

## Supplementary Material

# China's Biogas Industry's Sustainable Transition to a Low-Carbon Plan—A Socio-Technical Perspective

**Table S1.** Emission Reduction and Economy under Different Strategies.

	Total Amount of Manure (Bt)	Livestock Breeding Scale Rate (%)	Comprehensive Utilization Rate (%)	Amount of Manure Available (Bt)	Biogas Utiliza- tion Rate (%)	Biogas Pro- duction Per Unit of Ma- nure	Biogas Pro- duction (Billion m <sup>3</sup> )	Emission Re- duction (Mt CO <sub>2</sub> e)	Volumetric Gas Produc- tion Rate (m <sup>3</sup> /(m <sup>3</sup> -d))	Total Volume Capacity (Million m <sup>3</sup> )	Required Sub- sidies (Billion CNY)
Now	/	/	/	/	10	16	2.69	5	0.35	21.98	0
2025 RS	3.65	70	80	2.56	30	25	1.92	34	0.5	104.99	124.5
2030 RS	3.98	75	85	2.99	50	30	4.48	80	0.6	204.47	273.7
2060 RS	3.57	100	100	3.57	80	50	14.28	254	1	391.23	553.9
2030 RI	3.98	75	85	2.99	60	30	53.82	96	0.6	245.75	335.66
2030 II	3.98	75	85	2.99	10	16	4.78	9	0.35	37.45	23.21
2060 TS	3.57	100	100	3.57	100	50	17.85	319	1	467.06	700.59

Abbreviations: Bt, billion tons; Mt, million tons; CO<sub>2</sub>e, carbon dioxide equivalent; CNY, Chinese yuan renminbi; RS, report scenario; RI, radical innovation; II, incremental innovation; TS, technological substitution. Methodology from "China Biogas Industry Double Carbon Development Report" (<https://book.yunzhan365.com/zjsx/mtdn/mobile/index.html>, accessed on 14 February 2023) published by the China Biogas Society. Refer to China Rural Energy Yearbook (2014-2022) for the volumetric gas production rate. Biogas subsidies are calculated with reference to the Agricultural Sustainable Development of The Central Budget Investment In The Special Management of Temporary Measures (<http://www.gov.cn/zhengce/zhengceku/2020-01/15/5469487/files/e64a4894d15c45d1b44ed273dea26412.pdf>, accessed on 14 February 2023).