Table S1. The coefficients of reactive N (Nr) emission and greenhouse gas (GHG) emission for agricultural inputs at the agricultural materials stage (MS).

Item	Unit	Nr emission (g N unit^{-1})	GHG (kg CO_2-eq unit^{-1})	References
N fertilizer	kg N	7.15	8.3	Zhang et al., 2013
P fertilizer	kg P_2O_5	0.184	0.79	Zhang et al., 2013; Yue, 2013
K fertilizer	kg K_2O	0.146	0.55	Zhang et al., 2013; Pahlavan et al., 2012
Pesticides	kg	4.69	19.1	Clark et al., 2016; Cui et al., 2012
Diesel	L	1.97	3.75	Cui et al., 2013; Pishgar-Komleh et al., 2013
Plastic film	kg	--	0.1	He et al., 2016

N fertilizer include both inorganic N fertilizer and organic N fertilizer.

Table S2. The emission factor of NO_2, NH_3, NO_2 and NO_3^{-1} for N fertilizer inputs at the agricultural materials stage (FS).

Item	Source	Emission factor (%)	References
NO_2	N fertilizer	0.63	Wang et al., 2018a
NH_3	N fertilizer	0.81	Ti et al., 2015
NO	N fertilizer	1.17	Fan et., 2017
NO_3^{-1}	Inorganic N fertilizer	19.7	Lu et al., 2011; Min et al., 2012
NO_3^{-1}	Organic N fertilizer	11.1	Min et al., 2012

Table S3. Components EDC (CNY ha^{-1}) for vegetable production (Xia et al., 2016).

Items	Unit	Coefficient (CNY unit^{-1})
N_2O	kg N	2.1
NO	kg N	29.6
NH_3	kg N	37.5
N leaching and runoff	kg N	9.3
GHG emission	t CO_2-eq	174.3

Table S4. The application rate and price of various agricultural inputs for farm management under different elevation level for cabbage production. HAL represents high elevation level (900-1200m), LAL represents low elevation level (500-800m). The marketing price were obtained from the dealer in CNY, and converted into USD based on an average exchange rate of 7.

		Unit	HAL			LAL		
			Application rate		Price (RMB kg^{-1})	Application rate		Price (RMB kg^{-1})
			Mean	Range		Mean	Range	
Yield		t ha^{-1}	11.1	7.5-17.5	4.60	13.3	6.8-22.5	4.60
Synthetic fertilizers	N	kg ha^{-1}	271.8	168.0-484.1	5.89	252.7	116.0-484.1	6.48
	P_2O_5	kg ha^{-1}	276.0	72.0-792	5.75	215.0	0.0-660	6.32
	K_2O	kg ha^{-1}	135.7	0-447	8.20	208.0	0-432	9.02
Organic fertilizer		kg ha^{-1}	1063	0-5466	0.65	2048.7	0-6750	0.71
Pesticide		kg ha^{-1}	1.33	0-2.1	916	1.53	0-3.0	916
Plastic cover		kg ha^{-1}	52.1	0-105.0	20	53.4	26.3-108.8	22
Diesel		kg ha^{-1}	2.9	0-120	7.15	8.6	0-45	7.15
Seed		kg ha^{-1}	0.6	-	4000	0.6	-	4000
Cultivation labor		man-day ha^{-1}	90	-	65	37.5	-	65

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