Supplementary information

Lactic acid and biomethane production from bread waste: A techno-economic and profitability analysis using pinch technology

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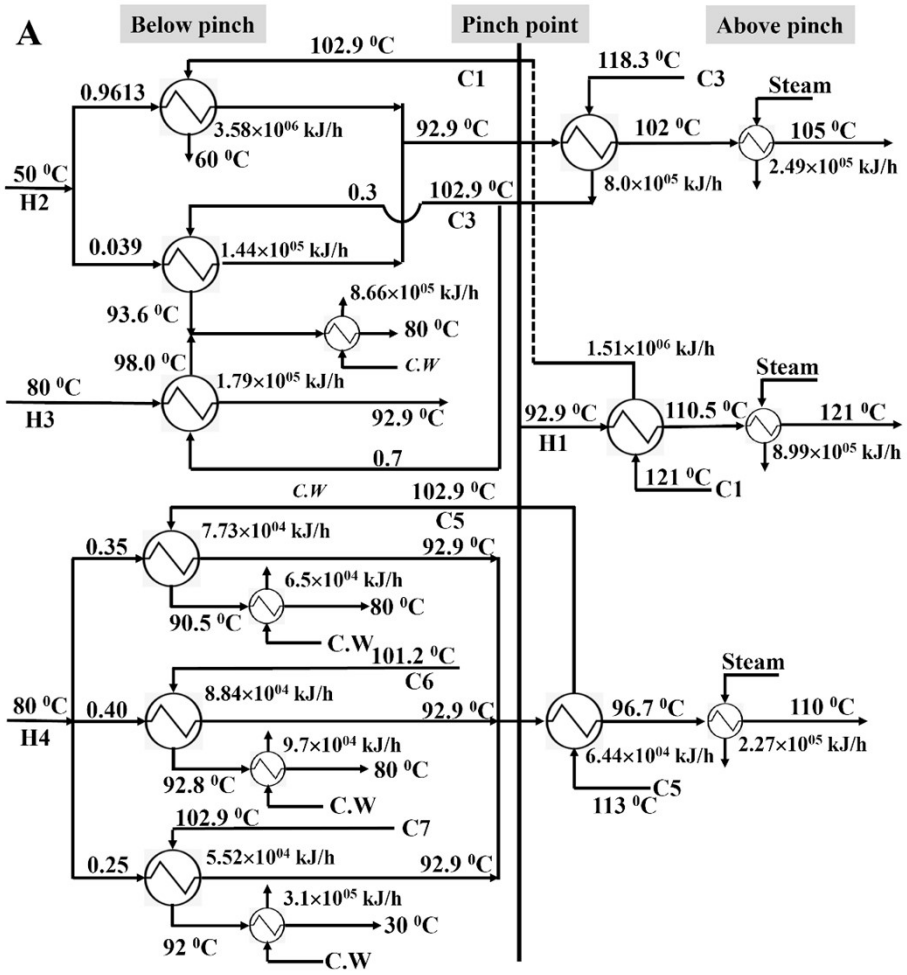
Table S1. Capital investments for the distillation columns in US$.

	Scenario I	Scenario II
DC1	438700	435700
DC2	138200	138200
DC3	198200	198200
DC4	231900	231900
DC5	163000	163000
DC6	109400	107100


A
Below pinch
Pinch point
Above pinch
102.9 °C
C1
118.3 °C
C3
Steam
0.9613
3.58×10^06 kJ/h
60 °C
92.9 °C
102 °C
105 °C
2.49×10^05 kJ/h
50 °C
H2
0.3
102.9 °C
C3
8.0×10^05 kJ/h
0.039
1.44×10^05 kJ/h
8.66×10^05 kJ/h
93.6 °C
80 °C
C.W
98.0 °C
1.79×10^05 kJ/h
1.51×10^06 kJ/h
Steam
80 °C
H3
92.9 °C
92.9 °C
H1
110.5 °C
121 °C
8.99×10^05 kJ/h
0.7
121 °C
C1
C.W
102.9 °C
C5
7.73×10^04 kJ/h
0.35
92.9 °C
6.5×10^04 kJ/h
80 °C
90.5 °C
C.W
101.2 °C
C6
Steam
8.84×10^04 kJ/h
80 °C
0.40
92.9 °C
96.7 °C
110 °C
H4
9.7×10^04 kJ/h
2.27×10^05 kJ/h
80 °C
92.8 °C
C.W
6.44×10^04 kJ/h
C5
113 °C
102.9 °C
C7
5.52×10^04 kJ/h
0.25
92.9 °C
3.1×10^05 kJ/h
30 °C
92 °C
C.W

