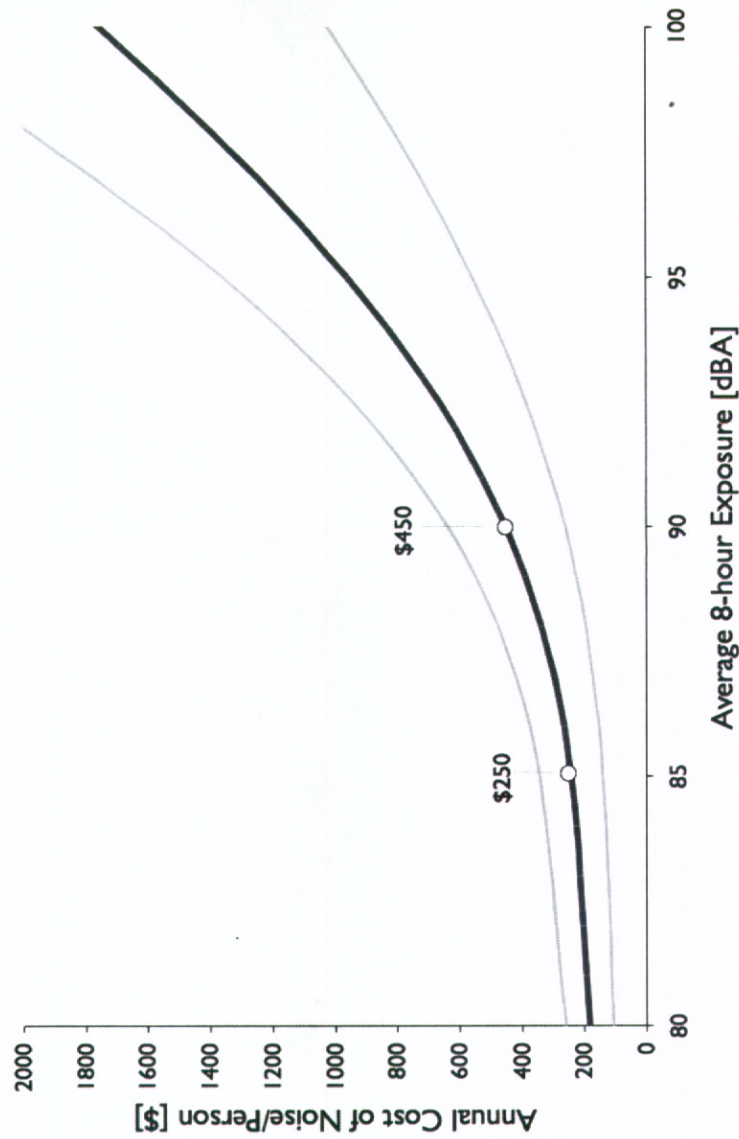


Developing the Case for Buy-Quiet Programs

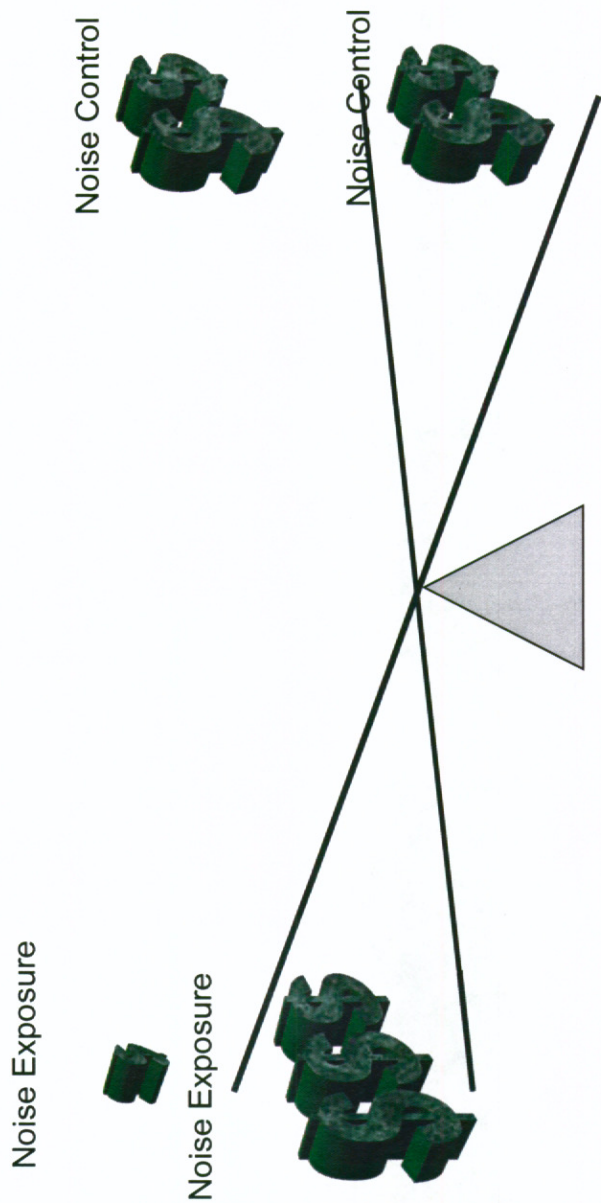
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Is Buy-Quiet ethical?

- Buy-Quiet vs. Buy-Noisy?
- Proper to talk about $\$/\text{dBA}$ with respect to hearing, which cannot be replaced?
 - ✓ $\$/\text{finger}$?
 - ✓ $\$/\text{eye}$?
- Fact: Buy-Noisy + HPDs is *status quo*
- Goal:
 - ✓ Buy-Quiet straightforward and automatic.
 - ✓ Policy directives unnecessary

Making the Case



First Exposure

- Large Industrial Client, 1995
 - ✓ 2,200 employees
 - ✓ 85 dBA @ 1m purchase specification
 - ✓ Typical TWA-8: 88 dBA
- Willing to spend \$20M on noise control to offset future noise exposure costs
 - ✓ Disability claims
 - ✓ Legal expenses

NASA (2007-present)

- Buy-Quiet Process Roadmap
- Broad input from industrial hygienists and equipment manufacturers
- Integrated into NASA acquisition culture

