

Fuel Cell Technology – Primary Metrics for FY2010 Budget Request

Incorporates approximate impacts of Energy Independence and Security Act (EISA) 2007.

Does not incorporate inputs of Troubled Asset Relief Program (TARP) 2008
or American Recovery and Reinvestment Act (ARRA) 2009.

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative ² (Bil bbl)	NEMS	ns	ns	0.2	N/A
		MARKAL	ns	ns	ns	7.3
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	ns	ns	-0.6	N/A
		MARKAL	ns	ns	ns	-2.3
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil ³ (%)	NEMS	ns	ns	1%	N/A
		MARKAL	ns	ns	1%	21%
Environmental Impacts	CO ₂ Emissions Reduction, cumulative (mtCO ₂)	NEMS	ns	Ns	95	N/A
		MARKAL	ns	ns	ns	ns
	SO ₂ Allowance Price Reduction ⁴ (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO _x Allowance Price Reduction (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	Hg Allowance Price Reduction (thousand \$/lb)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
Economic Impacts	Consumer Savings, cumulative ⁵ (Bil \$)	NEMS	ns	ns	5	N/A
		MARKAL	ns	ns	62	105
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	ns	ns	0	N/A
		MARKAL	ns	ns	ns	-60
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	ns	ns	10	N/A
		MARKAL	ns	ns	26	88

1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).

2. All cumulative metrics are based on results beginning in 2010.

3. Metric includes oil-derived fuel use by light-duty vehicles, commercial light trucks and freight trucks; the metric excludes buses. Reported oil use is adjusted to exclude ethanol, biodiesel and CTL.

4. All monetary metrics are in 2006\$.

5. Cumulative monetary metrics are in 2006\$ that are discounted to 2010 using a 3% discount rate.

ns - Not significant
NA - Not yet available
N/A - Not applicable

Fuel Cell Technology – Secondary Metrics for FY2010 Budget Request

(Incorporates approximate impacts of EISA 2007.

Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	ns	0.2	N/A
		MARKAL	ns	ns	0.0	2.00
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	ns	ns	-0.3	N/A
		MARKAL	ns	ns	ns	0.00
	MPG Improvement ² (%)	NEMS	ns	ns	3%	N/A
		MARKAL	ns	ns	ns	101%
Environmental Impacts	CO ₂ Intensity Reduction of US Economy (Kg CO ₂ /\$GDP)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	0.00
	CO ₂ Intensity Reduction of US Power Sector ³ (Kg CO ₂ /kWh)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	-0.01
	CO ₂ Intensity Reduction of US Transportation Sector ⁴ (Kg CO ₂ /mile)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	0.06
Economic Impacts	Consumer Savings, annual ⁵ (Bil \$)	NEMS	ns	ns	-1	N/A
		MARKAL	0	3	11	11
	Electric Power Industry Savings, annual (Bil \$)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	-12
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	ns	ns	0.03	N/A
		MARKAL	ns	ns	ns	0.02
	Net Energy System Cost Reduction, cumulative (Bil \$)	NEMS	N/A	N/A	N/A	N/A
		MARKAL	0	11	40	80
<p>1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).</p> <p>2. Change in light duty vehicles miles traveled per gallon of oil, where oil is only that derived from petroleum.</p> <p>3. Emissions include all power sector emissions. Generation calculated as total net generation adjusted for estimated T&D losses.</p> <p>4. Emissions calculated using highway fuel use and related carbon emission factor. Miles calculated as highway miles traveled, excluding buses.</p> <p>5. All monetary metrics are in 2006\$.</p> <p>ns - Not significant NA - Not yet available N/A - Not applicable</p>						

Biomass and Biorefinery Systems R&D – Estimated Primary Benefits

(Incorporates program contributions to EISA 2007.

Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative ² (Bil bbl)	NEMS	ns	ns	0.2	N/A
		MARKAL	ns	ns	0.7	5.7
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	ns	ns	0.2	N/A
		MARKAL	ns	ns	ns	0.5
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil ³ (%)	NEMS	ns	ns	1%	N/A
		MARKAL	ns	ns	2%	5%
Environmental Impacts	CO ₂ Emissions Reduction, cumulative (Mil mtCO ₂)	NEMS	ns	ns	55	N/A
		MARKAL	3	33	327	2295
	SO ₂ Allowance Price Reduction ⁴ (\$/ton)	NEMS	ns	ns	268	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO _x Allowance Price Reduction (\$/ton)	NEMS	ns	ns	328	N/A
		MARKAL	N/A	N/A	N/A	N/A
	Hg Allowance Price Reduction (thousand \$/lb)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
Economic Impacts	Consumer Savings, cumulative ⁵ (Bil \$)	NEMS	ns	3	29	N/A
		MARKAL	ns	1	30	49
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	ns	2	4	N/A
		MARKAL	ns	ns	2	-18
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	ns	ns	80	N/A
		MARKAL	ns	ns	11	4
<p>1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).</p> <p>2. All cumulative metrics are based on results beginning in 2009.</p> <p>3. Metric includes oil-derived fuel use by light-duty vehicles, commercial light trucks and freight trucks; the metric excludes buses. Reported oil use is adjusted to exclude ethanol, biodiesel and CTL.</p> <p>4. All monetary metrics are in 2005\$.</p> <p>5. Cumulative monetary metrics are in 2005\$ that are discounted to 2009 using a 3% discount rate.</p> <p>ns - Not significant NA - Not yet available N/A - Not applicable</p>						

Biomass and Biorefinery Systems R&D – Primary Metrics for FY2010 Budget Request

(Incorporates approximate impacts of EISA 2007.

Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative ² (Bil bbl)	NEMS	ns	0.2	0.4	N/A
		MARKAL	0.0	0.1	0.2	1.1
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	ns	0.1	0.6	N/A
		MARKAL	ns	ns	ns	ns
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil ³ (%)	NEMS	ns	ns	ns	N/A
		MARKAL	0%	0%	0%	1%
Environmental Impacts	CO ₂ Emissions Reduction, cumulative (Mil mtCO ₂)	NEMS	ns	100	255	N/A
		MARKAL	3	11	49	523
	SO ₂ Allowance Price Reduction ⁴ (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO _x Allowance Price Reduction (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	Hg Allowance Price Reduction (thousand \$/lb)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
Economic Impacts	Consumer Savings, cumulative ⁵ (Bil \$)	NEMS	ns	ns	39	N/A
		MARKAL	2	4	11	34
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	ns	0	6	N/A
		MARKAL	1	4	0	8
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	ns	ns	ns	N/A
		MARKAL	1	3	1	2
<p>1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).</p> <p>2. All cumulative metrics are based on results beginning in 2010.</p> <p>3. Metric includes oil-derived fuel use by light-duty vehicles, commercial light trucks and freight trucks; the metric excludes buses. Reported oil use is adjusted to exclude ethanol, biodiesel and CTL.</p> <p>4. All monetary metrics are in 2006\$.</p> <p>5. Cumulative monetary metrics are in 2006\$ that are discounted to 2010 using a 3% discount rate.</p> <p>ns - Not significant NA - Not yet available N/A - Not applicable</p>						

Note: For the Biomass and Biorefinery Systems R&D program, two different Primary Metrics tables are included. The results for modeling Biomass benefits during the FY09 budgeting cycle (May 2007) are shown in the table titled “Estimated Primary Benefits” (page 3). The results for modeling Biomass benefits during the FY10 budgeting cycle (May 2009) are shown in the table titled “Primary Metrics for FY 2010 Budget Request” (page 4). These two benefits results were significantly different, due to three main changes in assumptions.

New policy assumption in baseline

- The FY09 table was calculated before the Energy Independence and Security Act (EISA) of 2007 (EISA) was enacted. In the absence of EISA, all program contributions – including any that would ultimately make policies similar to EISA effective in achieving its goals – were included in the program case. Benefits are always shown as program case minus baseline, so the FY09 benefits were relatively high.
- The FY10 table was calculated for the FY10 budgeting cycle, after EISA was enacted. Following the philosophy of Government Performance and Results Act (GPRA) benefits calculations to include impacts of all current policies in the baseline, the effects of EISA on future biofuels use was included in the FY10 baseline, not the program case.
- EISA mandated the use of 36 billion gallons of biofuels by 2022, compared to the previous policy requirement (Energy Policy Act of 2005) of 7.5 billion gallons by 2013. The increased biofuels mandate, combined with assumed limits on how fast the biofuels industry will be able to grow, reduced the impact that the Biomass Program’s R&D could make in increasing biofuels penetration in the program case.
- While program R&D is projected to increase domestic production of cellulosic ethanol, much of this increase is offset by decreased production and imports of other biofuels, so that the EISA mandate is still met but not exceeded. Thus, the FY10 benefits metrics for Biomass are reduced as compared to the FY09 metric. However, it should be emphasized that the continuation of the Biomass Program R&D is vital to enable the Nation to meet the EISA biofuels mandates.

Lower cost assumption for cellulosic ethanol production in baseline

- The FY10 baseline assumptions for the costs of cellulosic ethanol production were significantly improved from the FY09 baseline assumptions. This improvement in production cost assumptions for the FY10 baseline was made to reflect the impacts of prior budget year investment in Biomass Program RD&D. In February 2007, the Biomass Program committed \$384 million dollars to co-fund six commercial-scale cellulosic ethanol production plants. This investment is assumed to reduce market barriers for cellulosic ethanol investments and to reduce costs and improve ethanol yields in future projects due to “learning-by-doing.” These impacts were incorporated into the FY10 baseline, but not into the FY09 baseline. Thus, the incremental benefit of the FY10 cellulosic ethanol baseline costs was reduced relative to FY09.

