MBT biowaste residue stabilisation for landfilling Republic of Croatia

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Global Methane Initiative

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Legislation in Croatia

- Croatia is EU member
- EU directives harmonised with Croatian legislation
- Landifll directive (1999/31/EC)
- The Law on waste
- The Rolebook on landfilling
  - Aditional conditions

Conditions for landfilling

- Prohibit landfilling of untreated waste
- Only treated waste can be landfilled
- Waste characterisation
  - Basic characterisation
  - Compliance testing
  - On-site verification
- Limit values for
  - Hazardous landfill
  - Non hazardous landfill
  - Inert landfill

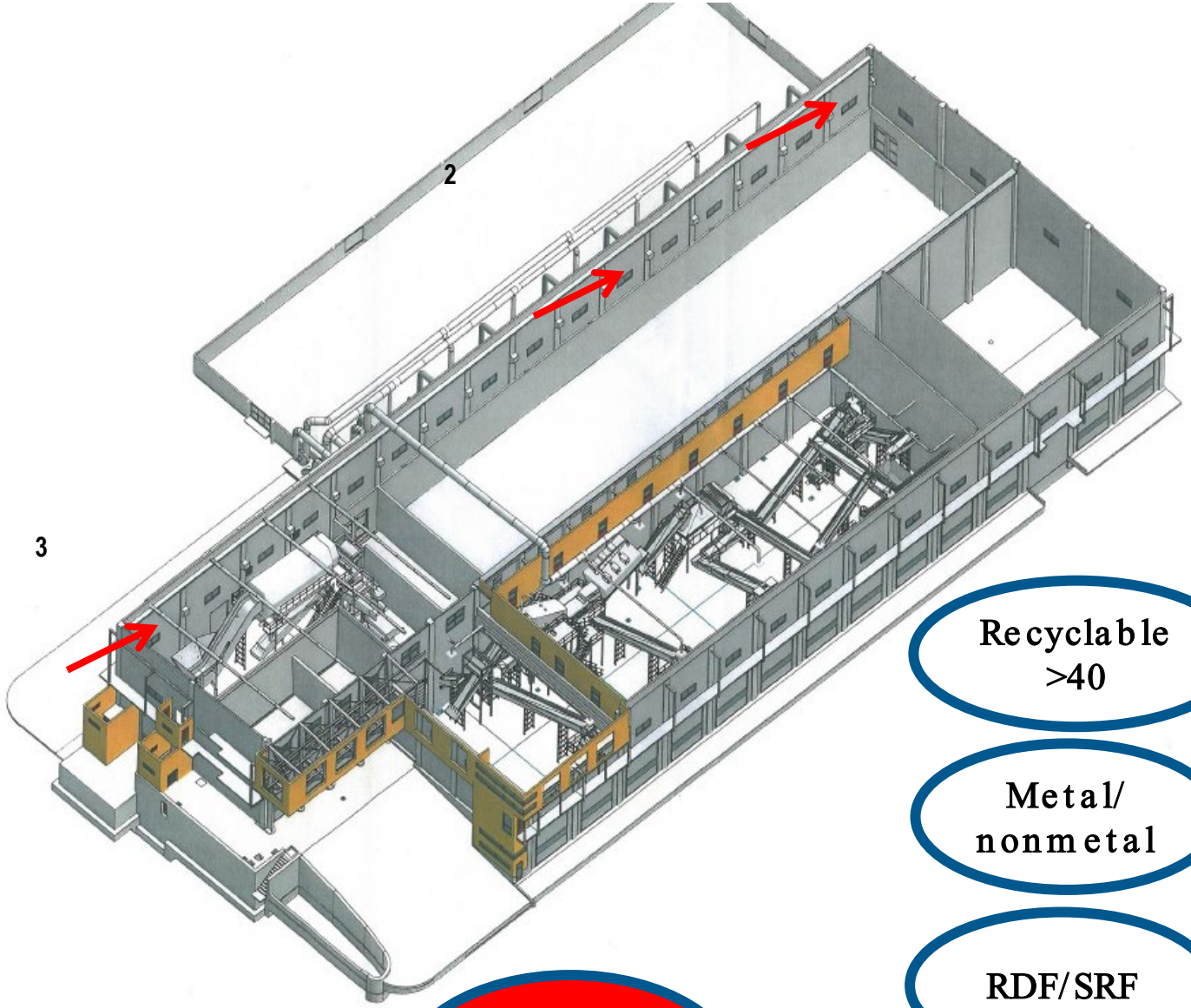
Conditions for landfilling

Parametar	Izražen kao	Jedinica	Granična vrijednost parametra eluata ***T/K = 10 l/kg
Arsen	As	mg/kg suhe tvari	2
Barij	Ba	mg/kg suhe tvari	100
Kadmij	Cd	mg/kg suhe tvari	1
Ukupni krom	Cr	mg/kg suhe tvari	10
Bakar	Cu	mg/kg suhe tvari	50
Živa	Hg	mg/kg suhe tvari	0,2
Molibden	Mo	mg/kg suhe tvari	10
Nikal	Ni	mg/kg suhe tvari	10
Olovo	Pb	mg/kg suhe tvari	10
Antimon	Sb	mg/kg suhe tvari	0,7
Selen	Se	mg/kg suhe tvari	0,5
Cink	Zn	mg/kg suhe tvari	50
Kloridi	Cl	mg/kg suhe tvari	15.000
Fluoridi	F	mg/kg suhe tvari	150
Sulfati	SO_4	mg/kg suhe tvari	20.000
