

## **APPENDIX D**

### **Example Answer Sheets**

An example GPRA2003 Answer Sheet is provided in this appendix to serve as a guide. The example provides information for a fictitious program that results in energy savings and productivity improvements in the industrial sector. Information here is consistent with the examples provided in Appendix B.

## Technology & Market Penetration Assumptions (Example)

### Technology Assumptions

	<b>Advanced EERE Technology (2009)</b>	<b>Next Best Alternative (2000)</b>
<b>Energy Use</b>		
Electricity (billion kWh)	0.018	0.020
Natural gas (billion cubic feet)	0.360	0.400
Annual energy improvement (%)	0.15%	0.20%
<b>Cost</b>		
Capital Cost (\$/unit)	6,600,000	6,000,000
O&M cost (\$/unit/year)	66,000	60,000
Annual Cost Improvement (%)	1.5%	1.0%
Productivity Improvement (\$/unit/year)	250,000	---
<b>Other</b>		
Technology Lifetime (years)	10	10

### Major milestones leading to commercialization

Major Milestone	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Initial Prototype	X									
Refined Prototype			X							
Commercial Prototype						X				
Commercialization								X		

X = base case, H = +30% case, L = -30% case

### Market Penetration Assumptions

Commercial Introduction: 2009 (w/EERE involvement); 2014 (w/out EERE involvement)  
 Market Size: 500 units  
 Annual Market Growth: 0%

## Cumulative Market Penetration

<b>Year</b>	<b># units</b>
2003	0
2004	0
2005	0
2006	0
2007	0
2008	0
2009	1
2010	2
2011	3
2012	4
2013	6
2014	9
2015	14
2016	22
2017	33
2018	50
2019	74
2020	106
2021	147
2022	196
2023	250
2024	304
2025	353
2026	394
2027	426
2028	450
2029	467
2030	478

## Example Program: Annual Benefits

Metric

2003

2004

2005

2006

2007

2010

2015

2020

2025

2030

### Energy Metrics

Total Primary Energy Displaced (Trillion Btu)	0	0	0	0	0	0.05	0.59	4.02	10.90	6.64
Direct Electricity Displaced (Billion Kilowatthours)	0	0	0	0	0	0	0.02	0.14	0.38	0.23
Direct Natural Gas Displaced (Billion Cubic Feet)	0	0	0	0	0	0.03	0.41	2.83	7.67	4.68
Direct Petroleum Displaced (Million Barrels)	0	0	0	0	0	0	0	0	0	0
Direct Coal Displaced (Million Short Tons)	0	0	0	0	0	0	0	0	0	0
Direct Biomass Displaced (Trillion Btu)	0	0	0	0	0	0	0	0	0	0
Direct Energy Displaced from Feedstocks (Trillion Btu)	0	0	0	0	0	0	0	0	0	0
Direct Energy Displaced from Wastes (Trillion Btu)	0	0	0	0	0	0	0	0	0	0
Other Direct Energy Displaced (Trillion Btu)	0	0	0	0	0	0	0	0	0	0

### Financial Metrics

Energy Cost Savings (Millions of 1999 \$'s)	0	0	0	0	0	0	\$2	\$17	\$47	\$30
Non-Energy Cost Savings (Millions of 1999 \$'s)	0	0	0	0	0	0	\$3	\$23	\$62	\$31
Consumer Investment (Millions of 1999 \$'s)	0	0	0	0	0	0	(\$1)	(\$7)	(\$12)	\$6
EERE Expenditures (Millions of 1999 \$'s)	(\$1)	(\$2)	(\$2)	(\$1)	(\$1)	0	0	0	0	0
Other Government Expenditures (Millions of 1999 \$'s)	0	0	0	0	0	0	0	0	0	0
Private Sector Expenditures (Millions of 1999 \$'s)	(\$1)	(\$2)	(\$2)	(\$1)	(\$1)					

### Environmental Metrics

Carbon Emissions Displaced (MMTC)	0	0	0	0	0	0	0.01	0.06	0.17	0.10
Other Greenhouse Emissions Displaced (MMTCe)	0	0	0	0	0	0	0	0	0	0
CO Displaced (Metric Tons)	0	0	0	0	0	1	15	107	290	177
SO2 Displaced (Metric Tons)	0	0	0	0	0	4	48	294	797	486
NOx Displaced (Metric Tons)	0	0	0	0	0	6	75	501	1,358	827
VOCs Displaced (Metric Tons)	0	0	0	0	0	0	2	11	30	18
PM10 Displaced (Metric Tons)	0	0	0	0	0	0	1	7	18	11
Other Environmental Benefits (Metric Tons)	0	0	0	0	0	0	0	0	0	0

## Example Program: Cumulative Benefits

Metric

2003

2004

2005

2006

2007

2010

2015

2020

2025

2030

### Energy Metrics

Total Primary Energy Displaced (Trillion Btu)	0	0	0	0	0	0.07	1.55	12.68	54.99	100.60
Direct Electricity Displaced (Billion Kilowatthours)	0	0	0	0	0	0	0.05	0.44	1.93	3.54
Direct Natural Gas Displaced (Billion Cubic Feet)	0	0	0	0	0	0.04	1.06	8.83	38.61	70.72
Direct Petroleum Displaced (Million Barrels)	0	0	0	0	0	0	0	0	0	0
Direct Coal Displaced (Million Short Tons)	0	0	0	0	0	0	0	0	0	0
Direct Biomass Displaced (Trillion Btu)	0	0	0	0	0	0	0	0	0	0
Direct Energy Displaced from Feedstocks (Trillion Btu)	0	0	0	0	0	0	0	0	0	0
Direct Energy Displaced from Wastes (Trillion Btu)	0	0	0	0	0	0	0	0	0	0
Other Direct Energy Displaced (Trillion Btu)	0	0	0	0	0	0	0	0	0	0

