

Environmental Justice Analysis of the
Formaldehyde Standards for Composite Wood
Products Act Implementing Regulations
Proposed Rule

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2010 Formaldehyde Standards for Composite Wood Products Act

- ▶ Amends Toxic Substances Control Act.
- ▶ Limits formaldehyde emissions from various types of pressed wood products.
- ▶ California Air Resources Board standards.

2010 Formaldehyde Standards for Composite Wood Products Act

- ▶ Support from both political parties, industry and environmental groups.
- ▶ Implementation decisions left to EPA (recordkeeping, enforcement, definitions, exemptions, etc.).

EJ origins of Act

- ▶ High levels of formaldehyde detected in FEMA trailers used after Hurricane Katrina.
- ▶ Many trailer residents minority or low income.

EJ origins of Act

- ▶ Citizen petition for EPA to regulate emissions under TSCA (2008).
- ▶ EPA agrees to consider TSCA regulation, issues Advance Notice of Proposed Rulemaking (2008).
- ▶ Congress mandates standards instead (2010).
- ▶ EPA proposes Implementation Rule (2013).

EJ Analysis

- ▶ Builds off of Benefit-Cost Analysis
- ▶ Disaggregates total benefits by race and income groups.

Benefits Analysis: Seven policy option categories

- ▶ Three allowed by statute
 - ▶ Exempt wood veneer laminators
 - ▶ Include laminators
 - ▶ Include laminators but exclude manufacturers using no-added formaldehyde resins.

Benefits Analysis: Seven policy option categories

- ▶ Two less stringent options
 - ▶ CARB Phase 1 excluding laminators
 - ▶ CARB Phase 1 including laminators

Benefits Analysis: Seven policy option categories

- ▶ Two more stringent options
 - ▶ No-added formaldehyde requirement excluding laminators
 - ▶ No-added formaldehyde requirement excluding laminators

Benefits Analysis: Housing categories

- ▶ Nine housing types (5 new, 4 remodelled)
- ▶ Eleven house ages.
- ▶ Five climate zones.

Benefits Analysis: Three outcomes

- ▶ Current eye irritation.
- ▶ Future nasopharyngeal cancer risk
 - ▶ Fatal and non-fatal.
- ▶ Monetized benefits.

Benefits Analysis: Demographics

- ▶ Age zero to 95.
- ▶ Several outside exposure scenarios.
 - ▶ school, occupation, unemployed, etc.

Benefits Analysis: Putting it all together

- ▶ Engineering exposure assessment calculates average daily formaldehyde concentration for each house type/house age/climate/exposure age/occupation combination.

Benefits Analysis: Putting it all together

- ▶ American Community Survey data (demographics, housing types, housing age, region) combined with American Housing Survey data (renovations) used to populate categories in exposure assessment.

Benefits Analysis: Putting it all together

- ▶ Epidemiological studies used to model concentration response for various age groups.
- ▶ Valuation studies used to monetize benefits.

EJ Analysis: Demographic categories

- ▶ Five racial/ethnic groups
 - ▶ Black, Hispanic, Native American, White, Other
- ▶ Two income groups.
 - ▶ Above Poverty, Below Poverty
- ▶ Here, I focus on income tables.

Selected EJ Tables

Table 6-2: Number of Cases Avoided by Income Population (Average Number of Cases Avoided Per Year of Regulation)

Analytical Option	Cancer		Eye Irritation	
	Lower	Higher	Lower	Higher
Number of Cases Avoided in Typical Year				
All Individuals				
Option SE/SEUR/SFCC	9	21	22,133	170,214
Option SI/SC/SCR/SCUR	10	24	23,650	191,590
Option SN	11	25	24,154	198,950
Option CE	7	16	18,015	130,720
Option CI	8	19	19,563	148,389
Option NE	39	92	58,492	626,726
Option NI	40	97	58,494	645,678
Individuals Living Above Poverty Line				
Option SE/SEUR/SFCC	8	18	17,551	142,637
Option SI/SC/SCR/SCUR	9	20	18,682	160,241
Option SN	9	21	19,056	166,305
Option CE	6	14	14,341	109,557
Option CI	7	15	15,517	124,097
Option NE	33	77	48,806	530,167
Option NI	34	80	48,808	545,677
Individuals Living Below Poverty Line				
Option SE/SEUR/SFCC	1	4	4,551	27,046
Option SI/SC/SCR/SCUR	2	4	4,935	30,750
Option SN	2	4	5,064	32,023
Option CE	1	3	3,647	20,756
Option CI	1	3	4,017	23,829
Option NE	6	15	9,641	94,701
Option NI	6	16	9,642	98,084

Option SCUR is the proposed option.

