

**ANALYSIS OF ENERGY SYSTEM CHANGES TO REDUCE CO2 EMISSIONS IN  
2010 FOR GREECE**

**National Technical University of Athens  
Primes Ver. 2 Energy Model**

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**9 March, 1999**

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Level of Carbon Value (in Eur'90/ton of Carbon)	0	1	2	5	10	20	40	70	110	160	220	290	370	460	560	700	900	
<b>DECOMPOSITION OF CO2 EMISSIONS REDUCTION (ktn of CO2 avoided in target year)</b>																		
<b>Industrial Sectors - Metals</b>																		
Total CO2 emissions reduction	0	-65	-63	-59	-73	-46	-732	-754	-804	-833	-838	-830	-909	-966	-1043	-1125	-1142	
Structural change and behavioural effects	0	-1	-3	-7	-14	-28	-56	-91	-139	-195	-234	-279	-316	-382	-432	-394	-417	
Technological improvement	0	0	-1	-2	-4	-7	-14	-22	-34	-48	-66	-134	-235	-306	-464	-867	-1032	
Energy saving in heat uses	0	0	-1	-1	-3	-5	-7	-13	-18	-24	-38	-50	-76	-91	-114	-164	-251	
Specific Industrial processes	0	0	0	-1	-1	-3	-5	-8	-13	-18	-28	-44	-89	-128	-253	-531	-590	
Electrical Equipment	0	0	0	0	0	1	-2	-1	-2	-7	0	-39	-71	-88	-97	-172	-191	
Change of fuel mix	0	-1	-1	-2	-5	-8	-15	-20	-26	-30	-31	-34	-36	-61	-65	-68	-104	
Change of emission factor of electricity and steam (supply effect)	0	-62	-58	-48	-51	-2	-647	-621	-605	-560	-507	-384	-321	-217	-81	204	411	
<b>Industrial Sectors - Chemicals</b>																		
Total CO2 emissions reduction	0	-17	-19	-26	-39	-53	-226	-257	-293	-330	-348	-399	-446	-504	-528	-602	-799	
Structural change and behavioural effects	0	-1	-1	-2	-5	-9	-19	-29	-43	-62	-71	-92	-117	-154	-171	-237	-239	
Technological improvement	0	-2	-3	-8	-16	-29	-51	-73	-98	-126	-154	-211	-246	-276	-280	-354	-598	
Energy saving in heat uses	0	0	0	0	0	0	-1	-2	-2	-3	-4	-6	-7	-8	-9	-10	-16	
Specific Industrial processes	0	-1	-2	-6	-11	-20	-34	-48	-63	-79	-107	-149	-172	-184	-179	-227	-419	
Electrical Equipment	0	0	-1	-2	-4	-8	-17	-24	-33	-43	-43	-57	-66	-84	-92	-117	-163	
Change of fuel mix	0	-1	-2	-5	-9	-15	-23	-30	-35	-38	-40	-42	-42	-56	-85	-47	-62	
Change of emission factor of electricity and steam (supply effect)	0	-14	-13	-11	-11	1	-133	-125	-118	-104	-83	-55	-41	-18	7	36	100	
<b>Industrial Sectors - Materials</b>																		
Total CO2 emissions reduction	0	-65	-67	-75	-102	-106	-803	-902	-1033	-1146	-1226	-1299	-1503	-1614	-1652	-1852	-1613	
Structural change and behavioural effects	0	-2	-4	-10	-20	-41	-83	-141	-220	-314	-403	-501	-633	-833	-929	-991	-1466	
Technological improvement	0	-1	-3	-8	-16	-31	-56	-91	-134	-174	-234	-316	-433	-587	-764	-1032	-1038	
Energy saving in heat uses	0	0	0	-1	-1	-2	-5	-9	-15	-21	-31	-49	-80	-91	-94	-113	-136	
Specific Industrial processes	0	-1	-1	-4	-7	-13	-23	-37	-53	-71	-100	-138	-187	-253	-342	-464	-598	
Electrical Equipment	0	-1	-1	-4	-8	-15	-28	-45	-66	-92	-123	-167	-223	-293	-381	-500	-658	
Change of fuel mix	0	-2	-4	-10	-19	-36	-63	-93	-122	-146	-166	-183	-200	-224	-232	-219	-230	
Change of emission factor of electricity and steam (supply effect)	0	-60	-56	-46	-46	2	-601	-577	-558	-512	-422	-299	-238	-128	11	218	622	
<b>Industrial Sectors - Others</b>																		
Total CO2 emissions reduction	0	-76	-75	-73	-84	-53	-828	-879	-971	-1101	-1128	-1217	-1375	-1635	-1674	-1990	-1609	
Structural change and behavioural effects	0	-1	-1	-3	-5	-11	-22	-36	-56	-81	-104	-137	-172	-201	-213	-307	-354	
Technological improvement	0	-2	-4	-13	-25	-49	-94	-161	-266	-441	-603	-809	-998	-1319	-1515	-1843	-2048	
Energy saving in heat uses	0	0	0	-1	-3	-5	-8	-17	-30	-46	-108	-189	-229	-349	-400	-514	-648	
Specific Industrial processes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Electrical Equipment	0	-2	-4	-11	-22	-43	-86	-144	-236	-395	-495	-620	-768	-970	-1115	-1330	-1400	
Change of fuel mix	0	0	0	0	-1	-1	-1	-1	0	1	0	-6	-19	-57	-51	-87	-83	
Change of emission factor of electricity and steam (supply effect)	0	-73	-69	-57	-53	7	-710	-680	-650	-580	-422	-264	-186	-58	105	248	877	
<b>Industrial Sectors - Total</b>																		
Total CO2 emissions reduction	0	-223	-225	-233	-298	-257	-2589	-2792	-3102	-3410	-3541	-3745	-4233	-4719	-4898	-5567	-5162	
Structural change and behavioural effects	0	-5	-9	-22	-44	-90	-181	-298	-458	-652	-811	-1009	-1327	-1670	-1925	-2323	-1483	
Technological improvement	0	-6	-11	-31	-60	-116	-215	-348	-531	-789	-1057	-1470	-2312	-2830	-3250	-4530	-5211	
Energy saving in heat uses	0	-1	-1	-3	-7	-13	-22	-41	-65	-93	-181	-294	-392	-540	-618	-802	-1051	
Specific Industrial processes	0	-2	-4	-10	-19	-36	-62	-93	-129	-168	-235	-331	-449	-593	-766	-1006	-1247	
Electrical Equipment	0	-3	-6	-18	-34	-67	-132	-213	-337	-527	-641	-845	-1072	-1337	-1526	-1939	-2112	
Change of fuel mix	0	-4	-7	-17	-33	-60	-102	-144	-182	-213	-238	-264	-297	-398	-434	-421	-480	
Change of emission factor of electricity and steam (supply effect)	0	-209	-197	-163	-161	8	-2091	-2003	-1931	-1756	-1435	-1002	-786	-420	42	706	2011	

