

Supplementary material

Table S1. Macro- and micro-nutrients supplementation.

Macro-nutrients	mg g COD ⁻¹	Micro-nutrients	mg g COD ⁻¹
NH ₄ Cl	15.3	FeCl ₃ ·6H ₂ O	0.42
(NH ₄) ₂ HPO ₄	9.5	H ₃ BO ₃	0.11
KCl	3.8	ZnSO ₄ ·7H ₂ O	0.01
Yeast extract	7.5	CuCl ₂ ·2H ₂ O	0.01
Alkaline-earth Metals		MnCl ₂ ·4H ₂ O	0.14
Mg ⁺² as MgCl ₂ ·6H ₂ O	40 mg Mg L ⁻¹	(NH ₄) ₆ Mo ₇ O ₂₄ ·4H ₂ O	0.06
Ca ⁺² as CaCl ₂ ·2H ₂ O	100 mg Ca L ⁻¹	Al ₂ O ₃	0.06
		CoCl ₂ ·6H ₂ O	0.16
		NiSO ₄ ·6H ₂ O	0.04
		EDTANa ₂	0.1

Table S2. One-way ANOVA analysis including Tukey's test for the methane production of reactors R1, R2 and R3 during phase I.

Overall results of one-way ANOVA

	DF	Sum of Squares	Mean Square	F Value	p-value
Model	2	259,98615	129,99308	5,26808	0,01034
Error	33	814,29519	24,67561		
Total	35	1074,28135			

Null Hypothesis: the means of all levels are equal.

Alternative Hypothesis: The mean of one or more levels are different.

At the 0.05 level, the population means are significantly different.

Results of Tukey's post hoc test

	MeanDiff	SEM	q Value	Prob	Alpha	Sig	LCL	UCL
R2 R1	6,01844	2,02796	4,19702	0,01493	0,05	1	1,04232	10,99456
R3 R1	5,31834	2,02796	3,7088	0,03413	0,05	1	3,42E-01	10,29447
R3 R2	-0,7001	2,02796	0,48822	0,93654	0,05	0	-5,67622	4,27603

Sig equals 1 indicates that the difference of the means is significant at the 0.05 level.

Sig equals 0 indicates that the difference of the means is not significant at the 0.05 level.

Table S3. One-way ANOVA analysis for the methane production of reactors R1, R2 and R3 during phase II and III.

Overall results of one-way ANOVA during phase II

	DF	Sum of Squares	Mean Square	F Value	p-value
Model	2	91,77927	45,88963	1,98827	0,15169
Error	36	830,8885	23,08024		
Total	38	922,66777			

Null Hypothesis: the means of all levels are equal.

Alternative Hypothesis: The mean of one or more levels are different.

At the 0.05 level, the population means are not significantly different.

Overall results of one-way ANOVA during phase III

	DF	Sum of Squares	Mean Square	F Value	p-value
Model	2	106,52227	53,26113	2,28189	0,12296
Error	25	583,52121	23,34085		
Total	27	690,04348			

Null Hypothesis: the means of all levels are equal.

Alternative Hypothesis: The mean of one or more levels are different.

At the 0.05 level, the population means are not significantly different.

Table S4. One-way ANOVA analysis including Tukey's test for the methane production of reactors R1, R2 and R3 during phase IV.

Overall results of one-way ANOVA

	DF	Sum of Squares	Mean Square	F Value	p-value
Model	2	6000,69041	3000,34521	73,82613	8,13793E-14
Error	38	1544,34633	40,64069		
Total	40	7545,03674			

Null Hypothesis: the means of all levels are equal.

Alternative Hypothesis: The mean of one or more levels are different.

At the 0.05 level, the population means are significantly different.

Results of Tukey's post hoc test

	MeanDiff	SEM	q Value	Prob	Alpha	Sig	LCL	UCL
R2 R1	29,71869	2,49693	16,83211	0	0,05	1	23,6292	35,80818
R3 R1	22,75061	2,56856	12,52616	0	0,05	1	16,48642	29,0148
R3 R2	-6,96808	2,33301	4,22387	0,01332	0,05	1	-12,65781	-1,27835

Sig equals 1 indicates that the difference of the means is significant at the 0.05 level.

Sig equals 0 indicates that the difference of the means is not significant at the 0.05 level.

Table S5. One-way ANOVA analysis including Tukey's test for the E2P removal of reactors R1, R2 and R3 during phase I.

Overall results of one-way ANOVA

	DF	Sum of Squares	Mean Square	F Value	p-value
Model	2	431,74849	215,87425	6,93081	0,00291
Error	35	1090,14652	31,14704		
Total	37	1521,89501			

Null Hypothesis: the means of all levels are equal.

Alternative Hypothesis: The mean of one or more levels are different.

At the 0.05 level, the population means are significantly different.

Results of Tukey's post hoc test

	MeanDiff	SEM	q Value	Prob	Alpha	Sig	LCL	UCL
R2 R1	-2,51093	2,23417	1,5894	0,50606	0,05	0	-7,97849	2,95662
R3 R1	5,4679	2,23417	3,46114	0,04999	0,05	1	3,40E-04	10,93545
R3 R2	7,97883	2,18903	5,15469	0,00242	0,05	1	2,62174	13,33592

Sig equals 1 indicates that the difference of the means is significant at the 0.05 level.

Sig equals 0 indicates that the difference of the means is not significant at the 0.05 level.

Table S6. One-way ANOVA analysis for the E2P removal of reactors R1, R2 and R3 during phase II and III.

Overall results of one-way ANOVA

	DF	Sum of Squares	Mean Square	F Value	p-value
Model	2	55,11708	27,55854	2,20345	0,12103
Error	50	625,34943	12,50699		
Total	52	680,46651			

Null Hypothesis: the means of all levels are equal.

