

Projected Benefits of EERE Portfolio of Programs – Primary Metrics

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, cumulative ² (Bil bbl)	NEMS	0.1	0.3	1.7	N/A
		MARKAL	0.3	1.1	4.6	39.6
	Natural Gas Imports Reduction, cumulative (Tcf)	NEMS	1.9	6.4	20.6	N/A
		MARKAL	3.3	9.3	28.5	111.6
	Reduction in Share of Highway Fuel Demand Derived from Crude Oil ³ (%)	NEMS	0%	1%	1%	N/A
MARKAL		ns	ns	1%	18%	
Environmental Impacts	CO ₂ Emissions Reduction, cumulative (Mil mtCO ₂)	NEMS	696	2683	10491	N/A
		MARKAL	830	2842	11080	46691
	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	846	2411	3855	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	107	268	902	N/A
		MARKAL	198	660	2061	5991
	Electric Power Industry Savings, cumulative (Bil \$)	NEMS	70	187	514	N/A
		MARKAL	48	184	570	1350
	Household Energy Expenditures Reduction (\$/household/yr)	NEMS	120	170	390	N/A
		MARKAL	184	340	620	2212
<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>						

Projected Benefits of EERE Portfolio of Programs – Secondary Metrics

	Metric ¹	Model	Year			
			2015	2020	2030	2050
Energy Security	Oil Imports Reduction, annual (Mbpd)	NEMS	ns	0.2	0.7	N/A
		MARKAL	0.2	0.7	1.4	7.2
	Natural Gas Imports Reduction, annual (Tcf)	NEMS	0.6	1.1	1.6	N/A
		MARKAL	0.9	1.4	2.4	4.6
	MPG Improvement ² (%)	NEMS	1%	2%	5%	N/A
		MARKAL	1%	1%	6%	199%
Environmental Impacts	CO ₂ Intensity Reduction of US Economy (Kg CO ₂ /\$GDP)	NEMS	0.02	0.03	0.05	N/A
		MARKAL	0.02	0.03	0.05	0.08
	CO ₂ Intensity Reduction of US Power Sector ³ (Kg CO ₂ /kWh)	NEMS	ns	0.01	0.04	N/A
		MARKAL	ns	0.01	0.03	0.09
	CO ₂ Intensity Reduction of US Transportation Sector ⁴ (Kg CO ₂ /mile)	NEMS	ns	0.01	0.02	N/A
		MARKAL	0.01	0.02	0.08	0.21
Economic Impacts	Consumer Savings, annual ⁵ (Bil \$)	NEMS	33	55	140	N/A
		MARKAL	72	155	297	755
	Electric Power Industry Savings, annual (Bil \$)	NEMS	22	38	68	N/A
		MARKAL	21	45	78	124
	Energy Intensity of US Economy (energy/\$GDP)	NEMS	0.23	0.42	0.64	N/A
		MARKAL	0.24	0.45	0.69	1.03
	Net Energy System Cost Reduction, cumulative (Bil \$)	NEMS	N/A	N/A	N/A	N/A
		MARKAL	727	1790	4303	9831

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

Selected Projected Benefits by Program

	Consumer Savings, cum (Bil 2006\$)		CO2 Emissions Reduction, cum (Mil mtCO2)		Oil Imports Reduction, cum (Bil bbl)		Natural Gas Imports Reduction, cum (Tcf)	
	<i>2030</i> <i>NEMS/MARKAL</i>	<i>2050</i> <i>MARKAL</i>	<i>2030</i> <i>NEMS/MARKAL</i>	<i>2050</i> <i>MARKAL</i>	<i>2030</i> <i>NEMS/MARKAL</i>	<i>2050</i> <i>MARKAL</i>	<i>2030</i> <i>NEMS/MARKAL</i>	<i>2050</i> <i>MARKAL</i>
Fuel Cell Technology	5/62	105	95/ns	ns	0.2/ns	7.3	-0.6/ns	-2.3
Biomass and Biorefinery Systems R&D	39/11	34	255/49	523	0.4/0.2	1.1	0.6/0.0	ns
Solar Energy	15/46	235	426/523	4795	ns/ns	ns	ns/ns	13.1
Wind Energy	113/97	279	1705/1760	8489	ns/ns	ns	4.9/3.6	13.6
Geothermal Technology	22/ns	20	556/638	6817	ns/ns	ns	1.5/0.2	0.1
Vehicle Technologies	40/150	998	277/1185	9558	0.7/2.8	23.4	0.1/ns	8.4
Building technologies	439/1250	3417	5193/4787	18919	0.4/0.4	1.5	7.3/22.5	65.6
Industrial Technologies	309/376	872	4086/3583	11726	0.3/1.2	4.3	10.3/12.7	37.5
Federal Energy Management Program	11/-64	-141	101/99	260	ns/ns	ns	N/A /0.2	0.2
Weatherization and Intergovernmental Activities	73/279	425	721/655	1367	0.3/0.1	0.2	2.6/3.6	6.1