**ANALYSIS OF ENERGY SYSTEM CHANGES TO REDUCE CO2 EMISSIONS IN 2010 FOR GREECE**

Level of Carbon Value (in Eur'90/ton of Carbon)	0	1	2	5	10	20	40	70	110	160	220	290	370	460	560	700	900	
<b>DECOMPOSITION OF CO2 EMISSIONS REDUCTION (ktn of CO2 avoided in target year)</b>																		
<b>Services</b>																		
Total CO2 emissions reduction	0	-376	-385	-405	-558	-1008	-4908	-5381	-6115	-7005	-8341	-9982	-10865	-11058	-10927	-10771	-10318	
Structural change and behavioural effects	0	-14	-27	-69	-132	-271	-463	-798	-1239	-1756	-2355	-2814	-3171	-3450	-3612	-3683	-3885	
Technological improvement	0	-15	-34	-71	-149	-733	-952	-1278	-1710	-2397	-3516	-5418	-6269	-6596	-6916	-8008	-8570	
Space heating and cooling	0	-8	-17	-36	-79	-209	-333	-508	-758	-1097	-1477	-2008	-2388	-2591	-2741	-2970	-3089	
Other heat uses (water heating, cooking, etc.)	0	-2	-4	-9	-21	-61	-136	-215	-313	-406	-474	-545	-610	-677	-751	-883	-1002	
Electric uses	0	-6	-13	-26	-49	-146	-255	-383	-538	-725	-965	-1275	-1655	-2105	-2635	-3255	-3975	
Change of fuel mix	0	0	1	2	4	9	14	22	28	34	34	36	39	-23	-23	-38	195	
Change of emission factor of electricity and steam (supply effect)	0	-348	-325	-267	-281	-13	-3508	-3327	-3194	-2887	-2504	-1787	-1463	-990	-376	958	1942	
<b>Agriculture</b>																		
Total CO2 emissions reduction	0	-17	-17	-18	-26	-52	-221	-242	-272	-305	-355	-405	-439	-451	-449	-438	-437	
Structural change and behavioural effects	0	-1	-2	-5	-9	-19	-33	-57	-88	-124	-164	-201	-230	-252	-266	-274	-286	
Technological improvement	0	0	-1	-2	-4	-31	-33	-37	-40	-49	-76	-112	-130	-141	-152	-188	-218	
Space heating and cooling	0	0	0	0	0	-2	-2	-2	-1	-1	-14	-7	-7	-5	-2	6	12	
Other heat uses (water heating, cooking, etc.)	0	0	0	0	0	0	0	1	3	4	7	9	10	12	15	19	17	
Electric uses	0	0	-1	-2	-4	-29	-31	-36	-42	-52	-69	-113	-133	-148	-164	-214	-247	
Change of fuel mix	0	0	0	0	0	-1	-1	-1	-2	-3	-1	-9	-10	-12	-14	-20	-22	
Change of emission factor of electricity and steam (supply effect)	0	-15	-14	-12	-12	-1	-154	-147	-142	-129	-113	-83	-69	-47	-18	45	89	
<b>Households</b>																		
Total CO2 emissions reduction	0	-339	-339	-352	-460	-406	-3965	-4331	-4895	-5475	-6083	-6614	-7449	-8419	-8902	-9147	-10461	
Structural change and behavioural effects	0	-15	-29	-73	-139	-272	-501	-836	-1293	-1838	-2400	-3056	-3671	-3923	-3982	-4693	-4776	
Technological improvement	0	-2	-2	-3	-1	2	-1	-51	-86	-185	-355	-594	-891	-1765	-2588	-2864	-4508	
Space heating	0	-1	-1	-2	-2	-3	-7	-21	-36	-71	-127	-228	-383	-997	-1615	-1827	-2028	
Other heat uses (water heating, cooking, air conditioning)	0	0	0	1	4	9	14	0	-4	-34	-118	-223	-340	-513	-575	-470	-486	
Electric appliances	0	-1	-1	-3	-3	-4	-9	-29	-46	-80	-111	-142	-169	-255	-398	-567	-1995	
Change of fuel mix	0	-7	-14	-35	-65	-125	-225	-356	-527	-716	-892	-1147	-1388	-1746	-1973	-2540	-3038	
Change of emission factor of electricity and steam (supply effect)	0	-314	-294	-242	-255	-11	-3237	-3088	-2989	-2737	-2436	-1816	-1499	-985	-359	950	1861	
<b>Passenger Transport</b>																		
Total CO2 emissions reduction	0	-40	-53	-93	-165	-283	-931	-1452	-1992	-2690	-3281	-3910	-4891	-5167	-5945	-7196	-8558	
Structural change and behavioural effects	0	-6	-12	-30	-60	-118	-227	-379	-570	-800	-1052	-1294	-1482	-1717	-1933	-2493	-3231	
Technological improvement	0	-9	-17	-43	-85	-164	-442	-825	-1183	-1669	-2030	-2468	-3281	-3365	-3980	-4787	-5488	
Train transports	0	-1	-3	-7	-13	-24	-45	-81	-133	-293	-371	-484	-503	-554	-584	-607	-616	
Aviation / Navigation	0	-7	-14	-35	-68	-132	-382	-715	-1001	-1293	-1535	-1789	-2421	-2246	-2443	-2590	-2680	
Road transports	0	0	-1	-2	-4	-7	-15	-29	-49	-83	-124	-195	-357	-566	-954	-1591	-2193	
Change of fuel mix	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	
Change of emission factor of electricity and steam (supply effect)	0	-25	-24	-20	-21	-1	-262	-249	-240	-222	-201	-149	-129	-86	-33	82	159	
<b>Goods Transport</b>																		
Total CO2 emissions reduction	0	-4	-6	-13	-25	-47	-108	-180	-354	-497	-676	-943	-1294	-1823	-2214	-2980	-3576	
Structural change and behavioural effects	0	-2	-3	-9	-18	-35	-71	-125	-257	-348	-452	-543	-621	-692	-748	-834	-885	
Technological improvement	0	-1	-1	-2	-5	-10	-20	-36	-76	-126	-199	-375	-746	-1305	-1690	-2613	-3120	
Train transports	0	0	0	-1	-1	-2	-4	-6	-23	-29	-30	-33	-33	-32	-32	-30	-32	
Aviation / Navigation	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-2	-2	-2	-3	
Road transports	0	0	-1	-2	-4	-8	-16	-30	-52	-97	-168	-341	-712	-1271	-1656	-2580	-3085	
Change of fuel mix	0	0	0	0	-1	-2	-4	-6	-9	-12	-15	-18	-20	-23	-24	-26	-28	
Change of emission factor of electricity and steam (supply effect)	0	-1	-1	-1	-1	0	-13	-13	-12	-11	-10	-7	-6	-4	-1	3	6	
<b>Final Energy Demand Sectors - Total</b>																		
Total CO2 emissions reduction	0	-999	-1025	-1115	-1532	-2053	-12721	-14377	-16729	-19382	-22277	-25599	-29171	-31637	-33335	-36100	-38513	
Structural change and behavioural effects	0	-42	-83	-208	-402	-805	-1476	-2492	-3904	-5517	-7234	-8917	-9913	-10905	-11548	-12810	-14096	
Technological improvement	0	-33	-67	-153	-304	-1052	-1663	-2574	-3627	-5215	-7234	-10436	-13630	-16001	-18577	-22991	-27116	
Change of fuel mix	0	-10	-20	-51	-95	-178	-317	-485	-691	-909	-1111	-1401	-1675	-2199	-2466	-3043	-3371	
Change of emission factor of electricity and steam (supply effect)	0	-914	-855	-703	-731	-18	-9266	-8826	-8507	-7741	-6698	-4845	-3952	-2532	-744	2744	6070	

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Level of Carbon Value (in Eur'90/ton of Carbon)	0	1	2	5	10	20	40	70	110	160	220	290	370	460	560	700	900	
<b>DECOMPOSITION OF CO2 EMISSIONS REDUCTION (ktn of CO2 avoided in target year)</b>																		
<b>Electricity production</b>																		
Total CO2 emissions reduction	0	-955	-949	-944	-1213	-1420	-11299	-11933	-13079	-14296	-15823	-17631	-19012	-20093	-20088	-19788	-20228	
Change of demand	0	-111	-161	-298	-520	-1340	-2579	-3633	-5023	-6921	-9226	-12718	-14900	-17271	-18990	-22445	-25527	
Production from non fossil fuels	0	-2	-7	-28	-372	-1059	-1133	-1351	-2290	-3162	-3549	-4238	-4652	-4983	-4437	-3596	-1836	
Large hydro	0	-1	-5	-20	-251	-654	-701	-827	-1267	-1637	-1848	-2220	-2461	-2706	-2653	-2507	-1517	
Small renewables	0	-1	-2	-7	-112	-293	-319	-391	-636	-1024	-1145	-1338	-1436	-1496	-1467	-1025	-319	
Biomass and waste	0	0	0	-1	-9	-112	-113	-133	-387	-501	-556	-680	-755	-781	-317	-64	0	
Nuclear energy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Change of fossil fuel mix	0	-795	-737	-580	-282	1010	-6658	-5993	-4770	-3303	-2174	274	1949	4393	4374	5061	5258	
Technological improvement of fossil fuel plants	0	-47	-43	-37	-39	-32	-928	-957	-996	-910	-874	-949	-1411	-2233	-1034	1192	1876	
<b>Steam production</b>																		
Total CO2 emissions reduction	0	-14	-16	-18	-14	-11	-120	-148	-177	-212	-120	-182	-240	-400	-405	-705	-264	
Change of demand	0	-1	-2	-4	-9	-18	-41	-64	-98	-140	-191	-262	-326	-425	-477	-525	-729	
Production from non fossil fuels	0	-4	-4	-3	-2	0	-17	-20	-25	-29	-45	-45	-53	-58	-18	-49	-138	
Technological improvement of fossil fuel plants and change of fuel mix	0	-9	-10	-11	-3	7	-63	-64	-54	-43	116	124	139	84	90	-131	602	
<b>Other Supply Sectors production</b>																		
Total CO2 emissions reduction	0	0	0	-1	-2	-4	-11	-20	-32	-47	-62	-77	-101	-113	-128	-160	-198	
<b>Statistical Difference</b>																		
Total CO2 emissions reduction	0	0	0	0	0	0	-3	-2	-2	-1	-2	-4	-96	-98	-105	-109	-100	
<b>Avoided CO2 Emissions - As in Final Report</b>																		
Total CO2 emissions reduction	0	-999	-1026	-1116	-1534	-2057	-12735	-14399	-16763	-19430	-22341	-25681	-29367	-31848	-33568	-36370	-38811	
In Final Energy Demand	0	-30	-61	-153	-305	-621	-1301	-2293	-3470	-4871	-6331	-7784	-9916	-11144	-12849	-15618	-18021	
In Electricity and Steam Generation	0	-969	-965	-962	-1227	-1432	-11423	-12086	-13261	-14513	-15947	-17820	-19351	-20591	-20591	-20591	-20591	
In Other Energy Conversion Sectors	0	0	0	-1	-2	-4	-11	-20	-32	-47	-62	-77	-101	-113	-128	-160	-198	

