Supplemental Material

CGE model framework and main functions

Production functions module

$$KEL_i = \beta_{keli} \cdot QX_i$$

$$ND_i = \beta_{inmpi} \cdot QX_i$$

$$PX_i = \beta_{keli} \cdot PKEL_i + \beta_{inmpi} \cdot PND_i$$

$$UND_{j,i} = \alpha_{j,i} \cdot ND_i$$

$$PND_i = \sum_j \alpha_{j,i} \cdot PQ_j$$

$$KE_{fr\_i} = \left(\frac{\left(\lambda_{fr\_i}^{kel}\right)^{\beta_{fr\_i}^{kel}} \cdot \beta_{fr\_kei} \cdot PKEL_{fr\_i}}{PKE_{fr\_i}} \right)^{\frac{1}{1-\beta_{fr\_i}^{kel}}} \cdot KEL_{fr\_i}$$

$$L_{fr\_i} = \left(\frac{\left(\lambda_{fr\_i}^{kel}\right)^{\beta_{fr\_i}^{kel}} \cdot \beta_{fr\_li} \cdot PKEL_{fr\_i}}{W_{fr}} \right)^{\frac{1}{1-\beta_{fr\_i}^{kel}}} \cdot KEL_{fr\_i}$$

$$KEL_{fr\_i} = \lambda_{fr\_i}^{kel} \cdot (\beta_{fr\_kei} \cdot KE_{fr\_i}^{\rho_{fr\_i}^{kel}} + \beta_{fr\_li} \cdot L_{fr\_i}^{\rho_{fr\_i}^{kel}})^{\frac{1}{\rho_{fr\_i}^{kel}}}$$

$$KE_{se\_i} = \left(\frac{\left(\lambda_{se\_i}^{kel}\right)^{\beta_{se\_i}^{kel}} \cdot \beta_{se\_kei} \cdot PKEL_{se\_i}}{PKE_{se\_i}} \right)^{\frac{1}{1-\beta_{se\_i}^{kel}}} \cdot KEL_{se\_i}$$

$$L_{se\_i} = \left(\frac{\left(\lambda_{se\_i}^{kel}\right)^{\beta_{se\_i}^{kel}} \cdot \beta_{se\_li} \cdot PKEL_{se\_i}}{W_{se}} \right)^{\frac{1}{1-\beta_{se\_i}^{kel}}} \cdot KEL_{se\_i}$$

$$KEL_{se\_i} = \lambda_{se\_i}^{kel} \cdot (\beta_{se\_kei} \cdot KE_{se\_i}^{\rho_{se\_i}^{kel}} + \beta_{se\_li} \cdot L_{se\_i}^{\rho_{se\_i}^{kel}})^{\frac{1}{\rho_{se\_i}^{kel}}}$$

$$KE_{th\_i} = \left(\frac{\left(\lambda_{th\_i}^{kel}\right)^{\beta_{th\_i}^{kel}} \cdot \beta_{th\_kei} \cdot PKEL_{th\_i}}{PKE_{th\_i}} \right)^{\frac{1}{1-\beta_{th\_i}^{kel}}} \cdot KEL_{th\_i}$$

$$L_{th\_i} = \left(\frac{\left(\lambda_{th\_i}^{kel}\right)^{\beta_{th\_i}^{kel}} \cdot \beta_{th\_li} \cdot PKEL_{th\_i}}{W_{th}} \right)^{\frac{1}{1-\beta_{th\_i}^{kel}}} \cdot KEL_{th\_i}$$

$$KEL_{th\_i} = \lambda_{th\_i}^{kel} \cdot (\beta_{th\_kei} \cdot KE_{th\_i}^{\rho_{th\_i}^{kel}} + \beta_{th\_li} \cdot L_{th\_i}^{\rho_{th\_i}^{kel}})^{\frac{1}{\rho_{th\_i}^{kel}}}$$

$$E_i = \left(\frac{(\lambda_i^e)^{\beta_i^{ke}} \cdot \beta_{ei} \cdot PKE_i}{PE_i}\right)^{\frac{1}{1-\beta_i^{ke}}} \cdot KE_i$$

$$K_i = \left(\frac{\beta_{ki} \cdot PKE_i}{R_i}\right)^{\frac{1}{1-\beta_i^{ke}}} \cdot KE_i$$

