

## EERE Portfolio

### Primary Benefits Metrics for FY09

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative <sup>2</sup> (Bil bbl)	NEMS	0.2	0.9	5.3	N/A
		MARKAL	0.2	1.4	10.0	66.1
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	1.7	4.0	15.0	N/A
		MARKAL	ns	0.3	5.5	41.7
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil <sup>3</sup> (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	4%	30%
Environmental Impacts	CO <sub>2</sub> Emissions Reduction, cumulative (Mil mtCO <sub>2</sub> )	NEMS	324	1234	6469	N/A
		MARKAL	591	2084	9926	47099
	SO <sub>2</sub> Allowance Price Reduction <sup>4</sup> (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO <sub>x</sub> Allowance Price Reduction (\$/ton)	NEMS	ns	ns	1167	N/A
		MARKAL	N/A	N/A	N/A	N/A
	Hg Allowance Price Reduction (thousand \$/lb)	NEMS	ns	ns	8	N/A
		MARKAL	N/A	N/A	N/A	N/A
Economic Impacts	Consumer Savings, cumulative <sup>5</sup> (Bil \$)	NEMS	63	156	623	N/A
		MARKAL	142	317	1318	4130
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	27	63	195	N/A
		MARKAL	30	73	265	720
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	60	140	450	N/A
		MARKAL	71	166	700	1739
<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&amp;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>						

## Secondary Benefits Metrics for FY09

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, annual (Mbpd)	NEMS	0.2	0.6	1.8	N/A
		MARKAL	0.2	1.0	3.9	10.4
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	0.4	0.6	1.4	N/A
		MARKAL	ns	0.1	0.9	2.1
	MPG Improvement <sup>2</sup> (%)	NEMS	2%	5%	19%	N/A
		MARKAL	2%	8%	45%	557%
Environmental Impacts	CO <sub>2</sub> Intensity Reduction of US Economy (Kg CO <sub>2</sub> /\$GDP)	NEMS	0.01	0.01	0.03	N/A
		MARKAL	0.01	0.02	0.05	0.06
	CO <sub>2</sub> Intensity Reduction of US Power Sector <sup>3</sup> (Kg CO <sub>2</sub> /kWh)	NEMS	ns	ns	0.03	N/A
		MARKAL	0.02	0.04	0.06	0.10
	CO <sub>2</sub> Intensity Reduction of US Transportation Sector <sup>4</sup> (Kg CO <sub>2</sub> /mile)	NEMS	0.01	0.02	0.07	N/A
		MARKAL	0.01	0.03	0.10	0.24
Economic Impacts	Consumer Savings, annual <sup>5</sup> (Bil \$)	NEMS	16	34	120	N/A
		MARKAL	32	55	239	529
	Electric Power Industry Savings, annual (Bil \$)	NEMS	7	13	28	N/A
		MARKAL	10	12	45	83
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	0.10	0.20	0.39	N/A
		MARKAL	0.16	0.30	0.61	0.71
Net Energy System Cost, annual (Bil \$)	NEMS	N/A	N/A	N/A	N/A	
	MARKAL	314	738	1828	3906	

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 2005\$.
- ns - Not significant  
NA - Not yet available  
N/A - Not applicable

## Hydrogen Technology

### Primary Benefits Metrics for FY09

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative <sup>2</sup> (Bil bbl)	NEMS	ns	ns	0.01	N/A
		MARKAL	ns	ns	0.5	10.6
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	-0.3	-10.2
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil <sup>3</sup> (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	1%	22%
Environmental Impacts	CO <sub>2</sub> Emissions Reduction, cumulative (Mil mtCO <sub>2</sub> )	NEMS	ns	ns	16	N/A
		MARKAL	0	0	264	2931
	SO <sub>2</sub> Allowance Price Reduction <sup>4</sup> (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO <sub>x</sub> 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 <sup>5</sup> (Bil \$)	NEMS	ns	ns	1.4	N/A
		MARKAL	ns	ns	-9	113
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	-6	-65
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	-15	11
<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&amp;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>						

