

## Assessment of U.S. Cap-and-Trade Proposals

MIT Joint Program on the Science and Policy of Global Change Report 160  
(Metcalf *et al.*, 2008)

### APPENDIX: Details of Simulation Results

This document is an appendix to Report 160 of the MIT Joint Program. The full report is available as a separate file at [http://mit.edu/globalchange/www/MITJPSPGC\\_Rpt160.pdf](http://mit.edu/globalchange/www/MITJPSPGC_Rpt160.pdf).

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<sup>1</sup> All prices and taxes are in 2005 dollars.

<i>Reference Scenario</i>										
	<i>2005</i>	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030</i>	<i>2035</i>	<i>2040</i>	<i>2045</i>	<i>2050</i>
<b>ECONOMY WIDE INDICATORS</b>										
<i>Population (million)</i>	296	309	321	334	347	359	369	379	388	397
<i>GDP (billion 2005\$)</i>	11981	14339	16921	19773	22846	26459	30534	34929	39530	44210
<i>% Change GDP from Reference</i>	--	--	--	--	--	--	--	--	--	--
<i>Market Consumption (billion 2005\$)</i>	8217	9858	11533	13384	15364	17761	20467	23392	26456	29567
<i>% Change Consumption from Reference</i>	--	--	--	--	--	--	--	--	--	--
<i>Welfare (billion 2005\$)</i>	9656	11773	13933	16342	18948	22016	25414	29032	32780	36553
<i>% Change Welfare from Reference(EV)</i>	--	--	--	--	--	--	--	--	--	--
<i>CO<sub>2</sub>-E Price (2005\$/tCO<sub>2</sub>-e)</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>PRICES (index, 2005=1.00)</b>										
<i>Petroleum Product</i>	1.00	1.15	1.30	1.48	1.69	1.87	1.97	2.09	2.19	2.25
<i>Natural Gas</i>	1.00	1.11	1.27	1.48	1.66	1.95	2.31	2.73	3.12	3.55
<i>Coal</i>	1.00	1.04	1.07	1.09	1.13	1.16	1.20	1.24	1.28	1.32
<i>Electricity</i>	1.00	1.11	1.19	1.27	1.35	1.38	1.42	1.42	1.42	1.41
<b>TRADE &amp; PRODUCTION (selected indicators)</b>										
<i>Bio Liquids Production in US (EJ)</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Net Bio Liquids Imports (EJ)</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Net Bio Liquids Imports (billion 2005\$)</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Net Crude Oil Imports (billion 2005\$)</i>	77.40	85.21	93.97	102.60	110.94	126.11	149.39	170.99	159.14	144.83
<i>Net Agriculture Exports (billion 2005\$)</i>	25.64	25.53	20.40	19.29	14.24	12.35	11.48	10.92	11.61	14.99
<b>GHG EMISSIONS (mmt CO<sub>2</sub>-e)</b>										
<i>GHG Emissions</i>	7091.9	7680.1	8201.5	8595.6	9219.3	9884.8	10711.0	11507.3	12433.3	13283.3
<i>CO<sub>2</sub> Emissions</i>	5984.3	6517.4	6995.2	7357.3	7915.4	8518.8	9283.0	10012.9	10871.0	11655.9
<i>CH<sub>4</sub> Emissions</i>	583.4	602.0	611.6	617.1	630.5	643.1	652.2	663.6	676.5	683.1
<i>N<sub>2</sub>O Emissions</i>	385.2	387.9	381.3	372.4	366.5	365.6	372.8	380.8	391.0	407.3
<i>Fluorinated Gases Emissions</i>	140.0	173.8	214.4	250.0	308.1	358.5	404.3	451.3	496.2	538.5
<b>PRIMARY ENERGY USE (EJ)</b>										
<i>Coal</i>	22.6	24.3	25.8	26.6	30.9	35.0	39.9	44.8	49.6	53.3
<i>Total Petroleum Products</i>	42.0	46.0	49.6	52.6	55.2	58.8	63.9	68.8	73.6	78.5
<i>Including Shale Oil</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.7	19.6
<i>Natural Gas</i>	22.5	24.7	26.8	28.9	28.4	28.3	27.7	26.8	25.8	25.1
<i>Nuclear (primary energy eq)</i>	9.3	9.0	8.8	8.7	8.6	8.5	8.4	8.4	8.3	8.3
<i>Hydro (primary energy eq)</i>	2.9	2.8	2.8	2.8	2.8	2.9	2.9	3.0	3.1	3.2
<i>Renewable Elec. (primary energy eq)</i>	0.6	0.7	0.8	1.0	0.9	1.2	1.1	1.4	1.5	1.6
<i>Biomass Liquids</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total Primary Energy Use</i>	99.8	107.6	114.6	120.5	126.8	134.6	143.9	153.1	161.9	170.0
<i>Reduced Use from Reference</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>ELECTRICITY PRODUCTION (EJ)</b>										
<i>Coal w/o CCS</i>	6.9	7.6	8.3	8.6	10.2	11.7	13.4	15.2	17.0	18.5
<i>Oil w/o CCS</i>	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6
<i>Gas w/o CCS</i>	2.1	2.5	3.1	3.9	3.3	3.1	2.9	2.7	2.4	2.3
<i>Nuclear</i>	3.0	3.0	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1
<i>Hydro</i>	0.9	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.2
<i>Other Renewables</i>	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.6
<i>Gas with CCS</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Coal with CCS</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Total Electricity Production</i>	13.4	14.6	15.9	17.1	18.2	19.7	21.3	23.1	24.7	26.2

**Scenario 1: Dingell Proposal, start in 2012 at 50\$/C (13.64\$/CO2) carbon tax and \$0.50/gallon gasoline tax, no increase in tax rates over time, but adjusted for inflation, CO2 only**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
<b>ECONOMY WIDE INDICATORS</b>										
Population (million)	296	309	321	334	347	359	369	379	388	397
GDP (billion 2005\$)	11981	14339	16896	19658	22706	26319	30514	34949	39603	44379
% Change GDP from Reference	0.00	0.00	-0.15	-0.58	-0.61	-0.53	-0.06	0.06	0.18	0.38
Market Consumption (billion 2005\$)	8217	9858	11526	13341	15294	17685	20456	23418	26524	29713
% Change Consumption from Reference	0.00	0.00	-0.06	-0.32	-0.46	-0.43	-0.05	0.11	0.26	0.49
Welfare (billion 2005\$)	9656	11773	13934	16326	18901	21969	25431	29094	32884	36733
% Change Welfare from Reference(EV)	0.00	0.00	0.01	-0.09	-0.25	-0.21	0.07	0.21	0.32	0.49
CO <sub>2</sub> -E Price (2005\$/tCO <sub>2</sub> -e)	0.00	0.00	13.64	13.64	13.64	13.64	13.64	13.64	13.64	13.64
<b>PRICES (index, 2005=1.00)</b>										
Petroleum Product	1.00	1.15	1.29	1.43	1.46	1.54	1.31	1.38	1.45	1.49
Natural Gas	1.00	1.11	1.23	1.53	1.94	2.13	2.43	2.83	3.25	3.59
Coal	1.00	1.04	1.04	1.03	1.01	1.06	1.09	1.12	1.16	1.19
Electricity	1.00	1.11	1.30	1.38	1.47	1.50	1.53	1.53	1.52	1.51
<b>TRADE &amp; PRODUCTION (selected indicators)</b>										
Bio Liquids Production in US (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (billion 2005\$)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Crude Oil Imports (billion 2005\$)	77.40	85.21	88.66	73.78	92.86	108.84	156.09	172.80	193.87	217.63
Net Agriculture Exports (billion 2005\$)	25.64	25.53	18.18	14.93	9.49	8.84	14.60	11.89	13.04	15.74
<b>GHG EMISSIONS (mmt CO<sub>2</sub>-e)</b>										
GHG Emissions	7091.9	7680.1	7680.6	7276.0	7422.5	8260.3	9397.8	10155.4	11032.3	11940.3
CO <sub>2</sub> Emissions	5984.3	6517.4	6483.0	6047.2	6129.4	6908.9	7985.1	8677.0	9490.6	10336.1
CH <sub>4</sub> Emissions	583.4	602.0	611.6	617.1	630.5	643.1	652.2	663.6	676.5	683.1
N <sub>2</sub> O Emissions	385.2	387.9	377.6	368.1	360.6	357.7	361.6	366.9	373.8	386.4
Fluorinated Gases Emissions	140.0	173.8	209.4	244.6	303.1	351.9	400.3	449.3	492.8	536.1
<b>PRIMARY ENERGY USE (EJ)</b>										
Coal	22.6	24.3	22.3	19.3	15.6	22.6	28.0	33.3	38.9	44.5
Petroleum Products	42.0	46.0	47.3	41.7	45.7	49.6	59.2	63.3	69.1	75.2
Including Shale Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	22.5	24.7	26.2	30.9	34.6	31.6	30.1	28.7	26.8	25.0
Nuclear (primary energy eq)	9.3	9.0	8.7	8.5	8.4	8.1	7.9	7.8	7.7	7.7
Hydro (primary energy eq)	2.9	2.8	2.9	2.9	2.9	2.8	2.8	2.9	3.0	3.0
Renewable Elec. (primary energy eq)	0.6	0.7	0.8	1.0	0.9	1.1	1.0	1.3	1.4	1.5
Biomass Liquids	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Primary Energy Use	99.8	107.6	108.1	104.3	108.0	115.8	129.1	137.3	146.9	156.9
Reduced Use from Reference	0.0	0.0	6.5	16.2	18.8	18.7	14.8	15.8	15.0	13.1
<b>ELECTRICITY PRODUCTION (EJ)</b>										
Coal w/o CCS	6.9	7.6	7.4	6.4	5.1	7.9	10.2	12.3	14.5	16.9
Oil w/o CCS	0.3	0.3	0.3	0.2	0.2	0.3	0.4	0.4	0.5	0.6
Gas w/o CCS	2.1	2.5	3.3	5.2	7.6	5.9	5.2	4.5	3.7	2.8
Nuclear	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Hydro	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2
Other Renewables	0.2	0.2	0.1	0.6	0.3	0.5	0.4	0.5	0.6	0.6
Gas with CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal with CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Electricity Production	13.4	14.6	15.1	16.5	17.3	18.7	20.4	22.0	23.6	25.3

