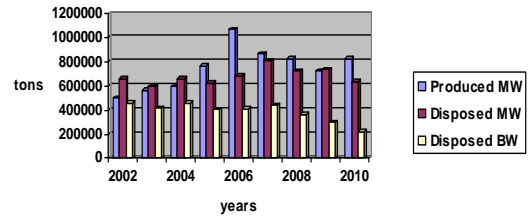


Treatment solutions, biowaste quantities and experiences with separate collection in Latvia, the RECO Tech 21 project experience

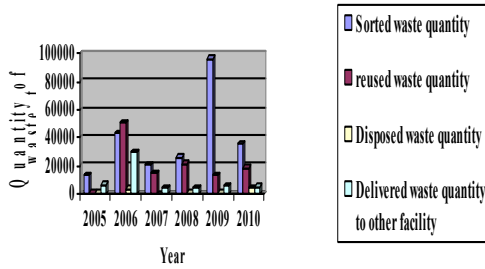
Dr. Ruta Bendere, LASA, Latvia

Municipal and biowaste disposal in Latvia



Quantity of produced organic waste and tipe of their utilization years

2005-2010



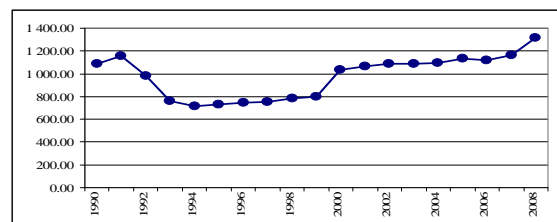
Quantity of produced, treated and utilised sludge in Latvia during 2007-2010 (tons of dry mass per year)

Year	Produced	Treated	Untreated	Used in agri culture	Composted	Incinerated	Stored	Other
2007	23259	18191	5068	8131	2066	0	8586	205
2008	22486	18093	4392	5249	2784	1,93	10943	927
2009	22 684	17 242	5442	7259	3402	0	9074	2949
2010	21751	18140	3612	9524	2269	0	7289	993

Organic waste quantity disposed in landfills

Type of waste	Disposed 2005, (t)	Disposed 2006, (t)	Disposed 2007, (t)	Disposed 2008, (t)	Disposed 2009, (t)
Organic waste as part of unsorted waste	313 106	337 590	413 944	358 540	380 354
Different organic waste	12 689	17 899	7 588	7 725	13 881
Total:	325 795	355 489	421 532	366 265	394 235

Total emissions from Waste sector in CO₂ equivalent (Gg)



Planned results for bio waste streams

Waste Management Plan for Latvia
from 2006. till 2012.

Waste type	Result	Year to be implemented
Bio degradable waste (disposed in the landfills)	To reduce the disposed quantity of biodegradable waste till 75% comparing with the year 1995.	2010.
	To reduce the disposed quantity of biodegradable waste till 50% comparing with the year 1995.	2013.
	To reduce the disposed quantity of biodegradable waste till 35 % comparing with the year 1995.	2020.

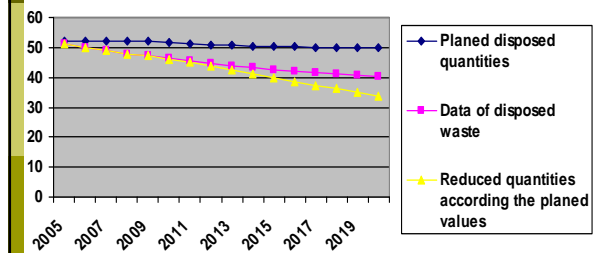
The stated quantities for the disposal and treatment of bio waste, year 2010-2020

Year	The forecasting quantity of produced bio waste, t	The amount of bio waste to be disposed, t	The amount of bio waste to be treated, t
2010	607 000	345 000	262 000
2013	632 000	230 000	402 000
2020	691 000	161 000	530 000