Notes:

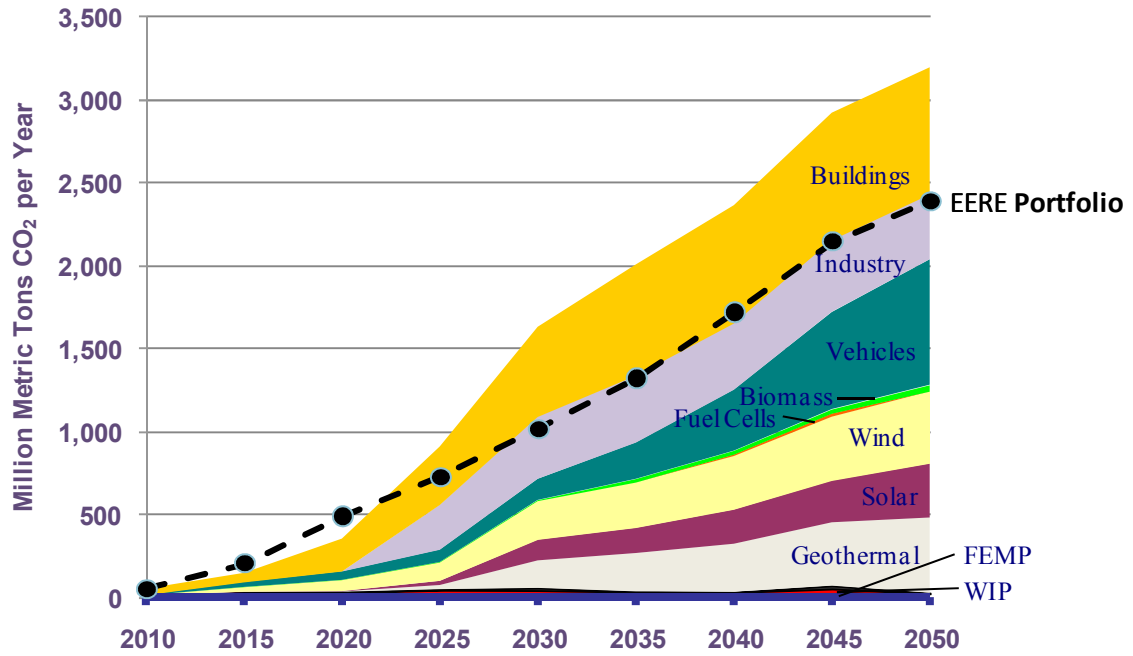
Prospective benefits do not include any potential policy changes that might enhance technology deployment.

EERE's portfolio approach to RD&D affects benefits and the way they are calculated. The total benefits reported for EERE's entire portfolio are usually less than the sum of the individual programs due to competition between the technologies and the resulting tradeoffs. For example, efficiency improvements reduce the future need for new electricity generating capacity, including the potential size of the renewable electric market. In addition, a research failure in one area will not necessarily reduce the technology's overall benefits, as the lack of market penetration by the failed technology may create a market opportunity elsewhere in the EERE portfolio. An integrated benefit total may be higher than the individual sums because of the added impact of multiple EERE programs. Estimates reflect the benefits that may be possible, if all of the program's technical targets are met and are funded at levels consistent with assumptions in the FY 2010 Budget through the program completion year, which varies by program.