**Scenario 1a: Dingell Cumulative GHG CO2 Only, fixed tax rate (\$80.48/tC) to match 2012-2050 cumulative emissions from Sc1, no gas tax, CO2 only**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
<b>ECONOMY WIDE INDICATORS</b>										
Population (million)	296	309	321	334	347	359	369	379	388	397
GDP (billion 2005\$)	11981	14339	16880	19703	22747	26377	30566	35016	39657	44371
% Change GDP from Reference	0.00	0.00	-0.24	-0.35	-0.43	-0.31	0.11	0.25	0.32	0.36
Market Consumption (billion 2005\$)	8217	9858	11521	13351	15299	17701	20469	23431	26524	29657
% Change Consumption from Reference	0.00	0.00	-0.10	-0.25	-0.42	-0.34	0.01	0.17	0.26	0.30
Welfare (billion 2005\$)	9656	11773	13934	16320	18888	21966	25427	29083	32857	36643
% Change Welfare from Reference(EV)	0.00	0.00	0.01	-0.13	-0.31	-0.22	0.05	0.17	0.23	0.25
CO <sub>2</sub> -E Price (2005\$/tCO <sub>2</sub> -e)	0.00	0.00	21.95	21.95	21.95	21.95	21.95	21.95	21.95	21.95
<b>PRICES (index, 2005=1.00)</b>										
Petroleum Product	1.00	1.15	1.29	1.44	1.48	1.57	1.35	1.43	1.51	1.55
Natural Gas	1.00	1.11	1.21	1.49	1.98	2.16	2.43	2.80	3.15	3.22
Coal	1.00	1.04	1.03	1.02	0.99	1.04	1.07	1.10	1.14	1.18
Electricity	1.00	1.11	1.37	1.44	1.51	1.57	1.60	1.59	1.59	1.57
<b>TRADE &amp; PRODUCTION (selected indicators)</b>										
Bio Liquids Production in US (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (billion 2005\$)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Crude Oil Imports (billion 2005\$)	77.40	85.21	84.90	94.64	115.97	135.36	185.44	209.43	231.55	254.03
Net Agriculture Exports (billion 2005\$)	25.64	25.53	16.90	15.67	10.45	10.03	16.02	14.26	16.26	20.61
<b>GHG EMISSIONS (mmt CO<sub>2</sub>-e)</b>										
GHG Emissions	7091.9	7680.1	7419.1	7505.2	7507.1	8374.0	9583.2	10455.5	11176.1	11286.3
CO <sub>2</sub> Emissions	5984.3	6517.4	6249.4	6323.1	6311.1	7090.7	8219.7	9014.8	9656.4	9696.4
CH <sub>4</sub> Emissions	583.4	602.0	588.6	578.5	548.2	577.6	594.8	613.9	633.8	646.9
N <sub>2</sub> O Emissions	385.2	387.9	371.4	361.6	355.0	357.8	374.1	383.6	395.8	412.3
Fluorinated Gases Emissions	140.0	173.8	210.7	243.1	294.0	348.9	395.7	444.4	491.5	532.2
<b>PRIMARY ENERGY USE (EJ)</b>										
Coal	22.6	24.3	21.0	17.5	11.5	18.2	23.7	29.1	34.9	41.9
Petroleum Products	42.0	46.0	45.9	49.0	53.5	58.5	69.2	75.8	81.8	87.3
Including Shale Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	22.5	24.7	25.6	29.8	35.4	32.1	30.2	28.5	26.3	23.0
Nuclear (primary energy eq)	9.3	9.0	8.7	8.5	8.4	7.9	7.7	7.6	7.5	7.4
Hydro (primary energy eq)	2.9	2.8	3.0	2.9	2.9	2.8	2.8	2.8	2.9	3.0
Renewable Elec. (primary energy eq)	0.6	0.7	0.8	1.0	0.9	1.1	1.0	1.3	1.4	1.5
Biomass Liquids	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Primary Energy Use	99.8	107.6	105.0	108.8	112.7	120.6	134.7	145.2	154.8	164.1
Reduced Use from Reference	0.0	0.0	9.5	11.7	14.1	13.9	9.3	8.0	7.1	5.8
<b>ELECTRICITY PRODUCTION (EJ)</b>										
Coal w/o CCS	6.9	7.6	7.0	5.9	3.7	6.4	8.7	10.6	12.0	10.3
Oil w/o CCS	0.3	0.3	0.3	0.2	0.1	0.2	0.3	0.4	0.5	0.4
Gas w/o CCS	2.1	2.5	3.3	5.4	8.9	7.0	6.1	5.3	4.2	2.3
Nuclear	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Hydro	0.9	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.2
Other Renewables	0.2	0.2	0.1	0.6	0.3	0.5	0.4	0.5	0.6	0.6
Gas with CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal with CCS	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.7	1.9	7.2
Total Electricity Production	13.4	14.6	14.8	16.3	17.1	18.5	20.1	21.8	23.5	25.1

**Scenario 2: Dingell Cumulative GHG, fixed tax rate (\$47/tC) to match 2012-2050 cumulative emissions from Sc1, no gas tax, all GHG**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
<b>ECONOMY WIDE INDICATORS</b>										
Population (million)	296	309	321	334	347	359	369	379	388	397
GDP (billion 2005\$)	11981	14339	16895	19725	22766	26388	30597	35054	39718	44489
% Change GDP from Reference	0.00	0.00	-0.16	-0.24	-0.35	-0.27	0.21	0.36	0.47	0.63
Market Consumption (billion 2005\$)	8217	9858	11525	13361	15311	17705	20483	23450	26559	29741
% Change Consumption from Reference	0.00	0.00	-0.06	-0.18	-0.34	-0.31	0.08	0.25	0.39	0.59
Welfare (billion 2005\$)	9656	11773	13934	16326	18898	21966	25437	29097	32888	36732
% Change Welfare from Reference(EV)	0.00	0.00	0.01	-0.10	-0.26	-0.23	0.09	0.22	0.33	0.49
CO <sub>2</sub> -E Price (2005\$/tCO <sub>2</sub> -e)	0.00	0.00	12.80	12.80	12.80	12.80	12.80	12.80	12.80	12.80
<b>PRICES (index, 2005=1.00)</b>										
Petroleum Product	1.00	1.15	1.30	1.47	1.57	1.67	1.39	1.46	1.53	1.58
Natural Gas	1.00	1.11	1.23	1.49	1.91	2.08	2.36	2.75	3.15	3.45
Coal	1.00	1.04	1.04	1.04	1.03	1.08	1.10	1.14	1.17	1.20
Electricity	1.00	1.11	1.30	1.37	1.46	1.50	1.53	1.52	1.52	1.51
<b>TRADE &amp; PRODUCTION (selected indicators)</b>										
Bio Liquids Production in US (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (billion 2005\$)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Crude Oil Imports (billion 2005\$)	77.40	85.21	87.33	96.86	113.02	133.31	188.79	214.28	239.21	263.36
Net Agriculture Exports (billion 2005\$)	25.64	25.53	16.97	16.15	13.48	16.38	33.48	33.52	37.54	49.74
<b>GHG EMISSIONS (mmt CO<sub>2</sub>-e)</b>										
GHG Emissions	7091.9	7680.1	7125.1	7234.3	7272.9	8175.2	9465.4	10381.2	11301.0	12219.5
CO <sub>2</sub> Emissions	5984.3	6517.4	6478.0	6601.6	6655.0	7531.8	8795.4	9692.8	10588.8	11479.9
CH <sub>4</sub> Emissions	583.4	602.0	383.1	380.5	367.4	388.0	399.5	410.6	424.3	439.6
N <sub>2</sub> O Emissions	385.2	387.9	256.3	243.4	239.9	243.6	258.1	264.9	274.6	286.6
Fluorinated Gases Emissions	140.0	173.8	8.3	9.4	11.2	12.4	13.0	13.5	13.9	14.2
<b>PRIMARY ENERGY USE (EJ)</b>										
Coal	22.6	24.3	22.4	19.6	15.5	22.9	28.5	34.0	39.8	45.7
Petroleum Products	42.0	46.0	47.1	50.2	54.0	58.9	70.9	77.8	84.4	90.7
Including Shale Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	22.5	24.7	26.0	30.0	34.2	31.1	29.6	28.2	26.4	24.8
Nuclear (primary energy eq)	9.3	9.0	8.7	8.5	8.4	8.1	7.9	7.8	7.8	7.7
Hydro (primary energy eq)	2.9	2.8	2.9	2.9	2.9	2.8	2.8	2.9	3.0	3.0
Renewable Elec. (primary energy eq)	0.6	0.7	0.8	1.0	0.9	1.1	1.0	1.3	1.4	1.5
Biomass Liquids	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Primary Energy Use	99.8	107.6	107.9	112.1	115.8	124.9	140.8	152.0	162.8	173.4
Reduced Use from Reference	0.0	0.0	6.6	8.3	11.0	9.7	3.1	1.1	-0.9	-3.4
<b>ELECTRICITY PRODUCTION (EJ)</b>										
Coal w/o CCS	6.9	7.6	7.4	6.5	5.1	8.0	10.4	12.6	14.9	17.4
Oil w/o CCS	0.3	0.3	0.3	0.2	0.2	0.3	0.4	0.5	0.6	0.7
Gas w/o CCS	2.1	2.5	3.3	5.2	7.8	6.0	5.3	4.6	3.8	2.9
Nuclear	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Hydro	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.2
Other Renewables	0.2	0.2	0.1	0.6	0.3	0.5	0.4	0.5	0.6	0.6
Gas with CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal with CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Electricity Production	13.4	14.6	15.1	16.7	17.5	19.0	20.7	22.5	24.2	25.9

