

Supporting Information  
for the research article:

**Energy and Air Emissions embodied in China-U.S. Trade: Eastbound Assessment using Adjusted  
Bilateral Trade Data**

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**Table S1 Eastbound China-U.S. trade data from official statistics and adjustments (in billion U.S. dollars).**

Year	Chinese data (1)	U.S. data (1)	Discrepancy (% of Chinese data)	Adjustment		
				This research	(2)	(3)
2002	70.1	133.5	90.4%	113.0	94.5~109.5	95.3
2003	92.6	163.3	76.4%	146.3	116.5~135.6	117.8
2004	125.2	210.5	68.1%	172.3	149.9~175.4	N/A
2005	163.2	259.8	59.2%	207.0	189.7~219.5	N/A
2006	203.8	305.8	50.1%	282.9	N/A	N/A
2007	233.1	340.1	45.9%	289.9	N/A	N/A

**Table S2 Classification of economic sectors in 45-sector format (bold) and 122-sector format (regular).**

<b>Farming, Forestry, Animal Husbandry, Fishery and Water Conservancy</b>	
Agriculture	Forestry
Livestock Husbandry	Fishery
Agriculture Services	
<b>Logging and Transport of Wood and Bamboo</b>	
Logging and Transport of Wood and Bamboo	
<b>Coal Mining and Dressing</b>	
Coal Mining and Dressing	
<b>Petroleum and Natural Gas Extraction</b>	
Petroleum and Natural Gas Extraction	
<b>Ferrous Metals Mining and Dressing</b>	
Ferrous Metals Mining and Dressing	
<b>Nonferrous Metals Mining and Dressing</b>	
Nonferrous Metals Mining and Dressing	
<b>Other Minerals Mining and Dressing</b>	
Other Minerals Mining and Dressing	
<b>Nonmetal Minerals Mining and Dressing</b>	
Nonmetal Minerals Mining and Dressing	
<b>Food Processing</b>	
Corn Milling	Feed Processing
Vegetable Oil Processing	Sugar Manufacturing
Abattoir and Meat Processing	Fishery Processing
<b>Food Production</b>	
Food Production	
<b>Beverage Production</b>	
Alcohol and Potable Spirit Manufacturing	Beverage Manufacturing
<b>Tobacco Processing</b>	
Tobacco Processing	
<b>Textile Industry</b>	
Cotton and Chemical Fiber Textile and Printing, Dyeing and Refining	Wool Textile and Dyeing, Finishing and Refining
Linen and Silk Textile and Refining	Textile Products
Knitting and Weaving Products	
<b>Garments, Footwear and Headgear</b>	
Garments, Footwear and Headgear	
<b>Leather, Furs, Down and Related Products</b>	
Leather, Furs, Down and Related Products	
<b>Timber Processing, Bamboo, Cane, Palm Fiber &amp; Straw Products</b>	
Timber Processing, Bamboo, Cane, Palm Fiber & Straw Products	
<b>Furniture Manufacturing</b>	
Furniture Manufacturing	
<b>Papermaking and Paper Products</b>	
Papermaking and Paper Products	
<b>Printing and Record Medium Reproduction</b>	
Printing and Record Medium Reproduction	
<b>Cultural, Educational and Sports Articles</b>	
Cultural and Educational Goods	Toy, Sports, and Entertainment Goods
<b>Petroleum Processing and Coking</b>	
Petroleum and Nuclear Fuel Processing	Coking
<b>Raw Chemical Materials and Chemical Products</b>	
Raw Chemical Materials	Fertilizer Manufacturing