## Secondary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
<b>Energy Security</b>	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	ns	0.03	N/A
		MARKAL	ns	ns	0.4	3.2
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	-1.5
	MPG Improvement <sup>2</sup> (%)	NEMS	ns	ns	1%	N/A
MARKAL		ns	ns	5%	147%	
<b>Environmental Impacts</b>	CO <sub>2</sub> Intensity Reduction of US Economy (Kg CO <sub>2</sub> /\$GDP)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	0.01
	CO <sub>2</sub> Intensity Reduction of US Power Sector <sup>3</sup> (Kg CO <sub>2</sub> /kWh)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	CO <sub>2</sub> Intensity Reduction of US Transportation Sector <sup>4</sup> (Kg CO <sub>2</sub> /mile)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	0.01	0.09
<b>Economic Impacts</b>	Consumer Savings, annual <sup>5</sup> (Bil \$)	NEMS	ns	ns	0.5	N/A
		MARKAL	ns	ns	-2	8
	Electric Power Industry Savings, annual (Bil \$)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	-2	-12
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	0.02	0.09
	Net Energy System Cost, annual (Bil \$)	NEMS	N/A	N/A	N/A	N/A
MARKAL		ns	ns	-9	122	

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 2005\$.

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

## Biomass and Biorefinery Systems

### Primary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative <sup>2</sup> (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 <sup>3</sup> (%)	NEMS	ns	ns	1%	N/A
		MARKAL	ns	ns	2%	5%
Environmental Impacts	CO <sub>2</sub> Emissions Reduction, cumulative (Mil mtCO <sub>2</sub> )	NEMS	ns	ns	55	N/A
		MARKAL	3	33	327	2295
	SO <sub>2</sub> Allowance Price Reduction <sup>4</sup> (\$/ton)	NEMS	ns	ns	268	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO <sub>x</sub> 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 <sup>5</sup> (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&amp;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>						

## Secondary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
<b>Energy Security</b>	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	ns	0.2	N/A
		MARKAL	ns	ns	0.4	0.9
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	0.1
	MPG Improvement <sup>2</sup> (%)	NEMS	ns	ns	3%	N/A
		MARKAL	ns	1%	4%	10%
<b>Environmental Impacts</b>	CO <sub>2</sub> Intensity Reduction of US Economy (Kg CO <sub>2</sub> /\$GDP)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	CO <sub>2</sub> Intensity Reduction of US Power Sector <sup>3</sup> (Kg CO <sub>2</sub> /kWh)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	CO <sub>2</sub> Intensity Reduction of US Transportation Sector <sup>4</sup> (Kg CO <sub>2</sub> /mile)	NEMS	ns	ns	0.02	N/A
		MARKAL	ns	ns	ns	ns
<b>Economic Impacts</b>	Consumer Savings, annual <sup>5</sup> (Bil \$)	NEMS	ns	2	17	N/A
		MARKAL	ns	1	1	ns
	Electric Power Industry Savings, annual (Bil \$)	NEMS	ns	ns	1	N/A
		MARKAL	ns	ns	ns	-3
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	ns	ns	0.01	N/A
		MARKAL	0.00	-0.01	-0.03	-0.02
Net Energy System Cost, annual (Bil \$)	NEMS	N/A	N/A	N/A	N/A	
	MARKAL	1	12	68	271	

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 2005\$.
- ns - Not significant  
 NA - Not yet available  
 N/A - Not applicable

## Solar Energy

### Primary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative <sup>2</sup> (Bil bbl)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	0.8
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	ns	0.5	1.1	N/A
		MARKAL	0.3	0.5	4.5	21.9
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil <sup>3</sup> (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO <sub>2</sub> Emissions Reduction, cumulative (Mil mtCO <sub>2</sub> )	NEMS	ns	ns	242	N/A
		MARKAL	25	78	368	2016
	SO <sub>2</sub> Allowance Price Reduction <sup>4</sup> (\$/ton)	NEMS	ns	ns	155	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO <sub>x</sub> Allowance Price Reduction (\$/ton)	NEMS	ns	ns	293	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 <sup>5</sup> (Bil \$)	NEMS	ns	1	11	N/A
		MARKAL	9	20	117	505
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	1	3	23	N/A
		MARKAL	4	14	62	318
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	ns	ns	20	N/A
		MARKAL	ns	ns	33	104

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 2009.