Otopljeni organski ugljik – DOC*	C	mg/kg suhe tvari	3.000
Ukupne rastopljene tvari **		mg/kg suhe tvari	60.000

Parametar	Jedinica	Norme
Parametri biorazgradivosti		
Parametar aerobne stabilnosti		
Realni dinamički respiracijski indeks (RDRI)	mg O_2 kg^{-1} s.tv. h^{-1}	HRN EN 15590:2012
ILI		
AT_4	mg O_2 g^{-1} s.tv.	ÖNORM S 2027-4, HRN EN 16087-1:2012
Parametar anaerobne stabilnosti		
Bioplinski potencijal kroz 21 dan	NL kg^{-1} s.tv.	HRN EN ISO 11734:2002, DIN 38414 – 8, ÖNORM S 2027-2, VDI 4630

MBT – Varaždin

100.000 t/y MSW



Experimental part

- Existing composting plant (old mushrum production area)
- Nine composting piles
- three locations
  - outdoor uncovered area,
  - outdoor covered area and
  - indoors
- Temperature and moisture were measured onsite in composting piles
- Outdoor air temperature, precipitation
- Laboratory measurements of Dissolved organic carbon (DOC)
- Weekly turning of the compost piles
- Inital mass, height

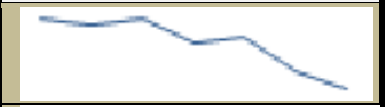
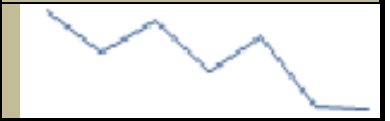
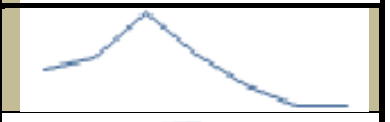
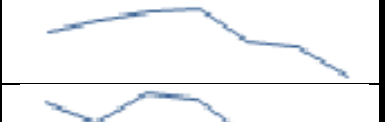
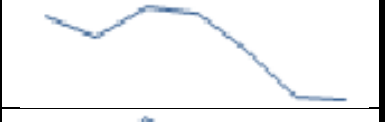
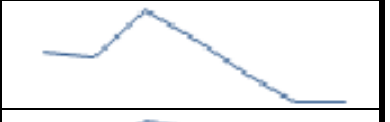
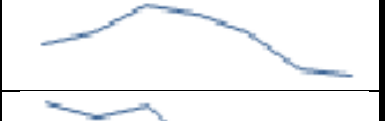
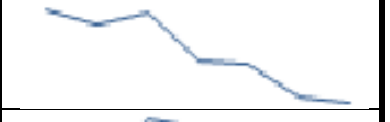
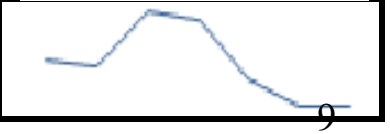
Results and discussion

