

Appendix C

Summary of Cost Analysis Methodology

Summary

The total cost of the proposed SCM to affected businesses is estimated to be \$65 million in nonrecurring costs and \$5.7 million per year in recurring costs. This equates to \$13.9 million dollars annually over the useful life of the control equipment. This represents the cost of raw materials, research and development, and changes to distribution for the manufacturers, and the cost of new equipment, training, and energy costs to automotive refinishing facilities. The annual average cost to a typical automotive coatings manufacturer is estimated to be \$320,000. The annual average cost to a typical automotive refinishing facilities is estimated to be about \$3,400.

Methodology

For this analysis, we considered the impact on two groups of businesses; coating manufacturers and automotive refinishing facilities. The total cost of the proposed SCM represents the combined costs to these two groups. Distributors of automotive coatings may also incur some costs if those costs cannot be passed on to the automotive refinishing facilities because of competitive pressures. However, we are unable to quantify these impacts. Potential costs to distributors include some cost sharing between the manufacturer and distributor to transition customers to new products such as water-borne color coatings. Staff does not have data on the extent to which such cost sharing might occur.

Cost to Businesses

The total cost to coating manufacturers is estimated to be \$14.4 million in non-recurring costs. This equates to \$3.2 million in annual cost. This estimate includes the cost to market and distribute compliant coatings in California, and is based on discussions with manufacturers (Taylor, 2005).

The total cost to automotive refinishing facilities is estimated to be \$65 million in non-recurring costs and \$5.7 million per year in recurring costs, assuming coating manufacturers pass on all their costs to automotive refinishing facilities. This equates to \$13.9 million dollars annually. The non-recurring costs include the cost of obtaining air movement and heating equipment which may be necessary to use water-borne coatings and maintain the level of production, and equipment and training costs associated with switching from solvent-borne to water-borne coatings.

Staff estimates there are about 4,100 automotive refinishing facilities in California. Since the large number of facilities makes it impractical to determine the impact on each facility, staff divided these facilities into general categories based on their annual revenue. Also, based on SCAQMD data, staff estimated the statewide number of heated spray booths and automotive refinishing facilities with multiple spray booths. Staff acknowledges that some facilities will experience cost impacts that differ from these estimates, but based on discussions with industry, the general assumptions are valid for typical facilities within each category. Table C-1 provides an overall summary of costs. Tables C-2 through C-4 summarize the estimated breakdown of costs for

automotive refinishing facilities (Elders, 2005; Decker, 2005; Phillips, 2005; SCAQMD, 2005; Taylor, 2005; Hagan, 2005; Mac, 2005; Phillips, 2005).

**Table C-1
Summary of Costs**

Annual Revenue Category	Less Than 1 Million	Between 1 Million and 2.5 Million	Greater Than 2.5 Million	Total
Number of Facilities	2,952	883	278	4,113
Facilities with One Booth/No Heat	2,332			
Non-Recurring Cost per Facility	6,600			
Annualized Cost	1,648			
Facilities with Two Booths/No Heat	620	503		1,123
Non-Recurring Cost per Facility	8,200	42,000		
Annualized Cost	1,871	7,966		
Facilities with Two Booths/Existing Heat		380	69	449
Non-Recurring Cost per Facility		16,000	48,000	
Annualized Cost		4,327	9,685	
Facilities with Three Booths/Existing Heat			209	209
Non-Recurring Cost per Facility			68,000	
Annualized Cost			12,484	
Total Cost	20,475,200	27,206,000	7,524,000	65,205,200
Total Annualized Cost	5,002,416	5,651,032	3,277,324	13,930,772

**Table C-2
Estimated Cost for Facilities with Annual Revenue Less Than 1 Million**

Category	Item	Non-Recurring Costs	Recurring Costs	Annualized Cost*
Single Booth with No Heating Equipment	Air Movement Equipment	1,600		144
	Other Equipment	1,500		185
	Training	1,000		225
	Material Loss	2,500		562
	Operating and Maintenance Costs		155	155
	Increased Cost of Coatings		378	378
	Total		6,600	
Two Booths with No Heating Equipment	Air Movement Equipment	3,200		288
	Other Equipment	1,500		185
	Training	1,000		225
	Material Loss	2,500		562
	Operating and Maintenance Costs		235	235
	Increased Cost of Coatings		378	378
	Total		8,200	

Table C-3
Estimated Cost for Facilities with Annual Revenue Between 1 Million and 2.5 Million