Correlation between the disposed quantity of biowaste and methan gas production in the landfills

year	Disposed biowaste quantity (t h. T)	Produced CH ₄ quantity (Gg)	Part of produced biowaste in landfills, t h. T	Produced CH ₄ quantity (Gg)	Disposed according the waste plan, t h. T	Produced CH ₄ quantity (Gg)
2005	611	43,98	326	23,47	326	23,47
2006	670	48,24	356	25,63	356	25,63
2007	775	55,81	421	30,38	421	30,38
2008	704	50,74	366	26,35	366	26,35
2009	637	45,90	394	28,37	394	28,37
2010	607	43,70	400	28,8	345	24,84
2011	615	44,28	406	29,23	307	22,10
2012	624	44,93	412	29,66	289	19,37
2013	632	45,50	417	30,02	230	16,56
2014	640	46,08	422	30,38	220	15,84
2015	649	46,73	428	30,82	210	15,12
2016	657	47,30	434	31,25	200	14,4
2017	665	47,88	439	31,61	190	13,68
2018	674	48,53	445	32,04	180	12,96
2019	682	49,10	450	32,40	170	12,24
2020	691	49,75	456	32,90	161	11,59

Calculated amount of methan gas produced from disposed organic waste (Gg), years 2005. - 2020.



PILOT PROJECTS OF BIO WASTE COLLECTION AND COMPOSTING

- The project "Treatment of Biodegradable Organic Municipal Waste Using Composting Technologies" (LIFE programme 2003-2005) promotes the reducing of organic waste quantities disposed in landfills by introducing the elaborated biotechnologies for rapid and high quality composting for separately sorted and collected biodegradable waste streams.
- The main goal of the project was to create an optimal scheme for local municipalities for the separation and collection of the municipal biodegradable waste and to elaborate and apply appropriate composting technologies on pre industrial scale, as well as to provide the high quality compost from the biodegradable municipal waste.

Collection of bio waste using bio degradable sacks and system - container to container



The treatment method of bio waste was detected by:

- Content of waste;
- Type and extent of possible pollution;
- Economical aspects;
- Technical and technological possibilities.

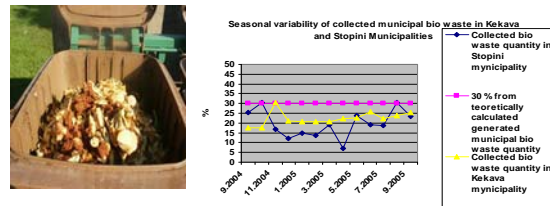
Experimental composting of municipal household waste using windrows and pits



Composting using closed system (bioreactor)



Results of the project



The main prepositions for bio gas production in Latvia

- The development of biogas production will increase the part of renewable energy sources in the total energy consumption in Latvia
- The usage of biogas will support the independence of Latvia in the energy market
- It will reduce the pollution created by unsuitable disposal of bio waste and emissions of CO₂ and metan gas.
(The program for development of biogas production, years 2008-2011)

Evaluated biogas production potential in Latvia (2005 – 2013)

Potential branch for bio gas production	Characterization of facilities	Quantity of waste t, 10 ³	Quantity of bio gas, mill.m ³	Year 2005 mill. m ³	Year 2013 mill.m ³	Planned bio gas production
Farming of pigs	23 biggest farms (>10 000 pigs)	83	41	-	20	95 mill.m ³
Waste water treatment plants	The central treatment plants	25	15	3	10	5.6 mill.m ³
Disposal of waste	Landfills with gas collection equipment	91	200	20	40	25 thousand tons
Production of beverages	The biggest factories of alcohol and bear production	47				3.4 mill.m ³
Meat production	Slaughter houses	8				10.65 mill. m ³

The bio gas production facilities from biowaste in Latvia

The total energy production from biogas – 7.7 MW per year:

- Ltd. "Rīgas ūdens" waste water bio treatment facility "Daugavgrīva" produce 2.096 MW from anaerobic sludge digestion;
- Sanitary landfill "Getliņi" (Riga district) produces 5.24 MW of energy from landfill gas;
- Sanitary landfill "Kivītes" in Liepāja region produces 450 kW of energy from landfill gas (there is planned additional generator of 1 MW).
- Sanitary landfill "Daibe" – Valmiera region (~1MW)

Getliņi landfill gas collection station



- The volume of biogas per year (calculated to CH₄) – 7844760m³ or 78011000kWh
- There are produced 40% of energy as electricity and 46% as heat

The maintenance of waste water sludge (the real situation, main reasons)

- About half of produced sludge (by dry mass) are stored and not used in spite of stated requirements – after three years of storage non used sludge must be disposed in a landfill
- The main reason for that is the allowance of the regulation to implement as the treatment method the long - term storage which is cheap and simple technology
- In the same time farmers are not interested to receive smelling and wet sludge (there is less evaporation of humidity as rainfall in Latvia) which is hard to use as fertilizer with common agricultural machines.

Composting of sludge



Composting of sludge in L.t.d. "Liepājas ūdens"

Parameters of sludge compost prepared in Ltd. "Eko Terra" and "Liepājas ūdens"

Parameters	Sludge compost from "Eko Terra"		Sludge compost from "Liepājas ūdens"	
	Lowest value	Highest value	Lowest value	Highest value
Heavy metals				
Cd, mg/kg	1,1	2,5	1,1	1,5
Hg, mg/kg	1,3	1,7	0,77	1,26
Cr, mg/kg	49	80	54,6	75,6
Pb, mg/kg	24	130	37,7	54,3
Zn, mg/kg	515	820	392	508
Ni, mg/kg	15	40	12,4	15,4
Cu, mg/kg	148	260	78,1	110

Parameters of sludge compost prepared in Ltd. "Eko Terra" and "Liepājas ūdens"

Parameters	Sludge compost from "Eko Terra"		Sludge compost from "Liepājas ūdens"	
	Lowest value	Highest value	Lowest value	Highest value
Agrochemical parameters				
Reaction of media (pHKCl)	6,42	7,14	5,68	7,77
Content of organic matter in dry mass (%)	37,1	45,0	51,9	66,3
Content of nitrogen in dry mass (g/kg)	13,0	29,0	19,9	27,0
Content of phosphorous in dry mass (g/kg)	8,0	19,0	9,44	16,5
Dry mass (%)	30,3	50,0	33,6	45,7




RECO Baltic 21 Tech supports the development of the waste management systems and prepares for investments in the BSR to meet actual demands.




"Meliorators - J" Ltd.

Gaujas 17, Mārupe, Mārupes nov., LV-2167, Latvia

- Solutions proposed by "Meliorators-J" within the project
 - Composting of green and biodegradable municipal waste by
 - open air composting and composting by supplying additional air,
 - composting in bio-reactor.
- The territory of composting field – 0,2 ha and whole necessary territory – 0,5 ha
- Amount of compost to be produced – ~8000m³/year
- Potential budget till the end of 2013 - ~ 75.000 €




Composting site of Ltd "Meliorators J" in Marupe




Malpils Biotechnology Center Ltd.



Recycling of the sewage sludge and other natural organic waste using the vermicomposting



- Composting of organic mater
- Feeding compost to earthworms
- Receiving vermicompost/biohum uss

CONCLUSIONS

- Multi- tonnages of municipal waste, wood processing waste and water treatment sludge can be considered as perspective organic raw materials for bioconversion as an alternative method to their disposal.
- The bio waste composting using windrows were selected as the main method for bio waste treatment.
- Till the year 2012 there are planned to be built more than 50 new composting sites. ~ 10% of them are created and working at present.
- There are no direct legislation demands to compost production from bio waste and its usage.
- The use of bio waste as new bio mass resource can facilitate the "green energy" production in our country and to be one of the possibilities to implement the decision on replacing fossil fuel for renewable materials in the EC.