Pesticide Manufacturing	Paints, Pigments, Printing Ink and Similar Products
Synthetic Materials	Special Chemical Products
General Chemical Products	
<b>Medical and Pharmaceutical Products</b>	
Medical and Pharmaceutical Products	
<b>Chemical Fiber</b>	
Chemical Fiber	
<b>Rubber Products</b>	
Rubber Products	
<b>Plastic Products</b>	
Plastic Products	
<b>Nonmetal Mineral Products</b>	
Cement, Lime, and Plaster	Glass and Glass wares
Ceramic Products	Refractory Material Products
Other Non-metal Products	
<b>Smelting and Pressing of Ferrous Metals</b>	
Iron Ore Smelting	Steel Smelting
Steel Pressing	Ferroalloy Smelting
<b>Smelting and Pressing of Nonferrous Metals</b>	
Nonferrous Metal Smelting	Non-ferrous Pressing
<b>Metal Products</b>	
Metal Products	
<b>Ordinary Machinery</b>	
Boilers, Engines, and Turbines	Metalworking Machinery
Other Ordinary Machinery	
<b>Equipment for Special Purposes</b>	
Agricultural Machinery	Other Equipment for Special Purposes
<b>Transportation Equipment</b>	
Railway Transportation Equipment	Automobile Manufacturing
Automobile Components and Parts Manufacturing	Ship and Floating Device Manufacturing
Other Transportation Equipment	
<b>Electric Equipment and Machinery</b>	
Motor Manufacturing	Household Appliance Manufacturing
Other Electric Equipment and Machinery	
<b>Electronic and Telecommunications Equipment</b>	
Telecommunication Equipment	Computer Manufacturing
Other Computer Equipment	Electronic Devices
Household Audio-Visual Equipment	Other Electronic and Telecommunications Equipment
<b>Instruments, Meters, Cultural and Office Machinery</b>	
Measuring Instruments and Meters Manufacturing	Cultural and Office Machinery
<b>Other Manufacturing Industry</b>	
Arts Manufacturing	Other Manufacturing
<b>Waste Resources and Materials Recycling and Processing</b>	
Waste Resources and Materials Recycling and Processing	
<b>Production and Supply of Electric Power, Steam and Hot Water</b>	
Production and Supply of Electric Power, Steam and Hot Water	
<b>Production and Supply of Gas</b>	
Production and Supply of Gas	
<b>Production and Supply of Tap Water</b>	
Production and Supply of Water	
<b>Construction</b>	
Construction	
<b>Transportation, Storage, Post and Telecommunication Services</b>	

Railway Passenger Transportation	Railway Freight Transportation
Road Transportation	Urban Public Transportation
Waterborne Transportation	Air Passenger Transportation
Air Freight Transportation	Pipeline Transportation
Storage	Post Services
Telecommunication Services	Computer and Software Services
<b>Wholesale, Retail Trade and Catering Services</b>	
Wholesale and Retail Trade	Hotels
Catering Services	
<b>Others</b>	
Financial Services	Insurance Services
Real Estate	Leasing
Business Services	Tourism
Scientific Research	Professional and Other Scientific and Technological Services
Geographical Surveying and Mapping	Water Conservation Management
Environmental Resources and Public Facilities Management	Resident and Other Services
Education	Sanitation
Social Security and Welfare	Culture, Arts, Broadcasting, Movie, and Television
Sports	Entertainment
Public Administration and Social Organizations	

