

A review of carbon recovery in sewage treatment and analysis of product options for a typical water recycling plant

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SUPPLEMENTARY INFORMATION

Table S1 Ranking system for the factors taken into consideration for TBL evaluation

	High (Score=3)	Moderate (Score=2)	Low (Score=1)
Simplicity	<3 Unit operations	> 3 Unit operations	Complex process
Readiness	TRL 7-9	TRL 5-7	TRL <5
Effectiveness	High recovery and sludge volume reduction (up to 90%)	Moderate recovery and sludge volume reduction	Low recovery and sludge volume reduction
Cost of technology	Low indicative cost	Medium indicative cost	High indicative cost
Ease of implementation	Minimal modification	Multiple modifications	Complex modification
Environmental impact	High waste and emission reduction	Moderate waste and emission reduction	Low waste and emission reduction
Market demand	¹ OGR > 1% and ² CMD >1B USD and less competitive	OGR > 1% and CMD > 1B USD and highly competitive	OGR < 1% and CMD < 1B USD

¹OGR: Overall growth rate, ²CMD: Current market demand

Table S2 Comparative assessment of potential carbonaceous products recovered from sewage

Product	¹ Simplicity	² Readiness	³ Effectiveness	⁴ Cost of Tech.	⁵ Ease of implementation	Env. Impact	Market demand	Total
Methane	3	3	2	3	3	3	3	20
Syngas	2	2	3	1	1	3	3	15
Biochar	3	2	3	2	3	3	3	19
Activated carbon	2	2	3	2	2	3	3	17
Bio-oil	2	2	1	2	2	3	1	13
Biodiesel	2	2	1	2	2	3	2	14
VFAs	3	2	2	3	3	3	3	19
PHAs	3	2	2	3	3	3	2	18
EPSs	3	2	3	3	3	3	1	18
Cellulose	3	3	3	3	3	3	3	21
Enzymes	3	3	1	3	3	2	2	17
Proteins	3	3	2	2	3	3	3	19
Bio-pesticides	3	2	2	2	3	3	2	17
Bio-surfactants	3	3	3	2	2	3	1	17
Bio-fertiliser	3	3	2	2	3	3	1	17

Ranking scale: 3 for high, 2 for moderate, and 1 for low

¹ Simplicity in terms of the number of unit operations and complexity of associated technology

² TRL

³ Efficiency of conversion of sludge into final products and sludge volume reduction

⁴ Energy and chemical costs associated with the production

⁵ Ease of integration into the current WRP