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 2005\$.

5. Cumulative monetary metrics are in 2005\$ that are discounted to 2009 using a 3% discount rate.

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

## Secondary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
<b>Energy Security</b>	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	0.0	0.1
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	ns	0.0	0.1	N/A
		MARKAL	ns	ns	0.5	1.2
	MPG Improvement <sup>2</sup> (%)	NEMS	ns	ns	ns	N/A
MARKAL		ns	ns	ns	ns	
<b>Environmental Impacts</b>	CO <sub>2</sub> Intensity Reduction of US Economy (Kg CO <sub>2</sub> /\$GDP)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	CO <sub>2</sub> Intensity Reduction of US Power Sector <sup>3</sup> (Kg CO <sub>2</sub> /kWh)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	0.01	0.01
	CO <sub>2</sub> Intensity Reduction of US Transportation Sector <sup>4</sup> (Kg CO <sub>2</sub> /mile)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
<b>Economic Impacts</b>	Consumer Savings, annual <sup>5</sup> (Bil \$)	NEMS	1	1	2	N/A
		MARKAL	3	3	28	105
	Electric Power Industry Savings, annual (Bil \$)	NEMS	1	2	6	N/A
		MARKAL	2	3	14	59
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	ns	ns	0.01	N/A
		MARKAL	ns	ns	0.02	0.03
	Net Energy System Cost, annual (Bil \$)	NEMS	N/A	N/A	N/A	N/A
		MARKAL	-1	3	33	140

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 2005\$.

ns - Not significant  
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N/A - Not applicable

## Wind Energy

### Primary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative <sup>2</sup> (Bil bbl)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	ns	0.3	2.0	N/A
		MARKAL	ns	ns	ns	3.1
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil <sup>3</sup> (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO <sub>2</sub> Emissions Reduction, cumulative (Mil mtCO <sub>2</sub> )	NEMS	ns	58	355	N/A
		MARKAL	28	107	593	4726
	SO <sub>2</sub> Allowance Price Reduction <sup>4</sup> (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO <sub>x</sub> Allowance Price Reduction (\$/ton)	NEMS	ns	ns	862	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 <sup>5</sup> (Bil \$)	NEMS	ns	1	26	N/A
		MARKAL	ns	ns	43	121
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	ns	4	10	N/A
		MARKAL	ns	2	14	27
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	ns	ns	20	N/A
		MARKAL	ns	ns	6	18
<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&amp;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>						

## Secondary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
<b>Energy Security</b>	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	ns	0.1	0.2	N/A
		MARKAL	ns	ns	ns	0.2
	MPG Improvement <sup>2</sup> (%)	NEMS	ns	ns	ns	N/A
MARKAL		ns	ns	ns	ns	
<b>Environmental Impacts</b>	CO <sub>2</sub> Intensity Reduction of US Economy (Kg CO <sub>2</sub> /\$GDP)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	0.01
	CO <sub>2</sub> Intensity Reduction of US Power Sector <sup>3</sup> (Kg CO <sub>2</sub> /kWh)	NEMS	ns	0.01	0.01	N/A
		MARKAL	ns	ns	0.02	0.06
	CO <sub>2</sub> Intensity Reduction of US Transportation Sector <sup>4</sup> (Kg CO <sub>2</sub> /mile)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
<b>Economic Impacts</b>	Consumer Savings, annual <sup>5</sup> (Bil \$)	NEMS	ns	3	4	N/A
		MARKAL	ns	ns	11	22
	Electric Power Industry Savings, annual (Bil \$)	NEMS	ns	1	1	N/A
		MARKAL	ns	1	3	7
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	ns	0.01	0.01	N/A
		MARKAL	ns	0.01	0.02	0.05
	Net Energy System Cost, annual (Bil \$)	NEMS	N/A	N/A	N/A	N/A
		MARKAL	1	10	28	77