**Scenario 2a: Dingell Cumulative GHG with Gas Tax, fixed tax rate (\$16.50/tC) with gas tax from Sc1 to match 2012-2050 cumulative emissions from Sc1, all GHG**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
<b>ECONOMY WIDE INDICATORS</b>										
Population (million)	296	309	321	334	347	359	369	379	388	397
GDP (billion 2005\$)	11981	14339	16912	19689	22758	26378	30589	35027	39686	44454
% Change GDP from Reference	0.00	0.00	-0.05	-0.42	-0.39	-0.31	0.18	0.28	0.39	0.55
Market Consumption (billion 2005\$)	8217	9858	11530	13357	15328	17726	20503	23465	26573	29753
% Change Consumption from Reference	0.00	0.00	-0.02	-0.20	-0.23	-0.19	0.18	0.31	0.44	0.63
Welfare (billion 2005\$)	9656	11773	13933	16337	18935	22008	25475	29137	32928	36768
% Change Welfare from Reference(EV)	0.00	0.00	0.01	-0.03	-0.07	-0.03	0.24	0.36	0.45	0.59
CO <sub>2</sub> -E Price (2005\$/tCO <sub>2</sub> -e)	0.00	0.00	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50
<b>PRICES (index, 2005=1.00)</b>										
Petroleum Product	1.00	1.15	1.30	1.46	1.55	1.64	1.35	1.41	1.47	1.51
Natural Gas	1.00	1.11	1.25	1.53	1.74	2.00	2.29	2.70	3.12	3.52
Coal	1.00	1.04	1.06	1.06	1.08	1.11	1.14	1.17	1.20	1.23
Electricity	1.00	1.11	1.23	1.30	1.39	1.42	1.45	1.45	1.45	1.44
<b>TRADE &amp; PRODUCTION (selected indicators)</b>										
Bio Liquids Production in US (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (billion 2005\$)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Crude Oil Imports (billion 2005\$)	77.40	85.21	91.58	75.39	89.73	106.53	159.06	177.05	200.43	225.44
Net Agriculture Exports (billion 2005\$)	25.64	25.53	19.21	16.46	14.73	16.63	33.90	33.41	36.91	48.88
<b>GHG EMISSIONS (mmt CO<sub>2</sub>-e)</b>										
GHG Emissions	7091.9	7680.1	7466.5	7087.7	7612.2	8276.4	9466.3	10182.1	11051.0	11885.9
CO <sub>2</sub> Emissions	5984.3	6517.4	6783.5	6422.6	6938.2	7587.2	8754.3	9455.7	10303.8	11117.6
CH <sub>4</sub> Emissions	583.4	602.0	407.1	412.1	419.2	430.9	438.6	447.2	457.2	465.1
N <sub>2</sub> O Emissions	385.2	387.9	266.7	242.4	241.9	243.9	258.2	263.2	273.4	286.3
Fluorinated Gases Emissions	140.0	173.8	9.8	11.2	13.5	15.0	15.8	16.6	17.2	17.7
<b>PRIMARY ENERGY USE (EJ)</b>										
Coal	22.6	24.3	24.3	22.6	25.8	30.5	35.8	40.8	46.3	51.0
Petroleum Products	42.0	46.0	48.7	42.8	46.1	49.9	60.8	65.1	71.3	77.7
Including Shale Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	22.5	24.7	26.6	30.8	30.8	29.9	28.9	27.9	26.4	25.5
Nuclear (primary energy eq)	9.3	9.0	8.7	8.6	8.4	8.3	8.2	8.2	8.1	8.1
Hydro (primary energy eq)	2.9	2.8	2.8	2.8	2.8	2.9	2.9	3.0	3.0	3.1
Renewable Elec. (primary energy eq)	0.6	0.7	0.8	1.0	0.9	1.2	1.0	1.4	1.5	1.6
Biomass Liquids	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Primary Energy Use	99.8	107.6	111.9	108.6	114.8	122.7	137.6	146.3	156.6	166.9
Reduced Use from Reference	0.0	0.0	2.7	11.9	12.0	11.9	6.3	6.9	5.3	3.1
<b>ELECTRICITY PRODUCTION (EJ)</b>										
Coal w/o CCS	6.9	7.6	7.9	7.4	8.6	10.4	12.4	14.3	16.4	18.2
Oil w/o CCS	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.5	0.6
Gas w/o CCS	2.1	2.5	3.2	4.7	4.5	4.0	3.7	3.3	2.7	2.5
Nuclear	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Hydro	0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2
Other Renewables	0.2	0.2	0.1	0.5	0.3	0.5	0.4	0.5	0.6	0.6
Gas with CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal with CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Electricity Production	13.4	14.6	15.5	16.9	17.8	19.3	21.1	22.8	24.5	26.2

**Scenario 3: Dingell 4%, same as Sc1, but both carbon tax and gasoline tax are increased by 4% annual, CO2 only**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
<b>ECONOMY WIDE INDICATORS</b>										
Population (million)	296	309	321	334	347	359	369	379	388	397
GDP (billion 2005\$)	11981	14339	16893	19631	22631	26166	30259	34502	38927	43338
% Change GDP from Reference	0.00	0.00	-0.17	-0.72	-0.94	-1.11	-0.90	-1.22	-1.53	-1.97
Market Consumption (billion 2005\$)	8217	9858	11525	13330	15257	17611	20325	23184	26136	29129
% Change Consumption from Reference	0.00	0.00	-0.07	-0.40	-0.69	-0.84	-0.69	-0.89	-1.21	-1.48
Welfare (billion 2005\$)	9656	11773	13934	16320	18875	21916	25334	28912	32552	36237
% Change Welfare from Reference(EV)	0.00	0.00	0.01	-0.13	-0.38	-0.45	-0.31	-0.42	-0.70	-0.87
CO <sub>2</sub> -E Price (2005\$/tCO <sub>2</sub> -e)	0.00	0.00	15.34	18.66	22.71	27.62	33.61	40.89	49.75	60.53
<b>PRICES (index, 2005=1.00)</b>										
Petroleum Product	1.00	1.15	1.29	1.43	1.46	1.53	1.28	1.32	1.37	1.36
Natural Gas	1.00	1.11	1.23	1.53	1.99	2.33	2.55	2.88	3.01	3.14
Coal	1.00	1.04	1.04	1.02	0.99	1.01	1.03	1.06	1.11	1.14
Electricity	1.00	1.11	1.32	1.41	1.51	1.62	1.69	1.74	1.55	1.53
<b>TRADE &amp; PRODUCTION (selected indicators)</b>										
Bio Liquids Production in US (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (billion 2005\$)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Crude Oil Imports (billion 2005\$)	77.40	85.21	87.86	69.56	82.00	89.83	123.29	123.51	127.15	124.08
Net Agriculture Exports (billion 2005\$)	25.64	25.53	17.91	13.94	7.35	4.32	8.46	2.89	5.60	5.41
<b>GHG EMISSIONS (mmt CO<sub>2</sub>-e)</b>										
GHG Emissions	7091.9	7680.1	7629.1	7076.5	6896.6	7157.3	7806.0	7718.0	7163.5	6873.0
CO <sub>2</sub> Emissions	5984.3	6517.4	6431.4	5847.6	5603.0	5805.0	6393.2	6237.8	5616.3	5262.4
CH <sub>4</sub> Emissions	583.4	602.0	611.6	617.1	630.5	643.1	652.2	663.6	676.5	683.1
N <sub>2</sub> O Emissions	385.2	387.9	377.7	368.4	361.1	358.8	363.5	370.1	378.3	393.5
Fluorinated Gases Emissions	140.0	173.8	209.4	244.6	303.2	351.7	398.4	447.9	493.8	535.5
<b>PRIMARY ENERGY USE (EJ)</b>										
Coal	22.6	24.3	22.0	18.2	12.3	14.7	19.9	23.9	33.0	38.5
Petroleum Products	42.0	46.0	47.0	40.3	41.9	43.1	47.9	46.6	46.6	44.0
Including Shale Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	22.5	24.7	26.0	30.8	35.7	34.4	31.5	29.2	25.4	22.8
Nuclear (primary energy eq)	9.3	9.0	8.7	8.5	8.5	8.1	7.6	7.4	7.3	7.2
Hydro (primary energy eq)	2.9	2.8	2.9	2.9	3.0	2.9	2.8	2.9	2.8	2.9
Renewable Elec. (primary energy eq)	0.6	0.7	0.8	1.0	0.9	1.2	1.0	1.3	1.3	1.4
Biomass Liquids	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Primary Energy Use	99.8	107.6	107.4	101.7	102.3	104.3	110.7	111.3	116.4	116.8
Reduced Use from Reference	0.0	0.0	7.2	18.7	24.5	30.2	33.2	41.9	45.5	53.2
<b>ELECTRICITY PRODUCTION (EJ)</b>										
Coal w/o CCS	6.9	7.6	7.3	6.1	3.8	4.8	6.8	7.0	4.4	4.0
Oil w/o CCS	0.3	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.1
Gas w/o CCS	2.1	2.5	3.3	5.3	8.4	7.9	6.5	5.3	3.3	1.6
Nuclear	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Hydro	0.9	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.2
Other Renewables	0.2	0.2	0.1	0.6	0.3	0.5	0.4	0.6	0.6	0.6
Gas with CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal with CCS	0.0	0.0	0.0	0.0	0.1	0.3	0.8	2.7	9.7	12.8
Total Electricity Production	13.4	14.6	15.0	16.3	16.9	17.9	19.1	20.1	22.3	23.5

**Scenario 3a: Dingell 4% Cumulative GHG CO2 Only, initial 2015 tax rate (\$91.67/tC) that grows at 4% real annually to match 2012-2050 cumulative emissions from Sc3, CO2 Only**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
<b>ECONOMY WIDE INDICATORS</b>										
Population (million)	296	309	321	334	347	359	369	379	388	397
GDP (billion 2005\$)	11981	14339	16873	19680	22712	26261	30348	34710	39278	43962
% Change GDP from Reference	0.00	0.00	-0.28	-0.47	-0.58	-0.75	-0.61	-0.63	-0.64	-0.56
Market Consumption (billion 2005\$)	8217	9858	11519	13338	15280	17633	20336	23215	26263	29394
% Change Consumption from Reference	0.00	0.00	-0.12	-0.35	-0.54	-0.72	-0.64	-0.76	-0.73	-0.59
Welfare (billion 2005\$)	9656	11773	13934	16312	18877	21907	25309	28885	32620	36419
% Change Welfare from Reference(EV)	0.00	0.00	0.01	-0.18	-0.37	-0.49	-0.42	-0.51	-0.49	-0.37
CO <sub>2</sub> -E Price (2005\$/tCO <sub>2</sub> -e)	0.00	0.00	25.00	30.42	37.01	45.02	54.78	66.65	81.08	98.65
<b>PRICES (index, 2005=1.00)</b>										
Petroleum Product	1.00	1.15	1.29	1.44	1.47	1.56	1.32	1.38	1.44	1.46
Natural Gas	1.00	1.11	1.21	1.47	1.90	2.34	2.51	2.49	2.59	2.57
Coal	1.00	1.04	1.03	1.01	0.99	0.98	1.01	1.08	1.12	1.16
Electricity	1.00	1.11	1.39	1.51	1.55	1.69	1.79	1.60	1.59	1.59
<b>TRADE &amp; PRODUCTION (selected indicators)</b>										
Bio Liquids Production in US (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (EJ)	0.0	0.0	0.0	0.3	0.2	0.1	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (billion 2005\$)	0.00	0.00	0.00	1.52	0.95	0.65	0.00	0.00	0.00	0.00
Net Crude Oil Imports (billion 2005\$)	77.40	85.21	83.60	89.95	108.22	123.11	163.86	179.17	191.50	203.98
Net Agriculture Exports (billion 2005\$)	25.64	25.53	16.44	14.51	9.03	6.25	10.84	11.23	12.42	14.50
<b>GHG EMISSIONS (mmt CO<sub>2</sub>-e)</b>										
GHG Emissions	7091.9	7680.1	7339.1	7164.1	7138.2	7168.5	7381.9	7202.0	7335.3	7433.2
CO <sub>2</sub> Emissions	5984.3	6517.4	6173.4	5996.9	5954.2	5945.4	6104.4	5859.2	5916.3	5935.5
CH <sub>4</sub> Emissions	583.4	602.0	586.1	568.9	541.9	536.1	540.7	557.7	578.4	596.7
N <sub>2</sub> O Emissions	385.2	387.9	370.3	358.2	350.5	347.6	357.7	363.5	373.2	388.8
Fluorinated Gases Emissions	140.0	173.8	210.4	241.1	292.7	340.6	380.3	422.8	468.7	513.6
<b>PRIMARY ENERGY USE (EJ)</b>										
Coal	22.6	24.3	20.6	16.1	11.3	10.1	15.0	25.7	32.4	39.0
Petroleum Products	42.0	46.0	45.4	47.3	50.8	54.1	61.3	64.8	67.5	69.7
Including Shale Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	22.5	24.7	25.4	29.5	34.3	34.9	31.5	26.3	23.0	19.9
Nuclear (primary energy eq)	9.3	9.0	8.7	8.6	8.5	8.3	7.9	7.8	7.9	7.9
Hydro (primary energy eq)	2.9	2.8	3.0	3.0	3.0	3.1	3.0	3.0	3.0	3.1
Renewable Elec. (primary energy eq)	0.6	0.7	0.8	1.0	0.9	1.2	1.1	1.3	1.5	1.6
Biomass Liquids	0.0	0.0	0.0	0.3	0.2	0.1	0.0	0.0	0.0	0.0
Total Primary Energy Use	99.8	107.6	104.0	105.9	108.9	111.8	119.9	129.0	135.2	141.1
Reduced Use from Reference	0.0	0.0	10.5	14.6	17.9	22.8	24.0	24.1	26.7	28.8
<b>ELECTRICITY PRODUCTION (EJ)</b>										
Coal w/o CCS	6.9	7.6	6.9	5.2	3.3	2.3	1.4	0.0	0.0	0.0
Oil w/o CCS	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0
Gas w/o CCS	2.1	2.5	3.3	5.4	8.4	9.3	7.9	5.2	3.4	1.6
Nuclear	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Hydro	0.9	1.0	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2
Other Renewables	0.2	0.2	0.1	0.6	0.3	0.5	0.4	0.5	0.6	0.6
Gas with CCS	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.0	0.0	0.0
Coal with CCS	0.0	0.0	0.0	0.2	0.5	1.3	4.7	11.3	14.5	17.7
Total Electricity Production	13.4	14.6	14.7	16.0	16.9	17.8	18.9	21.3	22.8	24.3

