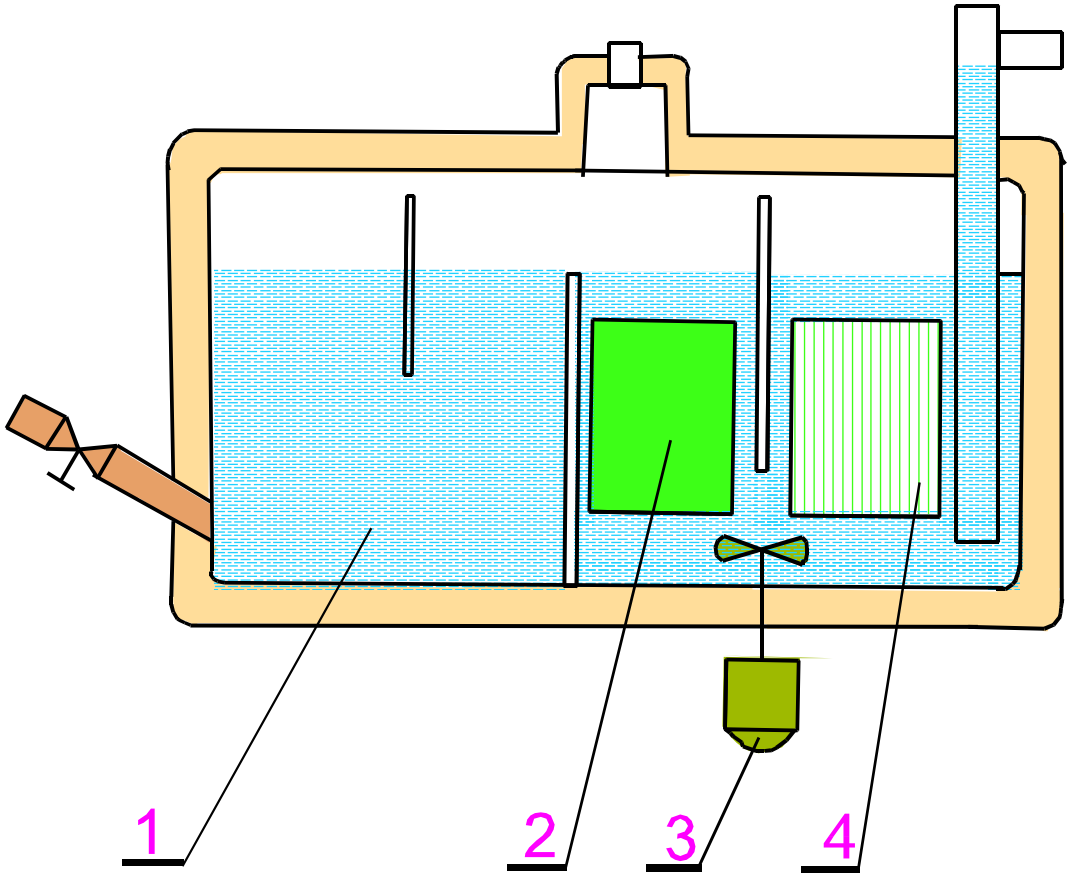
Average results

Name	Units	Results. Investigation period 730 days
Biogas yield	m^3/day	264,87
Energy from biogas	MJ/day	6091,92
CH_4 yield/kg DOS loaded	m^3/kg DOS day	0,320
CH_4/m^3 manure in digester	m^3/m^3 day	1,7
Biogas yield	m^3/kg DOS day	0,518
CH_4 content	%	64
Loading rate	%	18,25

Our technology based on:

- high temperature 54oC thermophile process, because it give sanitation effect,
- short time HRT-5 days, because it destroyed only general part quickly degradable part of organic matter and other part slowly degradable matter- benefits for soil microorganisms for humus building.