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Level of Carbon Value (in Eur'90/ton of Carbon)	0	1	2	5	10	20	40	70	110	160	220	290	370	460	560	700	900	
<b>DECOMPOSITION OF CO2 EMISSIONS REDUCTION (% contribution to avoid CO2 emissions in target year)</b>																		
<b>Industrial Sectors - Metals</b>																		
Total CO2 emissions reduction	0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Structural change and behavioural effects	0	2.2	4.5	11.9	19.3	61.9	7.7	12.1	17.3	23.4	27.9	33.6	34.8	39.5	41.5	35.0	36.5	
Technological improvement	0	0.5	1.1	3.2	5.0	15.1	1.9	2.9	4.2	5.8	7.9	16.1	25.9	31.7	44.5	77.1	90.4	
Energy saving in heat uses	0	0.4	0.8	2.3	3.5	10.4	1.0	1.7	2.3	2.8	4.5	6.1	8.3	9.4	11.0	14.6	22.0	
Specific Industrial processes	0	0.2	0.4	1.3	2.0	5.9	0.7	1.1	1.7	2.2	3.3	5.4	9.8	13.2	24.3	47.2	51.7	
Electrical Equipment	0	0.0	-0.1	-0.4	-0.6	-1.3	0.2	0.1	0.3	0.8	0.0	4.7	7.8	9.1	9.3	15.3	16.7	
Change of fuel mix	0	0.8	1.6	4.0	6.2	17.9	2.0	2.7	3.2	3.6	3.7	4.1	4.0	6.3	6.3	6.0	9.1	
Change of emission factor of electricity and steam (supply effect)	0	96.4	92.8	80.9	69.5	5.2	88.4	82.3	75.3	67.2	60.5	46.2	35.3	22.4	7.7	-18.1	-36.0	
<b>Industrial Sectors - Chemicals</b>																		
Total CO2 emissions reduction	0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Structural change and behavioural effects	0	3.1	5.3	9.1	12.0	17.8	8.6	11.3	14.5	18.7	20.3	23.1	26.2	30.6	32.3	39.3	29.9	
Technological improvement	0	9.9	17.1	31.0	39.6	55.8	22.7	28.5	33.5	38.1	44.2	52.8	55.2	54.8	53.0	58.8	74.9	
Energy saving in heat uses	0	0.1	0.2	0.5	0.6	0.9	0.5	0.6	0.8	1.0	1.2	1.4	1.6	1.7	1.8	1.7	2.0	
Specific Industrial processes	0	6.8	11.9	21.8	27.6	38.7	14.9	18.6	21.5	24.0	30.7	37.3	38.7	36.4	33.9	37.7	52.4	
Electrical Equipment	0	2.9	4.9	8.8	11.3	16.1	7.4	9.3	11.2	13.1	12.3	14.2	14.9	16.7	17.4	19.4	20.4	
Change of fuel mix	0	5.9	10.2	18.0	21.6	27.7	10.0	11.5	11.8	11.6	11.5	10.4	9.4	11.1	16.0	7.9	7.7	
Change of emission factor of electricity and steam (supply effect)	0	81.2	67.5	41.9	26.8	-1.3	58.7	48.7	40.2	31.6	24.0	13.7	9.2	3.5	-1.3	-6.0	-12.5	
<b>Industrial Sectors - Materials</b>																		
Total CO2 emissions reduction	0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Structural change and behavioural effects	0	3.1	6.0	13.4	19.7	38.8	10.3	15.6	21.3	27.4	32.9	38.6	15.5	20.6	26.7	20.8	29.3	
Technological improvement	0	2.2	4.4	11.3	16.0	29.0	6.9	10.1	12.9	15.2	19.1	24.3	55.4	57.5	59.9	79.2	95.0	
Energy saving in heat uses	0	0.2	0.3	0.8	1.2	2.3	0.6	1.0	1.4	1.8	2.5	3.8	5.3	5.7	5.7	6.1	8.4	
Specific Industrial processes	0	1.1	2.1	4.7	6.7	12.3	2.9	4.1	5.1	6.2	8.2	10.6	39.1	39.8	40.8	55.7	64.4	
Electrical Equipment	0	1.0	2.0	5.7	8.0	14.5	3.4	5.0	6.4	7.2	8.4	10.0	11.1	12.1	13.5	17.3	22.2	
Change of fuel mix	0	3.2	6.1	13.4	19.0	33.9	7.8	10.3	11.8	12.8	13.6	14.1	13.3	13.9	14.1	11.8	14.3	
Change of emission factor of electricity and steam (supply effect)	0	91.5	83.5	61.9	45.3	-1.7	74.9	63.9	54.0	44.7	34.4	23.0	15.8	7.9	-0.7	-11.8	-38.6	
<b>Industrial Sectors - Others</b>																		
Total CO2 emissions reduction	0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Structural change and behavioural effects	0	0.7	1.4	3.6	6.3	20.2	2.7	4.1	5.8	7.4	9.2	11.3	12.5	12.3	12.7	15.4	22.0	
Technological improvement	0	2.9	6.0	17.3	29.5	92.1	11.4	18.3	27.3	40.0	53.4	66.5	72.5	80.7	90.5	92.7	127.3	
Energy saving in heat uses	0	0.2	0.5	1.9	3.2	10.1	1.0	2.0	3.1	4.2	9.6	15.6	16.7	21.4	23.9	25.8	40.3	
Specific Industrial processes	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Electrical Equipment	0	2.7	5.5	15.5	26.3	82.0	10.4	16.4	24.3	35.9	43.9	51.0	55.9	59.3	66.6	66.8	87.1	
Change of fuel mix	0	0.1	0.2	0.5	0.7	1.8	0.1	0.1	0.0	-0.1	0.0	0.5	1.4	3.5	3.1	4.4	5.2	
Change of emission factor of electricity and steam (supply effect)	0	96.3	92.4	78.6	63.5	-14.1	85.8	77.4	66.9	52.7	37.4	21.7	13.5	3.5	-6.3	-12.4	-54.5	
<b>Industrial Sectors - Total</b>																		
Total CO2 emissions reduction	0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Structural change and behavioural effects	0	2.0	4.0	9.4	14.8	34.8	7.0	10.7	14.8	19.1	22.9	26.9	19.8	22.7	25.7	23.8	28.7	
Technological improvement	0	2.6	5.1	13.3	20.2	45.0	8.3	12.5	17.1	23.1	29.9	39.2	54.6	60.0	66.4	81.4	100.9	
Energy saving in heat uses	0	0.3	0.5	1.5	2.3	5.1	0.8	1.5	2.1	2.7	5.1	7.9	9.3	11.4	12.6	14.4	20.4	
Specific Industrial processes	0	0.9	1.8	4.3	6.4	14.0	2.4	3.3	4.2	4.9	6.6	8.8	20.0	20.2	22.6	32.1	39.7	
Electrical Equipment	0	1.4	2.8	7.6	11.5	25.9	5.1	7.6	10.9	15.5	18.1	22.6	25.3	28.3	31.2	34.8	40.9	
Change of fuel mix	0	1.6	3.2	7.5	11.1	23.2	3.9	5.1	5.9	6.3	6.7	7.1	7.0	8.4	8.9	7.6	9.3	
Change of emission factor of electricity and steam (supply effect)	0	93.8	87.7	69.7	53.9	-2.9	80.8	71.7	62.2	51.5	40.5	26.8	18.6	8.9	-0.9	-12.7	-39.0	

**ANALYSIS OF ENERGY SYSTEM CHANGES TO REDUCE CO2 EMISSIONS IN 2010 FOR GREECE**

Level of Carbon Value (in Eur'90/ton of Carbon)	0	1	2	5	10	20	40	70	110	160	220	290	370	460	560	700	900	
<b>DECOMPOSITION OF CO2 EMISSIONS REDUCTION (% contribution to avoid CO2 emissions in target year)</b>																		
<b>Services</b>																		
Total CO2 emissions reduction	0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Structural change and behavioural effects	0	3.6	7.0	17.1	23.7	26.9	9.4	14.8	20.3	25.1	28.2	28.2	29.2	31.2	33.1	34.2	37.7	
Technological improvement	0	4.0	8.9	17.6	26.7	72.7	19.4	23.7	28.0	34.2	42.1	54.3	57.7	59.6	63.3	74.3	83.1	
Space heating and cooling	0	2.0	4.4	8.9	14.2	20.7	6.8	9.4	12.4	15.7	17.7	20.1	22.0	23.4	25.1	27.6	29.9	
Other heat uses (water heating, cooking, etc.)	0	0.5	1.1	2.3	3.7	6.0	2.8	4.0	5.1	5.8	5.7	5.5	5.6	6.1	6.9	8.2	9.7	
Electric uses	0	1.5	3.4	6.4	8.8	46.0	9.8	10.3	10.4	12.8	18.8	28.7	30.1	30.1	31.3	38.6	43.4	
Change of fuel mix	0	-0.1	-0.2	-0.5	-0.8	-0.9	-0.3	-0.4	-0.5	-0.5	-0.4	-0.4	-0.4	0.2	0.2	0.4	-1.9	
Change of emission factor of electricity and steam (supply effect)	0	92.5	84.3	65.9	50.4	1.3	71.5	61.8	52.2	41.2	30.0	17.9	13.5	8.9	3.4	-8.9	-18.8	
<b>Agriculture</b>																		
Total CO2 emissions reduction	0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Structural change and behavioural effects	0	5.6	10.9	25.5	35.7	36.4	14.9	23.5	32.3	40.6	46.3	49.7	52.4	55.9	59.2	62.6	65.5	
Technological improvement	0	2.3	5.2	9.7	14.5	61.0	14.8	15.2	14.9	16.0	21.5	27.6	29.7	31.2	33.8	43.0	50.0	
Space heating and cooling	0	0.0	0.1	0.0	0.5	4.3	1.0	0.7	0.4	0.2	4.0	1.8	1.6	1.1	0.5	-1.4	-2.7	
Other heat uses (water heating, cooking, etc.)	0	-0.3	-0.6	-1.5	-1.6	0.9	0.0	-0.5	-0.9	-1.2	-1.9	-2.1	-2.2	-2.7	-3.3	-4.4	-3.8	
Electric uses	0	2.6	5.7	11.2	15.5	55.8	13.9	14.9	15.4	17.1	19.4	27.9	30.3	32.8	36.6	48.8	56.5	
Change of fuel mix	0	0.4	0.7	1.6	1.8	1.5	0.4	0.6	0.7	0.8	0.3	2.2	2.2	2.6	3.1	4.6	4.9	
Change of emission factor of electricity and steam (supply effect)	0	91.7	83.3	63.3	48.0	1.1	69.9	60.8	52.2	42.5	31.9	20.6	15.7	10.3	3.9	-10.2	-20.4	
<b>Households</b>																		
Total CO2 emissions reduction	0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Structural change and behavioural effects	0	4.5	8.6	20.8	30.2	67.0	12.6	19.3	26.4	33.6	39.5	46.2	49.3	46.6	44.7	51.3	45.7	
Technological improvement	0	0.7	0.7	0.8	0.3	-0.6	0.0	1.2	1.8	3.4	5.8	9.0	12.0	21.0	29.1	31.3	43.1	
Space heating	0	0.2	0.3	0.4	0.4	0.7	0.2	0.5	0.7	1.3	2.1	3.5	5.1	11.8	18.1	20.0	19.4	
Other heat uses (water heating, cooking, air conditioning)	0	0.1	0.0	-0.4	-0.9	-2.3	-0.4	0.0	0.1	0.6	1.9	3.4	4.6	6.1	6.5	5.1	4.6	
Electric appliances	0	0.3	0.4	0.8	0.7	1.1	0.2	0.7	0.9	1.5	1.8	2.1	2.3	3.0	4.5	6.2	19.1	
Change of fuel mix	0	2.1	4.0	9.8	14.2	30.8	5.7	8.2	10.8	13.1	14.7	17.3	18.6	20.7	22.2	27.8	29.0	
Change of emission factor of electricity and steam (supply effect)	0	92.8	86.6	68.6	55.3	2.8	81.6	71.3	61.1	50.0	40.0	27.5	20.1	11.7	4.0	-10.4	-17.8	
<b>Passenger Transports</b>																		
Total CO2 emissions reduction	0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Structural change and behavioural effects	0	15.0	22.7	32.5	36.2	41.8	24.4	26.1	28.6	29.7	32.0	33.1	30.3	33.2	32.5	34.6	37.7	
Technological improvement	0	21.9	32.7	46.4	51.4	57.9	47.5	56.8	59.4	62.0	61.9	63.1	67.1	65.1	67.0	66.5	64.1	
Train transports	0	3.7	5.1	7.1	7.9	8.6	4.9	5.6	6.7	10.9	11.3	12.4	10.3	10.7	9.8	8.4	7.2	
Aviation / Navigation	0	17.4	26.3	37.4	41.3	46.7	41.0	49.3	50.2	48.1	46.8	45.7	49.5	43.5	41.1	36.0	31.3	
Road transports	0	0.9	1.3	1.9	2.2	2.6	1.6	2.0	2.5	3.1	3.8	5.0	7.3	10.9	16.0	22.1	25.6	
Change of fuel mix	0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Change of emission factor of electricity and steam (supply effect)	0	63.1	44.7	21.1	12.5	0.3	28.1	17.1	12.1	8.2	6.1	3.8	2.6	1.7	0.5	-1.1	-1.9	
<b>Goods Transports</b>																		
Total CO2 emissions reduction	0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Structural change and behavioural effects	0	47.7	59.0	68.7	71.5	74.8	65.6	69.3	72.7	70.0	66.9	57.6	40.3	27.0	22.5	11.5	12.2	
Technological improvement	0	13.7	16.7	19.5	20.2	21.0	18.4	20.2	21.4	25.4	29.5	39.7	57.7	71.6	76.3	87.7	87.2	
Train transports	0	3.5	4.1	4.7	4.8	4.6	3.6	3.6	6.5	5.8	4.5	3.5	2.5	1.8	1.5	1.0	0.9	
Aviation / Navigation	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Road transports	0	10.1	12.6	14.8	15.4	16.3	14.8	16.6	14.8	19.6	24.9	36.1	55.0	69.7	74.8	86.6	86.3	
Change of fuel mix	0	2.7	3.3	3.9	3.9	4.0	3.4	3.4	2.5	2.4	2.2	1.9	1.6	1.2	1.1	0.9	0.8	
Change of emission factor of electricity and steam (supply effect)	0	35.9	20.9	8.0	4.4	0.1	12.5	7.1	3.4	2.2	1.5	0.8	0.5	0.2	0.1	-0.1	-0.2	
<b>Final Energy Demand Sectors - Total</b>																		
Total CO2 emissions reduction	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Structural change and behavioural effects	0	4.2	8.1	18.6	26.2	39.2	11.6	17.3	23.3	28.5	32.5	34.8	34.0	34.5	34.6	35.5	36.6	
Technological improvement	0	3.3	6.6	13.7	19.9	51.2	13.1	17.9	21.7	26.9	32.5	40.8	46.7	50.6	55.7	63.7	70.4	
Change of fuel mix	0	1.0	2.0	4.5	6.2	8.7	2.5	3.4	4.1	4.7	5.0	5.5	5.7	7.0	7.4	8.4	8.8	
Change of emission factor of electricity and steam (supply effect)	0	91.5	83.4	63.1	47.7	0.9	72.8	61.4	50.9	39.9	30.1	18.9	13.5	8.0	2.2	-7.6	-15.8	