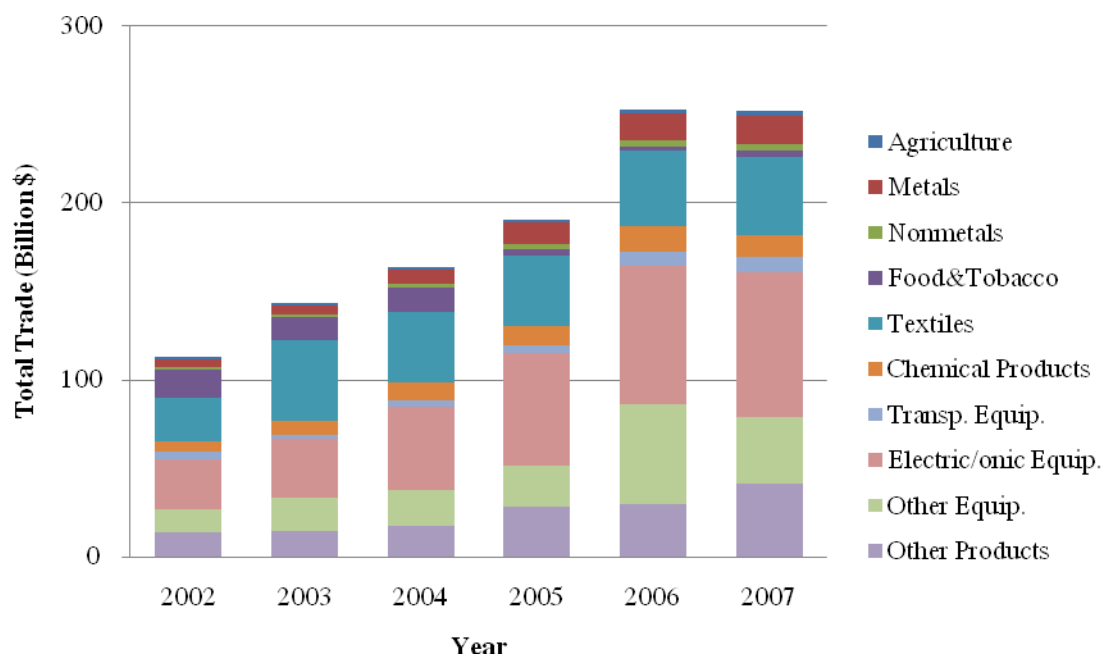


Figure S1 Total Chinese exports to the U.S. by commodity group in 2002 dollars.

**Table S3 Embodied energy in the eastbound China-U.S. trade by commodity group and energy type in PJ.**

2002	Coal	Coke	Crude Oil	Gasoline	Kerosene	Diesel Oil	Fuel Oil	Natural Gas	Electricity
Agriculture	20.1	1.8	7.8	0.6	0.0	3.2	0.9	0.9	3.9
Metals	814.5	79.8	56.5	4.2	0.5	13.7	26.5	6.5	96.4
Nonmetals	114.0	6.5	19.4	1.3	0.1	5.1	5.5	2.3	16.8
Food	280.8	13.2	54.0	12.0	0.5	13.5	10.7	7.4	48.0
Textiles	740.6	50.5	219.6	17.0	1.9	40.7	40.8	29.9	155.5
Chemical Products	344.0	32.2	186.1	5.4	0.7	14.5	20.7	31.3	70.9
Transportation Equipment	342.7	37.2	36.9	2.7	0.4	7.2	11.7	4.7	42.7
Electric/Electronic Equipment	2251.4	137.3	317.1	18.9	2.1	57.4	85.3	48.0	298.4
Other Equipment	1377.7	141.5	141.4	11.0	1.3	27.7	47.1	19.5	164.3
Other Products	818.8	59.5	160.0	12.8	1.7	29.6	32.3	20.9	123.4
2003									
Agriculture	23.7	2.0	9.3	1.2	0.2	4.6	1.2	1.1	4.9
Metals	274.6	72.2	55.8	6.4	1.3	13.9	12.2	5.9	68.0
Nonmetals	107.7	5.5	19.7	2.4	0.3	6.6	6.1	2.5	17.4
Food	172.3	9.8	42.5	11.3	1.1	16.0	8.8	6.0	35.9
Textiles	1194.4	76.7	359.1	47.3	8.1	102.0	70.1	54.1	273.6
Chemical Products	464.3	33.3	206.8	14.4	1.8	25.0	28.8	42.5	91.7
Transportation Equipment	86.9	20.6	21.6	2.5	0.6	5.1	4.1	2.7	18.3
Electric/Electronic Equipment	1074.7	120.2	313.1	34.5	6.4	71.1	59.4	50.2	235.6
Other Equipment	758.6	182.2	176.5	22.6	4.6	42.6	35.4	23.8	154.9
Other Products	471.5	50.2	144.0	17.0	3.6	35.0	24.5	20.2	100.7
2004									
Agriculture	19.6	1.7	9.2	1.3	0.2	5.6	1.0	1.1	4.6
Metals	293.3	97.5	81.5	7.9	2.1	18.6	13.5	7.8	78.2
Nonmetals	91.6	4.2	19.1	1.8	0.4	5.2	4.9	3.1	14.3
Food	114.4	6.7	31.7	5.1	1.1	14.1	5.5	5.5	27.3
Textiles	723.6	48.9	226.4	31.7	7.2	79.9	42.8	36.0	196.9
Chemical Products	378.7	28.6	189.6	8.9	2.1	21.5	20.0	33.7	80.9
Transportation Equipment	80.6	22.2	26.1	3.1	0.9	6.6	3.9	3.3	19.9
Electric/Electronic Equipment	1013.4	127.5	370.6	37.9	9.6	84.7	59.0	55.3	254.7
Other Equipment	524.1	139.4	163.9	19.1	4.8	40.0	25.6	21.3	120.1
Other Products	373.2	44.8	135.8	15.2	3.9	35.0	19.7	18.4	88.9
2005									
Agriculture	19.4	1.8	7.9	1.2	0.2	5.6	0.7	1.1	4.9