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 2005\$.
- ns - Not significant  
 NA - Not yet available  
 N/A - Not applicable

## Geothermal Technology

### Primary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative <sup>2</sup> (Bil bbl)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	ns	ns	0.2	N/A
		MARKAL	ns	ns	ns	-0.4
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil <sup>3</sup> (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO <sub>2</sub> Emissions Reduction, cumulative (Mil mtCO <sub>2</sub> )	NEMS	ns	ns	57	N/A
		MARKAL	4	33	275	1830
	SO <sub>2</sub> Allowance Price Reduction <sup>4</sup> (\$/ton)	NEMS	ns	ns	242	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO <sub>x</sub> 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 <sup>5</sup> (Bil \$)	NEMS	ns	ns	2	N/A
		MARKAL	ns	2	12	24
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	1	-1
	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 2009.

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 2005\$.

5. Cumulative monetary metrics are in 2005\$ that are discounted to 2009 using a 3% discount rate.

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

## Secondary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
<b>Energy Security</b>	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	ns	N/A
		MARKAL	ns	ns	ns	0.0
	MPG Improvement <sup>2</sup> (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
<b>Environmental Impacts</b>	CO <sub>2</sub> Intensity Reduction of US Economy (Kg CO <sub>2</sub> /\$GDP)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
	CO <sub>2</sub> Intensity Reduction of US Power Sector <sup>3</sup> (Kg CO <sub>2</sub> /kWh)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	0.01	0.02
	CO <sub>2</sub> Intensity Reduction of US Transportation Sector <sup>4</sup> (Kg CO <sub>2</sub> /mile)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
<b>Economic Impacts</b>	Consumer Savings, annual <sup>5</sup> (Bil \$)	NEMS	ns	ns	2	N/A
		MARKAL	ns	1	1	6
	Electric Power Industry Savings, annual (Bil \$)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	1
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	0.01	0.02
Net Energy System Cost, annual (Bil \$)	NEMS	N/A	N/A	N/A	N/A	
	MARKAL	ns	ns	2	11	

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 2005\$.

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

## Vehicle Technologies

### Primary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative <sup>2</sup> (Bil bbl)	NEMS	0.1	0.6	4.2	N/A
		MARKAL	0.2	1.1	8.5	47.1
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	6.5
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil <sup>3</sup> (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	7%
Environmental Impacts	CO <sub>2</sub> Emissions Reduction, cumulative (Mil mtCO <sub>2</sub> )	NEMS	38	212	1565	N/A
		MARKAL	173	705	3920	20209
	SO <sub>2</sub> Allowance Price Reduction <sup>4</sup> (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO <sub>x</sub> 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 <sup>5</sup> (Bil \$)	NEMS	6	40	246	N/A
		MARKAL	38	113	505	1739
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	6	-5
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	30	100	300	N/A
		MARKAL	53	114	442	970
<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&amp;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>						

## Secondary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
<b>Energy Security</b>	Oil Imports Reduction, annual (Mbpd)	NEMS	0.1	0.4	1.5	N/A
		MARKAL	0.1	0.8	3.1	6.7
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	0.6
	MPG Improvement <sup>2</sup> (%)	NEMS	2%	5%	17%	N/A
MARKAL		2%	8%	34%	127%	
<b>Environmental Impacts</b>	CO <sub>2</sub> Intensity Reduction of US Economy (Kg CO <sub>2</sub> /\$GDP)	NEMS	ns	ns	0.01	N/A
		MARKAL	ns	0.01	0.02	0.03
	CO <sub>2</sub> Intensity Reduction of US Power Sector <sup>3</sup> (Kg CO <sub>2</sub> /kWh)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	-0.01	-0.02
	CO <sub>2</sub> Intensity Reduction of US Transportation Sector <sup>4</sup> (Kg CO <sub>2</sub> /mile)	NEMS	0.01	0.02	0.06	N/A
		MARKAL	0.01	0.03	0.10	0.18
<b>Economic Impacts</b>	Consumer Savings, annual <sup>5</sup> (Bil \$)	NEMS	4	16	56	N/A
		MARKAL	11	25	101	224
	Electric Power Industry Savings, annual (Bil \$)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	1	2	-4
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	0.01	0.05	0.13	N/A
		MARKAL	0.05	0.13	0.35	0.44
	Net Energy System Cost, annual (Bil \$)	NEMS	N/A	N/A	N/A	N/A
		MARKAL	28	82	313	869

