

Energy and Climate Change in China

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Online Appendix

Table A1. Comparison of GHG emissions change at different time periods for similar tax levels

Tax (\$ / tCO ₂)	Year	Change of emissions wrt BaU	
		China	OECD
49	2030	-0.29	-0.27
51	2035	-0.32	-0.29
55	2055	-0.32	-0.30
102	2045	-0.53	-0.43
104	2035	-0.54	-0.40
115	2070	-0.54	-0.44
119	2045	-0.56	-0.47
698	2050	-0.78	-0.79
715	2085	-0.83	-0.88
731	2075	-0.82	-0.84
344	2070	-0.74	-0.72
351	2095	-0.73	-0.68
352	2060	-0.73	-0.66
1164	2095	-0.87	-0.98
1192	2085	-0.87	-0.95

Table A2. *Electricity generation (TWh) – China*

YEAR	ELECTRICITY	COAL	COAL CCS	GAS	GAS CCS	OIL	NUCLEAR	WIND	HYDRO	BECCS
BaU										
2010	3176	2174	0	69	0	104	128	90	611	0
2025	7066	5354	0	123	0	152	291	202	945	0
2050	15200	12843	0	161	0	145	618	280	1153	0
2075	19238	16623	0	122	0	98	885	301	1211	0
2100	19251	16123	0	96	0	75	1213	517	1227	0
t1										
2010	3171	2169	0	69	0	103	128	90	611	0
2025	6104	4259	0	146	0	182	371	202	945	0
2050	10473	7397	0	260	0	237	1146	280	1153	0
2075	10310	3130	806	320	0	267	3134	1088	1211	354
2100	11870	742	1550	60	132	133	5039	2528	1227	459
t2										
2010	3162	2160	0	70	0	104	127	90	611	0
2025	5000	2921	0	182	0	229	520	202	945	0
2050	7873	1972	909	390	0	363	2218	514	1153	354
2075	10469	468	1388	88	204	233	4399	2052	1211	428
2100	13138	112	429	9	273	91	7434	3105	1227	459
t3										
2010	3127	2119	0	71	0	107	129	90	611	0
2025	4393	2092	0	211	0	267	677	202	945	0
2050	7602	496	1667	343	0	345	2604	601	1153	392
2075	10934	119	850	34	272	191	5429	2368	1211	459
2100	14261	29	99	4	184	46	8749	3464	1227	459
t550										
2010	3176	2173	0	69	0	104	128	90	611	0
2025	6735	4984	0	131	0	163	310	202	945	0
2050	7937	1643	1481	268	0	250	2241	510	1153	392
2075	10342	390	1766	293	0	250	4154	1861	1211	418
2100	11791	1805	89	264	0	221	5175	2584	1227	428
t450										
2010	3172	2161	0	73	0	110	127	90	611	0
2025	4426	1711	201	266	0	337	671	202	945	95
2050	7664	406	1305	32	318	115	3157	719	1153	459
2075	11044	97	712	3	303	77	5749	2433	1211	459
2100	13918	24	163	0	204	56	8416	3368	1227	459

Table A3. *Electricity generation (TWh) – OECD*

YEAR	ELECTRICITY	COAL	COAL CCS	GAS	GAS CCS	OIL	NUCLEAR	WIND	HYDRO	BECCS
BaU										
2010	10897	3648	0	1637	0	357	3493	315	1444	0
2025	13128	4034	0	1694	0	326	4860	601	1611	0
2050	16992	6000	0	1460	0	230	6021	1565	1715	0
2075	19861	7420	0	998	0	143	7351	2204	1744	0
2100	21727	7442	0	725	0	100	8964	2743	1752	0
t1										
2010	10881	3635	0	1635	0	357	3493	315	1444	0
2025	12582	3128	0	1695	0	327	5215	604	1611	0
2050	15199	1869	554	1542	0	239	7297	1766	1715	216
2075	17463	446	1690	577	240	124	8584	2779	1744	1278
2100	19649	110	583	59	473	44	10120	3755	1752	2753
t2										
2010	10710	3311	0	1697	0	369	3570	315	1444	0
2025	12017	1484	291	1705	0	330	5887	607	1611	101
2050	15034	361	1234	794	348	198	7624	1901	1715	860
2075	17597	89	861	105	798	77	8800	3196	1744	1926
2100	19069	25	38	11	838	19	9609	3738	1752	3038
t3										
2010	10600	3098	0	1746	0	379	3616	315	1444	0
2025	11898	1320	324	1552	0	306	6038	609	1611	137
2050	15129	316	1098	351	836	160	7567	1930	1715	1154
2075	17240	79	751	48	917	49	8396	3164	1744	2092
2100	18715	23	0	5	538	8	9598	3751	1752	3038
t550										
2010	10895	3643	0	1643	0	358	3488	315	1444	0
2025	12382	2465	0	1902	0	364	5433	605	1611	0
2050	15201	587	1215	467	530	128	7383	1857	1715	1319
2075	17627	143	1316	47	709	82	8426	3046	1744	2113
2100	19405	38	720	41	624	71	10124	3825	1752	2210
t450										
2010	10662	3107	0	1812	0	394	3588	315	1444	0
2025	12022	1312	348	1540	0	392	6109	611	1611	97
2050	15688	315	1782	160	758	46	6991	1856	1715	2066
2075	17051	78	791	17	692	17	8041	3068	1744	2603
2100	18509	22	0	4	518	11	9680	3748	1752	2772