Metals	426.8	161.4	105.2	10.7	2.9	27.5	15.6	11.7	118.9
Nonmetals	206.6	9.7	29.7	3.3	0.9	12.4	10.2	7.0	34.0
Food	59.6	3.9	14.6	2.7	0.6	8.2	2.5	2.8	14.4
Textiles	711.7	53.2	195.3	29.6	6.6	79.3	32.5	36.9	209.7
Chemical Products	387.2	35.2	194.9	9.1	2.1	24.4	16.7	41.8	100.9
Transportation Equipment	90.1	27.8	24.6	3.4	0.9	7.6	3.5	4.1	22.7
Electric/Electronic Equipment	1330.3	181.0	415.0	46.6	11.7	114.2	63.6	76.2	351.5
Other Equipment	553.9	165.0	145.5	18.9	4.9	44.0	21.3	23.1	139.2
Other Products	595.4	79.3	187.7	23.7	5.8	58.4	25.1	30.9	161.3
2006									
Agriculture	21.7	2.4	8.3	1.4	0.2	6.8	0.8	1.2	6.1
Metals	481.2	201.1	102.9	12.2	3.3	30.2	15.9	13.7	139.1
Nonmetals	184.7	10.7	27.4	3.3	0.9	11.7	9.6	6.5	35.5
Food	25.8	2.0	6.1	1.3	0.3	4.4	1.0	1.2	7.5
Textiles	707.1	61.5	176.2	30.3	6.8	80.7	31.3	38.6	237.8
Chemical Products	428.4	47.3	193.6	10.8	2.6	28.2	18.5	47.6	133.9
Transportation Equipment	154.1	55.2	39.9	6.1	1.6	13.4	5.6	7.3	41.6
Electric/Electronic Equipment	1457.3	231.4	427.9	54.2	13.8	129.0	68.0	87.8	421.5
Other Equipment	1332.0	511.5	303.6	45.4	11.7	101.6	45.4	52.5	336.7
Other Products	571.7	87.1	165.6	23.7	6.0	57.4	23.4	31.3	168.6
2007									
Agriculture	22.1	2.3	8.4	1.4	0.2	6.5	0.7	1.4	5.9
Metals	436.3	169.3	97.4	11.5	3.2	27.8	12.4	14.6	131.7
Nonmetals	148.2	8.6	24.0	2.8	0.8	8.9	7.2	6.1	28.6
Food	48.8	3.7	11.6	2.4	0.6	7.3	1.8	2.6	13.1
Textiles	645.7	52.9	160.8	27.0	6.4	69.7	24.7	37.9	213.6
Chemical Products	348.8	38.2	168.9	8.7	2.1	21.8	13.3	41.5	97.8
Transportation Equipment	153.9	54.8	40.3	5.6	1.5	12.5	4.8	7.9	40.5
Electric/Electronic Equipment	1306.0	203.4	396.8	48.8	13.1	116.4	53.6	87.0	378.6
Other Equipment	753.2	273.6	182.7	26.5	7.1	59.1	22.7	33.8	195.5
Other Products	668.0	102.1	204.0	27.7	7.3	67.4	24.8	41.4	192.8