Higher oil price projections in baseline

- The GPRA baseline primarily uses the Energy Information Administration’s (EIA) Annual Energy Outlook (AEO) projections for macroeconomic variables such as fuel prices. The FY09 baseline included oil price projections from AEO 2007, while the FY10 baseline included oil price projections from AEO 2008, which were higher. This further improved the competitiveness of biofuels in the FY10 baseline as compared to the FY09 baseline, again contributing to reduced FY10 benefits metrics for biomass.

Biomass and Biorefinery Systems R&D – Secondary Metrics for FY2010 Budget Request
(Incorporates approximate impacts of EISA 2007.
Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	0.1	ns	N/A
		MARKAL	0.0	0.1	0.0	0.07
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	0.0	0.0	0.0	N/A
		MARKAL	ns	ns	ns	ns
	MPG Improvement ² (%)	NEMS	ns	ns	ns	N/A
		MARKAL	0%	1%	0%	2%
Environmental Impacts	CO ₂ Intensity Reduction of US Economy (Kg CO ₂ /\$GDP)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	CO ₂ Intensity Reduction of US Power Sector ³ (Kg CO ₂ /kWh)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	CO ₂ Intensity Reduction of US Transportation Sector ⁴ (Kg CO ₂ /mile)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Economic Impacts	Consumer Savings, annual ⁵ (Bil \$)	NEMS	ns	ns	3	N/A
		MARKAL	1	1	1	7
	Electric Power Industry Savings, annual (Bil \$)	NEMS	ns	0	0	N/A
		MARKAL	0	1	0	1
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	Net Energy System Cost Reduction, cumulative (Bil \$)	NEMS	N/A	N/A	N/A	N/A
		MARKAL	3	21	46	98
1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).						
2. Change in light duty vehicles miles traveled per gallon of oil, where oil is only that derived from petroleum.						
3. Emissions include all power sector emissions. Generation calculated as total net generation adjusted for estimated T&D losses.						
4. Emissions calculated using highway fuel use and related carbon emission factor. Miles calculated as highway miles traveled, excluding buses.						
5. All monetary metrics are in 2006\$.						
ns - Not significant						
NA - Not yet available						
N/A - Not applicable						

Solar Energy – Primary Metrics for FY2010 Budget Request
(Incorporates approximate impacts of EISA 2007.
Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative ² (Bil bbl)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	13.1
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil ³ (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO ₂ Emissions Reduction, cumulative (Mil mtCO ₂)	NEMS	ns	ns	426	N/A
		MARKAL	5	16	523	4795
	SO ₂ Allowance Price Reduction ⁴ (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO _x Allowance Price Reduction (\$/ton)	NEMS	ns	ns	626	N/A
		MARKAL	N/A	N/A	N/A	N/A
Hg Allowance Price Reduction (thousand \$/lb)	NEMS	ns	ns	ns	N/A	
	MARKAL	N/A	N/A	N/A	N/A	
Economic Impacts	Consumer Savings, cumulative ⁵ (Bil \$)	NEMS	ns	ns	15	N/A
		MARKAL	3	10	46	235
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	2	6	34	N/A
		MARKAL	5	10	14	111
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	ns	ns	30	N/A
		MARKAL	8	13	11	61
<p>1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).</p> <p>2. All cumulative metrics are based on results beginning in 2010.</p> <p>3. Metric includes oil-derived fuel use by light-duty vehicles, commercial light trucks and freight trucks; the metric excludes buses. Reported oil use is adjusted to exclude ethanol, biodiesel and CTL.</p> <p>4. All monetary metrics are in 2006\$.</p> <p>5. Cumulative monetary metrics are in 2006\$ that are discounted to 2010 using a 3% discount rate.</p> <p>ns - Not significant NA - Not yet available N/A - Not applicable</p>						

Solar Energy – Secondary Metrics for FY2010 Budget Request

(Incorporates approximate impacts of EISA 2007.

Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	0.0	0.0	N/A
		MARKAL	0.0	0.0	0.0	ns
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	0.0	0.0	0.1	N/A
		MARKAL	0.0	0.0	0.0	1.1
	MPG Improvement ² (%)	NEMS	0%	0%	0%	N/A
		MARKAL	ns	0%	0%	ns
Environmental Impacts	CO ₂ Intensity Reduction of US Economy (Kg CO ₂ /\$GDP)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	0.00	0.01	0.01
	CO ₂ Intensity Reduction of US Power Sector ³ (Kg CO ₂ /kWh)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	0.00	0.02	0.06
	CO ₂ Intensity Reduction of US Transportation Sector ⁴ (Kg CO ₂ /mile)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Economic Impacts	Consumer Savings, annual ⁵ (Bil \$)	NEMS	ns	ns	7	N/A
		MARKAL	1	3	12	69
	Electric Power Industry Savings, annual (Bil \$)	NEMS	1	1	8	N/A
		MARKAL	ns	ns	6	32
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	ns	ns	0.02	N/A
		MARKAL	ns	ns	0.03	0.07
	Net Energy System Cost Reduction, cumulative (Bil \$)	NEMS	N/A	N/A	N/A	N/A
		MARKAL	ns	2	15	80
<p>1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).</p> <p>2. Change in light duty vehicles miles traveled per gallon of oil, where oil is only that derived from petroleum.</p> <p>3. Emissions include all power sector emissions. Generation calculated as total net generation adjusted for estimated T&D losses.</p> <p>4. Emissions calculated using highway fuel use and related carbon emission factor. Miles calculated as highway miles traveled, excluding buses.</p> <p>5. All monetary metrics are in 2006\$.</p> <p>ns - Not significant NA - Not yet available N/A - Not applicable</p>						