Table A4. Total primary energy supply (EJ) – China

YEAR	TPES	COAL	COAL CCS	GAS	GAS CCS	OIL	NUCLEAR	WIND	HYDRO	BIOMASS	BECCS	BACKSTOP
BaU												
2010	81.9	48.1	0.0	3.1	0.0	18.7	0.5	0.3	2.2	8.9	0.0	0.0
2025	133.7	76.7	0.0	6.0	0.0	36.5	1.0	0.7	3.4	9.3	0.0	0.0
2050	214.1	129.8	0.0	9.2	0.0	57.5	2.2	1.0	4.1	10.1	0.0	0.0
2075	243.1	156.7	0.0	9.1	0.0	58.6	3.2	1.1	4.4	10.1	0.0	0.0
2100	235.3	152.7	0.0	8.3	0.0	53.9	4.4	1.9	4.4	9.8	0.0	0.0
t1												
2010	81.8	48.1	0.0	3.1	0.0	18.7	0.5	0.3	2.2	8.9	0.0	0.0
2025	122.3	65.9	0.0	5.9	0.0	35.7	1.3	0.7	3.4	9.3	0.0	0.0
2050	167.5	84.8	0.0	9.1	0.0	54.2	4.1	1.0	4.1	10.1	0.0	0.0
2075	149.1	48.7	7.3	8.9	0.0	51.2	11.3	3.9	4.4	9.9	3.6	0.0
2100	132.8	29.6	14.0	5.4	0.9	37.2	18.1	9.1	4.4	9.4	4.7	0.0
t2												
2010	81.7	48.0	0.0	3.1	0.0	18.7	0.5	0.3	2.2	8.9	0.0	0.0
2025	108.3	52.6	0.0	5.9	0.0	34.4	1.9	0.7	3.4	9.3	0.0	0.0
2050	140.4	40.0	8.2	9.9	0.0	50.7	8.0	1.8	4.1	10.0	3.6	3.9
2075	141.0	27.4	12.5	7.8	1.3	29.2	15.8	7.4	4.4	9.7	4.4	21.0
2100	122.8	24.6	3.9	4.3	1.8	1.0	26.8	11.2	4.4	9.3	4.7	30.9
t3												
2010	81.4	47.5	0.0	3.1	0.0	18.8	0.5	0.3	2.2	8.9	0.0	0.0
2025	99.5	44.4	0.0	5.9	0.0	33.4	2.4	0.7	3.4	9.3	0.0	0.0
2050	134.7	27.8	15.0	9.4	0.0	45.4	9.4	2.2	4.1	10.0	4.0	7.3
2075	130.5	24.6	7.7	6.3	1.8	20.8	19.5	8.5	4.4	9.7	4.7	22.4
2100	122.5	23.9	0.9	3.2	1.2	0.5	31.5	12.5	4.4	9.2	4.7	30.4
t550												
2010	81.9	48.1	0.0	3.1	0.0	18.7	0.5	0.3	2.2	8.9	0.0	0.0
2025	130.0	73.1	0.0	6.0	0.0	36.3	1.1	0.7	3.4	9.3	0.0	0.0
2050	130.0	37.3	13.3	7.5	0.0	43.9	8.1	1.8	4.1	10.0	4.0	0.0
2075	140.2	26.8	15.9	8.6	0.0	35.4	15.0	6.7	4.4	9.8	4.3	13.4
2100	141.2	38.1	0.8	8.3	0.0	20.7	18.6	9.3	4.4	9.4	4.4	27.0
t450												
2010	82.4	48.0	0.0	3.2	0.0	19.3	0.5	0.3	2.2	8.9	0.0	0.0
2025	103.0	40.6	1.8	6.7	0.0	37.0	2.4	0.7	3.4	9.3	1.0	0.0
2050	113.1	27.1	11.7	5.1	2.1	20.2	11.4	2.6	4.1	9.8	4.7	14.3
2075	114.6	24.5	6.4	4.1	2.0	5.6	20.7	8.8	4.4	9.6	4.7	23.8
2100	122.2	23.9	1.5	3.4	1.3	0.6	30.3	12.1	4.4	9.3	4.7	30.8