**Table S4 Embodied air emissions in the eastbound China-U.S. trade by commodity group in Mt.**

CO <sub>2</sub>	2002	2003	2004	2005	2006	2007
Agriculture	2.02	2.58	2.41	2.24	2.87	4.21
Metals	29.86	30.64	34.73	52.88	41.25	85.54
Nonmetals	15.76	16.51	13.63	30.90	41.36	27.73
Food	19.09	17.06	11.07	5.80	2.74	7.90
Textiles	66.42	118.87	71.15	69.00	65.54	105.70
Chemical Products	33.76	42.98	31.68	34.05	49.28	59.76
Transportation Equipment	15.33	9.50	9.23	10.79	14.20	29.96
Electric/Electronic Equipment	112.24	119.91	112.98	152.01	190.41	243.26
Other Equipment	61.85	85.51	61.12	67.38	126.43	147.07
Other Products	48.75	47.89	37.83	61.10	145.32	118.21
SO <sub>2</sub>						
Agriculture	0.01	0.02	0.02	0.01	0.02	0.03
Metals	0.46	0.45	0.44	0.56	0.57	0.74
Nonmetals	0.07	0.08	0.07	0.16	0.20	0.16
Food	0.15	0.13	0.08	0.04	0.02	0.06
Textiles	0.54	0.93	0.54	0.51	0.50	0.79
Chemical Products	0.28	0.33	0.25	0.25	0.42	0.43
Transportation Equipment	0.14	0.08	0.08	0.08	0.13	0.21
Electric/Electronic Equipment	1.56	1.34	1.25	1.44	1.70	1.94
Other Equipment	0.56	0.73	0.49	0.49	1.12	1.03
Other Products	0.42	0.39	0.30	0.45	0.92	0.86
NO <sub>x</sub>						
Agriculture	0.01	0.01	0.01	0.01	0.01	0.01
Metals	0.09	0.10	0.11	0.16	0.18	0.28
Nonmetals	0.04	0.04	0.04	0.08	0.11	0.08
Food	0.08	0.07	0.05	0.02	0.01	0.03
Textiles	0.27	0.49	0.30	0.29	0.29	0.41
Chemical Products	0.13	0.16	0.12	0.13	0.21	0.20
Transportation Equipment	0.05	0.03	0.03	0.03	0.06	0.10
Electric/Electronic Equipment	0.39	0.43	0.41	0.54	0.75	0.84
Other Equipment	0.20	0.29	0.20	0.22	0.55	0.48
Other Products	0.18	0.19	0.15	0.24	0.61	0.43

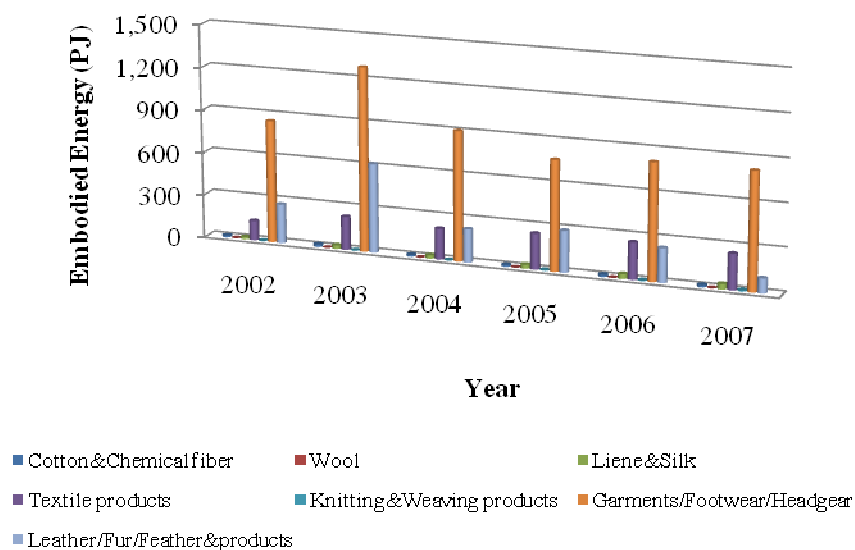


Figure S2 Embodied energy in Chinese textile exports to the U.S.

