

DETERMINATION AND SENSITIVITY ANALYSIS OF METHANE GENERATION RATE (K) NEEDED FOR LANDFILL GAS (LFG)- EXTRACTION POTENTIAL

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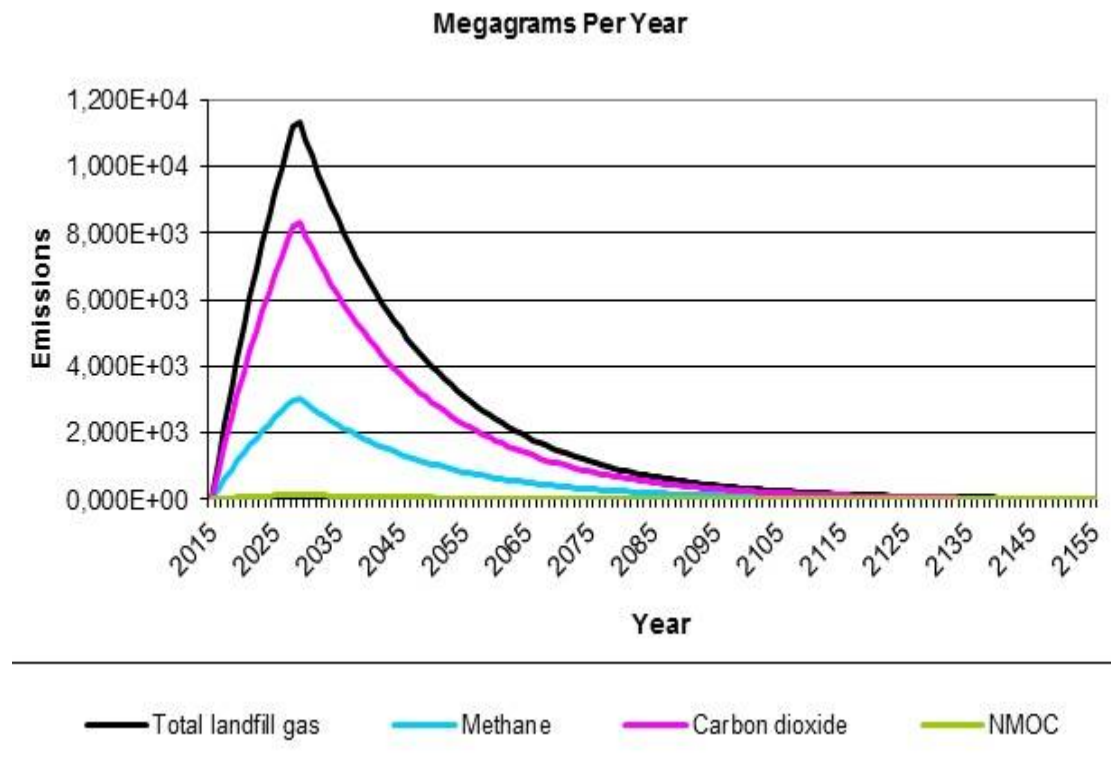


Scope:

- › 3600 landfills in Serbia (2,6 million tons MSW/y).
- › MSW strategy - 24 regional sanitary landfills (>250 000 inhabitants).
- › Methane emissions from MSW last 20 to 80 years after disposal.
- › LFG quantities are generally unknown.
- › Why is this important?
- › LFG - Renewable energy source vs GHG pollution?

LFG estimation parameters:

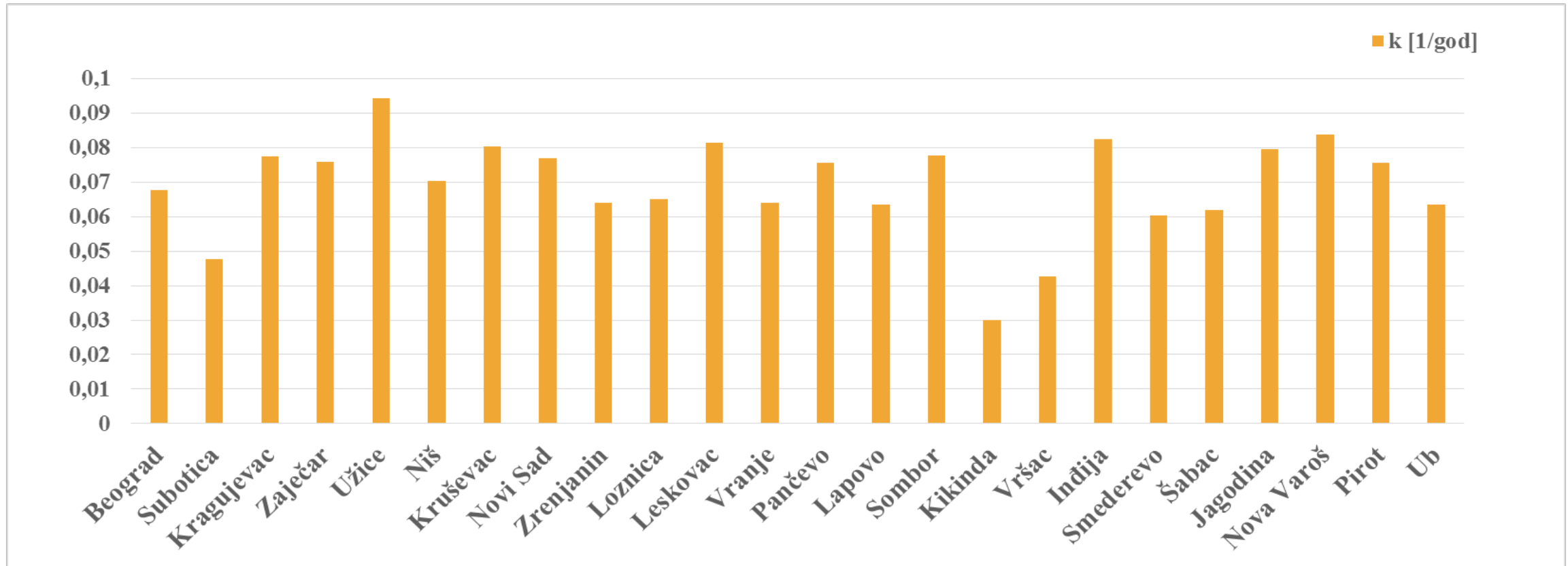
- Methane generation rate - k.
- Methane waste potential - Lo.
- Climate conditions.
- Waste structure.
- Waste disposal quantities for each year.



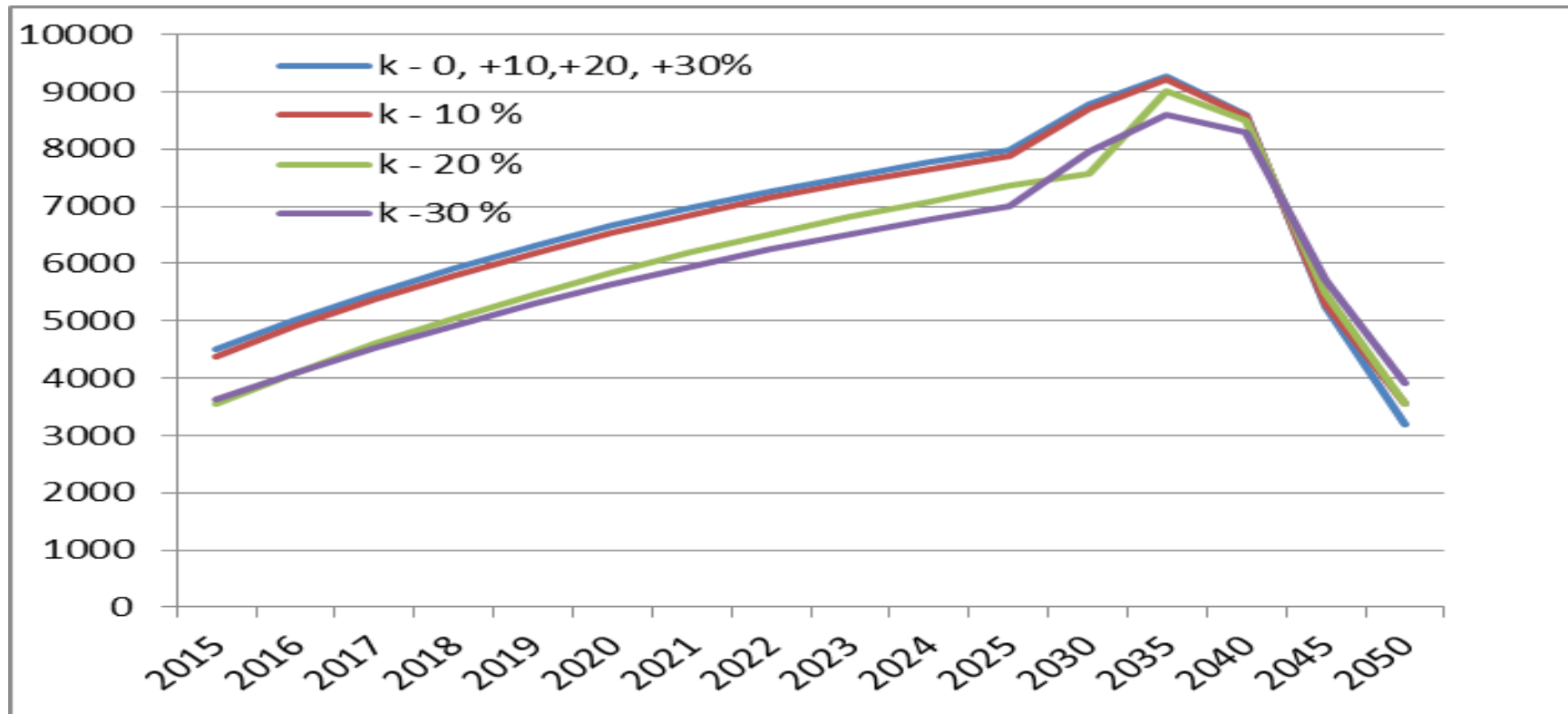
Input data for k-rate calculation:

Br.	Regionalna deponija	Padavine ¹ (mm/m ² /god)	x ₁ [%]	x ₂ [%]	x ₃ [%]	x ₄ [%]	Ostalo [%]
1.	Beograd	680	34,6	6,7	27,7	1,6	29,4
2.	Subotica	571	23,1	10,0	29,9	2,1	34,9
3.	Kragujevac	618	35,3	14,8	17,7	1,6	30,6
4.	Zaječar	581	34,3	18,0	15,0	1,7	31,0
5.	Užice	890	39,8	20,5	11,6	1,9	26,2
6.	Niš	620	41,5	11,4	15,0	0,3	31,8
7.	Kruševac	643	40,8	10,0	21,8	0,4	27,0
8.	Novi Sad	647	36,6	13,8	18,4	0,9	30,3
9.	Zrenjanin	635	35,5	11,6	21,5	0,4	31,0
10.	Loznica	868	37,5	12,5	18,0	4,0	28,0
11.	Leskovac	625	41,0	12,0	16,0	3,7	27,3
12.	Vranje	578	34,8	12,0	24,0	1,0	28,2
13.	Pančevo	622	36,0	18,0	10,7	2,1	33,2
14.	Lapovo	637	30,1	12,1	17,3	2,3	38,2
15.	Sombor	612	36,5	19,0	12,0	2,0	30,5
16.	Kikinda	556	15,0	5,0	18,9	2,5	58,6
17.	Vršac	570	22,0	5,0	8,0	7,0	48,0
18.	Indija	638	7,0	4,0	2,5	1,0	25,5
19.	Smederevo	660	9,0	7,0	3,0	5,5	35,5
20.	Šabac	513	4,0	3,0	8,5	1,0	33,5
21.	Jagodina	619	40,0	2,0	8,5	1,4	28,1
22.	Nova Varoš	826	1,9	11,5	20,1	2,5	34,0
23.	Pirot	504	0,1	5,0	0,2	3,1	21,6
24.	Ub	710	30,0	12,1	17,3	2,3	38,3

K-rate results (24 regional landfills):



K-rate sensitivity analysis:





Conclusion:

1. K-rate was calculated using **GMI** methodology, landfill acquired or estimated data about waste structures and quantities on existing and planned regional landfills.
2. Calculated values of *k-rate* in Serbia are in range 0,03 – 0,09 1/y.
3. Results show that landfills with bigger fraction of organic waste (in mountain regions and in wet climate regions) have highest k-rate values.
4. Sensitivity analysis show dependence upon climate regime change.
5. Leachate water recycling on regional landfills could generate higher methane quantities.