**ANALYSIS OF ENERGY SYSTEM CHANGES TO REDUCE CO2 EMISSIONS IN 2010 FOR GREECE**

Level of Carbon Value (in Eur'90/ton of Carbon)	0	1	2	5	10	20	40	70	110	160	220	290	370	460	560	700	900	
<b>DECOMPOSITION OF CO2 EMISSIONS REDUCTION (% contribution to avoid CO2 emissions in target year)</b>																		
<b>Electricity production</b>																		
Total CO2 emissions reduction	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Change of demand	0	11.6	16.9	31.6	42.9	94.3	22.8	30.4	38.4	48.4	58.3	72.1	78.4	86.0	94.5	113.4	126.2	
Production from non fossil fuels	0	0.2	0.8	3.0	30.6	74.5	10.0	11.3	17.5	22.1	22.4	24.0	24.5	24.8	22.1	18.2	9.1	
Large hydro	0	0.2	0.6	2.1	20.7	46.0	6.2	6.9	9.7	11.4	11.7	12.6	12.9	13.5	13.2	12.7	7.5	
Small renewables	0	0.1	0.2	0.8	9.3	20.6	2.8	3.3	4.9	7.2	7.2	7.6	7.6	7.4	7.3	5.2	1.6	
Biomass and waste	0	0.0	0.0	0.1	0.7	7.9	1.0	1.1	3.0	3.5	3.5	3.9	4.0	3.9	1.6	0.3	0.0	
Nuclear energy	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Change of fossil fuel mix	0	83.3	77.7	61.5	23.3	-71.1	58.9	50.2	36.5	23.1	13.7	-1.6	-10.3	-21.9	-21.8	-25.6	-26.0	
Technological improvement of fossil fuel plants	0	4.9	4.5	3.9	3.2	2.2	8.2	8.0	7.6	6.4	5.5	5.4	7.4	11.1	5.1	-6.0	-9.3	
<b>Steam production</b>																		
Total CO2 emissions reduction	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Change of demand	0	6.8	11.6	23.8	63.5	162.8	34.2	43.4	55.2	66.1	159.2	143.8	135.7	106.4	117.8	74.5	275.9	
Production from non fossil fuels	0	28.4	26.2	14.7	16.7	-2.5	13.8	13.3	14.2	13.9	37.3	24.6	22.2	14.5	4.5	6.9	52.2	
Technological improvement of fossil fuel plants and change of fuel mix	0	64.9	62.2	61.5	19.8	-60.3	52.1	43.3	30.6	20.0	-96.5	-68.4	-58.0	-21.0	-22.3	18.6	-228.1	
<b>Other Supply Sectors production</b>																		
Total CO2 emissions reduction	0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	
<b>Statistical Difference</b>																		
Total CO2 emissions reduction	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	
<b>Avoided CO2 Emissions - As in Final Report</b>																		
Total CO2 emissions reduction	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
In Final Energy Demand	0	3.0	5.9	13.7	19.9	30.2	10.2	15.9	20.7	25.1	28.3	30.3	33.8	35.0	38.3	42.9	46.4	
In Electricity and Steam Generation	0	96.9	94.0	86.2	80.0	69.6	89.7	83.9	79.1	74.7	71.4	69.4	65.9	64.7	61.3	56.6	53.1	
In Other Energy Conversion Sectors	0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	

**ANALYSIS OF ENERGY SYSTEM CHANGES TO REDUCE CO2 EMISSIONS IN 2010 FOR GREECE**

Level of Carbon Value (in Eur'90/ton of Carbon)	0	1	2	5	10	20	40	70	110	160	220	290	370	460	560	700	900	
<b>Heavy Industry</b>																		
Specific energy Consumption of Process Technology (toe per tn of output)																		
Iron and Steel	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.065	0.059	0.060	0.061	0.052	0.050	0.047	0.047	
Basic aluminium	1.502	1.502	1.502	1.502	1.502	1.501	1.500	1.499	1.497	1.496	1.491	1.482	1.467	1.460	1.365	1.186	1.146	
Other processing of non ferrous	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.026	0.025	0.024	0.023	0.022	
Chemicals	0.213	0.213	0.213	0.213	0.213	0.213	0.214	0.215	0.215	0.216	0.213	0.212	0.212	0.215	0.213	0.219	0.187	
Cement Production	0.086	0.086	0.086	0.086	0.086	0.086	0.086	0.085	0.085	0.085	0.085	0.085	0.079	0.079	0.078	0.074	0.074	
Glass basic processing	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.018	0.018	
Pulp and Paper	0.036	0.036	0.036	0.036	0.036	0.036	0.036	0.036	0.036	0.035	0.034	0.032	0.031	0.030	0.030	0.027	0.027	
Structural Change in basic processing (%)																		
Electric steelworks	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Aluminium recycling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	
Glass recycling	35.8	35.8	35.8	35.8	35.9	35.9	36.0	36.1	36.2	36.4	36.5	36.7	36.9	37.7	38.0	38.7	39.4	
Paper recycling	95.7	95.7	95.7	95.7	95.7	95.7	95.7	95.7	95.8	95.8	95.8	95.8	95.9	96.0	96.0	96.1	96.2	
Fuel Mix																		
electrotechnologies																		
% of mechanical processing in chemistry	14.5	14.5	14.4	14.3	14.0	13.6	12.5	11.8	11.0	9.9	10.2	9.4	8.5	6.5	5.9	4.3	2.0	
% of electric furnaces non ferrous	28.1	28.1	28.1	28.1	28.1	28.2	28.3	28.5	28.7	28.8	29.5	28.0	26.7	25.8	25.8	24.0	24.1	
% of mechanical processing glass production	73.1	73.1	73.0	73.0	72.9	72.7	72.2	71.7	71.1	70.4	70.7	70.4	69.2	67.5	64.2	59.0	56.8	
% of mechanical processing in paper and pulp	59.9	59.9	59.8	59.7	59.6	59.4	59.0	58.0	57.0	56.4	56.0	56.0	53.2	52.3	52.4	57.1	57.3	
% of heat pumps in specific heat uses	3.8	3.8	3.9	4.1	4.4	5.0	6.7	10.0	17.3	41.5	58.4	67.2	73.1	74.4	73.3	78.6	78.9	
natural gas directly substituting other fossil fuels (% in specific uses)	7.1	7.1	7.1	7.2	7.2	7.4	7.6	7.9	8.2	8.4	8.6	8.8	8.8	9.0	9.2	9.4	9.4	
market share of steam (% in industrial demand)	7.9	7.9	7.9	7.9	7.9	7.8	7.7	7.6	7.5	7.3	7.2	6.8	6.6	5.7	5.6	5.1	5.1	
Contribution of CHP for industrial Steam Production (%)	75.7	75.7	75.8	75.8	75.9	76.6	78.8	81.1	85.6	86.1	80.3	83.8	84.5	90.6	91.6	92.4	24.4	
<b>Equipment efficiency of electrical and cross-cutting technologies (index)</b>																		
Industrial Furnaces																		
Process Furnaces	100	100.0	100.0	100.1	100.2	100.4	100.8	101.3	101.9	102.4	103.1	103.8	105.6	106.6	106.9	109.2	109.9	
Electric Furnaces	100	100.0	100.0	100.1	100.2	100.3	100.5	100.8	101.1	101.5	102.1	104.0	106.4	108.4	110.1	115.2	124.3	
Industrial Motors, Air Compressors, Lighting, etc.																		
Motor Drives	100	100.0	100.0	100.0	100.1	100.1	100.2	100.4	100.6	100.8	101.5	102.0	102.4	104.4	105.9	108.8	113.5	
Air Compressors	100	100.0	100.1	100.2	100.3	100.6	101.2	102.0	103.0	103.6	105.2	106.8	108.0	108.4	108.8	110.4	111.0	
Lighting	100	100.1	100.1	100.3	100.6	101.2	102.3	103.8	105.8	107.6	114.5	132.2	142.6	147.0	147.9	156.0	157.4	
Electric Equipment in Households																		
Refrigerators	100	100.1	100.1	100.1	100.2	100.3	100.6	101.7	102.7	104.4	105.8	107.0	107.9	108.6	108.9	108.8	125.1	
Washing machines	100	100.1	100.1	100.2	100.2	100.3	100.6	102.0	103.4	106.2	108.6	110.4	111.8	112.9	113.5	113.4	134.3	
Lighting	100	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.2	100.8	112.1	123.4	481.1	
TV and similar	100	100.0	100.0	100.0	100.0	100.0	100.1	100.2	100.3	100.5	100.8	101.3	101.6	101.9	102.2	102.2	102.4	
Water heating	100	100.0	100.0	100.0	100.0	99.9	99.9	100.0	100.0	100.3	101.4	101.2	101.8	101.9	102.7	100.8	99.9	
Air Conditioning	100	100.0	100.0	100.0	99.9	99.8	99.7	100.2	100.4	101.5	104.0	109.9	117.5	142.3	145.3	142.0	140.6	
Electric Equipment in Tertiary																		
Offices	100	100.1	100.2	100.4	101.2	115.0	116.2	117.0	117.7	121.6	137.3	188.2	212.2	218.0	221.2	268.1	276.2	
Agriculture	100	100.1	100.1	100.2	100.5	104.9	105.4	106.0	106.5	107.8	110.1	118.1	121.8	123.2	124.2	126.9	127.5	