Wind Energy – Primary Metrics for FY2010 Budget Request
(Incorporates approximate impacts of EISA 2007.
Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative ² (Bil bbl)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	ns	1.1	4.9	N/A
		MARKAL	0.5	1.5	3.6	13.6
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil ³ (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO ₂ Emissions Reduction, cumulative (Mil mtCO ₂)	NEMS	ns	390	1705	N/A
		MARKAL	96	359	1760	8489
	SO ₂ Allowance Price Reduction ⁴ (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO _x Allowance Price Reduction (\$/ton)	NEMS	ns	328	909	N/A
		MARKAL	N/A	N/A	N/A	N/A
Hg Allowance Price Reduction (thousand \$/lb)	NEMS	ns	ns	ns	N/A	
	MARKAL	N/A	N/A	N/A	N/A	
Economic Impacts	Consumer Savings, cumulative ⁵ (Bil \$)	NEMS	13	44	113	N/A
		MARKAL	11	35	97	279
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	4	11	23	N/A
		MARKAL	ns	6	11	34
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	ns	30	20	N/A
		MARKAL	10	14	5	32
<p>1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).</p> <p>2. All cumulative metrics are based on results beginning in 2010.</p> <p>3. Metric includes oil-derived fuel use by light-duty vehicles, commercial light trucks and freight trucks; the metric excludes buses. Reported oil use is adjusted to exclude ethanol, biodiesel and CTL.</p> <p>4. All monetary metrics are in 2006\$.</p> <p>5. Cumulative monetary metrics are in 2006\$ that are discounted to 2010 using a 3% discount rate.</p> <p>ns - Not significant NA - Not yet available N/A - Not applicable</p>						

Wind Energy – Secondary Metrics for FY2010 Budget Request

(Incorporates approximate impacts of EISA 2007.

Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	ns	ns	0.4	N/A
		MARKAL	0.2	0.2	0.2	0.70
	MPG Improvement ² (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO ₂ Intensity Reduction of US Economy (Kg CO ₂ /\$GDP)	NEMS	ns	ns	ns	N/A
		MARKAL	0.00	0.00	0.01	0.01
	CO ₂ Intensity Reduction of US Power Sector ³ (Kg CO ₂ /kWh)	NEMS	ns	0.02	0.04	N/A
		MARKAL	0.01	0.02	0.05	0.09
	CO ₂ Intensity Reduction of US Transportation Sector ⁴ (Kg CO ₂ /mile)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Economic Impacts	Consumer Savings, annual ⁵ (Bil \$)	NEMS	ns	ns	ns	N/A
		MARKAL	4	8	15	39
	Electric Power Industry Savings, annual (Bil \$)	NEMS	2	2	2	N/A
		MARKAL	ns	3	4	10
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	ns	0.05	0.06	N/A
		MARKAL	0.02	0.02	0.06	0.07
	Net Energy System Cost Reduction, cumulative (Bil \$)	NEMS	N/A	N/A	N/A	N/A
		MARKAL	ns	9	31	119

1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).

2. Change in light duty vehicles miles traveled per gallon of oil, where oil is only that derived from petroleum.

3. Emissions include all power sector emissions. Generation calculated as total net generation adjusted for estimated T&D losses.

4. Emissions calculated using highway fuel use and related carbon emission factor. Miles calculated as highway miles traveled, excluding buses.

5. All monetary metrics are in 2006\$.

ns - Not significant

NA - Not yet available

N/A - Not applicable

Geothermal Technology – Primary Metrics for FY2010 Budget Request

(Incorporates approximate impacts of EISA 2007.

Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative ² (Bil bbl)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	ns	ns	1.5	N/A
		MARKAL	0.0	0.1	0.2	9.3
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil ³ (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO ₂ Emissions Reduction, cumulative (Mil mtCO ₂)	NEMS	ns	60	556	N/A
		MARKAL	2	10	638	6817
	SO ₂ Allowance Price Reduction ⁴ (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO _x Allowance Price Reduction (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	Hg Allowance Price Reduction (thousand \$/lb)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
Economic Impacts	Consumer Savings, cumulative ⁵ (Bil \$)	NEMS	ns	5	22	N/A
		MARKAL	ns	ns	ns	20
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	ns	1	4	N/A
		MARKAL	ns	ns	ns	ns
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns

1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).