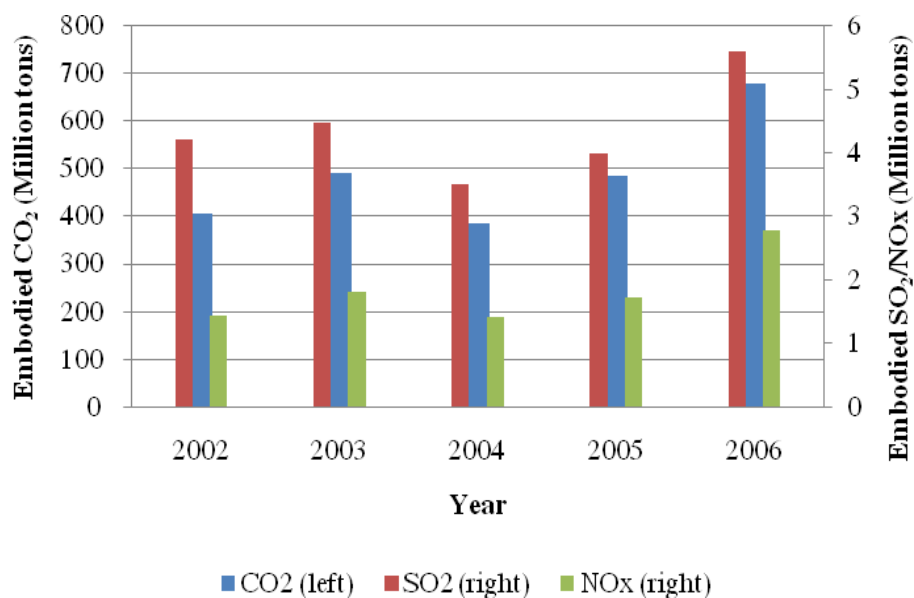


Figure S3 Embodied air emissions in Chinese exports to the U.S.

**Table S5 Total Chinese exports to the world and embodied energy and emissions.**

Item	Unit	2002	2003	2004	2005	2006	2007
Exports	Billion \$ <sup>1</sup>	325.56	429.10	564.73	702.32	865.22	1058.92
Energy	EJ	23.55	26.24	25.84	32.90	39.41	39.27
CO <sub>2</sub>	Mt	1566.07	2010.18	1695.49	2147.06	2344.56	4206.86
SO <sub>2</sub>	Mt	18.09	20.48	17.38	19.61	22.72	32.76
NO <sub>x</sub>	Mt	5.41	7.04	5.97	7.31	9.68	14.22

**Table S6 Eastbound trade to the U.S. and embodied energy and emissions.**

Item	Unit	2002	2003	2004	2005	2006	2007
Exports	Billion \$ <sup>1</sup>	112.97	143.22	163.99	190.83	252.59	252.04
Energy	EJ	10.64	8.52	7.13	8.57	10.76	9.08
CO <sub>2</sub>	Mt	405.08	491.45	385.83	486.15	679.39	829.34
SO <sub>2</sub>	Mt	4.20	4.48	3.51	4.00	5.60	6.25
NO <sub>x</sub>	Mt	1.43	1.81	1.42	1.72	2.78	2.86

**Table S7 Percentage of Chinese exports and embodied energy and emissions to the U.S. in the total exports to the world.**

Item	2002	2003	2004	2005	2006	2007
Exports	34.70%	26.33%	20.00%	16.08%	13.06%	10.67%
Energy	45.20%	32.46%	27.59%	26.05%	27.30%	23.11%
CO <sub>2</sub>	25.87%	24.45%	22.76%	22.64%	28.98%	19.71%
SO <sub>2</sub>	23.24%	21.88%	20.21%	20.39%	24.63%	19.09%
NO <sub>x</sub>	26.45%	25.69%	23.76%	23.47%	28.71%	20.11%

<sup>1</sup> Billion dollars in 2002 constant price

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