

Supplementary Materials: The Decoupling of Resource Consumption and Environmental Impact from Economic Growth in China: Spatial Pattern and Temporal Trend

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Table S1. The GDP elasticity of final energy consumption in China during 1997–2012.

	1997– 1998	1998– 1999	1999– 2000	2000– 2001	2001– 2002	2002– 2003	2003– 2004	2004– 2005	2005– 2006	2006– 2007	2007– 2008	2008– 2009	2009– 2010	2010– 2011	2011– 2012
Beijing	0.220	0.171	0.480	0.205	0.383	0.293	0.750	0.630	0.541	0.485	0.062	0.378	0.566	0.073	0.339
Tianjin	−0.061	0.440	0.873	0.369	0.281	0.431	0.946	0.770	0.687	0.607	0.493	0.577	0.924	0.697	0.580
Hebei	0.122	0.274	0.576	0.579	1.199	2.760	1.039	1.031	0.735	0.682	0.290	0.451	0.681	0.632	0.266
Shanxi	−0.609	−0.370	0.461	2.179	1.471	0.807	0.591	0.748	0.816	1.083	0.015	−0.118	0.569	0.690	0.552
Inner Mongolia	−1.000	3.165	−0.713	1.568	0.988	1.590	1.646	1.227	0.843	0.761	0.288	0.522	0.641	0.794	0.488
Liaoning	−0.468	0.372	1.655	−0.114	−0.052	0.537	1.264	1.002	0.591	0.263	0.567	0.562	0.676	0.691	0.377
Jilin	−1.492	−0.191	−0.112	0.612	1.335	1.848	0.680	0.528	0.744	−0.061	0.919	0.485	0.564	0.704	0.312
Heilongjiang	−0.868	0.185	0.218	−0.225	−0.054	1.158	0.957	0.647	0.722	0.620	0.544	0.428	0.580	0.637	0.527
Shanghai	0.235	0.659	0.495	0.565	0.458	0.900	0.631	1.103	0.657	0.548	0.479	0.191	0.781	0.075	0.109
Jiangsu	0.144	0.056	0.519	0.308	0.703	1.109	1.589	1.641	0.734	0.792	0.500	0.534	0.685	0.642	0.452
Zhejiang	0.297	0.448	0.847	0.886	1.037	1.968	0.944	0.872	0.711	0.674	0.399	0.340	0.699	0.630	0.175
Anhui	0.462	0.258	0.506	0.551	0.403	0.284	0.771	0.720	0.696	0.650	0.627	0.529	0.625	0.659	0.616
Fujian	0.157	0.756	−1.082	3.089	1.014	3.285	1.129	1.121	0.750	0.718	0.679	0.652	0.720	0.700	0.438
Jiangxi	−0.686	0.670	0.504	0.558	1.104	2.447	0.858	0.967	0.710	0.647	0.488	0.609	0.666	0.721	0.400
Shandong	−0.144	0.062	−0.908	2.115	0.947	3.685	1.179	1.336	0.731	0.805	0.385	0.497	0.599	0.615	0.488
Henan	0.913	0.235	0.715	0.513	0.458	2.144	1.708	0.829	0.765	0.685	0.423	0.374	0.683	0.635	0.250
Hubei	−0.120	−0.124	0.547	−0.391	1.185	1.525	1.635	0.662	0.728	0.860	0.428	0.498	0.705	0.689	0.585
Hunan	0.211	−1.962	−0.044	1.505	1.017	2.586	1.708	1.714	0.692	1.221	0.072	0.523	0.700	0.598	0.298
Guangdong	0.492	0.423	0.712	0.738	0.934	1.035	1.090	1.219	0.770	0.846	0.508	0.520	0.734	0.585	0.286
Guangxi	−0.640	0.180	1.003	0.000	1.107	1.779	1.637	1.400	0.789	0.580	0.651	0.638	0.838	0.690	0.582
Hainan	0.516	0.696	1.259	0.918	1.644	1.283	0.804	0.983	0.849	1.015	0.719	0.732	0.639	1.488	0.597
Chongqing	2.717	1.613	1.041	−2.719	0.594	−0.360	1.580	1.607	0.672	1.630	0.609	0.578	0.687	0.729	0.407
Sichuan	0.190	−0.849	0.273	0.501	1.003	1.987	1.277	0.446	0.821	0.913	0.596	0.536	0.637	0.672	0.354
Guizhou	1.060	−0.783	0.912	0.298	0.080	2.361	0.771	0.533	0.749	−0.236	0.370	0.597	0.629	0.728	0.657
Yunnan	−0.237	−0.314	−0.347	1.358	1.569	1.508	1.485	1.736	0.860	0.455	0.500	0.574	0.650	0.729	0.721
Shaanxi	−0.246	−1.137	0.227	1.966	1.261	1.043	1.126	1.076	0.694	1.009	0.476	0.621	0.714	0.712	0.687
Gansu	0.422	0.948	0.336	−0.364	0.394	1.564	0.943	0.994	0.747	0.628	0.458	0.246	0.684	0.773	0.072
Qinghai	0.508	3.337	−0.715	0.495	0.792	0.858	1.754	1.842	1.144	0.806	0.563	0.299	0.611	1.797	0.022
Ningxia	0.312	0.280	0.312	0.453	1.345	7.388	1.362	0.740	0.916	0.775	0.392	0.412	0.642	1.425	5.385
Xinjiang	0.206	−0.268	0.361	0.632	0.440	1.367	1.540	1.115	0.893	0.717	0.682	0.796	0.959	1.645	−0.284