**Scenario 4: Dingell 4% Cumulative GHG, initial 2015 tax rate (\$66/tC) that grows at 4% real annually to match 2012-2050 cumulative emissions from Sc3, all GHG**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
<b>ECONOMY WIDE INDICATORS</b>										
Population (million)	296	309	321	334	347	359	369	379	388	397
GDP (billion 2005\$)	11981	14339	16883	19697	22718	26275	30426	34816	39389	44077
% Change GDP from Reference	0.00	0.00	-0.22	-0.38	-0.56	-0.70	-0.35	-0.32	-0.36	-0.30
Market Consumption (billion 2005\$)	8217	9858	11522	13348	15285	17643	20386	23313	26338	29464
% Change Consumption from Reference	0.00	0.00	-0.09	-0.27	-0.51	-0.66	-0.39	-0.34	-0.45	-0.35
Welfare (billion 2005\$)	9656	11773	13934	16319	18879	21914	25363	28990	32689	36482
% Change Welfare from Reference(EV)	0.00	0.00	0.01	-0.14	-0.36	-0.46	-0.20	-0.15	-0.28	-0.19
CO <sub>2</sub> -E Price (2005\$/tCO <sub>2</sub> -e)	0.00	0.00	18.03	21.94	26.69	32.47	39.51	48.07	58.48	71.15
<b>PRICES (index, 2005=1.00)</b>										
Petroleum Product	1.00	1.15	1.30	1.46	1.57	1.66	1.37	1.42	1.47	1.49
Natural Gas	1.00	1.11	1.21	1.47	1.94	2.41	2.54	2.80	2.82	2.79
Coal	1.00	1.04	1.04	1.03	1.01	1.00	1.03	1.06	1.12	1.16
Electricity	1.00	1.11	1.34	1.45	1.52	1.66	1.74	1.79	1.59	1.58
<b>TRADE &amp; PRODUCTION (selected indicators)</b>										
Bio Liquids Production in US (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (EJ)	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.2	0.2
Net Bio Liquids Imports (billion 2005\$)	0.00	0.00	0.00	0.00	1.04	0.89	0.00	0.00	1.04	0.97
Net Crude Oil Imports (billion 2005\$)	77.40	85.21	84.86	92.34	105.41	122.23	170.00	188.09	203.21	218.24
Net Agriculture Exports (billion 2005\$)	25.64	25.53	15.62	13.85	10.30	10.09	25.61	23.57	29.40	40.50
<b>GHG EMISSIONS (mmt CO<sub>2</sub>-e)</b>										
GHG Emissions	7091.9	7680.1	6952.8	6879.8	6701.4	6823.7	7800.7	8092.3	7677.2	7726.1
CO <sub>2</sub> Emissions	5984.3	6517.4	6319.3	6271.0	6119.6	6249.3	7201.5	7484.1	7065.6	7098.2
CH <sub>4</sub> Emissions	583.4	602.0	374.1	364.3	342.4	336.6	351.0	357.8	357.6	367.2
N <sub>2</sub> O Emissions	385.2	387.9	252.1	236.4	230.1	227.9	238.2	240.6	244.4	251.5
Fluorinated Gases Emissions	140.0	173.8	7.9	8.6	9.9	10.5	10.5	10.4	10.1	9.7
<b>PRIMARY ENERGY USE (EJ)</b>										
Coal	22.6	24.3	21.5	17.7	11.6	10.5	16.8	22.5	32.2	39.6
Petroleum Products	42.0	46.0	46.2	48.6	51.3	54.9	64.1	68.4	71.6	74.6
Including Shale Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	22.5	24.7	25.6	29.5	35.0	35.7	31.7	29.0	24.4	21.5
Nuclear (primary energy eq)	9.3	9.0	8.7	8.5	8.5	8.2	7.5	7.5	7.2	7.2
Hydro (primary energy eq)	2.9	2.8	2.9	2.9	3.0	3.0	2.8	2.9	2.8	2.9
Renewable Elec. (primary energy eq)	0.6	0.7	0.8	1.0	0.9	1.2	1.0	1.4	1.3	1.4
Biomass Liquids	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.2	0.2
Total Primary Energy Use	99.8	107.6	105.8	108.3	110.4	113.6	123.9	131.8	139.7	147.3
Reduced Use from Reference	0.0	0.0	8.7	12.2	16.4	20.9	20.0	21.3	22.2	22.7
<b>ELECTRICITY PRODUCTION (EJ)</b>										
Coal w/o CCS	6.9	7.6	7.1	5.8	3.7	3.2	5.7	6.4	3.9	3.6
Oil w/o CCS	0.3	0.3	0.3	0.2	0.1	0.1	0.2	0.3	0.2	0.2
Gas w/o CCS	2.1	2.5	3.3	5.3	8.7	9.6	7.7	6.3	4.0	2.2
Nuclear	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Hydro	0.9	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.2
Other Renewables	0.2	0.2	0.1	0.6	0.3	0.5	0.4	0.6	0.6	0.6
Gas with CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal with CCS	0.0	0.0	0.0	0.2	0.1	0.3	0.8	2.5	10.0	13.6
Total Electricity Production	13.4	14.6	14.9	16.3	17.1	18.0	19.2	20.4	23.0	24.5

**Scenario 4a: Dingell 4% Cumulative GHG with Gas Tax, initial 2015 tax rate (\$34.83/tC) that grows at 4% real annually with gas tax from Sc3 to match 2012-2050 cumulative emissions from Sc3, all GHG**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
<b>ECONOMY WIDE INDICATORS</b>										
Population (million)	296	309	321	334	347	359	369	379	388	397
GDP (billion 2005\$)	11981	14339	16902	19651	22645	26201	30338	34632	39119	43557
% Change GDP from Reference	0.00	0.00	-0.12	-0.62	-0.88	-0.98	-0.64	-0.85	-1.04	-1.48
Market Consumption (billion 2005\$)	8217	9858	11527	13340	15267	17629	20370	23262	26280	29284
% Change Consumption from Reference	0.00	0.00	-0.05	-0.33	-0.63	-0.74	-0.47	-0.55	-0.67	-0.96
Welfare (billion 2005\$)	9656	11773	13934	16327	18884	21936	25377	28987	32705	36396
% Change Welfare from Reference(EV)	0.00	0.00	0.01	-0.09	-0.34	-0.36	-0.15	-0.16	-0.23	-0.43
CO <sub>2</sub> -E Price (2005\$/tCO <sub>2</sub> -e)	0.00	0.00	9.50	11.56	14.06	17.11	20.82	25.33	30.81	37.49
<b>PRICES (index, 2005=1.00)</b>										
Petroleum Product	1.00	1.15	1.30	1.46	1.55	1.63	1.32	1.36	1.40	1.38
Natural Gas	1.00	1.11	1.24	1.53	1.98	2.15	2.45	2.87	3.25	3.34
Coal	1.00	1.04	1.05	1.04	1.02	1.06	1.08	1.09	1.11	1.13
Electricity	1.00	1.11	1.27	1.36	1.47	1.53	1.59	1.62	1.66	1.69
<b>TRADE &amp; PRODUCTION (selected indicators)</b>										
Bio Liquids Production in US (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (billion 2005\$)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Crude Oil Imports (billion 2005\$)	77.40	85.21	88.97	69.91	78.19	87.46	126.23	128.87	135.76	134.90
Net Agriculture Exports (billion 2005\$)	25.64	25.53	17.84	14.33	10.50	11.44	26.55	23.51	24.17	32.60
<b>GHG EMISSIONS (mmt CO<sub>2</sub>-e)</b>										
GHG Emissions	7091.9	7680.1	7247.9	6682.0	6432.9	6996.6	7721.2	7872.9	7989.9	7327.0
CO <sub>2</sub> Emissions	5984.3	6517.4	6589.8	6051.7	5828.8	6375.8	7085.2	7231.0	7338.2	6670.3
CH <sub>4</sub> Emissions	583.4	602.0	390.3	389.0	368.9	386.0	393.2	400.4	407.1	410.3
N <sub>2</sub> O Emissions	385.2	387.9	259.6	232.3	224.7	223.7	231.6	230.4	233.8	235.9
Fluorinated Gases Emissions	140.0	173.8	8.7	9.6	11.0	11.8	11.8	11.7	11.5	11.1
<b>PRIMARY ENERGY USE (EJ)</b>										
Coal	22.6	24.3	23.0	19.9	14.6	21.2	27.4	28.8	33.5	37.2
Petroleum Products	42.0	46.0	47.7	40.9	42.1	43.5	49.6	48.8	49.6	47.3
Including Shale Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	22.5	24.7	26.3	30.9	35.4	32.1	31.1	29.2	27.4	24.3
Nuclear (primary energy eq)	9.3	9.0	8.7	8.5	8.5	8.0	8.1	7.6	7.6	7.4
Hydro (primary energy eq)	2.9	2.8	2.9	2.9	2.9	2.9	3.0	2.9	3.0	3.0
Renewable Elec. (primary energy eq)	0.6	0.7	0.8	1.0	0.9	1.1	1.0	1.3	1.4	1.5
Biomass Liquids	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Primary Energy Use	99.8	107.6	109.4	104.1	104.4	108.8	120.2	118.6	122.6	120.7
Reduced Use from Reference	0.0	0.0	5.2	16.3	22.4	25.7	23.7	34.5	39.3	49.3
<b>ELECTRICITY PRODUCTION (EJ)</b>										
Coal w/o CCS	6.9	7.6	7.6	6.6	4.6	7.3	9.2	10.5	11.3	9.1
Oil w/o CCS	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.3
Gas w/o CCS	2.1	2.5	3.2	5.1	7.9	6.0	5.4	4.7	3.8	2.1
Nuclear	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Hydro	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.3
Other Renewables	0.2	0.2	0.1	0.6	0.3	0.5	0.4	0.5	0.6	0.6
Gas with CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal with CCS	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.5	1.5	6.2
Total Electricity Production	13.4	14.6	15.3	16.6	17.2	18.4	19.7	20.9	22.0	22.8