Table A5. Total primary energy supply (EJ) – OECD

YEAR	TPES	COAL	COAL CCS	GAS	GAS CCS	OIL	NUCLEAR	WIND	HYDRO	BIOMASS	BECCS	BACKSTOP
BaU												
2010	209.6	50.8	0.0	46.2	0.0	92.2	12.6	1.1	5.2	1.4	0.0	0.0
2025	229.0	51.5	0.0	49.5	0.0	100.8	17.5	2.2	5.8	1.8	0.0	0.0
2050	252.8	63.1	0.0	49.2	0.0	104.6	21.7	5.6	6.2	2.4	0.0	0.0
2075	259.7	73.3	0.0	44.3	0.0	98.5	26.5	7.9	6.3	2.9	0.0	0.0
2100	259.1	73.5	0.0	40.9	0.0	93.1	32.3	9.9	6.3	3.2	0.0	0.0
t1												
2010	209.3	50.7	0.0	46.1	0.0	92.1	12.6	1.1	5.2	1.4	0.0	0.0
2025	217.9	43.0	0.0	48.2	0.0	98.1	18.8	2.2	5.8	1.8	0.0	0.0
2050	221.2	29.3	5.0	46.4	0.0	97.4	26.3	6.4	6.2	2.2	2.2	0.0
2075	216.4	17.5	15.2	35.6	1.6	84.0	30.9	10.0	6.3	2.1	13.1	0.0
2100	198.1	14.8	5.2	24.8	3.1	63.9	36.4	13.5	6.3	1.6	28.3	0.0
t2												
2010	207.2	47.4	0.0	46.7	0.0	92.5	12.9	1.1	5.2	1.4	0.0	0.0
2025	202.7	27.7	2.6	46.4	0.0	94.1	21.2	2.2	5.8	1.7	1.0	0.0
2050	227.2	16.9	11.1	47.3	0.0	87.6	27.4	6.8	6.2	1.9	8.8	13.1
2075	217.7	14.7	7.8	40.2	0.0	42.6	31.7	11.5	6.3	1.6	19.8	41.6
2100	184.2	14.2	0.3	26.7	0.0	0.6	34.6	13.5	6.3	1.0	31.3	55.7
t3												
2010	206.1	45.3	0.0	47.1	0.0	92.9	13.0	1.1	5.2	1.4	0.0	0.0
2025	196.1	26.2	2.9	43.8	0.0	90.4	21.7	2.2	5.8	1.6	1.4	0.0
2050	226.1	16.6	9.9	47.5	0.0	79.3	27.2	6.9	6.2	1.6	11.9	18.9
2075	201.2	14.6	6.8	35.8	0.0	29.7	30.2	11.4	6.3	1.3	21.5	43.7
2100	173.6	14.1	0.0	19.1	0.0	0.1	34.6	13.5	6.3	0.8	31.3	53.9
t550												
2010	209.7	50.8	0.0	46.3	0.0	92.3	12.6	1.1	5.2	1.4	0.0	0.0
2025	217.2	36.9	0.0	50.5	0.0	100.4	19.6	2.2	5.8	1.8	0.0	0.0
2050	198.6	18.8	10.9	32.3	3.5	78.5	26.6	6.7	6.2	1.6	13.6	0.0
2075	209.6	15.1	11.8	30.2	4.6	65.6	30.3	11.0	6.3	1.8	21.7	11.1
2100	213.5	14.3	6.5	30.5	4.1	54.1	36.4	13.8	6.3	1.9	22.7	22.9
t450												
2010	209.0	45.4	0.0	48.3	0.0	94.6	12.9	1.1	5.2	1.4	0.0	0.0
2025	219.9	26.1	3.1	51.5	0.0	100.7	22.0	2.2	5.8	1.7	1.0	5.7
2050	191.3	16.5	16.0	27.1	5.0	32.3	25.2	6.7	6.2	1.1	21.3	33.9
2075	171.1	14.6	7.1	19.9	4.5	4.8	28.9	11.0	6.3	0.9	26.8	46.2
2100	172.5	14.1	0.0	16.7	3.4	0.1	34.8	13.5	6.3	0.8	28.5	54.2