Table S2. The GDP elasticity of water consumption in China during 2003–2012.

	2002–2003	2003–2004	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009	2009–2010	2010–2011	2011–2012
Beijing	0.100	−0.091	−0.012	−0.045	0.112	0.071	0.118	−0.082	0.281	−0.043
Tianjin	0.182	0.480	0.318	−0.039	0.117	−0.258	0.282	−0.216	0.165	0.009
Hebei	−0.472	−0.153	0.225	0.082	−0.057	−0.343	−0.067	−0.002	0.106	−0.037
Shanxi	−0.163	−0.039	−0.024	0.543	−0.064	−0.099	−0.211	0.960	1.257	−0.108
Inner Mongolia	−0.378	0.142	0.088	0.120	0.040	−0.066	0.184	0.024	0.107	−0.017
Liaoning	0.080	0.118	0.189	0.434	0.073	−0.005	0.001	0.043	0.047	−0.165
Jilin	−0.675	−0.379	−0.067	0.306	−0.128	0.297	0.495	0.584	0.674	−0.088
Heilongjiang	−0.252	0.474	0.401	0.447	0.150	0.164	0.568	0.219	0.681	0.184
Shanghai	0.369	0.591	0.239	−0.186	0.096	−0.030	0.553	0.085	−0.173	−0.913
Jiangsu	−0.694	1.440	−0.077	0.344	0.147	0.000	−0.131	0.042	0.066	−0.070
Zhejiang	−0.065	0.060	0.080	−0.057	0.089	0.266	−0.973	0.224	−0.247	−0.024
Anhui	−1.135	1.310	−0.071	1.276	−0.291	1.224	0.740	0.030	0.037	−0.150
Fujian	−0.003	0.098	0.091	0.014	0.317	0.069	0.139	0.036	0.255	−0.366
Jiangxi	−1.125	1.362	0.174	−0.093	1.092	−0.021	0.229	−0.044	0.772	−0.704
Shandong	−0.954	−0.135	−0.118	0.474	−0.194	0.012	0.004	0.092	0.063	−0.101
Henan	−1.321	0.510	−0.102	1.025	−0.542	0.578	0.249	−0.311	0.168	0.409
Hubei	0.181	−0.088	0.364	0.162	−0.002	0.343	0.293	0.158	0.219	0.228
Hunan	0.404	0.125	0.128	−0.018	−0.073	−0.002	−0.026	0.053	0.028	0.058
Guangdong	0.158	0.108	−0.091	0.007	0.046	−0.019	0.042	0.097	−0.103	−0.348
Guangxi	−0.628	0.378	0.574	0.037	−0.085	−0.008	−0.156	−0.041	0.006	0.036
Hainan	0.473	0.000	−0.463	0.414	0.031	0.042	−0.443	−0.015	0.028	0.205
Chongqing	0.411	0.542	0.470	0.231	0.364	0.476	0.205	0.075	0.029	−0.327
Sichuan	0.054	0.017	0.074	0.100	−0.037	−0.270	0.526	0.202	0.093	0.422
Guizhou	0.414	0.058	0.242	0.222	−0.132	0.348	−0.130	0.083	−0.365	−0.336
Yunnan	−0.188	0.049	−0.008	−0.117	0.223	0.196	−0.027	−0.275	−0.033	0.264
Shaanxi	−0.316	0.044	0.339	0.528	−0.206	0.241	−0.096	−0.076	0.380	0.021
Gansu	−0.079	0.011	0.085	−0.045	0.011	−0.027	−0.123	0.084	0.071	−0.178
Qinghai	0.618	0.329	0.131	0.415	−0.271	0.669	−1.607	0.456	0.080	−0.969
Ningxia	−1.697	1.402	0.501	−0.046	−0.672	0.355	−0.221	0.014	0.140	−0.502
Xinjiang	0.492	−0.064	0.211	0.088	0.069	0.184	0.063	0.074	−0.180	1.061