### Financial Metrics

Energy Cost Savings (Millions of 1999 \$'s)	0	0	0	0	0	0	\$6	\$50	\$230	\$432
Non-Energy Cost Savings (Millions of 1999 \$'s)	0	0	0	0	0	0	\$8	\$70	\$312	\$553
Consumer Investment (Millions of 1999 \$'s)	0	0	0	0	0	0	(\$3)	(\$24)	(\$81)	(\$93)
EERE Expenditures (Millions of 1999 \$'s)	(\$6)	(\$8)	(\$9)	(\$10)	(\$11)	(\$11)	(\$11)	(\$11)	(\$11)	(\$11)
Other Government Expenditures (Millions of 1999 \$'s)	0	0	0	0	0	0	0	0	0	0
Private Sector Expenditures (Millions of 1999 \$'s)	(\$6)	(\$8)	(\$9)	(\$10)	(\$11)	(\$13)	(\$13)	(\$13)	(\$13)	(\$13)

### Environmental Metrics

Carbon Emissions Displaced (MMTC)	0	0	0	0	0	0	0.02	0.20	0.87	1.59
Other Greenhouse Emissions Displaced (MMTCe)	0	0	0	0	0	0	0	0	0	0
CO Displaced (Metric Tons)	0	0	0	0	0	2	40	334	1,459	2,672
SO2 Displaced (Metric Tons)	0	0	0	0	0	5	141	1,015	4,109	7,444
NOx Displaced (Metric Tons)	0	0	0	0	0	8	201	1,604	6,874	12,556
VOCs Displaced (Metric Tons)	0	0	0	0	0	0	4	35	151	277
PM10 Displaced (Metric Tons)	0	0	0	0	0	0	3	23	94	171
Other Environmental Benefits (Metric Tons)	0	0	0	0	0	0	0	0	0	0

## Example Program: Life Cycle Benefits

Metric

2003

2004

2005

2006

2007

2010

2015

2020

2025

2030

### Energy Metrics

Total Primary Energy Displaced (Trillion Btu)	0	0	0	0	0	0.46	5.89	40.80	114.94	107.22
Direct Electricity Displaced (Billion Kilowatthours)	0	0	0	0	0	0.02	0.20	1.43	4.04	3.77
Direct Natural Gas Displaced (Billion Cubic Feet)	0	0	0	0	0	0.31	4.09	28.63	80.82	75.38
Direct Petroleum Displaced (Million Barrels)	0	0	0	0	0	0	0	0	0	0
Direct Coal Displaced (Million Short Tons)	0	0	0	0	0	0	0	0	0	0
Direct Biomass Displaced (Trillion Btu)	0	0	0	0	0	0	0	0	0	0
Direct Energy Displaced from Feedstocks (Trillion Btu)	0	0	0	0	0	0	0	0	0	0
Direct Energy Displaced from Wastes (Trillion Btu)	0	0	0	0	0	0	0	0	0	0
Other Direct Energy Displaced (Trillion Btu)	0	0	0	0	0	0	0	0	0	0

### Financial Metrics

Energy Cost Savings (Millions of 1999 \$'s)	0	0	0	0	0	\$2	\$23	\$171	\$497	\$462
Non-Energy Cost Savings (Millions of 1999 \$'s)	0	0	0	0	0	\$2	\$32	\$230	\$651	\$542
Consumer Investment (Millions of 1999 \$'s)	0	0	0	0	0	(\$1)	(\$13)	(\$70)	(\$137)	(\$6)
EERE Expenditures (Millions of 1999 \$'s)	(\$11)	(\$11)	(\$11)	(\$11)	(\$11)	(\$11)	(\$11)	(\$11)	(\$11)	(\$11)
Other Government Expenditures (Millions of 1999 \$'s)	0	0	0	0	0	0	0	0	0	0
Private Sector Expenditures (Millions of 1999 \$'s)	(\$13)	(\$13)	(\$13)	(\$13)	(\$13)	(\$13)	(\$13)	(\$13)	(\$13)	(\$13)

### Environmental Metrics

Carbon Emissions Displaced (MMTC)	0	0	0	0	0	0.01	0.09	0.65	1.82	1.70
Other Greenhouse Emissions Displaced (MMTCe)	0	0	0	0	0	0	0	0	0	0
CO Displaced (Metric Tons)	0	0	0	0	0	12	155	1,082	3,053	2,847
SO2 Displaced (Metric Tons)	0	0	0	0	0	41	478	3,071	8,493	7,928
NOx Displaced (Metric Tons)	0	0	0	0	0	59	746	5,107	14,342	13,380
VOCs Displaced (Metric Tons)	0	0	0	0	0	1	16	112	316	295
PM10 Displaced (Metric Tons)	0	0	0	0	0	1	11	70	195	182
Other Environmental Benefits (Metric Tons)	0	0	0	0	0	0	0	0	0	0