**Scenario 5: Stark Proposal, start in 2012 at 10\$/tC (2.73\$/tCO<sub>2</sub>) and increase each year by 10\$/tC nominal, CO<sub>2</sub> only**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
<b>ECONOMY WIDE INDICATORS</b>										
Population (million)	296	309	321	334	347	359	369	379	388	397
GDP (billion 2005\$)	11981	14339	16902	19709	22740	26289	30375	34768	39352	44035
% Change GDP from Reference	0.00	0.00	-0.11	-0.32	-0.46	-0.64	-0.52	-0.46	-0.45	-0.39
Market Consumption (billion 2005\$)	8217	9858	11528	13357	15300	17655	20360	23259	26310	29423
% Change Consumption from Reference	0.00	0.00	-0.04	-0.20	-0.41	-0.59	-0.52	-0.57	-0.55	-0.49
Welfare (billion 2005\$)	9656	11773	13934	16327	18896	21929	25333	28921	32655	36433
% Change Welfare from Reference(EV)	0.00	0.00	0.01	-0.09	-0.27	-0.39	-0.32	-0.38	-0.38	-0.33
CO <sub>2</sub> -E Price (2005\$/tCO <sub>2</sub> -e)	0.00	0.00	10.44	22.92	33.69	42.97	50.98	57.89	63.85	68.99
<b>PRICES (index, 2005=1.00)</b>										
Petroleum Product	1.00	1.15	1.29	1.44	1.48	1.56	1.33	1.39	1.46	1.49
Natural Gas	1.00	1.11	1.24	1.48	1.90	2.36	2.71	2.73	2.89	2.80
Coal	1.00	1.04	1.04	1.03	1.00	0.99	1.00	1.07	1.12	1.16
Electricity	1.00	1.11	1.28	1.45	1.53	1.69	1.82	1.59	1.59	1.58
<b>TRADE &amp; PRODUCTION (selected indicators)</b>										
Bio Liquids Production in US (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (EJ)	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.1	0.0
Net Bio Liquids Imports (billion 2005\$)	0.00	0.00	0.00	0.00	1.08	0.78	0.00	0.00	0.34	0.00
Net Crude Oil Imports (billion 2005\$)	77.40	85.21	90.20	94.71	110.44	124.82	166.76	184.58	200.71	218.68
Net Agriculture Exports (billion 2005\$)	25.64	25.53	18.69	15.66	9.56	6.50	10.22	11.14	13.01	16.95
<b>GHG EMISSIONS (mmt CO<sub>2</sub>-e)</b>										
GHG Emissions	7091.9	7680.1	7783.8	7571.9	7433.5	7471.9	7774.7	7847.0	8043.5	7979.9
CO <sub>2</sub> Emissions	5984.3	6517.4	6586.3	6343.8	6140.7	6119.3	6363.6	6370.9	6502.0	6374.1
CH <sub>4</sub> Emissions	583.4	602.0	611.6	617.1	630.5	643.1	652.2	663.6	676.5	683.1
N <sub>2</sub> O Emissions	385.2	387.9	377.5	367.5	360.0	357.3	361.6	366.5	373.6	386.4
Fluorinated Gases Emissions	140.0	173.8	209.5	244.5	303.5	353.4	398.6	447.4	492.9	537.7
<b>PRIMARY ENERGY USE (EJ)</b>										
Coal	22.6	24.3	22.9	18.3	12.5	10.8	13.0	24.3	31.4	39.0
Petroleum Products	42.0	46.0	47.8	49.0	51.6	54.7	62.3	66.7	70.7	74.7
Including Shale Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	22.5	24.7	26.3	29.4	34.1	35.0	33.3	28.1	24.7	20.8
Nuclear (primary energy eq)	9.3	9.0	8.7	8.6	8.5	8.4	8.1	7.9	7.9	7.9
Hydro (primary energy eq)	2.9	2.8	2.9	3.0	3.0	3.1	3.1	3.0	3.0	3.1
Renewable Elec. (primary energy eq)	0.6	0.7	0.8	1.0	0.9	1.2	1.1	1.3	1.5	1.6
Biomass Liquids	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.1	0.0
Total Primary Energy Use	99.8	107.6	109.4	109.2	110.8	113.3	121.0	131.3	139.2	147.1
Reduced Use from Reference	0.0	0.0	5.1	11.3	16.0	21.3	22.9	21.8	22.7	22.9
<b>ELECTRICITY PRODUCTION (EJ)</b>										
Coal w/o CCS	6.9	7.6	7.5	6.0	3.8	2.8	1.9	1.3	1.2	0.0
Oil w/o CCS	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0
Gas w/o CCS	2.1	2.5	3.3	5.2	8.3	9.3	8.9	6.2	4.3	1.9
Nuclear	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Hydro	0.9	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.2
Other Renewables	0.2	0.2	0.1	0.6	0.3	0.5	0.4	0.5	0.6	0.6
Gas with CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal with CCS	0.0	0.0	0.0	0.2	0.3	0.9	3.1	9.1	12.5	17.6
Total Electricity Production	13.4	14.6	15.3	16.3	17.0	17.9	18.8	21.4	23.0	24.5

**Scenario 6: Stark Cumulative GHG, initial 2015 tax rate (\$5/tC) that grows at \$10/C nominal annually to match 2012-2050 cumulative emissions from Sc5, all GHG**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
<b>ECONOMY WIDE INDICATORS</b>										
Population (million)	296	309	321	334	347	359	369	379	388	397
GDP (billion 2005\$)	11981	14339	16918	19735	22748	26294	30452	34846	39434	44127
% Change GDP from Reference	0.00	0.00	-0.02	-0.19	-0.43	-0.63	-0.27	-0.24	-0.24	-0.19
Market Consumption (billion 2005\$)	8217	9858	11532	13370	15309	17661	20414	23341	26401	29494
% Change Consumption from Reference	0.00	0.00	-0.01	-0.11	-0.36	-0.56	-0.26	-0.22	-0.21	-0.25
Welfare (billion 2005\$)	9656	11773	13933	16336	18903	21934	25392	29020	32766	36506
% Change Welfare from Reference(EV)	0.00	0.00	0.00	-0.03	-0.24	-0.37	-0.09	-0.04	-0.04	-0.13
CO <sub>2</sub> -E Price (2005\$/tCO <sub>2</sub> -e)	0.00	0.00	1.50	13.98	24.74	34.03	42.04	48.95	54.91	60.05
<b>PRICES (index, 2005=1.00)</b>										
Petroleum Product	1.00	1.15	1.30	1.47	1.57	1.66	1.37	1.43	1.48	1.50
Natural Gas	1.00	1.11	1.26	1.47	1.92	2.44	2.59	2.91	3.17	3.02
Coal	1.00	1.04	1.06	1.05	1.02	1.00	1.03	1.06	1.09	1.16
Electricity	1.00	1.11	1.20	1.38	1.51	1.67	1.76	1.80	1.83	1.58
<b>TRADE &amp; PRODUCTION (selected indicators)</b>										
Bio Liquids Production in US (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (EJ)	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.3
Net Bio Liquids Imports (billion 2005\$)	0.00	0.00	0.00	0.00	0.14	0.92	0.00	0.00	0.00	1.35
Net Crude Oil Imports (billion 2005\$)	77.40	85.21	93.23	96.86	107.86	122.48	169.46	188.24	206.38	224.29
Net Agriculture Exports (billion 2005\$)	25.64	25.53	20.06	16.09	11.00	9.88	24.80	22.68	24.86	40.71
<b>GHG EMISSIONS (mmt CO<sub>2</sub>-e)</b>										
GHG Emissions	7091.9	7680.1	7637.7	7320.5	6962.2	6908.9	7885.5	8358.4	8605.0	8211.4
CO <sub>2</sub> Emissions	5984.3	6517.4	6919.9	6687.9	6371.8	6335.0	7287.4	7746.6	7978.2	7572.7
CH <sub>4</sub> Emissions	583.4	602.0	431.0	380.4	348.2	335.9	350.2	360.8	370.0	374.0
N <sub>2</sub> O Emissions	385.2	387.9	275.6	243.5	232.7	228.2	238.0	241.2	247.1	255.1
Fluorinated Gases Emissions	140.0	173.8	11.8	9.3	10.0	10.4	10.4	10.3	10.3	10.1
<b>PRIMARY ENERGY USE (EJ)</b>										
Coal	22.6	24.3	25.2	20.8	13.7	11.0	16.8	20.8	25.8	38.0
Petroleum Products	42.0	46.0	49.3	50.2	52.1	54.9	63.9	68.5	72.8	76.7
Including Shale Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	22.5	24.7	26.8	29.4	34.5	35.9	32.1	29.5	26.6	22.3
Nuclear (primary energy eq)	9.3	9.0	8.8	8.6	8.6	8.6	7.7	7.3	7.1	7.0
Hydro (primary energy eq)	2.9	2.8	2.8	2.9	3.0	3.1	2.9	2.9	2.9	2.8
Renewable Elec. (primary energy eq)	0.6	0.7	0.8	1.0	0.9	1.3	1.1	1.3	1.4	1.4
Biomass Liquids	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.3
Total Primary Energy Use	99.8	107.6	113.6	112.9	112.9	114.9	124.5	130.3	136.5	148.4
Reduced Use from Reference	0.0	0.0	0.9	7.5	13.9	19.6	19.4	22.9	25.4	21.5
<b>ELECTRICITY PRODUCTION (EJ)</b>										
Coal w/o CCS	6.9	7.6	8.1	6.9	4.4	3.4	5.9	7.5	7.9	5.1
Oil w/o CCS	0.3	0.3	0.3	0.3	0.2	0.1	0.2	0.3	0.3	0.2
Gas w/o CCS	2.1	2.5	3.1	4.9	8.3	9.6	7.9	6.7	5.3	2.8
Nuclear	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Hydro	0.9	1.0	1.0	1.0	1.1	1.1	1.2	1.2	1.3	1.2
Other Renewables	0.2	0.2	0.1	0.6	0.3	0.5	0.4	0.6	0.6	0.6
Gas with CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal with CCS	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.9	2.9	11.4
Total Electricity Production	13.4	14.6	15.7	16.7	17.2	18.0	19.2	20.4	21.6	24.5