Table S3. The GDP elasticity of CO2 emission in China during 1997–2010.

	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
Beijing	0.343	0.508	0.146	1.225	-0.069	0.540	0.501	0.446	0.401	0.539	-0.415	0.104	0.382
Tianjin	0.335	0.211	0.612	0.312	1.236	-0.019	0.939	1.006	0.452	0.590	0.366	0.632	0.256
Hebei	1.043	-0.620	0.697	0.722	1.296	1.336	1.054	1.791	0.398	0.606	0.468	0.313	1.543
Shanxi	-0.096	-0.274	0.259	2.938	1.707	0.806	0.413	0.500	0.910	0.632	0.320	0.189	0.624
Inner Mongolia	-0.495	0.628	0.864	0.925	0.792	-0.252	3.173	0.762	0.859	1.425	0.600	0.443	0.466
Liaoning	-0.346	-0.750	1.838	-1.293	1.274	0.874	0.597	0.842	1.063	0.685	0.198	0.794	0.876
Jilin	-1.581	0.211	-0.653	0.674	0.371	0.855	0.786	2.691	0.698	0.455	0.308	0.129	0.783
Heilongjiang	0.039	-0.893	0.435	-0.338	-0.596	0.327	0.776	1.770	0.875	0.519	0.396	0.165	0.615
Shanghai	0.630	0.993	-0.151	0.940	0.443	0.579	0.731	0.162	1.341	0.496	0.062	-0.986	0.497
Jiangsu	0.097	0.091	0.547	-0.350	0.689	0.756	2.069	1.984	0.573	0.396	0.429	0.309	0.959
Zhejiang	-0.183	0.374	0.827	0.785	0.619	0.837	1.579	1.427	1.015	0.888	0.216	0.204	0.554
Anhui	0.233	0.235	0.698	0.691	0.514	1.330	0.271	-0.175	1.025	0.826	1.263	0.829	0.315
Fujian	0.755	2.655	-0.527	-0.148	2.149	1.892	1.972	1.833	0.633	1.275	0.215	1.007	0.427
Jiangxi	-0.237	-0.176	0.386	1.004	0.539	1.702	1.249	0.550	1.005	1.327	0.099	0.539	0.481
Shandong	0.978	0.007	-1.110	2.122	1.060	2.355	1.541	2.702	0.549	0.808	0.466	0.264	0.567
Henan	0.017	0.075	1.512	0.107	0.155	1.040	1.357	2.172	0.999	1.455	0.096	0.304	1.160
Hubei	-0.152	0.308	0.058	-0.639	2.034	0.562	0.976	0.366	1.403	0.781	0.164	0.562	1.339
Hunan	0.115	-2.320	-0.559	-0.213	1.785	1.479	1.202	4.744	1.134	0.709	0.013	0.288	0.509
Guangdong	1.088	0.060	0.458	0.434	0.610	0.878	1.280	1.067	0.499	0.610	0.309	0.604	0.427
Guangxi	0.144	0.164	0.944	-0.412	-0.037	2.020	2.956	0.860	1.316	0.857	0.085	1.013	1.058
Hainan	12.410	-5.655	0.879	0.554	4.130	3.005	-0.556	0.966	0.888	1.427	1.814	0.152	0.037
Chongqing	1.691	1.118	0.266	-1.083	0.686	-1.005	0.805	1.751	0.783	0.619	2.015	0.310	-0.009
Sichuan	-0.027	-1.890	-0.584	0.291	1.449	2.414	1.071	-0.347	0.348	1.228	1.095	0.830	0.678
Guizhou	3.631	-2.222	0.514	-0.020	0.498	2.782	1.040	1.230	1.346	0.355	-0.452	1.035	0.140
Yunnan	-0.163	-0.551	-0.454	2.612	2.293	2.642	-3.194	15.286	1.031	0.437	0.138	1.071	0.343
Shaanxi	-0.433	-0.829	-0.040	0.314	2.152	0.618	1.952	0.764	0.696	1.427	0.700	0.796	1.274
Gansu	0.083	0.074	0.667	0.319	0.615	1.323	1.331	0.920	0.649	0.737	0.643	-0.327	2.170
Qinghai	-0.068	2.196	-1.353	1.819	0.424	1.254	0.588	0.360	1.842	0.448	1.143	0.060	-0.235
Ningxia	0.544	-0.140	4.186	2.753	2.455	2.364	1.353	-1.611	1.268	1.517	0.549	0.896	1.131
Xinjiang	0.257	-0.376	0.476	0.560	-0.729	1.451	2.153	1.676	0.805	0.722	0.683	1.508	0.653