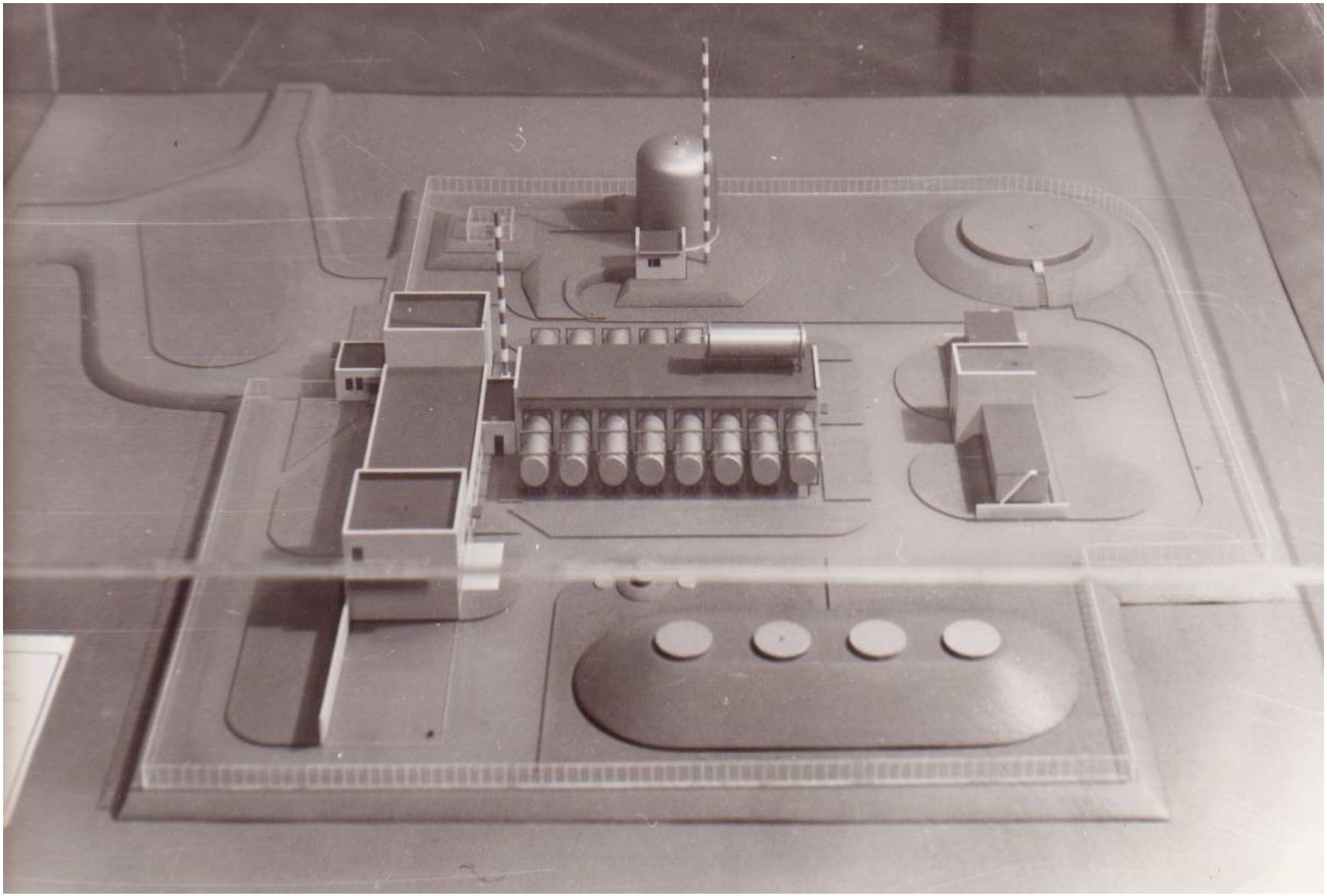
Module digester scheme



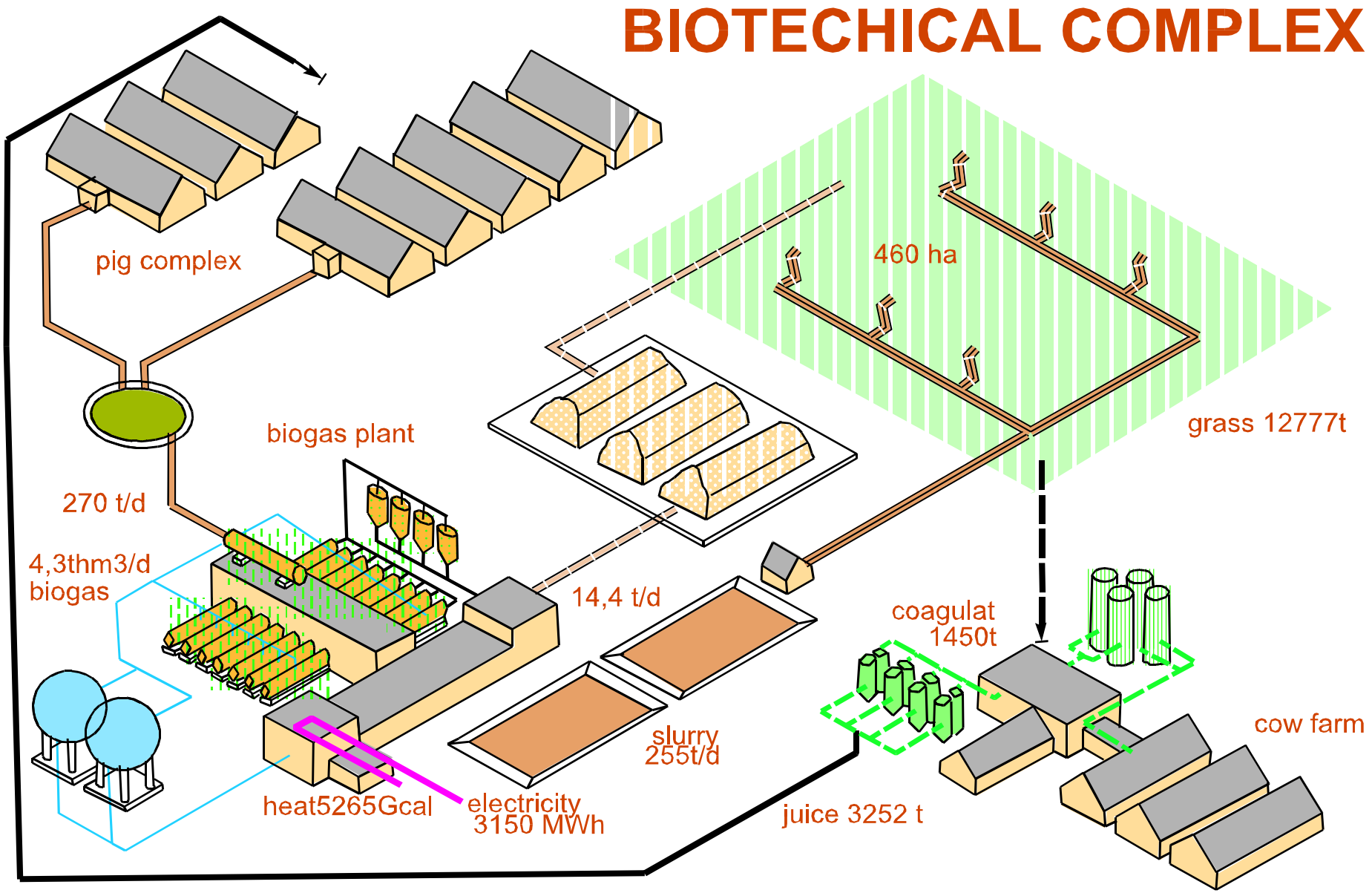
1-substrate; 2-container for bacteria immobilisation; 3-mixing device;