Category	Item	Non-Recurring Costs	Recurring Costs	Annualized Cost*	
Two Booths with No Heating Equipment	Air Movement Equipment	10,000		899	
	Heating Equipment	26,000		2,338	
	Other Equipment	1,500		185	
	Training	2,000		449	
	Material Loss	2,500		562	
	Operating and Maintenance Costs		1,875	1,875	
	Increased Cost of Coatings		1,657	1,657	
	Total		42,000		7,966
Two Booths with Existing Heating Equipment	Air Movement Equipment	10,000		899	
	Other Equipment	1,500		185	
	Training	2,000		449	
	Material Loss	2,500		562	
	Operating and Maintenance Costs		575	575	
	Increased Cost of Coatings		1,657	1,657	
	Total		16,000		4,327

Table C-4
Estimated Cost for Facilities with Annual Revenue Greater Than 2.5 Million

Category	Item	Non-Recurring Costs	Recurring Costs	Annualized Cost*
Two Booths with Existing Heating Equipment	Air Movement Equipment	40,000		3,598
	Other Equipment	1,500		185
	Training	4,000		899
	Material Loss	2,500		562
	Operating and Maintenance Costs		2,075	2,075
	Increased Cost of Coatings		2,367	2,367
	Total		48,000	
Three Booths with Existing Heating Equipment	Air Movement Equipment	60,000		5,396
	Other Equipment	1,500		185
	Training	4,000		899
	Material Loss	2,500		562
	Operating and Maintenance Costs		3,075	3,075
	Increased Cost of Coatings		2,367	2,367
	Total		68,000	

Impact on Businesses

In evaluating the impact of the SCM on businesses, we assumed that all costs were either completely absorbed by coating manufacturers or by automotive refinishing facilities. This gives us a worst-case scenario for coating manufacturers and automotive refinishing facilities. In reality, it is likely that coating manufacturers and automotive refinishing facilities will absorb and pass on some of the cost, making the actual impact to businesses less than what is estimated here.

To determine the maximum possible impact on coating manufacturers, we assumed they would absorb all costs relating to producing and marketing compliant coatings when calculating the change in “return on owner’s equity “(ROE). ROE is calculated by dividing the net profit by the net worth.

To calculate the change in ROE, we subtracted the cost to manufacturers from profit data. The results were used to calculate an adjusted three-year average ROE. The adjusted ROE was then compared with the ROE before the subtraction of the adjusted cost to determine the potential impact on the profitability of the businesses. A reduction of more than 10 percent in profitability is considered to indicate a potential for significant adverse economic impacts. The analysis found an average decrease in ROE of about 0.07 percent for coating manufacturers and 15 percent for automotive refinishing facilities.

To determine the maximum impact on automotive refinishing facilities, we assumed that manufacturers would pass on all costs from the SCM to the automotive refinishing facilities. To project a worst-case scenario, we assumed the automotive refinishing facilities would absorb all costs that they directly incur, as well as all costs passed on by the manufacturers. As with the manufacturers, staff calculated the change in ROE for these automotive refinishing facilities.

To determine the maximum impact on consumers, staff assumed that all costs from both the manufacturers and automotive refinishing facilities would be passed on to the consumers. If costs were passed on to the consumer, the impact would generally be in the form of higher insurance premiums and the total cost would be spread out among several million insured drivers in California. The impact to an individual consumer would be based on a number of factors such as type of insurance, driving history, and demographics. For this analysis, we assume costs would be directly passed on to consumers who need automotive refinishing. In this case, the average cost of having a vehicle refinished would increase by about \$11. If the consumer is paying for the refinishing directly, he or she would have to absorb the entire cost.

Annualized Costs

We annualized non-recurring fixed costs using the Capital Recovery Method. Using this method, we multiplied the non-recurring fixed costs by the Capital Recovery Factor

(CRF) to convert these costs into equal annual payments over a project horizon at a discount rate. The Capital Recovery Method for annualizing fixed costs is recommended by Cal/EPA (Cal/EPA, 1996), and is consistent with the methodology used in previous cost analyses for ARB regulations (ARB, 2000a; ARB, 2000b).

The CRF is calculated as follows:

$$CRF = \frac{i(1+i)^n}{(1+i)^n - 1}$$

where,

- CRF = Capital Recovery Factor
- i = discount interest rate in real terms (assumed to be 4%)
- n = project horizon or useful life of equipment

The costs of air movement and heating equipment for automotive refinishing facilities were annualized over 15 years, and all other equipment costs were annualized over 10 years. These values are based on an estimate of the expected lifetime of the equipment. All other costs were annualized over 5 years. The total annualized cost was obtained by adding the annual recurring costs to the annualized fixed costs derived by the Capital Recovery Method. With regard to the discount rate, Cal/EPA recommends 2% plus the current yield for a U.S. Treasury Note of similar maturity to the project horizon. Treasury yields have been around 4% in recent years and when adjusted for an inflation rate of 2%, the corresponding discount rate is 4%. (CNN, 2005).

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