Table S4. The GDP elasticity of SO₂ emission in China during 1999–2012.

	1999–2000	2000–2001	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009	2009–2010	2010–2011	2011–2012
Beijing	−0.344	−0.879	−0.389	−0.437	0.319	0.000	−0.614	−1.025	−1.756	−0.319	−0.326	−1.837	−0.535
Tianjin	3.337	−1.561	−0.972	0.698	−0.763	1.104	−0.260	−0.258	−0.118	−0.076	−0.048	−0.106	−0.199
Hebei	−0.039	−0.281	−0.081	0.965	0.032	0.355	0.244	−0.268	−0.915	−0.684	−0.124	1.277	−0.523
Shanxi	−0.392	−0.026	0.000	0.986	0.269	0.566	−0.212	−0.428	−0.183	−0.566	−0.108	0.924	−0.689
Inner Mongolia	−0.404	−0.279	1.087	4.538	−0.437	1.088	0.371	−0.341	−0.048	−0.132	−0.024	0.077	−0.152
Liaoning	−0.060	−1.113	−0.538	0.327	0.077	3.581	0.375	−0.126	−0.623	−0.540	−0.194	0.836	−0.630
Jilin	−0.298	−0.779	0.000	0.255	0.395	2.836	0.471	−0.152	−0.478	−0.292	−0.140	1.164	−0.196
Heilongjiang	0.106	−0.167	−0.168	2.353	0.409	3.119	0.163	−0.048	−0.148	−0.277	0.000	0.526	−0.146
Shanghai	1.392	0.166	−0.487	0.060	0.355	0.762	−0.081	−0.138	−0.902	−1.832	−0.538	−4.015	−0.660
Jiangsu	2.145	−0.441	−0.209	0.791	−0.004	0.741	−0.337	−0.444	−0.589	−0.398	−0.176	0.033	−0.581
Zhejiang	−0.621	−0.013	0.428	1.203	0.750	0.442	−0.008	−0.494	−0.699	−0.604	−0.275	−0.260	−0.686
Anhui	−0.429	0.020	0.000	1.588	0.564	1.450	0.179	−0.147	−0.232	−0.250	−0.076	−0.035	−0.154
Fujian	1.956	−1.277	−0.343	4.988	0.622	3.570	0.117	−0.323	−0.294	−0.170	−0.188	−0.394	−0.404
Jiangxi	1.707	−0.601	−0.404	3.785	1.417	1.415	0.279	−0.158	−0.456	−0.249	−0.089	0.389	−0.255
Shandong	−0.176	−0.407	−0.160	0.629	−0.052	0.658	−0.138	−0.499	−0.575	−0.495	−0.266	1.733	−0.441
Henan	0.340	0.252	0.469	1.007	1.525	2.054	−0.004	−0.257	−0.475	−0.612	−0.094	0.197	−0.680
Hubei	0.150	−0.411	−0.020	1.329	1.223	0.299	0.454	−0.472	−0.398	−0.287	−0.115	0.373	−0.575
Hunan	0.255	−0.198	−0.277	1.477	0.230	0.465	0.134	−0.221	−0.081	−0.221	−0.082	−1.001	−0.489
Guangdong	2.632	0.720	0.008	0.700	0.458	0.921	−0.143	−0.345	−0.499	−0.602	−0.143	−1.937	−0.702
Guangxi	5.355	−1.934	−0.190	2.734	0.684	0.634	−0.208	−0.133	−0.393	−0.271	0.110	−3.444	−0.288
Hainan	−0.985	−0.216	1.044	0.393	0.034	−0.414	0.689	0.527	−1.494	0.000	1.988	1.027	0.528
Chongqing	−1.242	−1.519	−0.290	0.810	0.301	0.452	0.222	−0.249	−0.367	−0.309	−0.212	−1.123	−0.278
Sichuan	5.963	−0.802	−0.155	0.707	0.374	0.220	−0.104	−0.544	−0.239	−0.078	−0.023	−1.350	−0.331
Guizhou	−0.354	−0.544	−0.448	−0.016	−0.052	0.257	0.615	−0.415	−0.895	−0.433	−0.173	−0.259	−0.421
Yunnan	2.064	−1.152	0.239	2.829	0.489	1.023	0.467	−0.190	−0.565	−0.049	0.033	2.772	−0.212
Shaanxi	−0.364	−0.070	0.277	1.701	0.526	1.009	0.500	−0.377	−0.206	−0.703	−0.213	1.273	−0.618
Gansu	1.850	0.042	1.562	1.459	−0.174	1.378	−0.262	−0.343	−0.396	−0.039	0.884	1.040	−0.656
Qinghai	0.350	0.800	−0.710	7.451	1.855	5.552	0.397	0.246	0.048	0.073	0.336	0.707	−0.143
Ningxia	−0.097	−0.279	1.074	2.537	−0.010	1.566	0.918	−0.267	−0.472	−0.821	−0.071	2.640	−0.080
Xinjiang	−0.907	−0.393	−0.163	1.068	3.934	0.745	0.525	0.463	0.078	0.105	−0.032	2.481	0.361