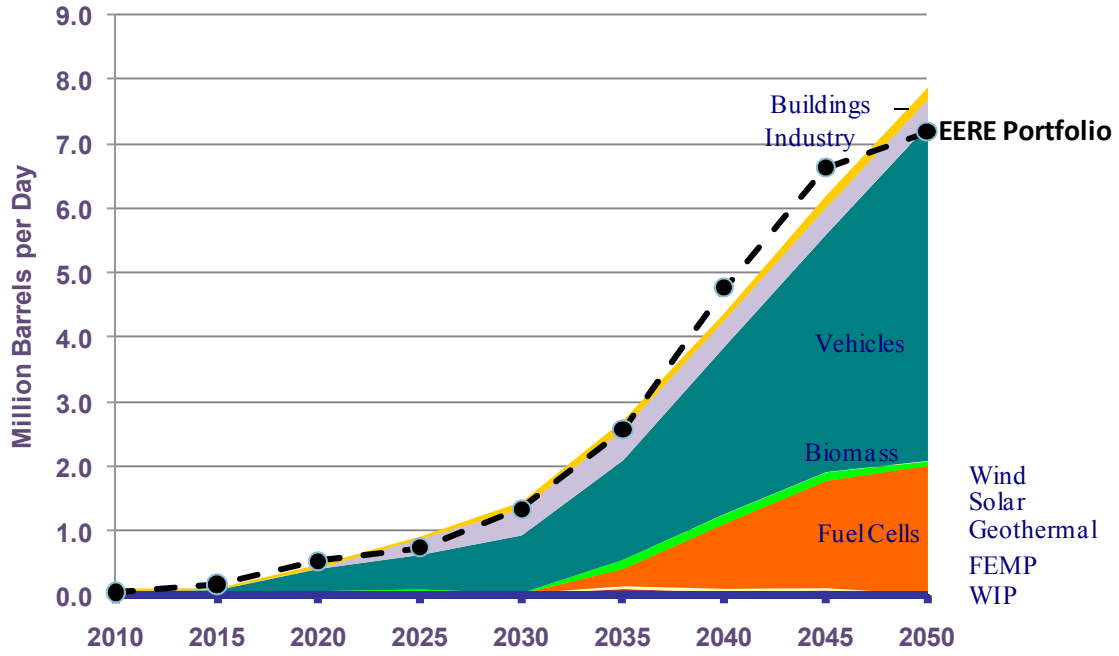
ns - Not significant

N/A - Not applicable

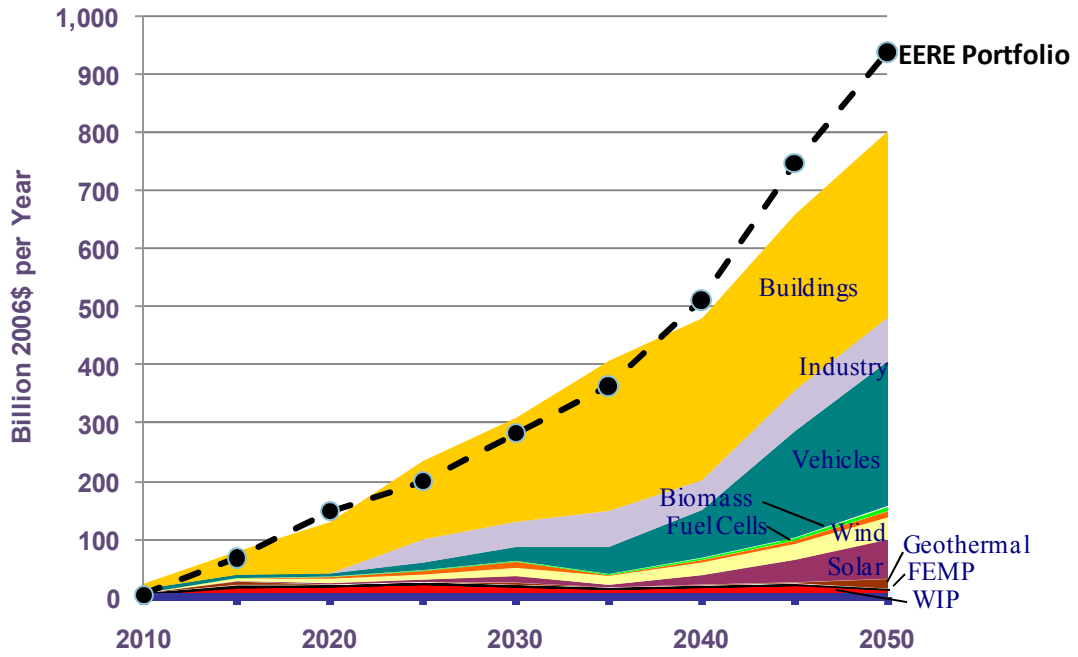
EERE Program Contributions to CO2 Emissions Avoidance