2. All cumulative metrics are based on results beginning in 2010.

3. Metric includes oil-derived fuel use by light-duty vehicles, commercial light trucks and freight trucks; the metric excludes buses. Reported oil use is adjusted to exclude ethanol, biodiesel and CTL.

4. All monetary metrics are in 2006\$.

5. Cumulative monetary metrics are in 2006\$ that are discounted to 2010 using a 3% discount rate.

ns - Not significant

NA - Not yet available

N/A - Not applicable

Geothermal Technology – Secondary Metrics for FY2010 Budget Request

(Incorporates approximate impacts of EISA 2007.

Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	ns	ns	0.1	N/A
		MARKAL	0.0	0.0	0.0	0.9
	MPG Improvement ² (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	0%
Environmental Impacts	CO ₂ Intensity Reduction of US Economy (Kg CO ₂ /\$GDP)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	0.01
	CO ₂ Intensity Reduction of US Power Sector ³ (Kg CO ₂ /kWh)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	0.03	0.10
	CO ₂ Intensity Reduction of US Transportation Sector ⁴ (Kg CO ₂ /mile)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Economic Impacts	Consumer Savings, annual ⁵ (Bil \$)	NEMS	ns	2	4	N/A
		MARKAL	ns	ns	ns	17
	Electric Power Industry Savings, annual (Bil \$)	NEMS	ns	0	1	N/A
		MARKAL	ns	ns	ns	ns
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	0.05	0.08
	Net Energy System Cost Reduction, cumulative (Bil \$)	NEMS	N/A	N/A	N/A	N/A
		MARKAL	0	3	16	67

1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).

2. Change in light duty vehicles miles traveled per gallon of oil, where oil is only that derived from petroleum.

3. Emissions include all power sector emissions. Generation calculated as total net generation adjusted for estimated T&D losses.

4. Emissions calculated using highway fuel use and related carbon emission factor. Miles calculated as highway miles traveled, excluding buses.

5. All monetary metrics are in 2006\$.

ns - Not significant

NA - Not yet available

N/A - Not applicable

Vehicle Technologies – Primary Metrics for FY2010 Budget Request
(Incorporates approximate impacts of EISA 2007.
Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative ² (Bil bbl)	NEMS	ns	ns	0.7	N/A
		MARKAL	0.2	0.6	2.8	23.4
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	0.0	0.1	0.1	N/A
		MARKAL	ns	ns	ns	8.4
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil ³ (%)	NEMS	0%	0%	0%	N/A
		MARKAL	ns	0.1%	1%	5%
Environmental Impacts	CO ₂ Emissions Reduction, cumulative (Mil mtCO ₂)	NEMS	ns	ns	277	N/A
		MARKAL	99	317	1185	9558
	SO ₂ Allowance Price Reduction ⁴ (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO _x Allowance Price Reduction (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	Hg Allowance Price Reduction (thousand \$/lb)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
Economic Impacts	Consumer Savings, cumulative ⁵ (Bil \$)	NEMS	ns	ns	40	N/A
		MARKAL	41	62	150	998
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	ns	ns	ns	N/A
		MARKAL	1	1	-1	-13
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	ns	ns	10	N/A
		MARKAL	ns	ns	26	1117

1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).

2. All cumulative metrics are based on results beginning in 2010.

3. Metric includes oil-derived fuel use by light-duty vehicles, commercial light trucks and freight trucks; the metric excludes buses. Reported oil use is adjusted to exclude ethanol, biodiesel and CTL.

4. All monetary metrics are in 2006\$.

5. Cumulative monetary metrics are in 2006\$ that are discounted to 2010 using a 3% discount rate.

ns - Not significant

NA - Not yet available

N/A - Not applicable

Vehicle Technologies – Secondary Metrics for FY2010 Budget Request

(Incorporates approximate impacts of EISA 2007.

Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	ns	0.4	N/A
		MARKAL	0.1	0.3	0.9	5.20
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	0.0	0.0	0.0	N/A
		MARKAL	ns	ns	ns	0.76
	MPG Improvement ² (%)	NEMS	0%	0%	3%	N/A
		MARKAL	1%	1%	7%	95%
Environmental Impacts	CO ₂ Intensity Reduction of US Economy (Kg CO ₂ /\$GDP)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	0.01	0.02
	CO ₂ Intensity Reduction of US Power Sector ³ (Kg CO ₂ /kWh)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	CO ₂ Intensity Reduction of US Transportation Sector ⁴ (Kg CO ₂ /mile)	NEMS	0.00	0.00	0.02	N/A
		MARKAL	0.01	0.01	0.03	0.16
Economic Impacts	Consumer Savings, annual ⁵ (Bil \$)	NEMS	ns	ns	15	N/A
		MARKAL	6	5	24	250
	Electric Power Industry Savings, annual (Bil \$)	NEMS	ns	ns	ns	N/A
		MARKAL	0	0	-1	3
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	ns	ns	0.05	N/A
		MARKAL	0.02	0.04	0.10	0.38
	Net Energy System Cost Reduction, cumulative (Bil \$)	NEMS	N/A	N/A	N/A	N/A
		MARKAL	-29	-52	-59	712
<p>1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).</p> <p>2. Change in light duty vehicles miles traveled per gallon of oil, where oil is only that derived from petroleum.</p> <p>3. Emissions include all power sector emissions. Generation calculated as total net generation adjusted for estimated T&D losses.</p> <p>4. Emissions calculated using highway fuel use and related carbon emission factor. Miles calculated as highway miles traveled, excluding buses.</p> <p>5. All monetary metrics are in 2006\$.</p> <p>ns - Not significant NA - Not yet available N/A - Not applicable</p>						