Table S5. The GDP elasticity of waste water discharge in China during 1998–2012.

	1999–2000	2000–2001	2001–2002	2002–2003	2003–2004	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009	2009–2010	2010–2011	2011–2012
Beijing	0.752	0.048	0.386	−0.024	0.326	0.254	0.308	0.202	0.465	2.389	−0.303	0.819	−0.464
Tianjin	1.074	1.264	0.504	−0.495	0.319	1.634	−0.168	−0.219	0.437	−0.157	0.824	−0.094	1.684
Hebei	−0.808	1.486	0.436	0.358	1.091	0.065	0.492	0.023	0.491	0.439	0.587	0.539	1.018
Shanxi	−0.243	−0.131	0.095	0.119	0.094	0.115	0.692	0.117	0.071	−0.179	0.844	−0.141	1.549
Inner Mongolia	0.090	0.180	0.176	0.346	0.180	0.323	0.501	−0.094	0.462	0.230	1.764	0.591	0.177
Liaoning	−0.354	−0.519	−0.350	0.131	0.139	0.976	−0.191	0.239	−0.303	0.185	0.034	0.528	0.295
Jilin	−0.082	−0.944	0.933	−0.400	0.440	1.062	−0.057	0.044	0.921	0.132	0.312	0.110	0.241
Heilongjiang	0.219	0.501	−0.165	0.146	−0.317	−0.023	0.117	−0.482	0.157	−0.039	0.578	2.186	0.791
Shanghai	−0.409	0.064	−0.136	−0.042	0.086	0.298	1.004	0.089	−0.109	0.369	0.747	−1.675	0.317
Jiangsu	0.374	2.248	0.060	−0.203	0.743	0.790	−0.050	−0.130	0.066	0.199	0.500	0.612	0.091
Zhejiang	0.995	1.308	0.521	0.296	0.283	0.886	0.402	0.153	0.361	0.467	0.684	0.708	0.025
Anhui	0.743	−0.573	0.536	−0.130	0.375	0.483	0.495	0.382	−0.314	0.505	0.191	2.347	0.376
Fujian	2.174	0.932	0.371	1.753	1.459	0.868	0.116	0.334	0.315	0.335	−0.220	2.648	−1.662
Jiangxi	0.094	0.355	0.577	0.510	0.550	0.210	0.738	0.386	−0.124	0.449	0.660	1.682	0.316
Shandong	0.207	0.259	−0.147	0.467	0.485	0.408	0.536	0.731	0.594	0.637	1.043	0.147	0.827
Henan	0.594	0.309	0.180	0.069	0.331	0.332	0.409	0.461	0.284	0.734	0.592	0.470	0.647
Hubei	−0.018	−0.489	0.438	−0.063	0.079	0.168	0.073	0.199	0.369	0.197	0.127	0.596	−0.087
Hunan	−0.182	−0.168	0.641	0.747	0.499	0.194	−0.369	0.224	−0.008	0.263	0.181	0.277	0.753
Guangdong	0.381	1.353	−0.348	0.791	−0.058	1.293	0.172	0.380	−0.176	0.154	0.415	0.867	0.827
Guangxi	−0.141	0.881	0.483	1.579	0.156	1.803	−0.302	1.534	0.625	−0.828	0.164	−2.346	0.923
Hainan	0.415	−0.370	0.454	0.806	2.516	0.639	0.018	−0.035	0.284	0.314	−0.138	−0.219	0.424
Chongqing	−0.389	−0.110	−0.075	0.540	0.094	0.612	0.299	−0.684	0.559	0.090	−0.754	0.159	0.055
Sichuan	4.970	−0.988	0.356	0.055	0.457	0.654	−0.266	0.016	0.337	0.010	−0.167	0.618	0.108
Guizhou	−0.887	0.124	−0.591	0.476	0.023	−0.003	−0.040	−0.033	0.121	0.517	0.220	1.875	1.276
Yunnan	0.210	−0.798	0.572	0.205	1.291	−0.440	0.590	0.251	0.012	0.367	0.409	4.406	0.338
Shaanxi	−0.034	−0.260	0.277	0.476	0.553	0.791	0.300	1.012	0.280	0.444	0.274	0.382	0.441
Gansu	−1.168	−0.608	0.000	2.424	−0.494	−0.270	0.396	−0.247	0.697	0.369	0.340	1.246	0.481
Qinghai	0.615	0.000	0.000	−0.485	2.145	2.918	0.020	0.223	0.016	1.072	0.129	−0.433	0.269
Ningxia	1.512	3.301	1.953	−0.152	0.089	4.648	−0.884	1.341	0.157	0.751	−0.122	−0.248	−0.107
Xinjiang	−0.046	0.693	−0.254	1.692	0.649	0.516	0.290	0.398	0.806	0.410	0.795	−0.036	1.048

Table S6. Results of unit root test for all variables of 30 provinces.