The screenshot shows the EARLAB website interface. At the top left is the NASA logo and the text "NATIONAL AERONAUTICS AND SPACE ADMINISTRATION". Below this is the EARLAB logo, which includes the text "EARLAB", "Education Auditory Research", and "NASA Auditory Demonstration Laboratory". To the right of the logo is the tagline "EDUCATIONAL TOOLS AND RESOURCES THAT ENERGIZE THE PRACTICE OF HEARING CONSERVATION". A search bar with the text "Search this site" and a "SEARCH" button is located at the top right. A navigation menu at the bottom includes links for "Home", "News", "About EARLAB", "Buy-Quiet Purchasing" (highlighted in a dark button), "Product Help", "Products", and "Downloads". A breadcrumb trail at the bottom reads "You are here: Home » Buy-Quiet Purchasing » Buy-Quiet Process Roadmap". Below the breadcrumb trail are the sections "BEFORE YOU START" and "Buy-Quiet Program Requirements".



US Navy working in parallel

- 2005: VA Disability Benefits
 - ✓ Hearing Loss: \$1,102,000,000
 - ✓ 750,000 Cases
 - 78,000 New in 2005
- Noise Evaluation Acquisition Tool (2008)

NIOSH (2011)

- Adapt Buy-Quiet Process Roadmap for Construction Firms
 - ✓ Streamlined procurement
 - ✓ Large number of smaller procurements
 - ✓ Emphasize \$/dBA/person/year