4-container for immobilisation of methane bacteria

Model for biogas plant for pig complex

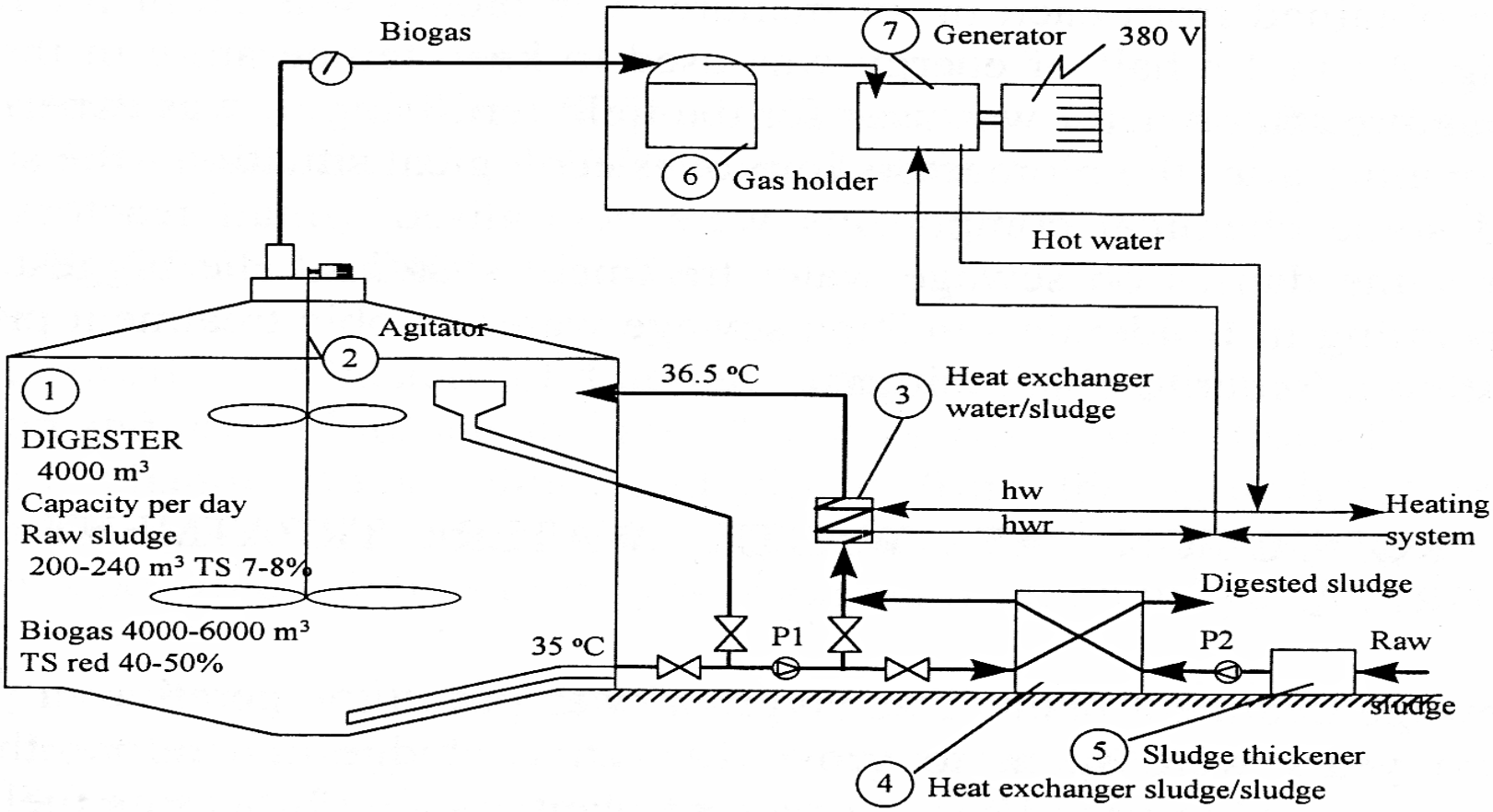


Scheme of biotechnical complex



Biogas production at waste water treatment plant

- Riga waste water treatment plant produce 400-500 m3/h biogas. There are two digesters as in scheme



Biogas from Riga landfill Getlini

Year	Biogas Nm^3	CH_4 Nm^3	CH_4 %	Electricity kwh	Heat kwh
2002	2549000	1274500	50,0	5098000	6245000
2003	8191011	4375839	54,1	17887400	21912062
2004	12633270	6648138	52,6	25748300	31544970
2005	12212326	6435980	52,8	25425000	31365740
2006	13450766	6609525	49,15	26391000	33432652
2007	13707697	6894972	50,3	27361000	34582455
2008	14632290	7242984	49,5	28742000	35678932
2009	15944674	7844780	49,2	31130000	38673492

Biogas from energy crops.