	Final Energy Consumption		Water Consumption		CO ₂		SO ₂		Wastewater	
	Levels	First Differences	Levels	First Differences	Levels	First Differences	Levels	First Differences	Levels	First Differences
Beijing	-3.33 ** (0.033)	-5.62 *** (0.001)	-4.42 ** (0.010)	-7.92 *** (0.000)	-4.41 *** (0.006)	-4.16 *** (0.001)	-2.92 * (0.072)	-3.84 *** (0.002)	-4.41 *** (0.006)	-7.44 *** (0.000)
Tianjin	-3.93 ** (0.012)	-4.09 ** (0.012)	-3.08 * (0.065)	-7.64 *** (0.000)	-5.10 *** (0.002)	-4.49 *** (0.001)	-9.40 *** (0.000)	-8.41 *** (0.000)	-3.43 ** (0.031)	-3.41 *** (0.004)
Hebei	-1.27 (0.178)	-4.49 *** (0.000)	-3.74 ** (0.029)	-2.58 *** (0.017)	-3.01 * (0.063)	-6.36 *** (0.000)	-2.95 * (0.068)	-4.00 *** (0.001)	-7.74 *** (0.000)	-5.87 *** (0.000)
Shanxi	-1.45 (0.132)	-3.33 *** (0.003)	-2.86 ** (0.092)	-2.77 ** (0.013)	-3.11 * (0.055)	-7.766 *** (0.000)	-3.13 * (0.052)	-4.68 *** (0.000)	-3.44 ** (0.031)	-3.13 *** (0.006)
Inner	-0.36 (0.532)	-19.18 *** (0.000)	-7.91 *** (0.000)	-6.03 *** (0.002)	-4.56 *** (0.005)	-4.61 *** (0.000)	-3.20 ** (0.046)	-3.40 *** (0.003)	-3.13 ** (0.051)	-3.46 *** (0.003)
Liaoning	-2.79 * (0.089)	-5.31 *** (0.002)	-1.39 (0.541)	-2.93 *** (0.009)	-5.28 *** (0.002)	-7.88 *** (0.000)	-2.79 * (0.089)	-4.97 *** (0.000)	-3.20 * (0.051)	-6.85 *** (0.000)
Jilin	-3.36 ** (0.037)	-4.38 *** (0.006)	-2.25 (0.205)	-2.33 ** (0.027)	-3.44 ** (0.031)	-6.33 *** (0.000)	-2.65 (0.110)	-4.41 *** (0.000)	-4.56 *** (0.005)	-6.91 *** (0.000)
Heilongjiang	-2.11 (0.245)	-4.68 *** (0.000)	-5.79 *** (0.002)	-5.37 *** (0.004)	-2.04 (0.268)	-4.71 *** (0.000)	-3.24 ** (0.043)	-6.96 *** (0.000)	-2.05 (0.265)	-4.69 *** (0.000)