$$KE_i = (\beta_{ki} \cdot K_i^{\rho_i^{ke}} + \beta_{ei} \cdot (\lambda_i^e \cdot E)_i^{\rho_i^{ke}})^{\frac{1}{\rho_i^{ke}}}$$

$$E_{fosi} = \left(\frac{\beta_{fosi} \cdot PE_i}{PE_{fosi}}\right)^{\frac{1}{1-\beta_i^e}} \cdot E_i$$

$$E_{powei} = \left(\frac{\beta_{powi} \cdot PE_i}{PE_{powi}}\right)^{\frac{1}{1-\beta_i^e}} \cdot E_i$$

$$E_i = (\beta_{fosi} \cdot E_{fosi}^{\rho_i^e} + \beta_{powi} \cdot E_{powei}^{\rho_i^e})^{\frac{1}{\rho_i^e}}$$

$$E_{coali} = \left(\frac{\beta_{coali} \cdot PE_{cpgi}}{PE_{coali}}\right)^{\frac{1}{1-\beta_i^{cpg}}} \cdot E_{fosi}$$

$$E_{pgi} = \left(\frac{\beta_{pgi} \cdot PE_{cpgi}}{PE_{pgi}}\right)^{\frac{1}{1-\beta_i^{cpg}}} \cdot E_{fosi}$$

$$E_{fosi} = (\beta_{coali} \cdot E_{coali}^{\rho_i^{cpg}} + \beta_{pgi} \cdot E_{pgi}^{\rho_i^{cpg}})^{\frac{1}{\rho_i^{cpg}}}$$

$$E_{petroi} = \left(\frac{\beta_{petroi} \cdot PE_{pgi}}{PE_{petroi}}\right)^{\frac{1}{1-\beta_i^{pg}}} \cdot E_{pgi}$$

$$E_{gasi} = \left(\frac{\beta_{gasi} \cdot PE_{pgi}}{PE_{gasi}}\right)^{\frac{1}{1-\beta_i^{pg}}} \cdot E_{pgi}$$

$$E_{pgi} = (\beta_{petroi} \cdot E_{petroi}^{\rho_i^{pg}} + \beta_{gasi} \cdot E_{gasi}^{\rho_i^{pg}})^{\frac{1}{\rho_i^{pg}}}$$

$$E_{thepi} = \left(\frac{\beta_{thepi} \cdot PE_{powi}}{PQ_{thepi}}\right)^{\frac{1}{1-\beta_i^{powe}}} \cdot E_{powei}$$

$$E_{clepi} = \left(\frac{\beta_{clepi} \cdot PE_{powi}}{PE_{clepi}}\right)^{\frac{1}{1-\beta_i^{powe}}} \cdot E_{powei}$$

$$E_{powei} = (\beta_{thepi} \cdot E_{thepi}^{\rho_i^{powe}} + \beta_{clepi} \cdot E_{clepi}^{\rho_i^{powe}})^{\frac{1}{\rho_i^{powe}}}$$

$$E_{coalmi} = \left(\frac{\beta_{coalmi} \cdot PE_{coali}}{PQ_{coalmi}}\right)^{\frac{1}{1-\beta_i^{coal}}} \cdot E_{coali}$$

$$E_{cokei} = \left(\frac{\beta_{cokei} \cdot PE_{coali}}{PQ_{cokei}}\right)^{\frac{1}{1-\beta_i^{coal}}} \cdot E_{coali}$$

$$E_{coali} = (\beta_{coalmi} \cdot E_{coalmi}^{\rho_i^{coal}} + \beta_{cokei} \cdot E_{cokei}^{\rho_i^{coal}})^{\frac{1}{\rho_i^{coal}}}$$

$$E_{nagasi} = \left(\frac{\beta_{nagasi} \cdot PE_{gasi}}{PQ_{nagasi}}\right)^{\frac{1}{1-\beta_i^{gas}}} \cdot E_{gasi}$$

$$E_{magasi} = \left(\frac{\beta_{magasi} \cdot PE_{gasi}}{PQ_{magasi}}\right)^{\frac{1}{1-\beta_i^{gas}}} \cdot E_{gasi}$$

$$E_{gasi} = (\beta_{nagasi} \cdot E_{nagasi}^{\rho_i^{gas}} + \beta_{magasi} \cdot E_{magasi}^{\rho_i^{gas}})^{\frac{1}{\rho_i^{gas}}}$$