Building Technologies – Primary Metrics for FY2010 Budget Request

(Incorporates approximate impacts of EISA 2007.

Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative ² (Bil bbl)	NEMS	ns	0.1	0.4	N/A
		MARKAL	0.1	0.2	0.4	1.5
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	0.8	2.4	7.3	N/A
		MARKAL	2.7	8.0	22.5	65.6
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil ³ (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO ₂ Emissions Reduction, cumulative (Mil mtCO ₂)	NEMS	326	1258	5193	N/A
		MARKAL	292	999	4787	18919
	SO ₂ Allowance Price Reduction ⁴ (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO _x Allowance Price Reduction (\$/ton)	NEMS	ns	1420	1827	N/A
		MARKAL	N/A	N/A	N/A	N/A
	Hg Allowance Price Reduction (thousand \$/lb)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
Economic Impacts	Consumer Savings, cumulative ⁵ (Bil \$)	NEMS	53	148	439	N/A
		MARKAL	140	404	1250	3417
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	42	118	338	N/A
		MARKAL	32	113	392	1050
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	70	120	240	N/A
		MARKAL	143	254	447	577

1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).

2. All cumulative metrics are based on results beginning in 2010.

3. Metric includes oil-derived fuel use by light-duty vehicles, commercial light trucks and freight trucks; the metric excludes buses. Reported oil use is adjusted to exclude ethanol, biodiesel and CTL.

4. All monetary metrics are in 2006\$.

5. Cumulative monetary metrics are in 2006\$ that are discounted to 2010 using a 3% discount rate.

ns - Not significant

NA - Not yet available

N/A - Not applicable

Building Technologies – Secondary Metrics for FY2010 Budget Request
(Incorporates approximate impacts of EISA 2007.
Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	0.1	0.1	N/A
		MARKAL	ns	0.1	0.1	0.2
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	0.2	0.4	0.6	N/A
		MARKAL	0.8	1.2	1.6	2.6
	MPG Improvement ² (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO ₂ Intensity Reduction of US Economy (Kg CO ₂ /\$GDP)	NEMS	ns	0.02	0.02	N/A
		MARKAL	ns	0.01	0.03	0.02
	CO ₂ Intensity Reduction of US Power Sector ³ (Kg CO ₂ /kWh)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	CO ₂ Intensity Reduction of US Transportation Sector ⁴ (Kg CO ₂ /mile)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Economic Impacts	Consumer Savings, annual ⁵ (Bil \$)	NEMS	17	32	69	N/A
		MARKAL	40	89	180	322
	Electric Power Industry Savings, annual (Bil \$)	NEMS	14	25	47	N/A
		MARKAL	10	29	59	100
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	0.10	0.20	0.30	N/A
		MARKAL	0.11	0.20	0.35	0.30
	Net Energy System Cost Reduction, cumulative (Bil \$)	NEMS	N/A	N/A	N/A	N/A
		MARKAL	585	1419	3479	7514

1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).

2. Change in light duty vehicles miles traveled per gallon of oil, where oil is only that derived from petroleum.

3. Emissions include all power sector emissions. Generation calculated as total net generation adjusted for estimated T&D losses.

4. Emissions calculated using highway fuel use and related carbon emission factor. Miles calculated as highway miles traveled, excluding buses.

5. All monetary metrics are in 2006\$.

ns - Not significant
NA - Not yet available
N/A - Not applicable

Industrial Technologies – Primary Metrics for FY2010 Budget Request
(Incorporates approximate impacts of EISA 2007.
Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative ² (Bil bbl)	NEMS	ns	ns	0.3	N/A
		MARKAL	ns	ns	1.2	4.3
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	0.7	2.7	10.3	N/A
		MARKAL	0.1	0.1	12.7	37.5
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil ³ (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO ₂ Emissions Reduction, cumulative (Mil mtCO ₂)	NEMS	260	1072	4086	N/A
		MARKAL	0	0	3583	11726
	SO ₂ Allowance Price Reduction ⁴ (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO _x Allowance Price Reduction (\$/ton)	NEMS	ns	427	804	N/A
		MARKAL	N/A	N/A	N/A	N/A
Hg Allowance Price Reduction (thousand \$/lb)	NEMS	ns	ns	ns	N/A	
	MARKAL	N/A	N/A	N/A	N/A	
Economic Impacts	Consumer Savings, cumulative ⁵ (Bil \$)	NEMS	37	107	309	N/A
		MARKAL	0	0	376	872
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	19	52	130	N/A
		MARKAL	0	0	137	290
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	ns	50	60	N/A
		MARKAL	0	0	18	ns

1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).