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 2005\$.
- ns - Not significant  
NA - Not yet available  
N/A - Not applicable

## Building Technologies

### Primary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative <sup>2</sup> (Bil bbl)	NEMS	ns	ns	0.2	N/A
		MARKAL	ns	ns	0.2	2.1
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	1.0	2.2	5.2	N/A
		MARKAL	0.6	1.1	5.2	18.6
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil <sup>3</sup> (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO <sub>2</sub> Emissions Reduction, cumulative (Mil mtCO <sub>2</sub> )	NEMS	75	330	1611	N/A
		MARKAL	142	517	2143	7872
	SO <sub>2</sub> Allowance Price Reduction <sup>4</sup> (\$/ton)	NEMS	ns	ns	121	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO <sub>x</sub> 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 <sup>5</sup> (Bil \$)	NEMS	17	31	138	N/A
		MARKAL	50	133	458	1271
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	13	34	111	N/A
		MARKAL	20	52	136	343
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	10	20	80	N/A
		MARKAL	13	35	177	302
<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&amp;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>						

## Secondary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
<b>Energy Security</b>	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	ns	0.1	N/A
		MARKAL	ns	ns	0.1	0.3
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	0.2	0.2	0.3	N/A
		MARKAL	0.1	0.1	0.5	0.8
	MPG Improvement <sup>2</sup> (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
<b>Environmental Impacts</b>	CO <sub>2</sub> Intensity Reduction of US Economy (Kg CO <sub>2</sub> /\$GDP)	NEMS	ns	ns	0.01	N/A
		MARKAL	ns	0.01	0.01	0.01
	CO <sub>2</sub> Intensity Reduction of US Power Sector <sup>3</sup> (Kg CO <sub>2</sub> /kWh)	NEMS	ns	ns	ns	N/A
		MARKAL	0.01	0.02	0.02	0.01
	CO <sub>2</sub> Intensity Reduction of US Transportation Sector <sup>4</sup> (Kg CO <sub>2</sub> /mile)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
<b>Economic Impacts</b>	Consumer Savings, annual <sup>5</sup> (Bil \$)	NEMS	2	7	27	N/A
		MARKAL	17	25	73	140
	Electric Power Industry Savings, annual (Bil \$)	NEMS	3	8	16	N/A
		MARKAL	8	9	20	36
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	0.03	0.05	0.09	N/A
		MARKAL	0.05	0.08	0.12	0.12
Net Energy System Cost, annual (Bil \$)	NEMS	N/A	N/A	N/A	N/A	
	MARKAL	215	464	1032	1970	

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 2005\$.

ns - Not significant

NA - Not yet available

N/A - Not applicable

## Industrial Technologies (BAU)

### Primary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative <sup>2</sup> (Bil bbl)	NEMS	ns	0.2	0.6	N/A
		MARKAL	ns	ns	0.2	1.1
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	0.8	2.5	9.4	N/A
		MARKAL	ns	0.3	5.2	23.4
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil <sup>3</sup> (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO <sub>2</sub> Emissions Reduction, cumulative (Mil mtCO <sub>2</sub> )	NEMS	134	413	1547	N/A
		MARKAL	139	440	1574	4880
	SO <sub>2</sub> Allowance Price Reduction <sup>4</sup> (\$/ton)	NEMS	ns	ns	ns	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO <sub>x</sub> 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 <sup>5</sup> (Bil \$)	NEMS	24	55	176	N/A
		MARKAL	23	63	199	387
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	4	11	33	N/A
		MARKAL	6	18	49	90
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	ns	ns	30	N/A
		MARKAL	9	3	15	28

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 2009.