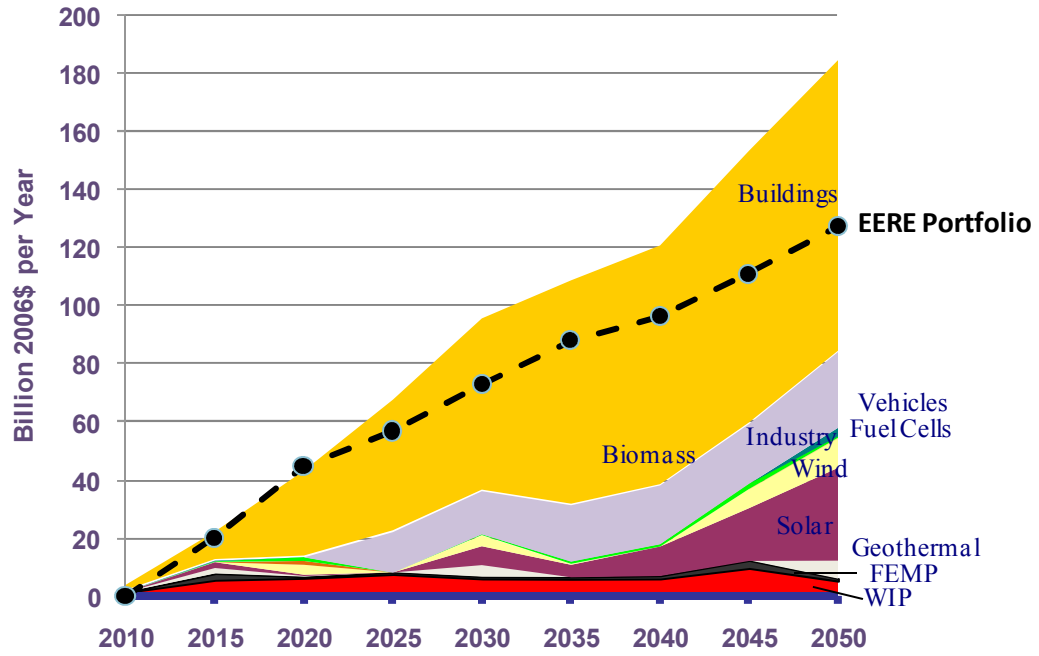
EERE Program Contributions to Petroleum Import Savings



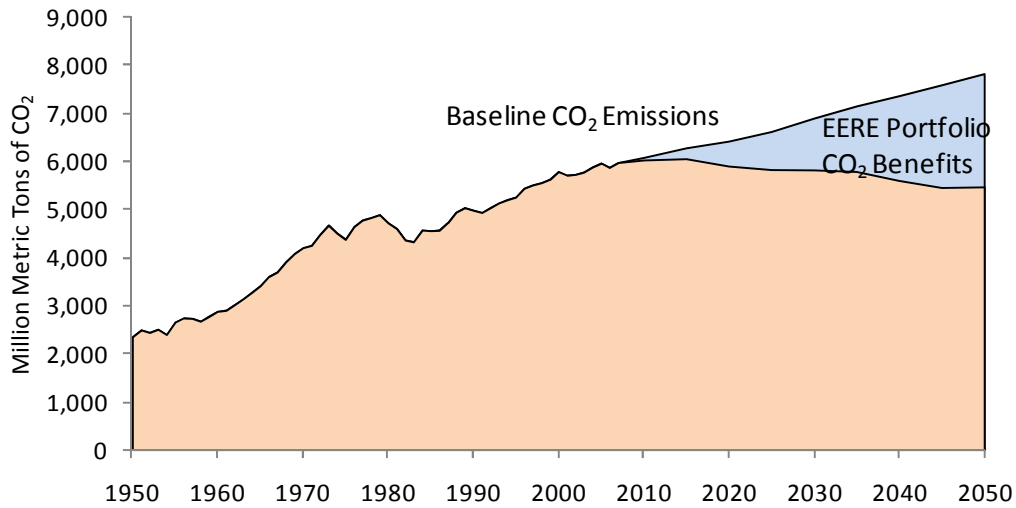
EERE Program Contributions to Consumer Savings



EERE Program Contributions to Electric Power Industry Savings



Impact of EERE's Portfolio on Carbon Dioxide Emissions



Note: The Baseline CO₂ Emission trajectory includes the impact of policies enacted by the end of 2007, including the Energy Independence and Security Act of 2007. The baseline does not include the impact of policies enacted in 2008 or 2009 (e.g., Troubled Asset Relief Program of 2008 or American Recovery and Reinvestment Act of 2009.)