**ANALYSIS OF ENERGY SYSTEM CHANGES TO REDUCE CO2 EMISSIONS IN 2010 FOR GREECE**

Level of Carbon Value (in Eur'90/ton of Carbon)	0	1	2	5	10	20	40	70	110	160	220	290	370	460	560	700	900
<b>Low enthalpy heat uses (index)</b>																	
Industrial heat uses	100	100.0	100.0	100.1	100.1	100.3	100.5	101.0	101.7	102.9	104.7	106.8	114.8	119.2	121.0	127.6	129.3
Buildings (thermal integrity, efficiency of heat generation)																	
Houses																	
efficiency of heat generation	100	100.0	100.0	100.0	100.0	100.0	99.9	99.9	99.9	100.0	100.1	100.5	101.3	104.2	108.6	111.7	113.6
thermal integrity	100	100.0	100.1	100.1	100.3	100.5	101.1	101.8	102.8	103.9	105.1	106.5	107.7	108.6	108.9	111.1	111.2
Offices																	
efficiency of heat generation	100	100.0	100.0	100.1	100.2	100.4	101.0	102.2	104.2	106.3	109.8	110.9	113.7	114.9	116.1	116.3	116.6
thermal integrity	100	100.0	100.1	100.2	100.3	100.6	101.1	101.9	103.0	104.4	106.1	107.6	108.9	109.7	110.1	110.2	110.6
Agriculture																	
efficiency of heat generation	100	100.0	100.0	100.0	100.0	100.1	100.1	100.2	100.2	100.3	100.9	101.0	101.1	101.2	101.2	101.3	101.3
thermal integrity	100	100.0	100.1	100.2	100.3	100.6	101.2	102.0	103.1	104.5	106.1	107.6	108.8	109.7	110.2	110.4	110.8
<b>Transports</b>																	
Passenger Cars (efficiency index)	100	100.0	100.0	100.0	100.0	100.0	100.1	100.1	100.3	100.4	100.7	101.1	102.3	103.2	105.9	113.4	121.1
Trucks (efficiency index)	100	100.0	100.0	100.0	100.0	100.1	100.2	100.3	100.6	101.0	101.8	103.8	108.2	115.7	121.5	137.6	149.0
Transport modes for passengers (% of transport activity)																	
Passenger Cars	64.6	64.6	64.6	64.6	64.7	64.8	64.9	65.1	65.4	65.1	65.2	65.3	65.2	65.1	64.9	65.9	68.5
Train transport	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.2	8.0	8.4	8.6	9.0	8.9	8.9	8.3	7.6
Transport modes for goods (% of transport activity)																	
Train transport	5.8	5.8	5.9	5.9	5.9	5.9	6.0	6.1	6.9	7.1	7.3	7.4	6.8	6.1	5.6	3.7	3.5
<b>Renewables in Final Energy (%)</b>																	
Biomass	3.2	3.2	3.2	3.2	3.2	3.3	3.4	3.5	3.7	4.0	4.3	4.6	5.1	5.5	5.8	6.1	6.9
Solar energy	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.2	1.2	1.3	1.4	1.5	1.6	1.8	2.0
<b>Power Generation</b>																	
Fuel Mix in Thermal (electricity from gas over thermal production)	32.7	34.4	34.3	33.9	33.1	29.9	46.9	45.3	42.3	38.5	36.1	28.6	23.5	15.1	14.8	8.8	7.0
Contribution of Nuclear (% over total production)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Renewables (as % over total production)	10.2	10.2	10.3	10.3	10.9	12.1	12.4	12.9	14.7	16.4	17.3	18.8	19.7	20.4	19.3	16.3	13.8
hydro of utilities (as % over total production)	7.3	7.3	7.3	7.3	7.3	7.5	7.7	7.9	8.1	8.5	9.0	9.8	10.4	11.1	11.6	12.5	11.3
hydro of other generators (as % over total production)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
biomass (as % over total production)	0.3	0.2	0.2	0.3	0.3	1.3	1.2	1.3	2.5	2.6	2.7	3.0	3.2	3.2	1.4	0.3	0.0
wind energy and other renewables (as % over total production)	2.7	2.7	2.7	2.7	3.2	3.3	3.4	3.7	4.0	5.3	5.5	5.8	6.0	6.1	6.3	3.3	2.4
CHP indicators																	
Steam/electricity ratio from CHP	1.40	1.40	1.40	1.40	1.38	1.32	1.34	1.33	1.28	1.25	1.47	1.19	0.69	0.71	0.74	1.58	0.54
% of electricity from CHP	4.5	4.5	4.5	4.5	4.6	4.8	4.8	4.9	5.1	5.3	4.6	5.9	10.4	9.9	9.6	4.4	2.9
% of steam from chp	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	42.9	40.9	9.3
<b>Implications for other policies</b>																	
Import dependency (percent)	81.3	82.1	82.1	82.0	81.8	80.8	89.2	88.9	88.0	87.3	86.7	86.0	85.2	84.6	84.9	85.3	84.8
Market Liberalisation (% of utilities production)	86.9	86.9	86.9	87.0	86.5	86.4	87.3	87.1	87.3	86.7	88.4	87.3	87.6	88.0	87.9	94.5	96.0

**ANALYSIS OF ENERGY SYSTEM CHANGES TO REDUCE CO2 EMISSIONS IN 2010 FOR GREECE**

Level of Carbon Value (in Eur'90/ton of Carbon)	0	1	2	5	10	20	40	70	110	160	220	290	370	460	560	700	900	
<b>ADDITIONAL SYSTEM COSTS INCLUDING CARBON VALUE (mio Eur'90)</b>																		
Total area in the marginal cost abatement curve as % of GDP	0 0.00%	1 0.00%	1 0.00%	1 0.00%	3 0.00%	9 0.01%	222 0.19%	272 0.23%	367 0.31%	500 0.42%	675 0.57%	908 0.76%	1203 1.01%	1427 1.20%	1599 1.34%	1991 1.67%	2479 2.08%	
<b>COST ANALYSIS BY SECTOR</b>																		
<b>Industrial Sectors - Metals</b>																		
Average cost of Sectoral Production excluding Carbon Value																		
Eur'90 per tn of output	1059	1059	1059	1058	1056	1053	1053	1046	1038	1028	1006	985	954	947	917	874	790	
% change from Baseline	0.0	0.0	-0.1	-0.1	-0.3	-0.5	-0.5	-1.2	-2.0	-3.0	-5.0	-7.0	-9.9	-10.6	-13.5	-17.5	-25.4	
Average cost of Sectoral Production including Carbon Value																		
Eur'90 per tn of output	1059	1060	1060	1062	1065	1072	1085	1103	1126	1156	1184	1222	1253	1319	1366	1417	1489	
% change from Baseline	0.0	0.1	0.1	0.3	0.6	1.2	2.5	4.1	6.4	9.2	11.8	15.4	18.3	24.5	29.0	33.8	40.6	
Structure of costs (%)																		
Non energy costs	72.9	72.8	72.8	72.7	72.5	72.1	71.2	70.2	68.8	67.2	65.7	63.9	62.0	58.9	56.9	55.0	52.4	
Technology and fuel costs	27.1	27.1	27.0	26.9	26.7	26.2	25.8	24.7	23.4	21.7	19.3	16.7	14.1	12.9	10.2	6.7	0.6	
Carbon value cost	0.0	0.1	0.2	0.4	0.9	1.7	3.0	5.1	7.8	11.1	15.0	19.4	23.9	28.2	32.9	38.4	47.0	
<b>Industrial Sectors - Chemicals</b>																		
Average cost of Sectoral Production excluding Carbon Value																		
Eur'90 per tn of output	417	417	417	417	417	417	417	417	417	416	415	414	413	414	413	411	407	
% change from Baseline	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	-0.1	-0.2	-0.5	-0.8	-1.0	-0.8	-1.0	-1.4	-2.3	
Average cost of Sectoral Production including Carbon Value																		
Eur'90 per tn of output	417	417	417	418	418	420	422	425	429	434	440	445	452	461	469	478	479	
% change from Baseline	0.0	0.0	0.1	0.1	0.3	0.6	1.1	1.9	2.9	4.1	5.4	6.7	8.3	10.4	12.3	14.7	14.8	
Structure of costs (%)																		
Non energy costs	90.3	90.2	90.2	90.1	90.0	89.8	89.3	88.7	87.8	86.8	85.7	84.7	83.4	81.9	80.4	78.7	78.8	
Technology and fuel costs	9.7	9.7	9.7	9.7	9.7	9.6	9.5	9.4	9.3	9.1	8.7	8.3	8.0	8.0	7.7	7.3	6.2	
Carbon value cost	0.0	0.0	0.1	0.2	0.3	0.6	1.1	1.9	2.9	4.1	5.6	7.0	8.6	10.1	11.9	14.0	14.9	
<b>Industrial Sectors - Materials</b>																		
Average cost of Sectoral Production excluding Carbon Value																		
Eur'90 per tn of output	148	148	148	148	148	148	148	148	149	149	148	148	145	147	147	146	142	
% change from Baseline	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.4	0.5	0.1	-0.1	-1.8	-0.6	-0.7	-1.5	-3.8	
Average cost of Sectoral Production including Carbon Value																		
Eur'90 per tn of output	148	148	148	149	149	150	152	154	158	162	167	172	176	186	194	203	218	
% change from Baseline	0.0	0.1	0.1	0.3	0.6	1.3	2.5	4.3	6.7	9.7	12.7	16.5	19.1	25.4	31.1	37.2	47.5	
Structure of costs (%)																		
Non energy costs	74.0	74.0	73.9	73.8	73.6	73.1	72.2	71.0	69.4	67.6	65.8	63.7	60.5	57.5	55.1	52.4	48.9	
Technology and fuel costs	26.0	26.0	26.0	25.9	25.8	25.7	25.6	25.1	24.7	24.1	23.0	22.0	21.9	21.8	20.6	19.4	16.3	
Carbon value cost	0.0	0.1	0.1	0.3	0.6	1.2	2.3	3.9	5.9	8.3	11.1	14.2	17.5	20.7	24.3	28.2	34.8	
<b>Industrial Sectors - Others</b>																		
Average cost of Sectoral Production excluding Carbon Value																		
Eur'90 per tn of output	3062	3062	3063	3063	3063	3063	3067	3068	3070	3073	3068	3067	3066	3080	3080	3081	3066	
% change from Baseline	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.2	0.2	0.1	0.6	0.6	0.6	0.1	
Average cost of Sectoral Production including Carbon Value																		
Eur'90 per tn of output	3062	3063	3063	3064	3066	3070	3079	3090	3104	3121	3135	3154	3175	3209	3237	3268	3326	
% change from Baseline	0.0	0.0	0.0	0.1	0.1	0.3	0.6	0.9	1.4	1.9	2.4	3.0	3.7	4.8	5.7	6.7	8.6	
Structure of costs (%)																		
Non energy costs	95.9	95.9	95.9	95.9	95.8	95.7	95.4	95.1	94.6	94.1	93.7	93.1	92.5	91.5	90.8	89.8	88.3	
Technology and fuel costs	4.1	4.1	4.1	4.1	4.1	4.1	4.2	4.2	4.3	4.3	4.2	4.1	4.0	4.4	4.4	4.4	3.9	
Carbon value cost	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.7	1.1	1.6	2.1	2.8	3.4	4.0	4.9	5.7	7.8	