**Scenario 7: Stark Real, same as Sc5 but increase by 10\$/tC real each year, CO2 only**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
<b>ECONOMY WIDE INDICATORS</b>										
Population (million)	296	309	321	334	347	359	369	379	388	397
GDP (billion 2005\$)	11981	14339	16902	19705	22731	26271	30346	34687	39248	43936
% Change GDP from Reference	0.00	0.00	-0.12	-0.34	-0.50	-0.71	-0.61	-0.69	-0.71	-0.62
Market Consumption (billion 2005\$)	8217	9858	11527	13355	15297	17648	20346	23208	26250	29381
% Change Consumption from Reference	0.00	0.00	-0.04	-0.22	-0.43	-0.63	-0.59	-0.79	-0.78	-0.63
Welfare (billion 2005\$)	9656	11773	13934	16327	18895	21927	25327	28885	32614	36410
% Change Welfare from Reference(EV)	0.00	0.00	0.01	-0.09	-0.28	-0.41	-0.34	-0.51	-0.51	-0.39
CO <sub>2</sub> -E Price (2005\$/tCO <sub>2</sub> -e)	0.00	0.00	10.91	24.55	38.18	51.82	65.45	79.09	92.73	106.36
<b>PRICES (index, 2005=1.00)</b>										
Petroleum Product	1.00	1.15	1.29	1.44	1.47	1.56	1.32	1.37	1.43	1.46
Natural Gas	1.00	1.11	1.24	1.47	1.88	2.30	2.52	2.45	2.56	2.55
Coal	1.00	1.04	1.04	1.03	1.00	0.99	1.00	1.08	1.12	1.15
Electricity	1.00	1.11	1.28	1.46	1.55	1.71	1.83	1.60	1.60	1.59
<b>TRADE &amp; PRODUCTION (selected indicators)</b>										
Bio Liquids Production in US (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (EJ)	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0
Net Bio Liquids Imports (billion 2005\$)	0.00	0.00	0.00	0.00	1.07	0.76	0.51	0.00	0.00	0.00
Net Crude Oil Imports (billion 2005\$)	77.40	85.21	89.97	93.98	108.49	121.02	159.00	173.17	185.65	199.68
Net Agriculture Exports (billion 2005\$)	25.64	25.53	18.62	15.43	9.11	5.72	9.44	10.07	11.17	13.54
<b>GHG EMISSIONS (mmt CO<sub>2</sub>-e)</b>										
GHG Emissions	7091.9	7680.1	7768.2	7523.8	7355.7	7329.5	7485.5	7157.7	7287.4	7415.5
CO <sub>2</sub> Emissions	5984.3	6517.4	6570.6	6295.7	6062.6	5979.0	6073.9	5677.8	5742.3	5808.3
CH <sub>4</sub> Emissions	583.4	602.0	611.6	617.1	630.5	643.1	652.2	663.6	676.5	683.1
N <sub>2</sub> O Emissions	385.2	387.9	377.6	367.5	360.1	357.5	361.9	367.1	374.5	387.8
Fluorinated Gases Emissions	140.0	173.8	209.5	244.5	303.6	351.2	398.8	450.5	495.5	537.7
<b>PRIMARY ENERGY USE (EJ)</b>										
Coal	22.6	24.3	22.8	18.0	12.4	10.9	14.5	25.6	32.1	38.7
Petroleum Products	42.0	46.0	47.7	48.7	50.9	53.3	59.6	62.7	65.5	68.2
Including Shale Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	22.5	24.7	26.3	29.4	33.8	34.4	31.7	26.1	22.9	19.9
Nuclear (primary energy eq)	9.3	9.0	8.7	8.6	8.5	8.4	8.1	8.0	8.0	8.0
Hydro (primary energy eq)	2.9	2.8	2.9	3.0	3.0	3.1	3.1	3.0	3.1	3.2
Renewable Elec. (primary energy eq)	0.6	0.7	0.8	1.0	0.9	1.3	1.1	1.4	1.5	1.6
Biomass Liquids	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0
Total Primary Energy Use	99.8	107.6	109.2	108.6	109.8	111.5	118.2	126.8	133.1	139.7
Reduced Use from Reference	0.0	0.0	5.3	11.8	17.0	23.1	25.7	26.3	28.8	30.3
<b>ELECTRICITY PRODUCTION (EJ)</b>										
Coal w/o CCS	6.9	7.6	7.5	5.9	3.7	2.7	1.8	0.0	0.0	0.0
Oil w/o CCS	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0
Gas w/o CCS	2.1	2.5	3.3	5.2	8.2	9.0	8.1	5.2	3.5	1.7
Nuclear	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Hydro	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.2	1.2
Other Renewables	0.2	0.2	0.1	0.6	0.3	0.5	0.4	0.5	0.6	0.6
Gas with CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal with CCS	0.0	0.0	0.0	0.2	0.4	1.1	3.9	11.2	14.4	17.5
Total Electricity Production	13.4	14.6	15.2	16.2	16.9	17.8	18.7	21.2	22.7	24.2

**Scenario 8: Stark Real Cumulative GHG, initial 2015 tax rate (\$0.002/tC) that grows at \$10/C real annually to match 2012-2050 cumulative emissions from Sc7, all GHG**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
<b>ECONOMY WIDE INDICATORS</b>										
Population (million)	296	309	321	334	347	359	369	379	388	397
GDP (billion 2005\$)	11981	14339	16921	19738	22749	26285	30380	34734	39273	43942
% Change GDP from Reference	0.00	0.00	0.00	-0.18	-0.42	-0.66	-0.50	-0.56	-0.65	-0.61
Market Consumption (billion 2005\$)	8217	9858	11532	13372	15310	17661	20376	23277	26310	29381
% Change Consumption from Reference	0.00	0.00	0.00	-0.09	-0.35	-0.56	-0.45	-0.49	-0.55	-0.63
Welfare (billion 2005\$)	9656	11773	13932	16338	18905	21938	25359	28969	32693	36413
% Change Welfare from Reference(EV)	0.00	0.00	0.00	-0.02	-0.22	-0.35	-0.21	-0.22	-0.27	-0.38
CO <sub>2</sub> -E Price (2005\$/tCO <sub>2</sub> -e)	0.00	0.00	0.00	13.64	27.27	40.91	54.55	68.18	81.82	95.46
<b>PRICES (index, 2005=1.00)</b>										
Petroleum Product	1.00	1.15	1.30	1.47	1.57	1.66	1.36	1.41	1.46	1.47
Natural Gas	1.00	1.11	1.26	1.47	1.90	2.39	2.84	3.03	3.20	2.91
Coal	1.00	1.04	1.06	1.05	1.02	1.00	0.99	1.02	1.06	1.14
Electricity	1.00	1.11	1.19	1.38	1.51	1.69	1.86	1.94	2.01	1.58
<b>TRADE &amp; PRODUCTION (selected indicators)</b>										
Bio Liquids Production in US (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (EJ)	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.3	0.3	0.1
Net Bio Liquids Imports (billion 2005\$)	0.00	0.00	0.00	0.00	1.25	0.94	1.00	1.53	1.54	0.80
Net Crude Oil Imports (billion 2005\$)	77.40	85.21	94.07	97.11	106.19	119.60	162.03	176.51	190.13	205.08
Net Agriculture Exports (billion 2005\$)	25.64	25.53	20.51	16.22	10.66	8.76	21.13	17.75	17.93	34.52
<b>GHG EMISSIONS (mmt CO<sub>2</sub>-e)</b>										
GHG Emissions	7091.9	7680.1	8191.1	7364.2	6921.5	6832.1	7277.4	7627.2	7639.0	7149.7
CO <sub>2</sub> Emissions	5984.3	6517.4	6996.9	6729.7	6333.8	6264.2	6707.9	7043.5	7045.1	6547.7
CH <sub>4</sub> Emissions	583.4	602.0	760.0	381.7	346.6	332.4	328.5	341.4	347.9	349.7
N <sub>2</sub> O Emissions	385.2	387.9	365.3	244.0	231.7	225.9	231.6	233.2	237.0	243.7
Fluorinated Gases Emissions	140.0	173.8	69.9	9.3	9.8	10.1	9.9	9.7	9.4	9.1
<b>PRIMARY ENERGY USE (EJ)</b>										
Coal	22.6	24.3	25.8	21.3	14.0	11.2	11.5	16.2	21.2	35.8
Petroleum Products	42.0	46.0	49.6	50.3	51.5	54.0	61.2	64.3	67.1	70.0
Including Shale Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	22.5	24.7	26.8	29.3	34.2	35.4	34.7	30.4	26.8	21.8
Nuclear (primary energy eq)	9.3	9.0	8.8	8.6	8.7	8.6	8.1	7.3	7.0	6.7
Hydro (primary energy eq)	2.9	2.8	2.8	2.9	3.0	3.2	3.1	2.9	2.9	2.7
Renewable Elec. (primary energy eq)	0.6	0.7	0.8	1.0	0.9	1.3	1.1	1.4	1.4	1.3
Biomass Liquids	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.3	0.3	0.1
Total Primary Energy Use	99.8	107.6	114.6	113.4	112.6	113.8	119.9	122.8	126.8	138.5
Reduced Use from Reference	0.0	0.0	0.0	7.1	14.2	20.8	24.1	30.4	35.1	31.4
<b>ELECTRICITY PRODUCTION (EJ)</b>										
Coal w/o CCS	6.9	7.6	8.3	7.0	4.5	3.4	3.7	5.6	5.6	2.9
Oil w/o CCS	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.2	0.3	0.1
Gas w/o CCS	2.1	2.5	3.1	4.7	8.1	9.4	9.7	7.8	6.0	3.1
Nuclear	3.0	3.0	3.0	3.1	3.1	3.1	3.1	3.2	3.2	3.1
Hydro	0.9	1.0	1.0	1.0	1.1	1.1	1.2	1.3	1.3	1.2
Other Renewables	0.2	0.2	0.1	0.6	0.3	0.5	0.4	0.6	0.7	0.6
Gas with CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Coal with CCS	0.0	0.0	0.0	0.0	0.0	0.1	0.3	1.0	3.4	12.8
Total Electricity Production	13.4	14.6	15.7	16.7	17.2	17.9	18.6	19.6	20.4	24.0