$$E_{petromi} = \left(\frac{\beta_{petromi} \cdot PE_{petroi}}{PQ_{petromi}}\right)^{\frac{1}{1-\beta_i^{petro}}} \cdot E_{petroi}$$

$$E_{petroei} = \left(\frac{\beta_{petrorei} \cdot PE_{petroi}}{PQ_{petrorei}}\right)^{\frac{1}{1-\beta_i^{petro}}} \cdot E_{petroi}$$

$$E_{petroi} = (\beta_{petromi} \cdot E_{petromi}^{\rho_i^{petro}} + \beta_{petrorei} \cdot E_{petrorei}^{\rho_i^{petro}})^{\frac{1}{\rho_i^{petro}}}$$

$$E_{hyepi} = \left(\frac{\beta_{hyepi} \cdot PE_{clepi}}{PQ_{hyepi}}\right)^{\frac{1}{1-\beta_i^{clep}}} \cdot E_{clepi}$$

$$E_{nuepi} = \left(\frac{\beta_{nuepi} \cdot PE_{clepi}}{PQ_{nuepi}}\right)^{\frac{1}{1-\beta_i^{clep}}} \cdot E_{clepi}$$

$$E_{wiepi} = \left(\frac{\beta_{wiepi} \cdot PE_{clepi}}{PQ_{wiepi}}\right)^{\frac{1}{1-\beta_i^{clep}}} \cdot E_{clepi}$$

$$E_{soepi} = \left(\frac{\beta_{soepi} \cdot PE_{clepi}}{PQ_{soepi}}\right)^{\frac{1}{1-\beta_i^{clep}}} \cdot E_{clepi}$$

$$E_{clepi} = (\beta_{hyepi} \cdot E_{hyepi}^{\rho_i^{clep}} + \beta_{nuepi} \cdot E_{nuepi}^{\rho_i^{clep}} + \beta_{wiepi} \cdot E_{wiepi}^{\rho_i^{clep}} + \beta_{soepi} \cdot E_{soepi}^{\rho_i^{clep}})^{\frac{1}{\rho_i^{clep}}}$$

Trade functions module

$$PM_i = PWM_i \cdot EXR$$

$$PE_i = PWE_i \cdot EXR$$

$$QD_i = \left(\frac{\lambda_{mi}^{\rho_{mi}} \cdot \delta d_i \cdot PQ_i}{PD_i}\right)^{\frac{1}{1-\rho_{mi}}} \cdot QQ_i$$

$$QM_i = \left(\frac{\lambda_{mi}^{\rho_{mi}} \cdot \delta d_i \cdot PQ_i}{(1+t_{mi}) \cdot PM_i}\right)^{\frac{1}{1-\rho_{mi}}} \cdot QQ_i$$

$$QQ_i = \gamma_{mi} \cdot [\delta d_i \cdot (QD_i)^{\rho_{mi}} + \delta m_i \cdot (QM_i)^{\rho_{mi}}]^{\frac{1}{\rho_{mi}}}$$

$$QD_i = \left(\frac{\lambda_{ei}^{\rho_{ei}} \cdot \xi d_i \cdot (1+t_{indi}) \cdot PX_i}{PD_i}\right)^{\frac{1}{1-\rho_{ei}}} \cdot QX_i$$

$$QE_i = \left(\frac{\lambda_{ei}^{\rho_{ei}} \cdot \xi e_i \cdot (1+t_{indi}) \cdot PX}{PE_i}\right)^{\frac{1}{1-\rho_{ei}}} \cdot QX_i$$

$$QX_i = \gamma_{ei} \cdot \left[\xi d_i \cdot QD_i^{\rho_{ei}} + \xi e_i \cdot QE_i^{\rho_{ei}}\right]^{\frac{1}{\rho_{mi}}}$$

Income and expenditure functions module

$$YL_{fr\_i} = W_{fr} \cdot L_{fr\_i}$$

$$YL_{se\_i} = W_{se} \cdot L_{se\_i}$$

$$YL_{th\_i} = W_{th} \cdot L_{th\_i}$$

$$TYL = \sum_i (YL_{fr\_i} + YL_{se\_i} + YL_{th\_i})$$

$$THK = ratehk \cdot TYK$$

$$YHW = ratehw \cdot \sum_i PQ_i \cdot QM_i$$

$$THT = TYL + YHK + YEH + YHG + YHW$$

$$SH = sh \cdot YHT$$

$$CH = (1-sh) \cdot (1-h_t)YHT$$

$$HD_i \cdot PQ_i = \theta_i \cdot PQ_i + \beta_i \cdot (CH - \sum_i \theta_i \cdot PQ_i)$$