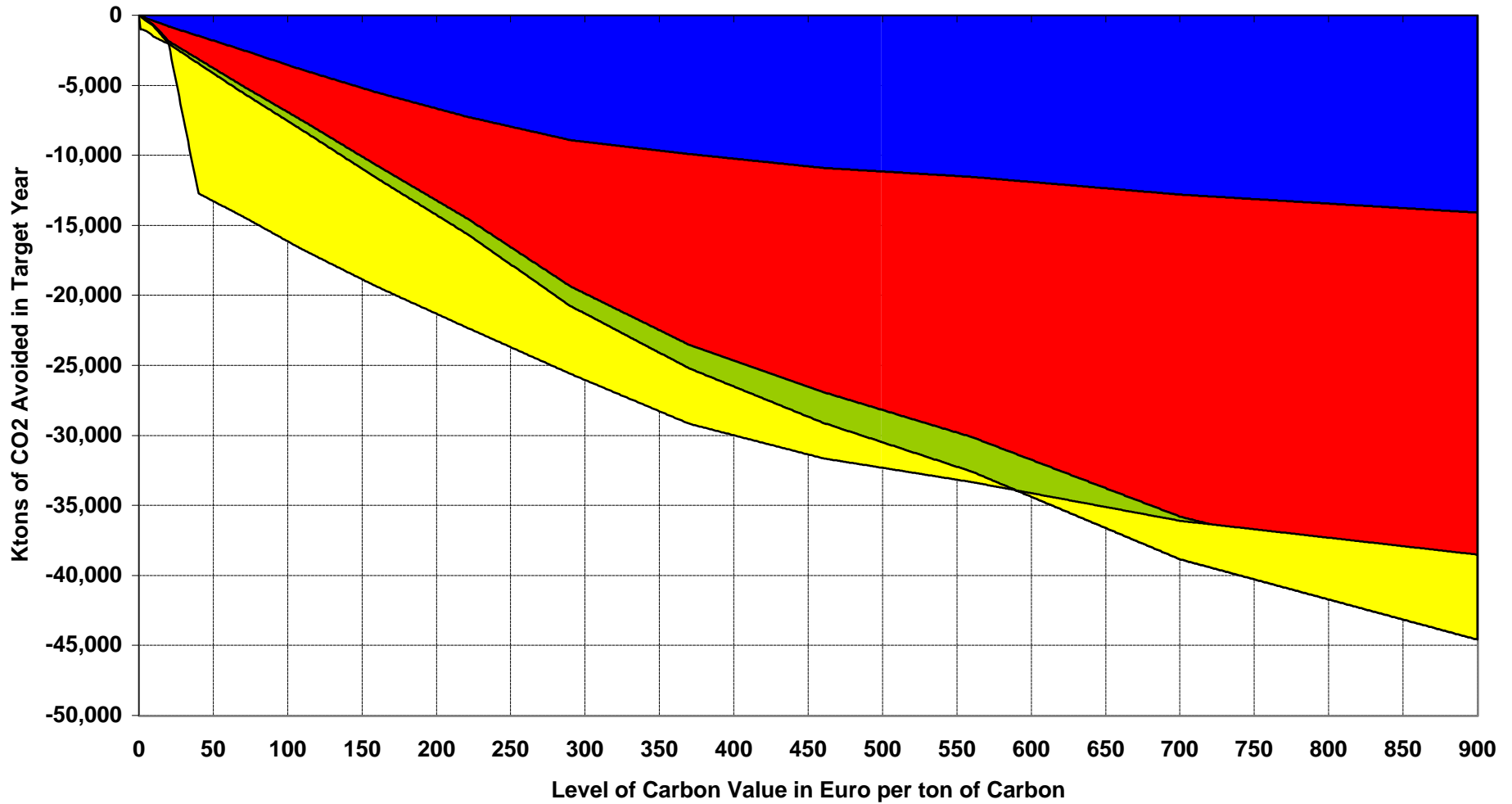
**ANALYSIS OF ENERGY SYSTEM CHANGES TO REDUCE CO2 EMISSIONS IN 2010 FOR GREECE**

Level of Carbon Value (in Eur'90/ton of Carbon)	0	1	2	5	10	20	40	70	110	160	220	290	370	460	560	700	900
<b>Services</b>																	
Average cost of Energy Service excluding Carbon Value																	
Eur'90 per unit of energy service	4472	4472	4471	4471	4468	4450	4447	4437	4426	4406	4421	4450	4459	4481	4510	4658	4800
% change from Baseline	0.0	0.0	0.0	0.0	-0.1	-0.5	-0.6	-0.8	-1.0	-1.5	-1.2	-0.5	-0.3	0.2	0.9	4.2	7.3
Average cost of Energy Service including Carbon Value																	
Eur'90 per unit of energy service	4472	4474	4475	4479	4485	4485	4505	4537	4580	4626	4708	4799	4886	5013	5170	5494	5921
% change from Baseline	0.0	0.0	0.1	0.2	0.3	0.3	0.7	1.5	2.4	3.4	5.3	7.3	9.3	12.1	15.6	22.8	32.4
Structure of costs (%)																	
Non energy costs	60.2	60.2	60.2	60.1	60.0	60.1	59.8	59.3	58.7	58.1	57.1	56.1	55.1	53.6	52.0	49.0	45.6
Technology and fuel costs	39.8	39.8	39.8	39.7	39.6	39.2	38.9	38.5	37.9	37.1	36.8	36.7	36.2	35.7	35.2	35.8	35.5
Carbon value cost	0.0	0.0	0.1	0.2	0.4	0.8	1.3	2.2	3.4	4.7	6.1	7.3	8.7	10.6	12.7	15.2	18.9
<b>Agriculture</b>																	
Average cost of Energy Service excluding Carbon Value																	
Eur'90 per unit of energy service	5797	5797	5797	5797	5796	5777	5782	5785	5791	5794	5816	5826	5835	5857	5883	5988	6054
% change from Baseline	0.0	0.0	0.0	0.0	0.0	-0.3	-0.3	-0.2	-0.1	0.0	0.3	0.5	0.7	1.0	1.5	3.3	4.4
Average cost of Energy Service including Carbon Value																	
Eur'90 per unit of energy service	5797	5799	5801	5807	5816	5816	5852	5907	5983	6074	6198	6322	6464	6645	6853	7219	7653
% change from Baseline	0.0	0.0	0.1	0.2	0.3	0.3	1.0	1.9	3.2	4.8	6.9	9.1	11.5	14.6	18.2	24.5	32.0
Structure of costs (%)																	
Non energy costs	81.0	80.9	80.9	80.8	80.7	80.6	80.1	79.4	78.4	77.2	75.7	74.3	72.7	70.8	68.6	65.3	61.7
Technology and fuel costs	19.0	19.0	19.0	19.0	19.0	18.8	18.7	18.6	18.4	18.1	18.1	17.9	17.6	17.4	17.2	17.7	17.4
Carbon value cost	0.0	0.0	0.1	0.2	0.3	0.7	1.2	2.1	3.2	4.6	6.2	7.8	9.7	11.9	14.2	17.1	20.9
<b>Households</b>																	
Average cost of Energy Service excluding Carbon Value																	
Eur'90 per unit of energy service	231	231	231	231	231	231	231	230	229	228	227	226	226	228	226	233	245
% change from Baseline	0.0	0.0	0.0	-0.1	-0.2	-0.4	-0.3	-0.6	-0.9	-1.3	-2.0	-2.2	-2.3	-1.4	-2.3	0.7	5.8
Average cost of Energy Service including Carbon Value																	
Eur'90 per unit of energy service	231	232	232	232	233	234	237	240	245	250	256	265	273	284	293	317	345
% change from Baseline	0.0	0.1	0.1	0.3	0.6	1.1	2.2	3.8	5.8	8.3	10.8	14.4	18.1	22.8	26.5	36.9	49.1
Structure of costs (%)																	
Non energy costs	28.1	28.1	28.1	28.0	27.9	27.7	27.3	26.7	25.9	25.0	24.2	23.1	22.1	21.1	20.5	18.7	17.3
Technology and fuel costs	71.9	71.8	71.8	71.6	71.4	70.8	70.3	69.1	67.7	66.1	64.3	62.4	60.7	59.2	56.7	54.8	53.6
Carbon value cost	0.0	0.1	0.1	0.4	0.7	1.5	2.5	4.2	6.3	8.8	11.6	14.5	17.3	19.7	22.8	26.5	29.1
<b>Passenger Transports</b>																	
Average cost of Energy Service excluding Carbon Value																	
Eur'90 per 1000 passenger-km	120	120	120	120	120	120	120	120	120	120	120	120	120	120	121	123	125
% change from Baseline	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.7	2.4	4.2
Average cost of Energy Service including Carbon Value																	
Eur'90 per 1000 passenger-km	120	120	120	120	120	121	121	122	123	124	126	128	129	132	134	138	143
% change from Baseline	0.0	0.0	0.1	0.1	0.3	0.5	1.0	1.7	2.7	3.7	4.9	6.4	7.9	9.7	11.5	15.1	19.2
Structure of costs (%)																	
Non energy costs	19.1	19.1	19.1	19.1	19.0	19.0	18.8	18.7	18.4	18.3	18.1	17.8	17.5	17.2	16.9	15.9	14.8
Technology and fuel costs	80.9	80.9	80.8	80.8	80.7	80.5	80.2	79.7	79.1	78.2	77.3	76.4	75.5	74.3	73.4	73.1	72.7
Carbon value cost	0.0	0.0	0.1	0.1	0.3	0.5	1.0	1.6	2.5	3.5	4.6	5.8	7.0	8.5	9.8	11.0	12.5
<b>Goods Transports</b>																	
Average cost of Energy Service excluding Carbon Value																	
Eur'90 per 1000 tonne-km	280	280	280	280	280	280	280	279	277	276	275	273	271	267	263	274	267
% change from Baseline	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.4	-1.1	-1.5	-2.0	-2.7	-3.3	-4.7	-6.1	-2.2	-5.0
Average cost of Energy Service including Carbon Value																	
Eur'90 per 1000 tonne-km	280	281	281	281	281	282	284	287	288	292	297	301	306	308	311	329	331
% change from Baseline	0.0	0.0	0.1	0.2	0.3	0.6	1.3	2.2	2.8	4.2	5.7	7.3	9.1	9.8	10.9	17.2	18.2
Structure of costs (%)																	
Non energy costs	13.2	13.2	13.2	13.2	13.2	13.2	13.1	13.0	13.0	12.8	12.6	12.5	12.2	12.1	11.9	11.1	10.9
Technology and fuel costs	86.8	86.7	86.7	86.6	86.4	86.1	85.5	84.5	83.2	81.7	80.0	78.2	76.5	74.7	72.8	72.4	69.5
Carbon value cost	0.0	0.0	0.1	0.2	0.4	0.7	1.4	2.5	3.9	5.5	7.3	9.3	11.3	13.3	15.4	16.6	19.6