2. All cumulative metrics are based on results beginning in 2010.

3. Metric includes oil-derived fuel use by light-duty vehicles, commercial light trucks and freight trucks; the metric excludes buses. Reported oil use is adjusted to exclude ethanol, biodiesel and CTL.

4. All monetary metrics are in 2006\$.

5. Cumulative monetary metrics are in 2006\$ that are discounted to 2010 using a 3% discount rate.

ns - Not significant

NA - Not yet available

N/A - Not applicable

Industrial Technologies – Secondary Metrics for FY2010 Budget Request
(Incorporates approximate impacts of EISA 2007.
Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	ns	0.2	N/A
		MARKAL	ns	0.0	0.4	0.4
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	0.2	0.5	0.8	N/A
		MARKAL	0.3	0.3	0.8	1.3
	MPG Improvement ² (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO ₂ Intensity Reduction of US Economy (Kg CO ₂ /\$GDP)	NEMS	ns	0.01	0.02	N/A
		MARKAL	ns	0.05	0.02	0.01
	CO ₂ Intensity Reduction of US Power Sector ³ (Kg CO ₂ /kWh)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	0.02	0.01
	CO ₂ Intensity Reduction of US Transportation Sector ⁴ (Kg CO ₂ /mile)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Economic Impacts	Consumer Savings, annual ⁵ (Bil \$)	NEMS	13	25	39	N/A
		MARKAL	0	0	44	76
	Electric Power Industry Savings, annual (Bil \$)	NEMS	7	10	14	N/A
		MARKAL	0	0	15	26
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	0.09	0.19	0.24	N/A
		MARKAL	0.04	0.04	0.26	0.20
	Net Energy System Cost Reduction, cumulative (Bil \$)	NEMS	N/A	N/A	N/A	N/A
		MARKAL	0	0	747	1289
<p>1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).</p> <p>2. Change in light duty vehicles miles traveled per gallon of oil, where oil is only that derived from petroleum.</p> <p>3. Emissions include all power sector emissions. Generation calculated as total net generation adjusted for estimated T&D losses.</p> <p>4. Emissions calculated using highway fuel use and related carbon emission factor. Miles calculated as highway miles traveled, excluding buses.</p> <p>5. All monetary metrics are in 2006\$.</p> <p>ns - Not significant NA - Not yet available N/A - Not applicable</p>						

Federal Energy Management Program – Primary Metrics for FY2010 Budget Request
(Incorporates approximate impacts of EISA 2007.
Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative ² (Bil bbl)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	NA	NA	NA	N/A
		MARKAL	0.0	0.1	0.2	0.2
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil ³ (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO ₂ Emissions Reduction, cumulative (Mil mtCO ₂)	NEMS	9	32	101	N/A
		MARKAL	8	23	99	260
	SO ₂ Allowance Price Reduction ⁴ (\$/ton)	NEMS	NA	NA	NA	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO _x Allowance Price Reduction (\$/ton)	NEMS	NA	NA	NA	N/A
		MARKAL	N/A	N/A	N/A	N/A
	Hg Allowance Price Reduction (thousand \$/lb)	NEMS	NA	NA	NA	N/A
		MARKAL	N/A	N/A	N/A	N/A
Economic Impacts	Consumer Savings, cumulative ⁵ (Bil \$)	NEMS	2	5	11	N/A
		MARKAL	-9	-19	-64	-141
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	1	3	7	N/A
		MARKAL	6	11	15	26
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	ns	ns	ns	N/A
		MARKAL	15	-2	-1	-2

1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).
2. All cumulative metrics are based on results beginning in 2010.
3. Metric includes oil-derived fuel use by light-duty vehicles, commercial light trucks and freight trucks; the metric excludes buses. Reported oil use is adjusted to exclude ethanol, biodiesel and CTL.
4. All monetary metrics are in 2006\$.
5. Cumulative monetary metrics are in 2006\$ that are discounted to 2010 using a 3% discount rate.
ns - Not significant
NA - Not yet available
N/A - Not applicable