$$YK_i = R_i \cdot K_i$$

$$TYK = \sum_i R_i \cdot K_i$$

$$YWK = ratewk \cdot TYK$$

$$YEK = (1 - ratehk - ratewk) \cdot TYK$$

$$YEH = ratehe \cdot YEK$$

$$SE = (1 - ratehe) \cdot (1-t_e) \cdot YEK$$

$$STO_i = \text{rate}sto_i \cdot QX_i$$

$$INV_i = inv_i \cdot TINV/PQ_i$$

$$GINDTAX_i = t_{indi} \cdot PX_i \cdot QX_i$$

$$GTRIMF_i = t_{mi} \cdot PM_i \cdot QM_i$$

$$GHTAX = t_h \cdot THT$$

$$GETAX = t_e \cdot YEK$$

$$GWY = rategw \cdot \sum_i PM_i \cdot QM_i$$

$$YGT = \sum_i GINDTAX_i + \sum_i GTRIFM_i + GHTAX + GETAX + GWY$$

$$YHG = ratehg \cdot YGT$$

$$YWG = ratewg \cdot YGT$$

$$SG = sg \cdot YGT$$

$$GD_i = \mu_{gi} \cdot (1 - ratehg - ratewg - sg) \cdot YGT/PQ_i$$

Model closure and market clearing functions module

$$\sum_i PM_i \cdot QM_i + YWK + YWG = \sum_i PE_i \cdot QE_i + YHW + GWY + SF \cdot EXR$$

$$TSAV = SE + SG + SH + SF \cdot EXR$$

$$TINV = TSAV - \sum_i STO_i \cdot PQ_i$$

$$TINV = TSAV - \sum_i STO_i \cdot PQ_i + WALRAS$$

$$HD_i + GD_i + INV_i + STO_i + ND_i = QQ_i$$

$$LS_{fr} = \sum_i L_{fr\_i}$$

$$LS_{se} = \sum_i L_{se\_i}$$

$$LS_{th} = \sum_i L_{th\_i}$$

$$KS_i = \alpha_i^{-\rho} \cdot (R_i/AR)^{\rho} \cdot TKS$$

$$K_i = KS_i$$

$$TKS = sum\left(i, \alpha_i \cdot K_i^{(1+\rho)/\rho}\right)^{\rho/(1+\rho)}$$

$$GDPN = \sum_i YK_i + \sum_i (YL_{fr\_i} + YL_{se\_i} + YL_{th\_i}) + \sum_i t_{indi} \cdot PX_i \cdot QX_i$$

$$GDPR = \sum_i QX_i + \sum_i t_{indi} \cdot QX_i - \sum_i ND_i - \sum_i E_i$$

$$GDPR\_FR = \sum_{fr\_i} QX_i + \sum_{fr\_i} t_{indi} \cdot QX_i - \sum_{fr\_i} ND_i - \sum_{fr\_i} E_i$$

$$GDPR\_SE = \sum_{se\_i} QX_i + \sum_{se\_i} t_{indi} \cdot QX_i - \sum_{se\_i} ND_i - \sum_{se\_i} E_i$$

$$GDPR\_TH = \sum_{th\_i} QX_i + \sum_{th\_i} t_{indi} \cdot QX_i - \sum_{th\_i} ND_i - \sum_{th\_i} E_i$$

Social welfare function

$$EV = E(U^s, PQ^b) - E(U^b, PQ^b) = \sum_i PQ_i^b \cdot HD_i^s - \sum_i PQ_i^b \cdot HD_i^b$$