Shanghai	-2.98 ** (0.061)	-7.41 *** (0.000)	-0.068 (0.803)	-2.44 ** (0.022)	-3.43 ** (0.031)	-6.05 *** (0.000)	-0.22 (0.909)	-6.83 *** (0.000)	-4.15 *** (0.010)	-4.27 (0.001)
Jiangsu	0.70 (0.395)	3.37 *** (0.003)	-3.84 ** (0.026)	-18.60 *** (0.000)	-2.05 (0.264)	-3.63 *** (0.002)	-5.71 *** (0.001)	-6.89 *** (0.000)	-1.29 (0.588)	-8.24 *** (0.000)
Zhejiang	-2.04 (0.268)	-4.17 *** (0.008)	-4.55 *** (0.008)	-3.65 *** (0.003)	-2.27 (0.196)	-2.59 ** (0.015)	-1.55 (0.473)	-2.15 ** (0.036)	-4.31 *** (0.008)	-3.39 *** (0.004)
Anhui	-2.41 (0.158)	-4.81 *** (0.003)	-6.49 *** (0.001)	-10.07 *** (0.000)	-3.17 ** (0.048)	-3.65 *** (0.002)	-1.90 (0.321)	-5.71 *** (0.000)	-3.85 ** (0.016)	-8.27 *** (0.000)
Fujian	-2.39 (0.166)	-4.92 *** (0.004)	-4.15 ** (0.014)	-4.94 *** (0.007)	-3.30 ** (0.039)	-4.35 *** (0.001)	-3.35 ** (0.036)	-6.39 *** (0.000)	-4.42 *** (0.006)	-5.97 *** (0.000)
Jiangxi	-3.65 ** (0.019)	-5.13 *** (0.001)	-3.52 ** (0.039)	-5.24 *** (0.006)	-2.66 (0.108)	-3.56 *** (0.003)	-2.82 * (0.084)	-4.76 *** (0.000)	-2.80 * (0.092)	-4.50 *** (0.000)
Shandong	-3.18 ** (0.047)	-7.49 *** (0.000)	-5.05 *** (0.005)	-5.19 *** (0.000)	-2.76 * (0.094)	-3.07 *** (0.006)	-3.49 ** (0.028)	-5.26 *** (0.000)	-2.92 * (0.072)	-6.77 *** (0.000)
Henan	-2.30 (0.184)	-3.52 ** (0.027)	-6.97 *** (0.001)	-7.50 *** (0.001)	-2.86 * (0.079)	-4.62 *** (0.000)	-1.37 (0.562)	-2.97 *** (0.007)	-2.01 (0.280)	-4.52 *** (0.000)
Hubei	-1.88 (0.330)	-4.80 *** (0.003)	-5.22 *** (0.005)	-8.65 *** (0.000)	-3.78 ** (0.018)	-6.08 *** (0.000)	-1.89 (0.327)	-3.29 *** (0.004)	-1.74 (0.386)	-5.97 *** (0.000)
Hunan	-2.20 (0.218)	-6.75 *** (0.000)	-4.97 *** (0.005)	-5.41 ** (0.015)	-2.19 (0.219)	-5.28 *** (0.000)	-2.54 (0.130)	-5.71 (0.000)	-2.17 (0.226)	-3.35 *** (0.003)