**Scenario 9: Larson Proposal, start in 2012 at 15\$/CO2 carbon tax, increase at 10% real annually, CO2 only**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
<b>ECONOMY WIDE INDICATORS</b>										
Population (million)	296	309	321	334	347	359	369	379	388	397
GDP (billion 2005\$)	11981	14339	16884	19679	22678	26329	30346	34616	38824	43105
% Change GDP from Reference	0.00	0.00	-0.22	-0.47	-0.73	-0.49	-0.61	-0.90	-1.79	-2.50
Market Consumption (billion 2005\$)	8217	9858	11522	13339	15291	17563	20108	22853	25705	28649
% Change Consumption from Reference	0.00	0.00	-0.09	-0.33	-0.47	-1.11	-1.75	-2.30	-2.84	-3.11
Welfare (billion 2005\$)	9656	11773	13934	16315	18903	21853	25097	28535	32099	35740
% Change Welfare from Reference(EV)	0.00	0.00	0.01	-0.16	-0.24	-0.74	-1.25	-1.71	-2.08	-2.23
CO <sub>2</sub> -E Price (2005\$/tCO <sub>2</sub> -e)	0.00	0.00	19.96	32.15	51.78	83.40	134.31	216.31	348.38	561.07
<b>PRICES (index, 2005=1.00)</b>										
Petroleum Product	1.00	1.15	1.29	1.44	1.47	1.46	1.16	1.15	1.16	1.14
Natural Gas	1.00	1.11	1.22	1.46	1.86	2.18	2.11	1.97	1.55	1.56
Coal	1.00	1.04	1.03	1.01	0.98	0.97	1.00	1.06	1.11	1.10
Electricity	1.00	1.11	1.35	1.52	1.59	1.79	1.88	1.62	1.62	1.60
<b>TRADE &amp; PRODUCTION (selected indicators)</b>										
Bio Liquids Production in US (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	5.0	7.1
Net Bio Liquids Imports (EJ)	0.0	0.0	0.0	0.3	0.2	15.7	24.6	31.4	29.2	29.1
Net Bio Liquids Imports (billion 2005\$)	0.00	0.00	0.00	1.52	0.85	83.96	131.52	168.01	156.10	155.63
Net Crude Oil Imports (billion 2005\$)	77.40	85.21	85.76	88.93	102.51	57.74	51.32	30.05	29.86	29.96
Net Agriculture Exports (billion 2005\$)	25.64	25.53	17.20	14.30	7.16	7.60	14.50	8.94	-7.11	-20.35
<b>GHG EMISSIONS (mmt CO<sub>2</sub>-e)</b>										
GHG Emissions	7091.9	7680.1	7499.1	7196.8	6999.3	5673.2	4679.0	3953.1	3557.7	3454.2
CO <sub>2</sub> Emissions	5984.3	6517.4	6301.4	5975.5	5712.9	4326.1	3271.1	2477.1	2009.6	1837.3
CH <sub>4</sub> Emissions	583.4	602.0	611.6	623.7	635.7	647.1	655.0	665.4	678.3	684.4
N <sub>2</sub> O Emissions	385.2	387.9	377.8	354.7	347.6	345.9	350.9	360.2	374.1	394.5
Fluorinated Gases Emissions	140.0	173.8	209.4	244.0	304.2	355.3	403.2	451.8	497.0	539.4
<b>PRIMARY ENERGY USE (EJ)</b>										
Coal	22.6	24.3	21.3	16.2	10.4	11.6	18.6	29.7	39.3	39.8
Petroleum Products	42.0	46.0	46.2	47.1	48.8	33.9	26.6	19.9	19.4	18.5
Including Shale Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	22.5	24.7	25.8	29.4	33.9	34.6	28.7	24.2	16.2	15.5
Nuclear (primary energy eq)	9.3	9.0	8.7	8.6	8.6	8.7	8.7	8.6	8.6	8.6
Hydro (primary energy eq)	2.9	2.8	2.9	3.0	3.1	3.2	3.4	3.3	3.4	3.5
Renewable Elec. (primary energy eq)	0.6	0.7	0.8	1.0	0.9	1.3	1.2	1.4	1.6	1.7
Biomass Liquids	0.0	0.0	0.0	0.3	0.2	15.7	24.6	32.8	34.2	36.2
Total Primary Energy Use	99.8	107.6	105.7	105.6	105.9	109.1	111.8	119.9	122.7	123.8
Reduced Use from Reference	0.0	0.0	8.9	14.9	20.9	25.5	32.1	33.2	39.2	46.1
<b>ELECTRICITY PRODUCTION (EJ)</b>										
Coal w/o CCS	6.9	7.6	7.1	5.2	3.0	1.7	0.6	0.0	0.0	0.0
Oil w/o CCS	0.3	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0
Gas w/o CCS	2.1	2.5	3.3	5.3	8.5	8.8	5.8	4.2	0.0	0.0
Nuclear	3.0	3.0	3.1	3.1	3.1	3.1	3.2	3.1	3.1	3.1
Hydro	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.2	1.3
Other Renewables	0.2	0.2	0.1	0.6	0.2	0.6	0.4	0.5	0.6	0.6
Gas with CCS	0.0	0.0	0.0	0.2	0.1	0.3	0.9	0.5	1.3	1.9
Coal with CCS	0.0	0.0	0.0	0.2	0.5	1.5	5.9	11.0	15.5	16.0
Total Electricity Production	13.4	14.6	14.9	16.0	16.6	17.2	18.1	20.6	21.7	22.9

**Scenario 10: Larson Cumulative GHG, initial 2015 tax rate (\$13.30/tCO<sub>2</sub>) that grows at 10% real annually to match 2012-2050 cumulative emissions from Sc9, all GHG**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
<b>ECONOMY WIDE INDICATORS</b>										
Population (million)	296	309	321	334	347	359	369	379	388	397
GDP (billion 2005\$)	11981	14339	16894	19704	22713	26261	30248	34740	39149	43405
% Change GDP from Reference	0.00	0.00	-0.16	-0.35	-0.58	-0.75	-0.94	-0.54	-0.96	-1.82
Market Consumption (billion 2005\$)	8217	9858	11525	13354	15287	17624	20307	22943	25810	28705
% Change Consumption from Reference	0.00	0.00	-0.07	-0.23	-0.50	-0.77	-0.78	-1.92	-2.44	-2.92
Welfare (billion 2005\$)	9656	11773	13934	16325	18886	21907	25309	28631	32182	35775
% Change Welfare from Reference(EV)	0.00	0.00	0.01	-0.10	-0.33	-0.49	-0.41	-1.38	-1.82	-2.13
CO <sub>2</sub> -E Price (2005\$/tCO <sub>2</sub> -e)	0.00	0.00	13.30	21.42	34.50	55.56	89.48	144.10	232.08	373.76
<b>PRICES (index, 2005=1.00)</b>										
Petroleum Product	1.00	1.15	1.30	1.46	1.57	1.64	1.34	1.22	1.22	1.17
Natural Gas	1.00	1.11	1.23	1.47	1.89	2.33	2.77	2.78	2.31	1.50
Coal	1.00	1.04	1.04	1.03	1.01	0.99	0.97	0.99	1.09	1.14
Electricity	1.00	1.11	1.30	1.44	1.53	1.72	1.97	2.15	1.61	1.61
<b>TRADE &amp; PRODUCTION (selected indicators)</b>										
Bio Liquids Production in US (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	3.5
Net Bio Liquids Imports (EJ)	0.0	0.0	0.0	0.0	0.2	2.8	0.1	32.0	34.7	32.6
Net Bio Liquids Imports (billion 2005\$)	0.00	0.00	0.00	0.00	1.08	14.86	0.55	170.89	185.54	174.17
Net Crude Oil Imports (billion 2005\$)	77.40	85.21	87.09	92.83	102.39	104.34	145.89	40.87	37.94	39.98
Net Agriculture Exports (billion 2005\$)	25.64	25.53	16.84	14.04	9.03	7.01	14.63	19.48	21.70	5.21
<b>GHG EMISSIONS (mmt CO<sub>2</sub>-e)</b>										
GHG Emissions	7091.9	7680.1	7107.6	6953.5	6620.9	6278.9	6432.3	3898.0	3120.1	2596.7
CO <sub>2</sub> Emissions	5984.3	6517.4	6461.9	6342.0	6046.9	5727.1	5896.4	3370.6	2601.0	2085.9
CH <sub>4</sub> Emissions	583.4	602.0	382.1	366.2	337.8	322.5	307.4	301.4	290.6	281.0
N <sub>2</sub> O Emissions	385.2	387.9	255.9	237.2	227.3	220.3	220.1	217.7	220.0	221.4
Fluorinated Gases Emissions	140.0	173.8	8.3	8.6	9.4	9.5	9.0	8.9	9.0	8.9
<b>PRIMARY ENERGY USE (EJ)</b>										
Coal	22.6	24.3	22.3	18.0	12.1	9.5	8.3	12.7	28.2	40.0
Petroleum Products	42.0	46.0	47.0	48.8	50.2	49.1	55.6	23.3	21.5	20.8
Including Shale Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	22.5	24.7	26.0	29.5	34.2	35.0	34.5	29.7	21.9	12.0
Nuclear (primary energy eq)	9.3	9.0	8.7	8.5	8.5	8.4	8.1	8.1	7.9	7.9
Hydro (primary energy eq)	2.9	2.8	2.9	2.9	3.0	3.1	3.2	3.3	3.1	3.2
Renewable Elec. (primary energy eq)	0.6	0.7	0.8	1.0	0.9	1.3	1.2	1.6	1.4	1.5
Biomass Liquids	0.0	0.0	0.0	0.0	0.2	2.8	0.1	32.0	34.9	36.1
Total Primary Energy Use	99.8	107.6	107.7	108.8	109.1	109.1	111.0	110.5	118.9	121.6
Reduced Use from Reference	0.0	0.0	6.8	11.6	17.7	25.5	33.0	42.6	43.0	48.4
<b>ELECTRICITY PRODUCTION (EJ)</b>										
Coal w/o CCS	6.9	7.6	7.4	6.0	3.8	2.8	2.0	1.5	0.0	0.0
Oil w/o CCS	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0
Gas w/o CCS	2.1	2.5	3.3	5.3	8.4	9.5	10.0	7.9	4.7	0.0
Nuclear	3.0	3.0	3.1	3.1	3.1	3.1	3.2	3.2	3.1	3.1
Hydro	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.3	1.2	1.3
Other Renewables	0.2	0.2	0.1	0.6	0.3	0.5	0.4	0.6	0.6	0.6
Gas with CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.4
Coal with CCS	0.0	0.0	0.0	0.0	0.1	0.3	1.0	3.5	12.1	17.6
Total Electricity Production	13.4	14.6	15.1	16.3	17.0	17.6	18.0	18.3	21.9	23.0