CO_2 emissions functions module

$$FCE_{fos\_i} = QQ_{fos\_i} \cdot \varepsilon_{fos\_i}$$

$$TCE = \sum_{fos,i} FCE_{fos\_i}$$

Dynamic functions module

$$LS_{fr,t+1} = L_{fr,t} \cdot \left(1 + lag_{fr,t}\right)$$

$$LS_{se,t+1} = L_{se,t} \cdot \left(1 + lag_{se,t}\right)$$

$$LS_{th,t+1} = L_{th,t} \cdot \left(1 + lag_{th,t}\right)$$

$$TFP_{i,t+1} = TFP_{i,t} \cdot \left(1 + tfpg_{i,t}\right)$$

$$TKS_{t+1} = TKS_t - \sum_i K_{i,t} \cdot depr_i + TINV_t$$

Table S1. Main variables and descriptions in the CGE model

No.	Variables	Variable descriptions
1	QX_i	Total output in sector *i*
2	PX_i	Production price of commodity *i*
3	ND_i	Intermediate input in sector *i*
4	PND_i	Synthetic price of intermediate input in sector *i*
5	$UND_{j,i}$	Input from sector j of 1 units production in sector *i*
6	KEL_i	Capital-Labor-Energy input in sector *i*
7	$PKEL_i$	Synthetic price of Capital-Labor-Energy in sector *i*
8	L_{fr_i}	Labor input in sector *i* of the primary industry
9	L_{se_i}	Labor input in sector *i* of the secondary industry
10	L_{th_i}	Labor input in sector *i* of the tertiary industry
11	W_{fr}	Average wage of labor input in the primary industry
12	W_{se}	Average wage of labor input in the secondary industry
13	W_{th}	Average wage of labor input in the tertiary industry
14	KE_i	Capital-Energy input in sector *i*
15	PKE_i	Synthetic price of Capital-Energy in sector *i*
16	K_i	Capital input in sector *i*
17	R_i	Revenue rate of capital input in sector *i*
18	E_i	Energy input in sector *i*
19	PE_i	Synthetic price of Energy in sector *i*
20	E_{fosi}	Fossil energy input in sector *i*
21	PE_{fosi}	Synthetic price of fossil energy in sector *i*
22	E_{pgi}	Petroleum energy and Gas energy input in sector *i*
23	PE_{pgi}	Synthetic price of Petroleum energy and Gas energy in sector *i*
24	E_{coali}	Coal and Coking energy input in sector *i*
25	PE_{coali}	Synthetic price of Coal and Coking energy in sector *i*
26	E_{coalmi}	Coal energy input in sector *i*
27	E_{cokei}	Coking energy input in sector *i*

28	E_{gasi}	Natural gas and Gas energy input in sector *i*
29	PE_{gasi}	Synthetic price of Natural gas and Gas energy in sector *i*
30	E_{nagasi}	Natural gas input in sector *i*
31	E_{magasi}	Gas input in sector *i*
32	E_{petroi}	Crude oil and Petroleum energy input in sector *i*
33	PE_{petroi}	Synthetic price of Crude oil and Petroleum energy in sector *i*
34	$E_{petroei}$	Crude oil input in sector *i*
35	$E_{petromi}$	Petroleum input in sector *i*
36	E_{powei}	Power energy input in sector *i*
37	PE_{powi}	Synthetic price of power energy in sector *i*
38	E_{thepi}	Thermal power input in sector *i*
39	PE_{clepi}	Synthetic price of clean power energy in sector *i*
40	E_{clepi}	Clean power input in sector *i*
41	E_{hyepi}	Hydropower input in sector *i*
42	E_{nuepi}	Nuclear power input in sector *i*
43	E_{wiepi}	Wind power input in sector *i*
44	E_{soepi}	Solar energy power input in sector *i*
45	PM_i	Domestic price of imported commodity *i*
46	PE_i	Domestic price of exported commodity *i*
47	EXR	Exchange rate
48	PQ_i	Domestic demand price of commodity *i*
49	PD_i	Domestic supply price of commodity *i*
50	QQ_i	Domestic demand of commodity *i*
51	QD_i	Domestic supply volume of commodity *i*
52	QM_i	Import volume of commodity *i*
53	QE_i	Export volume of commodity *i*
54	PWM_i	International market prices of import commodity in sector *i*
55	PWE_i	International market prices of export commodity in sector *i*
56	YL_{fr_i}	Residents' labour income in sector *i* of the primary industry

57	YL_{se_i}	Residents' labour income in sector *i* of the secondary industry
58	YL_{th_i}	Residents' labour income in sector *i* of the tertiary industry
59	TYL	Total labor income
60	THK	Residents' capital income
61	YHW	Residents' foreign income
62	YHT	Total residents income
63	SH	Residents' savings
64	CH	Residents' consumption expenditure
65	HD_i	Residents' consumption of products *i*
66	YK_i	Capital income from sector *i*
77	TYK	Total capital income
67	YWK	Foreign capital investment income
68	YEK	Business capital income
69	YEH	Business transfer payment to residents
70	SE	Business savings
71	STO_i	Inventory of sector *i*
72	INV_i	Sector investment
73	$GINDTAX_i$	Indirect tax of sector *i*
74	$GTRIMF_i$	Import tariff of products *i*
75	$GHTAX$	inhabitant income tax
76	$GETAX$	Business income tax
85	GWY	Government revenue from the foreign
78	YGT	Total government revenue
79	YHG	Government transfer payments to residents
80	YWG	Government assistance to the abroad
81	SG	Government savings
82	GD_i	Government consumption of products *i*
83	SF	Foreign savings
84	$TINV$	Total investment