Table S6. *Cont.*

	Final Energy Consumption		Water Consumption		CO ₂		SO ₂		Wastewater	
	Levels	First Differences	Levels	First Differences	Levels	First Differences	Levels	First Differences	Levels	First Differences
Guangdong	-1.28 (0.608)	-3.58 ** (0.023)	-1.50 (0.484)	-2.13 ** (0.040)	-2.74 * (0.096)	-5.84 *** (0.000)	-1.48 (0.507)	-4.88 *** (0.000)	-2.86 * (0.085)	-2.95 *** (0.008)
Guangxi	-4.36 *** (0.008)	-4.52 *** (0.007)	-4.07 ** (0.019)	-5.84 *** (0.004)	-2.44 (0.153)	-3.72 *** (0.002)	-5.41 *** (0.001)	-6.78 *** (0.000)	-0.63 (0.826)	-9.52 *** (0.000)
Hainan	-0.14 (0.616)	-5.93 *** (0.000)	-3.18 (0.060)	-3.99 ** (0.021)	-4.39 *** (0.009)	-3.69 *** (0.002)	-3.84 ** (0.015)	-5.80 *** (0.000)	-2.35 (0.175)	-3.96 *** (0.001)
Chongqing	-6.37 *** (0.000)	-3.54 ** (0.031)	-0.34 (0.965)	-1.94 * (0.055)	-3.10 * (0.054)	-3.23 *** (0.005)	-2.16 (0.228)	-3.21 *** (0.004)	-4.00 ** (0.012)	-5.56 *** (0.000)
Sichuan	-4.10 ** (0.012)	-4.85 *** (0.005)	-2.74 (0.104)	-3.96 *** (0.002)	-4.57 *** (0.006)	-3.09 *** (0.006)	-12.18 *** (0.000)	-12.41 *** (0.000)	-20.64 *** (0.000)	-4.90 *** (0.000)
Guizhou	-4.28 *** (0.009)	-2.96 *** (0.008)	0.405 (0.967)	-7.66 *** (0.000)	-5.44 *** (0.001)	-9.74 *** (0.000)	-2.88 * (0.077)	-3.66 *** (0.002)	0.98 (0.992)	-6.89 *** (0.000)
Yunnan	-1.93 (0.312)	-3.12 *** (0.005)	-3.29* (0.052)	-3.26 *** (0.006)	-4.30 *** (0.007)	-6.54 *** (0.000)	-4.13 *** (0.010)	-5.48 *** (0.000)	-3.47 ** (0.029)	-6.75 *** (0.000)
Shaanxi	-2.33 (0.178)	-3.89 ** (0.015)	-3.72 ** (0.026)	-4.40 *** (0.001)	-2.52 (0.136)	-6.13 *** (0.000)	-2.75 * (0.095)	-4.44 *** (0.000)	-2.80* (0.088)	-6.79 *** (0.000)
Gansu	-2.64 (0.109)	-4.22 *** (0.009)	-4.56 ** (0.010)	-4.84 ** (0.010)	-2.85 * (0.080)	-3.95 *** (0.001)	-5.36 ** (0.026)	-5.75 *** (0.000)	-3.37 ** (0.037)	-3.52 *** (0.003)
Qinghai	-4.76 *** (0.002)	-7.77 *** (0.000)	-3.96 ** (0.019)	-4.52 *** (0.001)	-7.26 *** (0.000)	-11.69 *** (0.000)	-3.26 ** (0.042)	-7.42 *** (0.000)	-2.61 (0.117)	-3.51 *** (0.003)
Ningxia	-2.56 (0.123)	-4.24 *** (0.007)	-5.67 *** (0.002)	-7.58 *** (0.000)	-2.70 (0.102)	-4.55 *** (0.000)	-3.16** (0.049)	-4.61 *** (0.000)	-3.64 ** (0.022)	-3.98 *** (0.001)
Xinjiang	-2.39 (0.162)	-3.50 ** (0.026)	-4.53 ** (0.011)	-4.09 *** (0.002)	-2.35 (0.174)	-4.01 *** (0.001)	-2.93 * (0.071)	-4.33 *** (0.001)	-4.33 *** (0.010)	-8.22 *** (0.000)