

national output decrease for all fuel is estimated to be about 0.01 percent for all years, and is relatively constant across all four regional fuel markets.

b. Expected Welfare Impacts

Social cost impact estimates are presented in Table V.F–2. A time series of social costs from 2007 through 2030 is presented in Table IV.F–3. As described above, the total social cost of the regulation is the sum of the changes in producer and consumer surplus estimated by the model plus engine maintenance savings (negative costs) resulting from using fuel with a lower sulfur content. Total social costs in 2013 are projected to be 1,202.4 million (\$2001). About 82 percent of the total social costs is expected to be borne by producers and consumers in the application markets, indicating that the

majority of the costs are expected to be passed on in the form of higher prices. When these estimated impacts are broken down, 58 percent are expected to be borne by consumers in the application markets and 42 percent are expected to be borne by producers in the application markets. Equipment manufacturers are expected to bear about 10 percent of the total social costs. Engine manufacturers and diesel fuel refineries are expected to bear 2.5 percent and 0.5 percent, respectively. The remaining 5.0 percent is accounted for by fuel marker costs and the additional costs of 15 ppm fuel being sold in to markets such as marine diesel, locomotive, and home heating fuel that do not require it.

In 2030, the total social costs are projected to be about \$1,509.6 million (\$2001). The increase is due to the

projected annual growth in the engine and equipment populations. As in earlier years, producers and consumers in the application markets are expected to bear the large majority of the costs, approximately 94 percent. This is consistent with economic theory, which states that, in the long run, all costs are passed on to the consumers of goods and services.

The present value of total social costs through 2030 is estimated to be \$16.5 billion (\$2001). This present value is calculated using a social discount rate of 3 percent from 2004 through 2030. We also performed an analysis using an alternative 7 percent social discount rate. Using that discount rate, the present value of the social costs through 2030 is estimated to be \$9.9 billion (\$2001).

TABLE V.F–2.—SUMMARY OF SOCIAL COSTS ESTIMATES ASSOCIATED WITH PRIMARY PROGRAM: 2013, 2020, AND 2030
[\$million]^{a,b}

	Maximum cost year (2013)			Year 2020			Final year (2030)		
	Market surplus (\$10 ⁶)	Operating savings (\$10 ⁶)	Total	Market surplus (\$10 ⁶)	Operating savings (\$10 ⁶)	Total	Market surplus (\$10 ⁶)	Operating savings (\$10 ⁶)	Total
Engine Producers									
Total	30.2	.....	30.2	0.1	.....	0.1	0.1	.....	0.1
Equipment Producers									
Total	116.1	.....	116.1	102.6	.....	102.6	5.3	.....	5.3
Agricultural Equipment	39.9	.....	39.9	33.2	.....	33.2	1.3	.....	1.3
Construction Equipment	53.0	.....	53.0	48.2	.....	48.2	3.8	.....	3.8
Industrial Equipment	23.2	.....	23.2	21.2	.....	21.2	0.2	.....	0.2
Application Producers and Consumers									
Total	1,231.8	(241.9)	989.8	1,386.5	(190.1)	1,196.3	1,598.9	(174.5)	1,424.5
Total Producer	515.7	.....	.....	583.4	.....	.....	672.9	.....	.....
Total Consumer	716.1	.....	.....	803.1	.....	.....	926.0	.....	.....
Agriculture	348.7	(44.7)	304.0	339.2	(35.2)	364.0	416.5	(32.3)	429.2
Construction	468.3	(77.9)	390.4	550.4	(61.2)	489.3	635.7	(56.1)	579.5
Manufacturing	414.8	(119.3)	295.5	436.8	(93.8)	343.0	501.8	(86.0)	415.7
Fuel Producers Total ..	7.8	.....	7.8	9.0	.....	9.0	10.5	.....	10.5
PADD I&III	3.6	.....	3.6	4.1	.....	4.1	4.8	.....	4.8
PADD II	2.9	.....	2.9	3.3	.....	3.3	3.9	.....	3.9
PADD IV	0.8	.....	0.8	0.9	.....	0.9	1.0	.....	1.0
PADD V	0.5	.....	0.5	0.6	.....	0.6	0.8	.....	0.8
Nonroad Spillover .....	.....	51.2	.....	.....	58.6	.....	.....	69.2	.....
Marker Costs .....	.....	7.3	.....	.....	.....	.....	.....	.....	.....
Total	1,385.8	(183.4)	1,202.4	1,498.2	(131.5)	1,366.7	1,614.9	(105.3)	1,509.6

Notes:

^a Figures are in 2001 dollars.

^b Operating savings are shown as negative costs.