Electronic Supplementary Information

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Table S1. Empirical correlations to calculate H_2, CO, CO_2 and CH_4 yields during pyrolysis.

Gas (vol %)	**Empirical equation**
Hydrogen	$0.04694T_p - 16.96286$
Carbon monoxide	$0.0371T_p + 19.961$
Carbon dioxide	$0.000143(T_p)^2 - 0.27808T_p + 139.948$
Methane	$-9\times10^{-5}(T_p)^2 + 0.1221T_p - 25.206$

* T_p = Pyrolysis temperature in degree Celsius

Table S2. Carbon balance with variable temperature from 800 to 1600 ^oC (at 30 wt % SS).

Temperature (^oC)	**Total input C (kg/h) (RDF = 7 kg/h and SS = 3 kg/h)**	**Output C in syngas (kg/h)**	**Output solid residual C (kg/h)**	**Total output C (kg/h)**
800	4.9669	2.9237	2.0420	4.9657
1000	4.9669	3.1318	1.8350	4.9668
1200	4.9669	3.1409	1.8260	4.9669
1400	4.9669	3.1396	1.8260	4.9656
1600	4.9669	3.1397	1.8270	4.9667

Table S3. Carbon balance with variable sewage sludge concentration from 0 to 100 wt. % (at 1200 ^{o}C).

Sewage sludge concentration (wt %)	Total input C (kg/h)	Output C in syngas (kg/h)	Output solid residual C (kg/h)	Total output C (kg/h)
0	6.2170	2.6916	3.5250	6.2166
30	4.9669	3.1409	1.8260	4.9669
50	4.1335	2.9236	1.2010	4.1246
70	3.3001	2.2614	1.0380	3.2994
100	2.0500	2.0497	0.0000	2.0497