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 2005\$.

5. Cumulative monetary metrics are in 2005\$ that are discounted to 2009 using a 3% discount rate.

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

## Secondary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
<b>Energy Security</b>	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	0.1	0.1	N/A
		MARKAL	ns	ns	ns	0.1
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	0.2	0.4	0.9	N/A
		MARKAL	ns	0.1	0.8	0.4
	MPG Improvement <sup>2</sup> (%)	NEMS	ns	ns	ns	N/A
MARKAL		ns	ns	ns	ns	
<b>Environmental Impacts</b>	CO <sub>2</sub> Intensity Reduction of US Economy (Kg CO <sub>2</sub> /\$GDP)	NEMS	ns	ns	0.01	N/A
		MARKAL	ns	ns	0.01	ns
	CO <sub>2</sub> Intensity Reduction of US Power Sector <sup>3</sup> (Kg CO <sub>2</sub> /kWh)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	0.01	ns	0.01
	CO <sub>2</sub> Intensity Reduction of US Transportation Sector <sup>4</sup> (Kg CO <sub>2</sub> /mile)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
<b>Economic Impacts</b>	Consumer Savings, annual <sup>5</sup> (Bil \$)	NEMS	5	12	29	N/A
		MARKAL	8	12	23	24
	Electric Power Industry Savings, annual (Bil \$)	NEMS	1	3	4	N/A
		MARKAL	2	4	6	7
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	0.04	0.07	0.10	N/A
		MARKAL	0.04	0.08	0.10	0.04
	Net Energy System Cost, annual (Bil \$)	NEMS	N/A	N/A	N/A	N/A
		MARKAL	50	132	290	423

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 2005\$.
- ns - Not significant  
NA - Not yet available  
N/A - Not applicable

## Federal Energy Management Program

### Primary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative <sup>2</sup> (Bil bbl)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	0.1
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	NA	NA	NA	N/A
		MARKAL	ns	ns	ns	0.1
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil <sup>3</sup> (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
Environmental Impacts	CO <sub>2</sub> Emissions Reduction, cumulative (Mil mtCO <sub>2</sub> )	NEMS	5	13	27	N/A
		MARKAL	6	16	49	99
	SO <sub>2</sub> Allowance Price Reduction <sup>4</sup> (\$/ton)	NEMS	NA	NA	NA	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO <sub>x</sub> 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 <sup>5</sup> (Bil \$)	NEMS	0	1	2	N/A
		MARKAL	3	7	18	34
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	0	1	3	N/A
		MARKAL	ns	2	4	8
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	ns	ns	ns	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&amp;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>						

The NEMS run that generated the above results is based on a target budget that is different than the submitted target request. The NEMS analysis includes the technical guidance and assistance activity that is no longer part of the submitted target request (\$6.5 M vs. \$0 M in the target request), but does not include the DOE-specific investments activity included in the target request (\$0 M vs. \$10 M in the target request)

## Secondary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	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	ns	ns	ns	ns
	MPG Improvement <sup>2</sup> (%)	NEMS	ns	ns	ns	N/A
MARKAL		ns	ns	ns	ns	
Environmental Impacts	CO <sub>2</sub> Intensity Reduction of US Economy (Kg CO <sub>2</sub> /\$GDP)	NEMS	NA	NA	NA	N/A
		MARKAL	ns	ns	ns	ns
	CO <sub>2</sub> Intensity Reduction of US Power Sector <sup>3</sup> (Kg CO <sub>2</sub> /kWh)	NEMS	NA	NA	NA	N/A
		MARKAL	ns	ns	ns	ns
	CO <sub>2</sub> Intensity Reduction of US Transportation Sector <sup>4</sup> (Kg CO <sub>2</sub> /mile)	NEMS	NA	NA	NA	N/A
		MARKAL	ns	ns	ns	ns
Economic Impacts	Consumer Savings, annual <sup>5</sup> (Bil \$)	NEMS	0	0	0	N/A
		MARKAL	1	1	2	1
	Electric Power Industry Savings, annual (Bil \$)	NEMS	0	0	0	N/A
		MARKAL	ns	ns	ns	ns
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	NA	NA	NA	N/A
		MARKAL	ns	ns	ns	ns
	Net Energy System Cost, annual (Bil \$)	NEMS	N/A	N/A	N/A	N/A
		MARKAL	10	20	33	48

