Supplementary Material

Table S1

Classification and weighing of solid waste for the 6 collection and transportation routes in the municipality of Puerto Carreño.

Classification	Type of material	Route E		Route F		Route B		Route A		Route C		Route D	
		Kg	%	Kg	%	Kg	%	Kg	%	Kg	%	Kg	%
Recyclable organic waste	Food waste	7,58	11,32 %	5,1	7,74%	8,98	14,70 %	4,15	6,74%	5,95	8,96%	3,08	4,56%
	Organic waste	9,83	14,68 %	15,25	23,14 %	9,78	16,01 %	16,84	27,36 %	22,04	33,18 %	19,4	28,71 %
Recyclable inorganic waste	Plastics	13,79	20,60 %	5,23	7,94%	7,64	12,51 %	3,75	6,09%	6,87	10,34 %	5,43	8,04%
	Paper	1,03	1,54%	1,78	2,70%	1,69	2,77%	2,4	3,90%	2	3,01%	3,76	5,56%
	Cardboard	6,8	10,16 %	2	3,03%	4,74	7,76%	5	8,12%	4,44	6,68%	8,3	12,28 %
	Glass	1,15	1,72%	2,99	4,54%	4,92	8,06%	0,57	0,93%	1,72	2,59%	0,73	1,08%
	Metals	0,58	0,87%	0,65	0,99%	1,03	1,69%	0,64	1,04%	1,16	1,75%	1,55	2,29%
	Textiles	0	0,00%	0	0,00%	0	0,00%	3,52	5,72%	0,81	1,22%	0	0,00%
Non-recyclable waste	Non-recyclable waste	26,18	39,11 %	32,9	49,92 %	22,3	36,51 %	24,69	40,11 %	21,43	32,26 %	25,32	37,47 %
Total sample weight		66,94	100%	65,9	100%	61,08	100%	61,56	100%	66,42	100%	67,57	100%

Table S2

Summary of percentage waste composition (%) for the city of Puerto Carreño, by solid waste type, with the indication of the 95%-confidence intervals across the samples for the 6 routes.

Classification	Type of material	Percentage distribution of Solid Waste generated (95% confidence interval)
Recyclable organic waste	Food waste	9% ± 3%
	Organic waste	24% ± 5%
Recyclable inorganic waste	Plastics	11% ± 4%
	Paper	3% ± 1%
	Cardboard	8% ± 2%
	Glass	3% ± 2%
	Metals	1% ± 0.4%
	Textiles	1% ± 1%
Non-recyclable waste	Non-recyclable waste	39% ± 4%

Table S3

Calculation of the capacity of the waste collection vehicle based on the percentage distribution of solid waste, the unit weight of each material and the total volume of the vehicle.

Type of material	Percentage distribution of solid waste generated (%)	Vehicle capacity distributed in the percentage of solid waste produced per material (10.7038 m^3) [i]	Unit weight (kg/m^3) [ii]	Weight of solid waste (kg)	Weight of solid waste (Ton)
Food waste	9%	0,9575	481	460,56	0,461
Organic waste	24%	2,5598	700	1791,84	1,792
Plastics	11%	1,1738	131	153,77	0,154
Paper	3%	0,3479	131	45,58	0,046
Cardboard	8%	0,8597	80	68,77	0,069
Glass	3%	0,3320	481	159,69	0,160
Metals	1%	0,1542	240	37,00	0,037
Textiles	1%	0,1190	101	12,02	0,012
Non-recyclable waste	39%	4,2000	451	1894,18	1,894
Total	100%	10,7038	N/A	4623,41	4,623

[i] The vehicle is a waste compactor truck maximizing the amount of waste per volume unit.

[ii] Source: (MVCT, 2012)

Table S4

The annual estimate of the solid waste produced and potentially recyclable based on the population of the municipality of Puerto Carreño based on our characterization projected from 2020 to 2035 (projections of population by DANE, (DANE, 2018)).

Year	Number of inhabitants	Projection of Waste Generated (ton/year)	Potentially recyclable waste (ton/year)
2020	15.697	2891,4	1763,7
2021	15.911	2930,8	1787,8
2022	16.069	2959,9	1805,5
2023	16.216	2987,0	1822,1
2024	16.224	2988,5	1823,0
2025	16.222	2988,1	1822,7
2026	16.222	2988,1	1822,7
2027	16.252	2993,6	1826,1
2028	16.281	2999,0	1829,4
2029	16.317	3005,6	1833,4
2030	16.364	3014,2	1838,7
2031	16.416	3023,8	1844,5
2032	16.441	3028,4	1847,3
2033	16.482	3036,0	1852,0

2034	16.511	3041,3	1855,2
2035	16.528	3044,5	1857,1
Total waste		47920,1826	29231,3