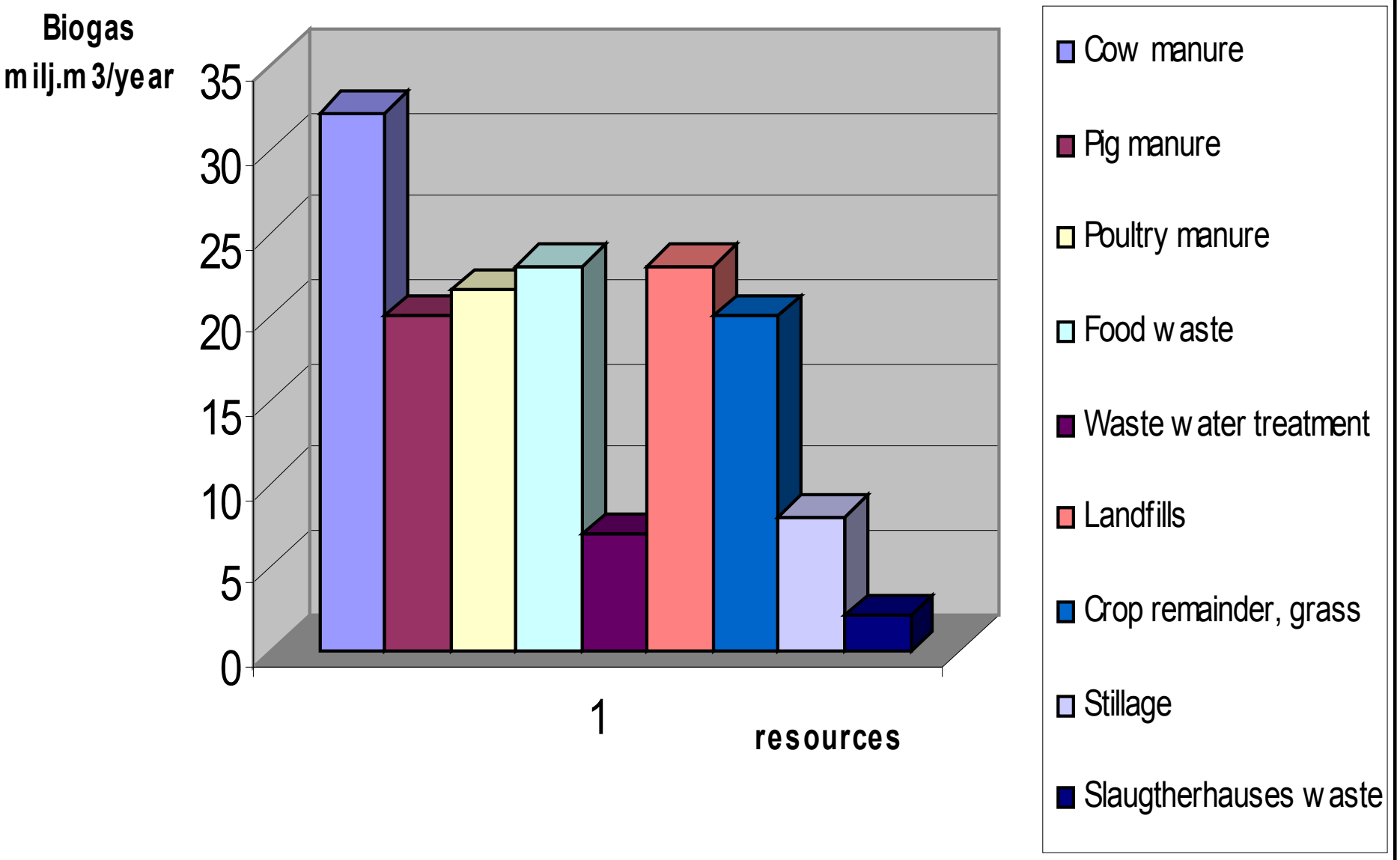
- First biogas plant, was built in our University Research farm Vecauce, which use cows manure and maize silage. It start to produce biogas in year 2008.
- Today it works according as planed 260 KWel and 356 KW th.
- Second biogas plant, which produce biogas from cows manure and maize silage start January 2010. It is foreseened there power about 0,8-1MWel
- Total biogas potential from energy crops is aproximatly 1200 milj. m3/year, because there are many ha free land in Latvia

Biogas plant in Vecauce

Potential for biogas production in Latvia

Nr.	Resource	Dry biomass t/year	Biogas milj.m^3/year	Energy MWh/year
1.	Cow manure	107300	32,2	193295
2.	Pig manure	44400	20	118830
3.	Poultry manure	43159	21,6	129478
4.	Food waste	57500	23	138000
5.	Waste water treatment	23000	7	42000
6.	Landfills	400000	23	138000
7.	Crop remainder, grass	80000 (800000)	20(200)	120000 (1200000)
8.	Stillage	20000	8	64000
9.	Slaugtherhouses waste	3500	2,1	12600

Potential of producing biogas in Latvia



BIOGAS PROGRAMME 2007-2013

- **Government priorities for energetics for next 10 years:**
- Selfconsuming of electricity at year 2016 will be 100%. For it is need more than 700 MWh new power
- Consuming of local energy resources will increase from 65 PJ till 82 PJ 2016 year.
- At year 2010 electricity production 49,3% from renewable resources.
- At year 2016 increasing coogeneration units from biomass. For it foreseen 90 millions LVL
- **Project of Biogas programme foreseen:**
- Every year to realize 2-3 biogas plants (total 13)
- Every year from state budget to support biogas projects financially 0,7-14 millions LVL (total 30,4 million LVL)

Last activities.

- Support for renewable resources was started at 2009 as feed in tariff. It was good enough (0,13 LVL/kwh) and about 70 owners ask for quota for electricity selling, but received about 32. From them in 2010 really possible finishing building 10 biogas plants. For next will be more difficulties, because Ministry of Economics is planing to decrease tariff value. Today continues disscussion about new Law of renewables resources.
- Of course, it is small progress, but this is for start activities and I am sure- biogas technology will find development step by step in our country too.

THANK YOU FOR ATTENTION