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 2005\$.  
ns - Not significant  
NA - Not yet available  
N/A - Not applicable

The NEMS run that generated the above results is based on a target budget that is different than the submitted target request. The NEMS analysis includes the technical guidance and assistance activity that is no longer part of the submitted target request (\$6.5 M vs. \$0 M in the target request), but does not include the DOE-specific investments activity included in the target request (\$0 M vs. \$10 M in the target request)

## Weatherization and Intergovernmental Activities

### Primary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
<b>Energy Security</b>	Oil Imports Reduction, cumulative <sup>2</sup> (Bil bbl)	NEMS	ns	ns	0.2	N/A
		MARKAL	ns	ns	0.1	0.2
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	NA	NA	NA	N/A
		MARKAL	ns	ns	0.2	2.0
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil <sup>3</sup> (%)	NEMS	ns	ns	ns	N/A
MARKAL		ns	ns	ns	ns	
<b>Environmental Impacts</b>	CO <sub>2</sub> Emissions Reduction, cumulative (Mil mtCO <sub>2</sub> )	NEMS	65	139	243	N/A
		MARKAL	32	102	308	653
	SO <sub>2</sub> Allowance Price Reduction <sup>4</sup> (\$/ton)	NEMS	NA	NA	NA	N/A
		MARKAL	N/A	N/A	N/A	N/A
	NO <sub>x</sub> 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	
<b>Economic Impacts</b>	Consumer Savings, cumulative <sup>5</sup> (Bil \$)	NEMS	6	12	25	N/A
		MARKAL	15	41	115	207
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	7	15	24	N/A
		MARKAL	4	12	30	55
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	10	10	20	N/A
MARKAL		ns	ns	13	7	
<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&amp;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>						

## Secondary Benefits Metrics for FY09 Target Request – NEMS and MARKAL

	Metric <sup>1</sup>	Model	Year			
			2015	2020	2030	2050
<b>Energy Security</b>	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	ns	0.1	N/A
		MARKAL	ns	ns	ns	ns
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	NA	NA	NA	N/A
		MARKAL	ns	ns	ns	0.1
	MPG Improvement <sup>2</sup> (%)	NEMS	ns	ns	ns	N/A
		MARKAL	ns	ns	ns	ns
<b>Environmental Impacts</b>	CO <sub>2</sub> Intensity Reduction of US Economy (Kg CO <sub>2</sub> /\$GDP)	NEMS	NA	NA	NA	N/A
		MARKAL	ns	ns	ns	ns
	CO <sub>2</sub> Intensity Reduction of US Power Sector <sup>3</sup> (Kg CO <sub>2</sub> /kWh)	NEMS	NA	NA	NA	N/A
		MARKAL	ns	ns	ns	ns
	CO <sub>2</sub> Intensity Reduction of US Transportation Sector <sup>4</sup> (Kg CO <sub>2</sub> /mile)	NEMS	NA	NA	NA	N/A
		MARKAL	ns	ns	ns	ns
<b>Economic Impacts</b>	Consumer Savings, annual <sup>5</sup> (Bil \$)	NEMS	2	2	5	N/A
		MARKAL	6	7	17	13
	Electric Power Industry Savings, annual (Bil \$)	NEMS	2	2	2	N/A
		MARKAL	2	2	4	3
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	NA	NA	NA	N/A
		MARKAL	0.01	0.01	0.01	0.01
Net Energy System Cost, annual (Bil \$)	NEMS	N/A	N/A	N/A	N/A	
	MARKAL	84	141	219	306	

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 2005\$.
- ns - Not significant  
 NA - Not yet available  
 N/A - Not applicable