85	$TSAV$	Total savings
86	$WALRAS$	Walras variable
87	LS_{fr}	Total labor supply of the primary industry
88	LS_{se}	Total labor supply of the secondary industry
89	LS_{th}	Total labor supply of the tertiary industry
90	R_i	capital return rate of sector *i*
91	AR	the average return rate of the total social capital
92	TKS	Total capital supply
93	KS_i	The capital supply in sector i
94	$GDPN$	Nominal GDP
95	$GDPR$	Real GDP
96	$GDPR\_FR$	Real GDP of the primary industry
97	$GDPR\_SE$	Real GDP of the secondary industry
98	DPR_TH	Real GDP of the tertiary industry
99	EV	Social welfare
100	FCE_{fos_i}	Carbon emissions from fossil energy *fos_i*
101	TCE	Total carbon emissions
102	$LS_{fr,t}$	Total labor supply of the primary industry in period *t*
103	$LS_{se,t}$	Total labor supply of the secondary industry in period *t*
104	$LS_{th,t}$	Total labor supply of the tertiary industry in period *t*
105	$TFP_{i,t}$	Total factor productivity of sector i in period *t*
106	$TINV_t$	Total investment of the whole society in period *t*

Table S2. The substitute elasticities of production functions, Armington functions and CET functions

Sectors	The substitute elasticities of production functions										**Armington functions**	**CET functions**
	σ_i^{kel}	σ_i^{ke}	σ_i^{e}	σ_i^{cpg}	σ_i^{pg}	σ_i^{coal}	σ_i^{petr}	σ_i^{gas}	σ_i^{pow}	σ_i^{clep}	σ^{mi}	σ^{ei}
Agriculture, Forestry, Farming of Animals and Fishing	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	3.00	4.00
Mining and Processing of others Ores	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Manufacture and Processing of Foods and Tobacco	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Manufacture and Processing of Textile and Related Product	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Processing Manufacture of Timber, Paper, Printing and Articles For Culture, Education and Sport Activity	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Chemical Industry	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Manufacture of Cement, Lime and Gypsum	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Manufacture of Non-metallic Mineral Products	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Smelting and Pressing and Manufacture of Metals and Related Product	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Manufacture of Machinery and Equipment	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Manufacture of Communication Equipment, Measuring Instruments and Other Manufacturing	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Production and Distribution of Water	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Construction	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50

Transport ,Storage and Post	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Wholesale, Retail Trade, Hotel and Restaurants	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Information Transfer, Computer Services and Software	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Finance and Insurance	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Real Estate, Tenancy and Business Services	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Other services	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Processing of Nuclear Fuel	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Mining and Washing of Coal	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Coking	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Extraction of Petroleum	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Processing of Petroleum	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Extraction of Natural Ga	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Production and Distribution of Gas	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	2.50	3.50
Production and Distribution of thermal Power	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	1.10	0.50
Production and Distribution of Hydropower	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	1.10	0.50
Production and Distribution of Nuclear Power	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	1.10	0.50
Production and Distribution of Wind Power	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	1.10	0.50
Production and Distribution of Solar and Others	0.80	0.60	2.50	2.50	2.50	2.00	2.00	3.00	3.00	3.00	1.10	0.50

Table S3. The coefficients of carbon emissions

Items	Units	Coal	Coking	Crude oil	Petroleum	Natural Gas	Gas
Carbon Emissions	10,000 tons	615088.31	119868.87	3626.05	132336.74	61768.74	29067.26
Energy Consumption Value	billion	2186.73	502.15	258.21	3653.33	331.81	312.28
Oxidation rate	%	0.90	0.90	0.98	0.98	0.99	0.99
Coefficients of Carbon Emissions	Tons/RMB100,000	253.1537	214.8380	13.7621	35.4992	184.2946	92.1486