**Scenario 11: 216 bmt, start in 2015 at \$38.50/tCO<sub>2</sub>-e, increase at 4% real annually, all GHG**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
<b>ECONOMY WIDE INDICATORS</b>										
Population (million)	296	309	321	334	347	359	369	379	388	397
GDP (billion 2005\$)	11981	14339	16841	19619	22682	26288	30194	34547	39259	44048
% Change GDP from Reference	0.00	0.00	-0.47	-0.78	-0.72	-0.65	-1.11	-1.09	-0.69	-0.37
Market Consumption (billion 2005\$)	8217	9858	11504	13308	15219	17519	20235	23120	26068	29036
% Change Consumption from Reference	0.00	0.00	-0.25	-0.57	-0.94	-1.36	-1.13	-1.16	-1.47	-1.80
Welfare (billion 2005\$)	9656	11773	13928	16294	18829	21803	25233	28813	32434	36050
% Change Welfare from Reference(EV)	0.00	0.00	-0.03	-0.29	-0.63	-0.97	-0.71	-0.76	-1.05	-1.38
CO <sub>2</sub> -E Price (2005\$/tCO <sub>2</sub> -e)	0.00	0.00	38.50	46.84	56.99	69.34	84.36	102.63	124.87	151.92
<b>PRICES (index, 2005=1.00)</b>										
Petroleum Product	1.00	1.15	1.30	1.46	1.53	1.57	1.34	1.39	1.34	1.24
Natural Gas	1.00	1.11	1.16	1.41	1.81	2.18	2.14	2.19	2.21	2.06
Coal	1.00	1.04	1.02	1.01	0.99	0.98	1.02	1.08	1.12	1.15
Electricity	1.00	1.11	1.50	1.63	1.60	1.74	1.81	1.61	1.60	1.59
<b>TRADE &amp; PRODUCTION (selected indicators)</b>										
Bio Liquids Production in US (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Net Bio Liquids Imports (EJ)	0.0	0.0	0.4	0.3	5.6	14.0	0.0	0.0	16.6	33.7
Net Bio Liquids Imports (billion 2005\$)	0.00	0.00	1.92	1.65	30.03	74.68	0.14	0.00	88.45	179.85
Net Crude Oil Imports (billion 2005\$)	77.40	85.21	75.28	80.64	74.45	59.73	144.15	157.90	114.46	67.65
Net Agriculture Exports (billion 2005\$)	25.64	25.53	10.78	8.03	6.69	8.70	17.62	18.01	27.69	43.75
<b>GHG EMISSIONS (mmt CO<sub>2</sub>-e)</b>										
GHG Emissions	7091.9	7680.1	6383.6	6116.6	5638.6	4955.3	5804.2	5781.5	4710.4	3583.4
CO <sub>2</sub> Emissions	5984.3	6517.4	5786.8	5551.9	5096.3	4423.3	5269.6	5240.7	4154.0	3009.3
CH <sub>4</sub> Emissions	583.4	602.0	349.9	334.0	316.4	308.4	307.1	311.7	321.4	331.0
N <sub>2</sub> O Emissions	385.2	387.9	240.5	223.6	217.8	215.0	218.9	220.7	226.7	234.7
Fluorinated Gases Emissions	140.0	173.8	6.9	7.5	8.6	9.1	9.0	8.9	8.9	8.9
<b>PRIMARY ENERGY USE (EJ)</b>										
Coal	22.6	24.3	19.2	14.0	9.7	10.5	18.8	29.1	35.5	41.9
Petroleum Products	42.0	46.0	42.9	44.6	41.3	35.6	55.3	58.2	44.1	28.9
Including Shale Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	22.5	24.7	24.2	28.5	33.3	34.8	29.0	25.9	22.6	19.5
Nuclear (primary energy eq)	9.3	9.0	8.8	8.7	8.6	8.7	8.7	8.6	8.6	8.6
Hydro (primary energy eq)	2.9	2.8	3.1	3.1	3.1	3.2	3.3	3.3	3.4	3.5
Renewable Elec. (primary energy eq)	0.6	0.7	0.9	1.1	0.9	1.3	1.2	1.5	1.6	1.7
Biomass Liquids	0.0	0.0	0.4	0.3	5.6	14.0	0.0	0.0	16.6	34.0
Total Primary Energy Use	99.8	107.6	99.4	100.3	102.6	108.1	116.3	126.6	132.4	138.1
Reduced Use from Reference	0.0	0.0	15.2	20.2	24.2	26.5	27.6	26.6	29.6	31.9
<b>ELECTRICITY PRODUCTION (EJ)</b>										
Coal w/o CCS	6.9	7.6	6.4	4.4	2.7	1.4	0.5	0.0	0.0	0.0
Oil w/o CCS	0.3	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0
Gas w/o CCS	2.1	2.5	3.2	5.4	8.5	9.3	6.3	4.5	2.8	1.1
Nuclear	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Hydro	0.9	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2
Other Renewables	0.2	0.2	0.1	0.6	0.3	0.5	0.4	0.5	0.6	0.6
Gas with CCS	0.0	0.0	0.0	0.2	0.1	0.1	0.3	0.2	0.1	0.1
Coal with CCS	0.0	0.0	0.0	0.2	0.6	1.6	6.6	11.4	14.6	17.6
Total Electricity Production	13.4	14.6	14.2	15.4	16.5	17.3	18.5	21.0	22.4	23.8

**Scenario 12: 287 bmt, start in 2012 at \$16/tCO<sub>2</sub>-e, increase at 4% real annually, all GHG**

	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
<b>ECONOMY WIDE INDICATORS</b>										
Population (million)	296	309	321	334	347	359	369	379	388	397
GDP (billion 2005\$)	11981	14339	16884	19698	22720	26280	30433	34828	39388	44086
% Change GDP from Reference	0.00	0.00	-0.22	-0.38	-0.55	-0.68	-0.33	-0.29	-0.36	-0.28
Market Consumption (billion 2005\$)	8217	9858	11522	13349	15286	17646	20390	23322	26346	29470
% Change Consumption from Reference	0.00	0.00	-0.09	-0.26	-0.51	-0.65	-0.37	-0.30	-0.42	-0.33
Welfare (billion 2005\$)	9656	11773	13934	16320	18880	21917	25367	28999	32701	36488
% Change Welfare from Reference (EV)	0.00	0.00	0.01	-0.13	-0.36	-0.45	-0.19	-0.12	-0.24	-0.18
CO <sub>2</sub> -E Price (2005\$/tCO <sub>2</sub> -e)	0.00	0.00	17.72	21.56	26.23	31.92	38.83	47.25	57.48	69.94
<b>PRICES (index, 2005=1.00)</b>										
Petroleum Product	1.00	1.15	1.30	1.46	1.57	1.66	1.37	1.43	1.47	1.49
Natural Gas	1.00	1.11	1.22	1.47	1.94	2.40	2.53	2.81	2.82	2.80
Coal	1.00	1.04	1.04	1.03	1.01	1.00	1.03	1.06	1.12	1.16
Electricity	1.00	1.11	1.34	1.44	1.52	1.66	1.74	1.79	1.69	1.58
<b>TRADE &amp; PRODUCTION (selected indicators)</b>										
Bio Liquids Production in US (EJ)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net Bio Liquids Imports (EJ)	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.2	0.2
Net Bio Liquids Imports (billion 2005\$)	0.00	0.00	0.00	0.00	1.05	0.93	0.00	0.00	1.12	1.05
Net Crude Oil Imports (billion 2005\$)	77.40	85.21	85.00	92.53	105.64	122.50	170.46	188.75	203.50	218.94
Net Agriculture Exports (billion 2005\$)	25.64	25.53	15.70	13.94	10.38	10.26	25.83	23.71	28.26	40.58
<b>GHG EMISSIONS (mmt CO<sub>2</sub>-e)</b>										
GHG Emissions	7091.9	7680.1	6962.3	6897.1	6715.0	6866.1	7867.0	8216.8	7738.8	7804.9
CO <sub>2</sub> Emissions	5984.3	6517.4	6328.1	6287.4	6132.4	6289.6	7265.2	7605.2	7125.6	7174.9
CH <sub>4</sub> Emissions	583.4	602.0	374.6	365.0	342.9	338.1	353.1	360.4	359.0	368.8
N <sub>2</sub> O Emissions	385.2	387.9	252.3	236.7	230.4	228.3	238.8	241.3	244.6	252.0
Fluorinated Gases Emissions	140.0	173.8	7.9	8.6	9.9	10.5	10.5	10.4	10.2	9.8
<b>PRIMARY ENERGY USE (EJ)</b>										
Coal	22.6	24.3	21.5	17.7	11.6	10.8	17.2	22.7	30.9	39.6
Petroleum Products	42.0	46.0	46.3	48.7	51.4	55.0	64.3	68.7	71.7	74.8
Including Shale Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	22.5	24.7	25.7	29.6	35.0	35.5	31.6	29.1	24.4	21.5
Nuclear (primary energy eq)	9.3	9.0	8.7	8.5	8.5	8.2	7.5	7.5	7.2	7.2
Hydro (primary energy eq)	2.9	2.8	2.9	2.9	3.0	3.0	2.8	2.9	2.9	2.9
Renewable Elec. (primary energy eq)	0.6	0.7	0.8	1.0	0.9	1.2	1.0	1.4	1.4	1.4
Biomass Liquids	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.2	0.2
Total Primary Energy Use	99.8	107.6	106.0	108.4	110.5	113.9	124.4	132.3	138.7	147.6
Reduced Use from Reference	0.0	0.0	8.6	12.0	16.3	20.7	19.6	20.9	23.2	22.3
<b>ELECTRICITY PRODUCTION (EJ)</b>										
Coal w/o CCS	6.9	7.6	7.2	5.8	3.7	3.4	6.0	6.9	4.2	3.9
Oil w/o CCS	0.3	0.3	0.3	0.2	0.1	0.1	0.2	0.3	0.2	0.2
Gas w/o CCS	2.1	2.5	3.3	5.4	8.7	9.5	7.6	6.3	4.0	2.2
Nuclear	3.0	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Hydro	0.9	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.2
Other Renewables	0.2	0.2	0.3	0.4	0.3	0.5	0.4	0.6	0.6	0.6
Gas with CCS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal with CCS	0.0	0.0	0.0	0.1	0.1	0.3	0.7	2.1	9.1	13.3
Total Electricity Production	13.4	14.6	15.1	16.1	17.1	18.0	19.2	20.5	22.4	24.5