Alternative Hypothesis: The mean of one or more levels are different.

At the 0.05 level, the population means are not significantly different.

Fig. S1. Schematic diagram of the reactor configuration.

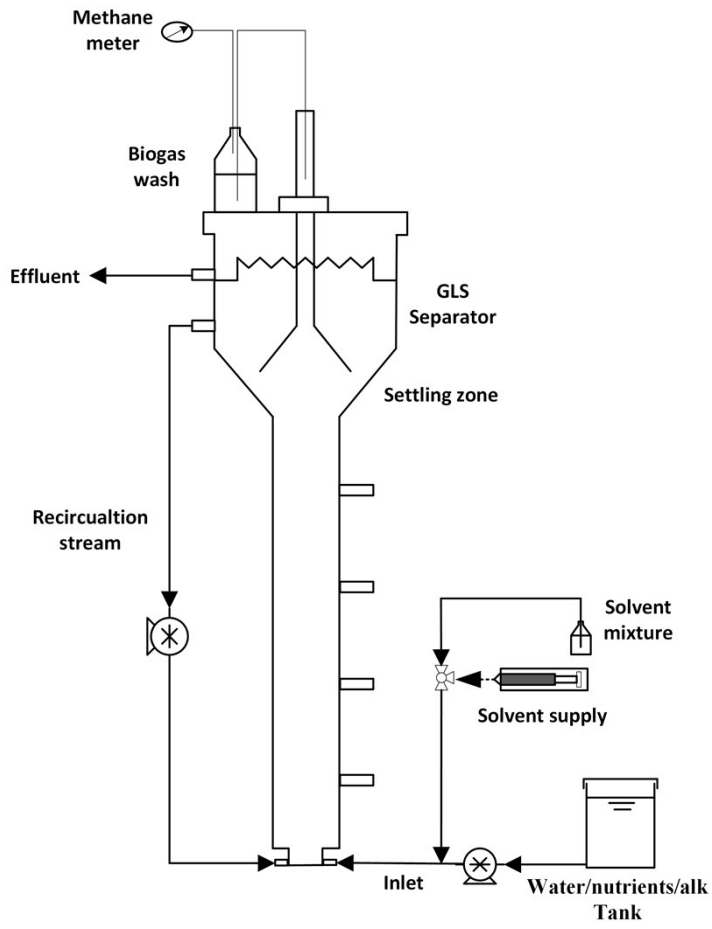


Fig. S2. Variation with time of the Volatile Suspended Solids (VSS) concentration of the effluent of the reactors.

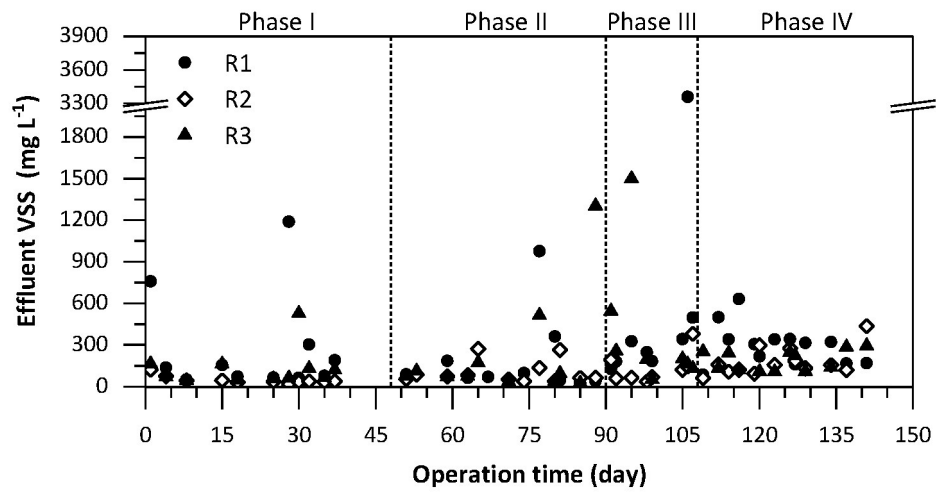


Fig. S3. Cumulative methane production of the UASB reactors during 106 h of intermittent operation.

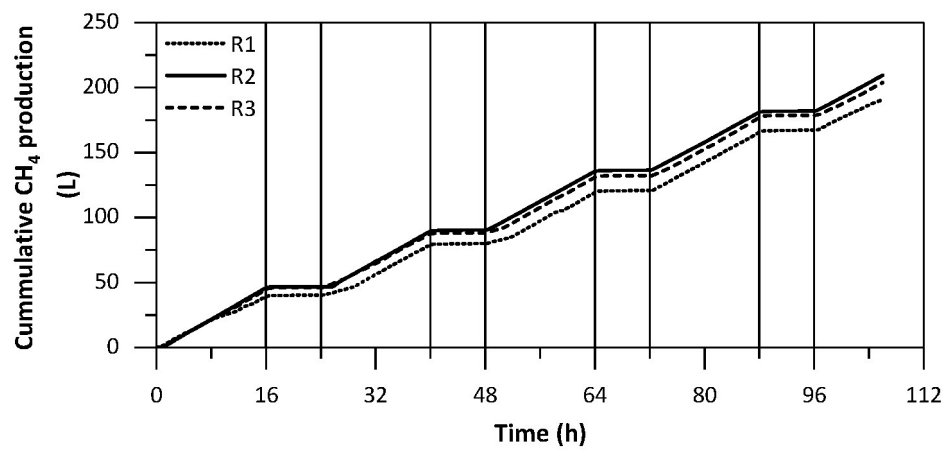


Fig. S4. Variation of the particle size distribution of the sludge from the reactors throughout the experiment.