- KH1, KH4, KH7 no wood chips
- KH2, KH5, KH8 70:30 ratio
- KH3, KH6, KH8 50:50 ratio

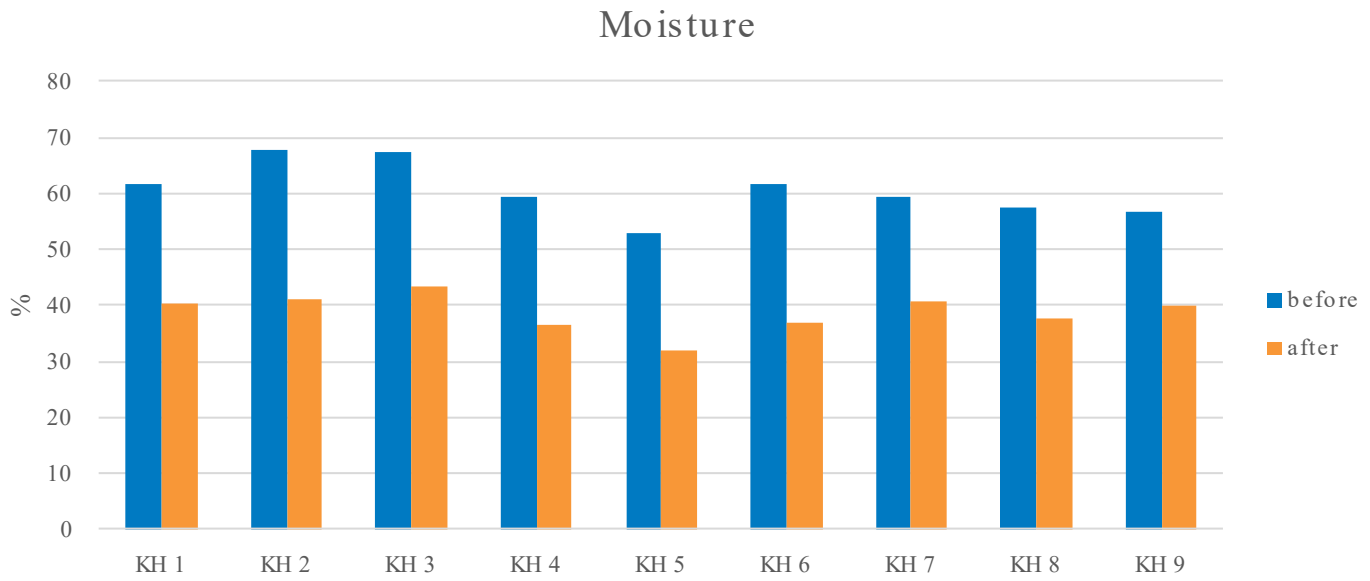
Location	Outdoor uncovered area			Outdoor covered area			Indoors		
	KH 1	KH 2	KH 3	KH 4	KH 5	KH 6	KH 7	KH 8	KH 9
Initial mass, t	5.280	5.048	5.560	6.336	7.352	6.950	5.280	5.718	5.838
Height, m	1	1.1	1.5	1	1.2	1.2	1.5	1.6	1.6
Moisture content, %	61.5	67.7	67.5	59.3	53	61.7	59.3	57.6	56.6