**ANALYSIS OF ENERGY SYSTEM CHANGES TO REDUCE CO2 EMISSIONS IN 2010 FOR GREECE**

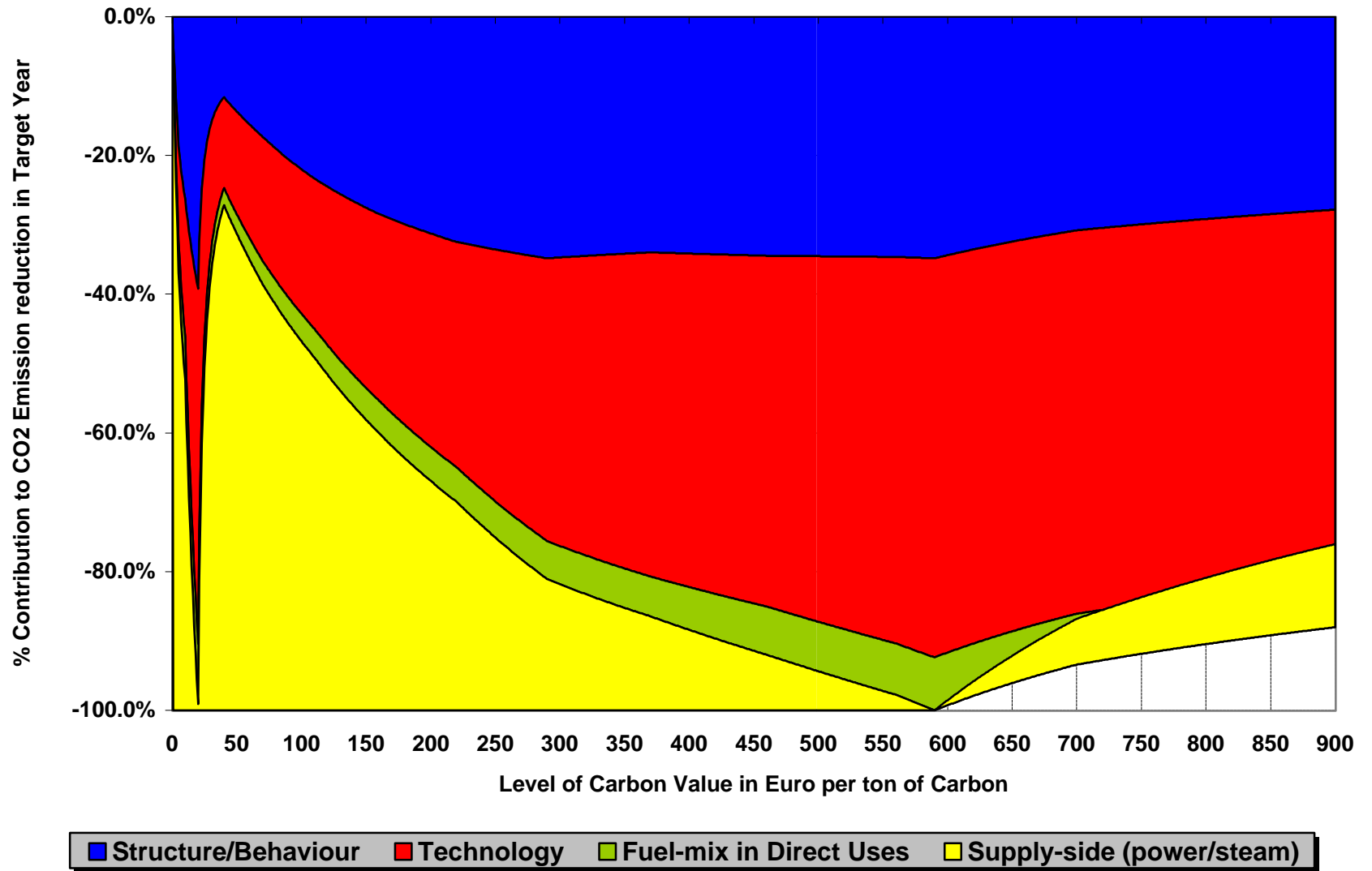
Level of Carbon Value (in Eur'90/ton of Carbon)	0	1	2	5	10	20	40	70	110	160	220	290	370	460	560	700	900	
<b>Electricity and Steam production</b>																		
Average cost of production excluding Carbon Value																		
mEur'90 per kWh+kWhth	47	47	47	47	47	47	49	49	49	50	50	51	53	55	55	58	74	
% change from Baseline	0.0	0.0	0.0	0.0	0.0	0.0	3.6	4.1	5.3	6.4	7.5	9.6	12.4	16.9	17.9	24.6	57.1	
Average cost of production including Carbon Value																		
mEur'90 per kWh+kWhth	47	47	47	48	49	50	54	59	66	74	84	97	112	131	151	189	253	
% change from Baseline	0.0	0.4	0.9	1.9	3.8	7.7	16.2	26.3	40.4	57.9	79.3	107.3	138.9	178.8	223.5	302.8	440.8	
Structure of costs (%)																		
Annual Capital cost	17.1	17.0	16.9	16.8	16.9	16.3	16.9	15.9	14.9	13.9	12.6	11.6	10.7	10.4	8.9	7.6	9.9	
O & M costs	16.9	16.8	16.7	16.6	16.3	15.9	15.3	14.2	13.2	12.0	11.0	10.0	9.3	8.4	7.3	6.2	5.9	
Transm. \$ Distr. Costs	31.8	31.7	31.6	31.2	30.7	29.6	27.6	25.4	22.8	20.2	17.8	15.2	13.1	11.1	9.6	7.8	5.7	
Fuel Costs	34.0	33.8	33.7	33.3	32.5	31.2	29.4	26.9	24.0	21.2	18.6	16.0	14.0	10.7	9.3	7.6	7.6	
Carbon value costs	0.0	0.4	0.8	1.9	3.7	7.1	10.8	17.6	25.0	32.6	40.0	47.1	53.0	58.1	63.5	69.1	71.0	
Investment expenditure for Electricity and Steam production																		
000mio Eur'90 spent in 1995 to 2010	4330	4321	4312	4286	4336	4279	5007	4932	5058	4956	4786	4537	4560	5038	4568	4546	9634	
% change from Baseline	0.0	-0.2	-0.4	-1.0	0.1	-1.2	15.6	13.9	16.8	14.5	10.5	4.8	5.3	16.4	5.5	5.0	122.5	
Investment expenditure per KWh produced in 2010																		
mEur'90 per kWh+kWhth	53.0	53.1	53.1	53.0	54.1	54.8	67.2	69.6	76.4	81.7	87.5	95.2	107.6	135.4	136.6	163.8	409.7	
% change from Baseline	0.0	0.1	0.1	0.0	2.1	3.3	26.7	31.4	44.2	54.0	65.0	79.6	102.9	155.3	157.7	209.1	672.9	
Electricity tariffs (mEur'90 per kWh - includes effect of carbon value for electricity production)																		
Sectoral Average	59	60	60	61	62	64	68	74	82	93	105	122	141	170	198	247	328	
Industry	48	48	48	49	50	52	56	62	69	80	87	100	114	151	174	196	237	
Tertiary	59	59	59	60	61	63	66	71	79	89	105	121	138	162	192	245	329	
Households	69	69	69	70	71	74	79	85	95	107	120	141	164	194	222	297	420	
Transports	51	51	51	52	53	55	60	66	74	85	97	115	133	158	180	196	230	
Others	52	52	52	53	54	57	62	68	77	88	101	121	141	169	195	217	251	
Electricity tariffs (% change from Baseline)																		
Sectoral Average	0.0	0.4	0.8	1.9	3.6	7.1	14.4	24.1	38.3	56.2	77.4	106.2	137.4	187.0	232.5	315.7	451.7	
Industry	0.0	0.2	0.6	1.9	3.8	7.9	18.0	28.7	45.0	66.3	81.0	108.2	137.7	215.5	263.8	310.3	396.4	
Tertiary	0.0	0.3	0.7	1.7	3.2	6.3	12.0	21.0	33.9	50.0	77.3	105.4	134.6	175.1	224.9	314.4	458.0	
Households	0.0	0.4	0.9	2.0	3.8	7.4	14.7	24.5	38.5	56.2	75.2	105.1	139.0	182.6	224.7	334.2	513.4	
Transports	0.0	0.6	1.0	2.4	4.5	8.9	17.9	29.5	46.5	67.3	90.6	125.8	161.6	210.6	254.7	286.0	353.5	
Others	0.0	0.6	1.0	2.5	4.6	9.1	18.7	30.6	48.2	70.1	94.6	132.2	172.1	225.8	275.1	317.5	383.6	