Figure S1 – Calculation of the lifetime gain of El Merey sanitary landfill due to the removal of the recycling waste fraction. On the left, from left to right, the Table shows Years, population (# inhabitants), total annual waste production, annual recyclable waste production, accumulated total waste production and accumulated recyclable waste production. In a business-as-usual scenario, the accumulated total waste production column shows that in 2042, end of the legal lifetime of the sanitary landfill, 157 389 tons are produced. This amount of waste is reached by 2071 in a plausible scenario where i) no recycling is performed from 2013 to 2022, and ii) a 100% recycling policy is performed where 61% of the waste is not eventually going to El Merey.
Population trends available from 2020 to 2035 (Supplementary Table 4; DANE, 2018) were linearly extrapolated to the periods 2013-2019 and 2035-2072 (equation in orange, graphic on the right). Total waste production was estimated multiplying the yearly population with the per capita waste production (equation in blue; assuming here a per capita waste production of 0.884 kg/capita/day; note that the same results are obtained with the estimate of our study: 0.504 kg/capita/day). Recycling waste production is assumed to be ~61% of the total waste production which corresponds to the percentage calculated in our characterization (equation in grey).

Years	Population	TOTAL WASTE	RECYCLABLE WASTE	Accumulated TOTAL WASTE	Accumulated TOTAL - RECYCLABLE
	(# hab.)	Yearly waste production (tons)	Yearly waste production (tons)	Yearly waste production (tons)	Yearly waste production (tons)
2013	15637	5045	3078	5045	5045
2014	15680	5059	3086	10105	10105
2015	15723	5073	3095	15178	15178
2016	15766	5087	3103	20265	20265
2017	15809	5101	3112	25366	25366
2018	15852	5115	3120	30480	30480
2019	15895	5129	3128	35609	35609
2020	15697	5065	3090	40674	40674
2021	15911	5134	3132	45807	45807
2022	16069	5185	3163	50992	50992
2023	16216	5232	3192	56224	53033
2024	16224	5235	3193	61459	55074
2025	16222	5234	3193	66694	57116
2026	16222	5234	3193	71928	59157
2027	16252	5244	3199	77172	61202
2028	16281	5253	3204	82425	63251
2029	16317	5265	3212	87690	65304
2030	16364	5280	3221	92970	67363
2031	16416	5297	3231	98266	69429
2032	16441	5305	3236	103571	71498
2033	16482	5318	3244	108889	73572
2034	16511	5327	3250	114217	75650
2035	16528	5333	3253	119550	77730
2036	16625	5364	3272	124914	79822
2037	16668	5378	3281	130292	81919
2038	16710	5392	3289	135684	84022
2039	16753	5406	3297	141089	86130
2040	16796	5420	3306	146509	88244
2041	16839	5433	3314	151942	90363
2042	16882	5447	3323	157389	92487
2043	16925	5461	3331		94617
2044	16968	5475	3340		96752
2045	17011	5489	3348		98893
2046	17054	5503	3357		101039
2047	17097	5516	3365		103190
2048	17140	5530	3374		105347
2049	17183	5544	3382		107509
2050	17226	5558	3390		109677
2051	17269	5572	3399		111850
2052	17312	5586	3407		114028
2053	17355	5600	3416		116212
2054	17398	5613	3424		118402
2055	17440	5627	3433		120596
2056	17483	5641	3441		122796
2057	17526	5655	3450		125002
2058	17569	5669	3458		127213
2059	17612	5683	3466		129429
2060	17655	5697	3475		131651
2061	17698	5710	3483		133878
2062	17741	5724	3492		136110
2063	17784	5738	3500		138348
2064	17827	5752	3509		140591
2065	17870	5766	3517		142840
2066	17913	5780	3526		145094
2067	17956	5794	3534		147354
2068	17999	5807	3543		149619
2069	18042	5821	3551		151889
2070	18085	5835	3559		154165
2071	18128	5849	3568		156446
2072	18171	5863	3576		158732

No recycling during 2013-2022

Everything is recycled and no recyclable waste goes to El Merey

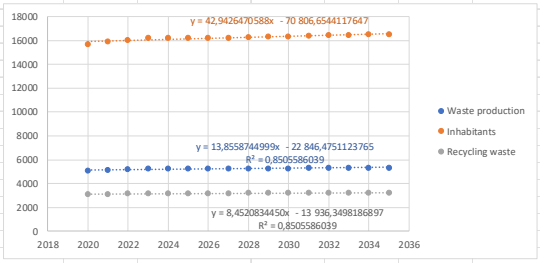

Figure S2
Comparison of percentage (%) of solid waste distribution (only for recyclable material) between 4 main cities of Colombia (according to municipal reports found in CONPES, 2016) and our estimate in Puerto Carreño (Vichada-Colombia, black bar).