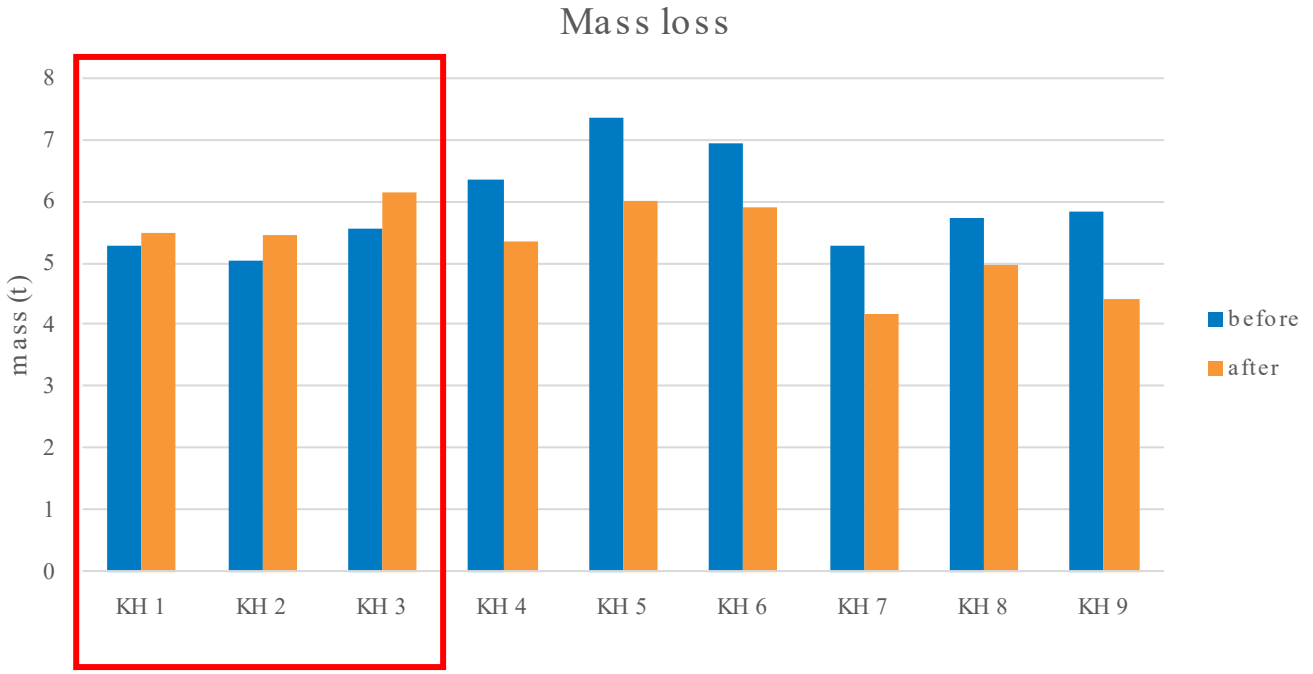
- 84 day process, 21 day rain
- 14 times piles were turned for aeration

Results and discussion

Composition material		27.08.	09.09.	25.09.	07.10.	22.10.	05.11.	19.11.	Trend
		0	14	28	40	55	69	84	
KH 1	100% FF	16,709	15,368	16,469	11,791	13,118	6,770	2,883	
KH 2	70% FF 30% WC	14,815	9,774	13,326	7,340	11,484	2,999	2,651	
KH 3	50% FF 50% WC	7,862	9,809	16,624	10,311	6,002	2,637	2,637	
KH 4	100% FF	16,709	20,396	22,307	23,558	14,559	12,905	4,868	
KH 5	70% FF 30% WC	14,815	11,815	16,341	15,447	10,048	3,587	2,916	
KH 6	50% FF 50% WC	7,862	7,317	12,237	9,068	5,917	2,650	2,650	
KH 7	100% FF	16,709	19,635	26,911	24,196	19,664	10,076	8,709	
KH 8	70% FF 30% WC	14,815	12,857	14,431	8,154	7,522	3,416	2,616	
KH 9	50% FF 50% WC	7,862	7,304	13,343	12,317	6,025	3,046	3,046	

Results and discussion





Conclusion

- Composting of heavy fraction can decrease DOC
- Structural material increase the speed of composting
- The best result – outdoor composting
- 50:50 ratio of structural material and composting material - better result
- Duration 11-14 weeks - conditions for landfilling

Thank You!

Questions?

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