Federal Energy Management Program – Secondary Metrics for FY2010 Budget Request
(Incorporates approximate impacts of EISA 2007.
Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	NA	NA	NA	N/A
		MARKAL	0.01	0.01	0.01	ns
	MPG Improvement ² (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO ₂ Intensity Reduction of US Economy (Kg CO ₂ /\$GDP)	NEMS	NA	NA	NA	N/A
		MARKAL	ns	ns	ns	ns
	CO ₂ Intensity Reduction of US Power Sector ³ (Kg CO ₂ /kWh)	NEMS	NA	NA	NA	N/A
		MARKAL	ns	ns	ns	ns
	CO ₂ Intensity Reduction of US Transportation Sector ⁴ (Kg CO ₂ /mile)	NEMS	NA	NA	NA	N/A
		MARKAL	ns	ns	ns	ns
	Consumer Savings, annual ⁵ (Bil \$)	NEMS	NA	NA	NA	N/A
		MARKAL	2	-6	-9	-15
Economic Impacts	Electric Power Industry Savings, annual (Bil \$)	NEMS	0.3	0.4	0.6	N/A
		MARKAL	2.2	0.5	0.8	0.8
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	NA	NA	NA	N/A
		MARKAL	0.003	0.004	0.004	0.001
	Net Energy System Cost Reduction, cumulative (Bil \$)	NEMS	ns	ns	ns	N/A
		MARKAL	24	51	91	133
<p>1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).</p> <p>2. All cumulative metrics are based on results beginning in 2010.</p> <p>3. Metric includes oil-derived fuel use by light-duty vehicles, commercial light trucks and freight trucks; the metric excludes buses. Reported oil use is adjusted to exclude ethanol, biodiesel and CTL.</p> <p>4. All monetary metrics are in 2006\$.</p> <p>5. Cumulative monetary metrics are in 2006\$ that are discounted to 2010 using a 3% discount rate.</p> <p>ns - Not significant NA - Not yet available N/A - Not applicable</p>						

Weatherization and Intergovernmental Activities
– Primary Metrics for FY2010 Budget Request
(Incorporates approximate impacts of EISA 2007.
Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative ² (Bil bbl)	NEMS	ns	0.1	0.3	N/A
		MARKAL	ns	ns	ns	0.2
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	0.2	0.5	2.6	N/A
		MARKAL	0.5	1.5	3.6	6.1
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil ³ (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO ₂ Emissions Reduction, cumulative (Mil mtCO ₂)	NEMS	67	241	721	N/A
		MARKAL	118	261	655	1367
	SO ₂ Allowance Price Reduction ⁴ (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO _x Allowance Price Reduction (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
Hg Allowance Price Reduction (thousand \$/lb)	NEMS	ns	ns	ns	N/A	
	MARKAL	N/A	N/A	N/A	N/A	
Economic Impacts	Consumer Savings, cumulative ⁵ (Bil \$)	NEMS	18	35	73	N/A
		MARKAL	66	140	279	425
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	10	19	36	N/A
		MARKAL	20	43	85	139
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	ns	ns	10	N/A
		MARKAL	ns	ns	ns	ns
<p>1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).</p> <p>2. All cumulative metrics are based on results beginning in 2010.</p> <p>3. Metric includes oil-derived fuel use by light-duty vehicles, commercial light trucks and freight trucks; the metric excludes buses. Reported oil use is adjusted to exclude ethanol, biodiesel and CTL.</p> <p>4. All monetary metrics are in 2006\$.</p> <p>ns - Not significant ns - Not significant NA - Not yet available N/A - Not applicable</p>						

Weatherization and Intergovernmental Activities
– Secondary Metrics for FY2010 Budget Request
(Incorporates approximate impacts of EISA 2007.
Does not incorporate inputs of TARP 2008 or ARRA 2009.)

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	0.1	0.0	N/A
		MARKAL	ns	ns	ns	ns
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	0.0	0.1	0.2	N/A
		MARKAL	0.2	0.2	0.2	ns
	MPG Improvement ² (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO ₂ Intensity Reduction of US Economy (Kg CO ₂ /\$GDP)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	CO ₂ Intensity Reduction of US Power Sector ³ (Kg CO ₂ /kWh)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	CO ₂ Intensity Reduction of US Transportation Sector ⁴ (Kg CO ₂ /mile)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Economic Impacts	Consumer Savings, annual ⁵ (Bil \$)	NEMS	4	6	5	N/A
		MARKAL	18	20	20	14
	Electric Power Industry Savings, annual (Bil \$)	NEMS	3	3	3	N/A
		MARKAL	6	6	6	5
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	ns	ns	ns	N/A
		MARKAL	0.04	0.04	0.03	0.01
	Net Energy System Cost Reduction, cumulative (Bil \$)	NEMS	N/A	N/A	N/A	N/A
		MARKAL	200	363	592	749

1. “Reductions” and “savings” are calculated as the difference between results from the baseline case (i.e. no DOE technology) and the technology case (i.e. all DOE technology R&D programs are successful).

2. Change in light duty vehicles miles traveled per gallon of oil, where oil is only that derived from petroleum.

3. Emissions include all power sector emissions. Generation calculated as total net generation adjusted for estimated T&D losses.

4. Emissions calculated using highway fuel use and related carbon emission factor. Miles calculated as highway miles traveled, excluding buses.

5. All monetary metrics are in 2006\$.

ns - Not significant
NA - Not yet available
N/A - Not applicable