### GREECE: CO2 Emission Reduction - Decomposition

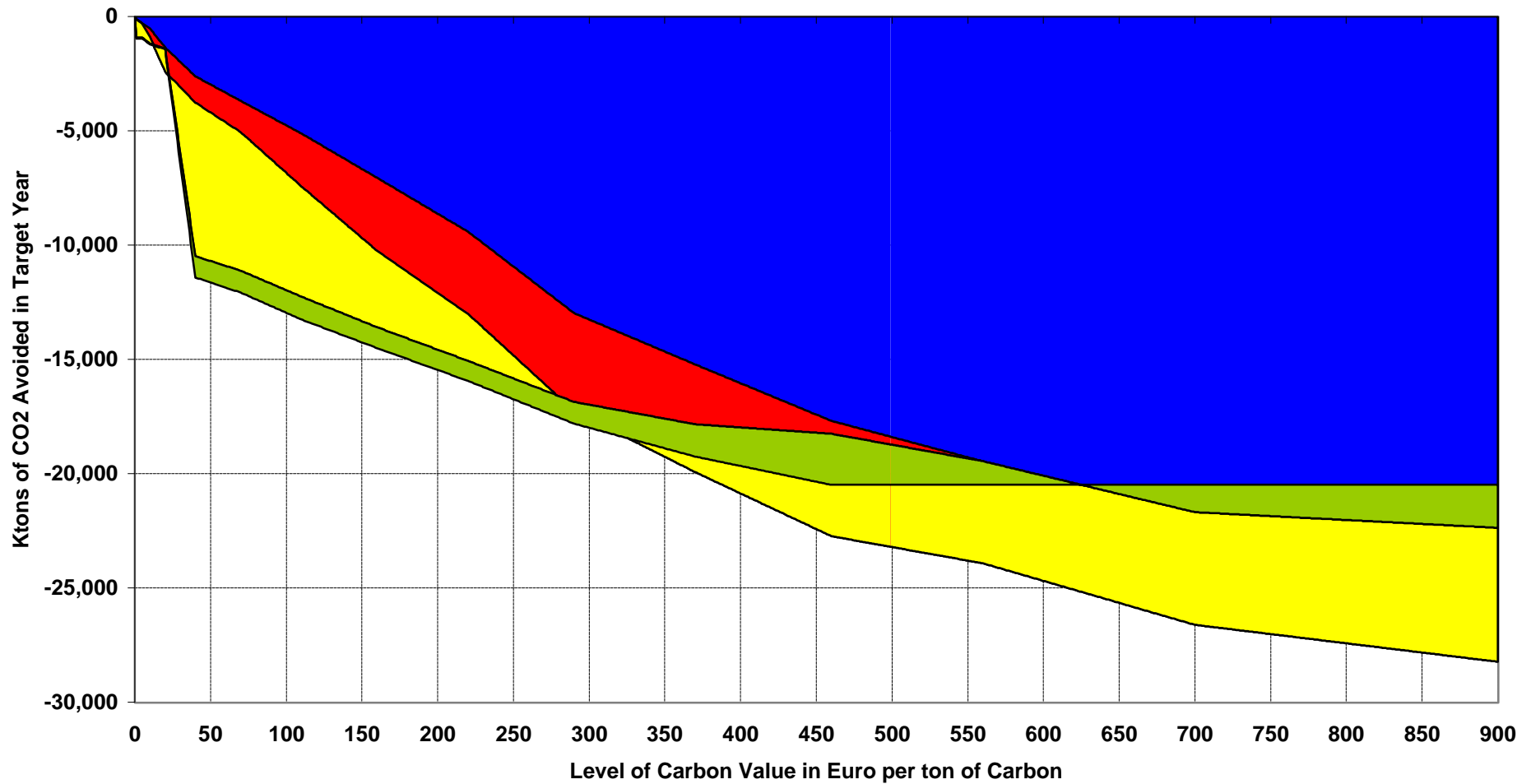


■ Structure/Behaviour  
 ■ Technology  
 ■ Fuel-mix in Direct Uses  
 ■ Supply-side (power/steam)

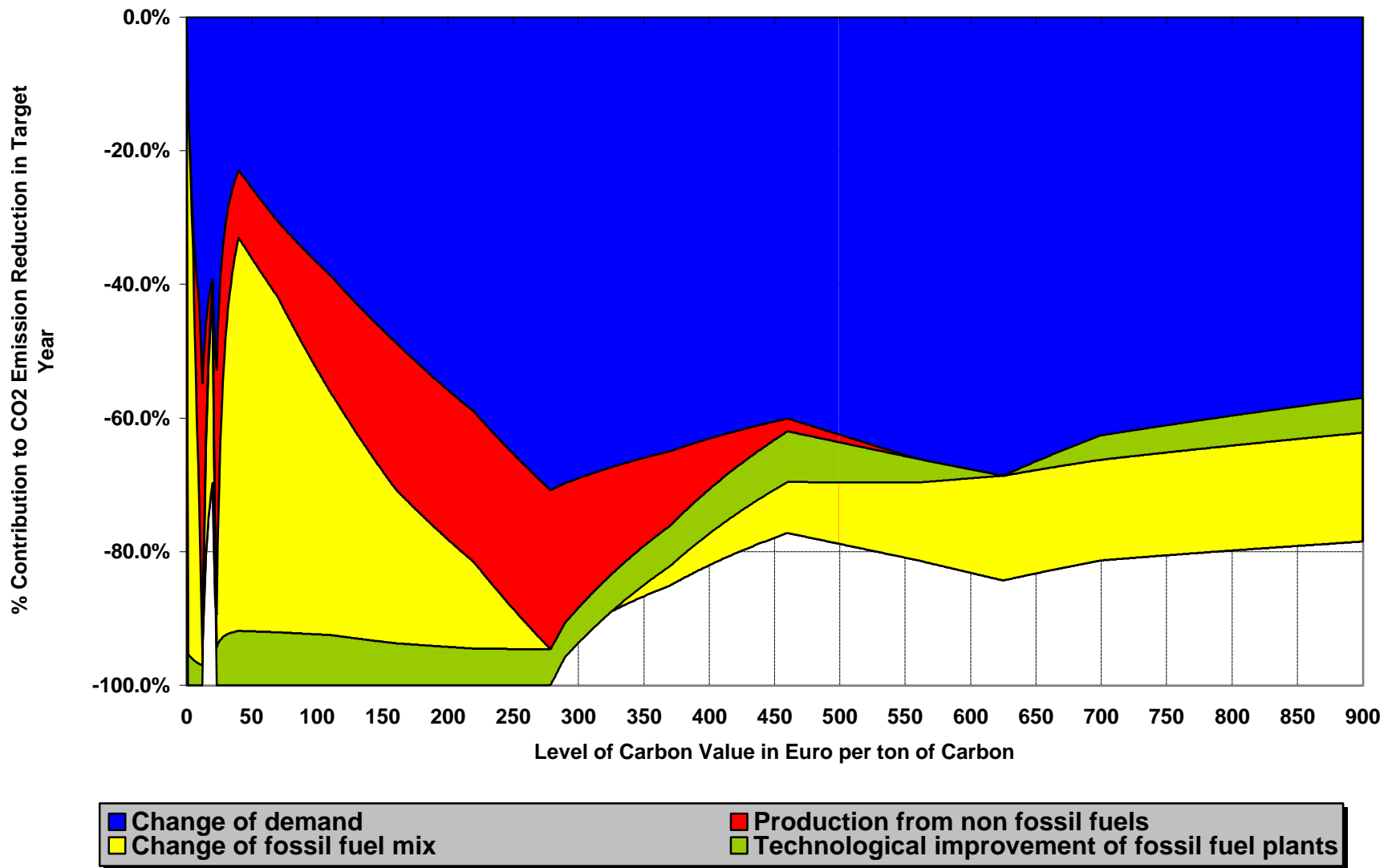
### GREECE: CO2 Emission Reduction - Decomposition in Percentage



### GREECE: CO2 Emission Reduction in Power and Steam Generation - Decomposition

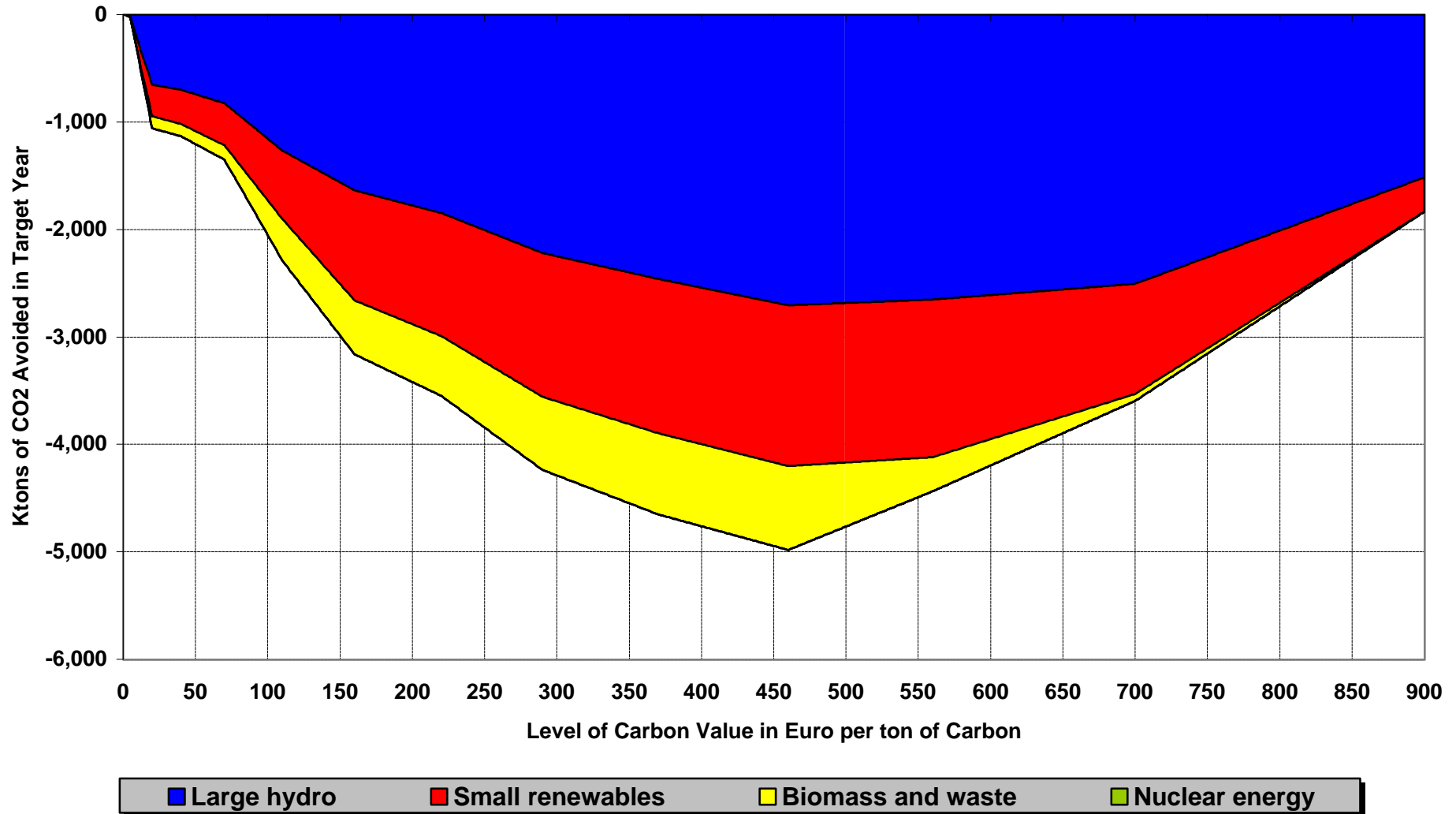


## GREECE: CO2 Emission Reduction in Power and Steam Generation - Decomposition in %





## GREECE: CO2 Emission Reduction - Contribution of Non-Fossil Fuel in Power and Steam



### GREECE: CO2 Emission Reduction - Contribution of Non-Fossil Fuel in Power and Steam - in %