Selected EJ Tables

Table 6-4: Summary of Number of Cases Avoided by Income

Analytical Option	Population Affected (thousands)	Population Affected as Percent of Total Affected Population	Total Lower Estimates of Cases Avoided	Total Higher Estimate of Cases Avoided	Percentage of Total Cases Avoided Lower Estimate	Percentage of Total Cases Avoided Higher Estimate
All Individuals						
Option SE/SEUR/SFCC	106,057	100.0%	22,142	170,236	100%	100%
Option SL/SC/SCR/SCUR			23,660	191,615	100%	100%
Option SN			24,165	198,975	100%	100%
Option CE			18,022	130,737	100%	100%
Option CI			19,571	148,407	100%	100%
Option NE			58,530	626,818	100%	100%
Option NI			58,535	645,775	100%	100%
Individuals Living Below Poverty Line						
Option SE/SEUR/SFCC	13,081	12.3%	4,553	27,049	20.6%	15.9%
Option SL/SC/SCR/SCUR			4,937	30,754	20.9%	16.1%
Option SN			5,066	32,027	21.0%	16.1%
Option CE			3,648	20,759	20.2%	15.9%
Option CI			4,018	23,832	20.5%	16.1%
Option NE			9,647	94,716	16.5%	15.1%
Option NI			9,648	98,100	16.5%	15.2%
Individuals Living Above Poverty Line						
Option SE/SEUR/SFCC	92,631	87.3%	17,558	142,655	79.3%	83.8%
Option SL/SC/SCR/SCUR			18,690	160,261	79.0%	83.6%
Option SN			19,065	166,326	78.9%	83.6%
Option CE			14,347	109,571	79.6%	83.8%
Option CI			15,524	124,113	79.3%	83.6%
Option NE			48,839	530,244	83.4%	84.6%
Option NI			48,843	545,758	83.4%	84.5%
Option SCUR is the proposed option.						

Selected EJ Tables

Table 6-6: Summary of Quantified Benefits by Poverty Status (annualized at 3% rate)

Analytical Option	Population Affected (thousands)	Population Affected as Percent of Total Affected Population	Total Quantified Benefits Lower Estimate (millions 2010\$ or percent of total)	Total Quantified Benefits Higher Estimate (millions 2010\$ or percent of total)	Total Quantified Benefits per Affected Individual Lower Estimate (in dollars)	Total Quantified Benefits per Affected Individual Higher Estimate (in dollars)
All Individuals						
Option SE/SEUR/SFCC	106,057	100.0%	\$18	\$42	\$0.17	\$0.39
Option SI/SC/SCR/SCUR			\$20	\$48	\$0.19	\$0.45
Option SN			\$21	\$50	\$0.20	\$0.47
Option CE			\$14	\$32	\$0.13	\$0.30
Option CI			\$16	\$37	\$0.15	\$0.34
Option NE			\$76	\$178	\$0.72	\$1.68
Option NI			\$80	\$186	\$0.75	\$1.76
Individuals Living Below Poverty Line						
Option SE/SEUR/SFCC	13,081	12.3%	14.1%	14.5%	\$0.19	\$0.46
Option SI/SC/SCR/SCUR			14.3%	14.7%	\$0.22	\$0.53
Option SN			14.3%	14.7%	\$0.23	\$0.56
Option CE			14.1%	14.5%	\$0.15	\$0.35
Option CI			14.3%	14.6%	\$0.17	\$0.41
Option NE			13.9%	14.3%	\$0.81	\$1.94
Option NI			14.0%	14.4%	\$0.85	\$2.05
Individuals Living Above Poverty Line						
Option SE/SEUR/SFCC	92,631	87.3%	85.6%	85.1%	\$0.16	\$0.38
Option SI/SC/SCR/SCUR			85.5%	84.9%	\$0.19	\$0.44
Option SN			85.4%	84.9%	\$0.19	\$0.46
Option CE			85.7%	85.1%	\$0.13	\$0.29
Option CI			85.5%	84.9%	\$0.14	\$0.34
Option NE			85.9%	85.3%	\$0.71	\$1.64
Option NI			85.8%	85.2%	\$0.74	\$1.71

Option SCUR is the proposed option.

The number of individuals above and below the poverty line does not sum to the total number of individuals because poverty status could not be determined for some individuals.

Conclusion of EJ Analysis

- ▶ “proposed rule will not have disproportionately high and adverse human health ... effects on any population, including any minority or low-income population. These proposed standards would **reduce emissions ... for all populations** that are exposed, with slightly **larger quantified benefits for ... minority or low-income** affected populations.”
- ▶ Implicit criterion: No EJ problem if no group average worse, and minority/low-income receive above average benefit.

Strengths of the EJ Analysis

- ▶ Provides information on outcomes that are important to people.
 - ▶ Health and Monetized value
 - ▶ Not proximity, emissions, or ambient concentrations.
- ▶ Compares policy alternatives.
- ▶ Conclusions based on disaggregated data.
- ▶ Information on relative mean changes in outcomes (relative to baseline) is useful.

Limitations of the EJ Analysis

- ▶ No information on distribution of outcomes **across** groups.
 - ▶ Was there a pre-existing disparity at baseline?
 - ▶ What is the remaining disparity under each policy option?
 - ▶ How can one rank the various options in terms of addressing any disparity?

Limitations of the EJ Analysis

- ▶ No information of distribution of outcomes **within** groups.
 - ▶ Are there “hotspots” masked by group averages?

For more information

- ▶ Docket ID: EPA-HQ-OPPT-2012-0018

- ▶ Economic Analysis:

<http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OPPT-2012-0018-0484>

- ▶ Public comments until August 9, 2013

<http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OPPT-2012-0018-0001>