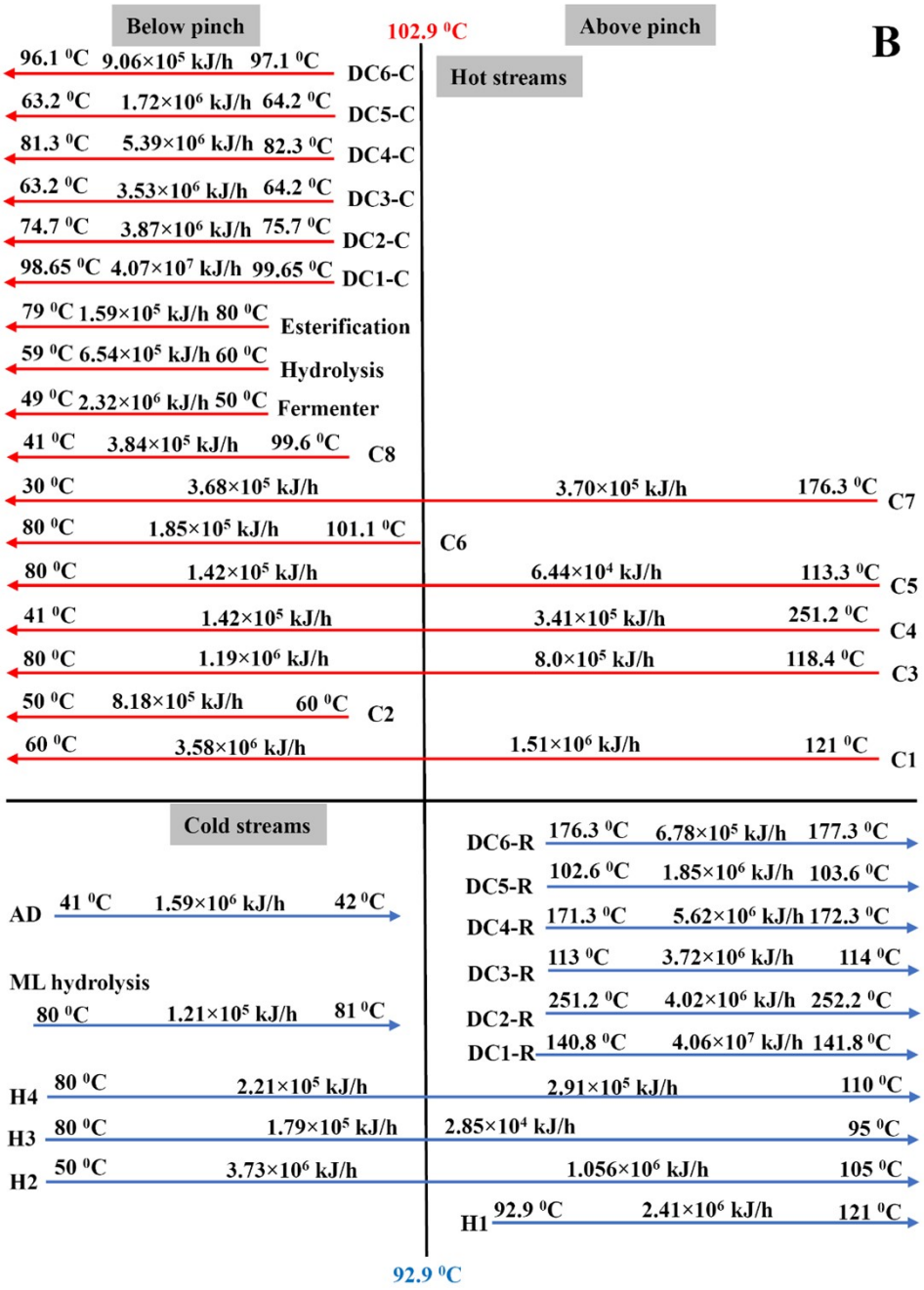


Fig. S1. (a) Heat exchanger network (HEN) and (b) grid diagram for Scenario II to produce lactic acid (LA) from 100 MT bread waste (BW) per day.