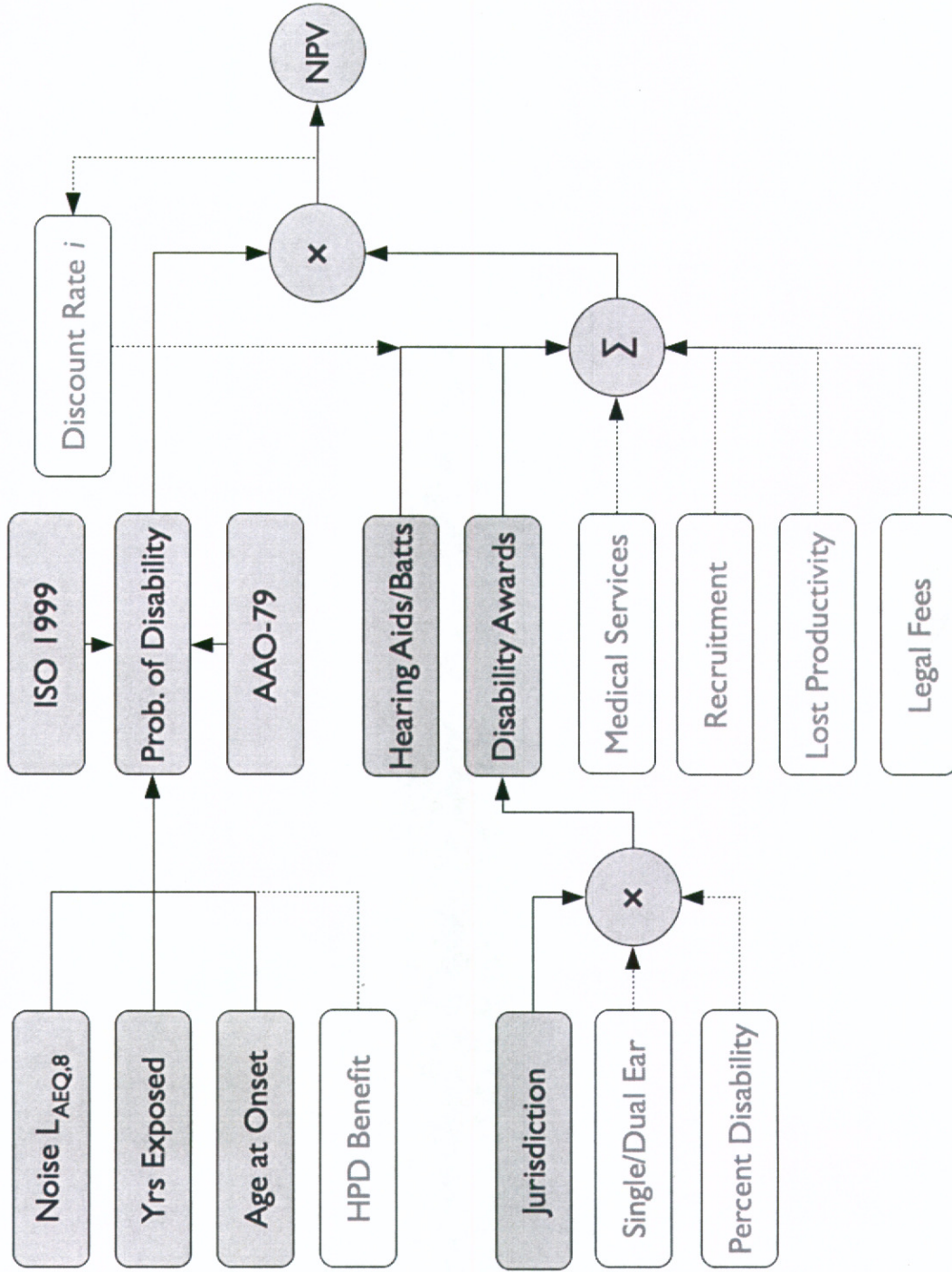
Coolcentric (2011)

- Quieter method of cooling IT equipment
 - ✓ Slightly more expensive
 - ✓ Cost of noise now one of many factors offsetting higher price.
 - ✓ Marginal benefit on the order of \$10k to \$50k per small data center

Nuances

- **Advocacy**
 - ✓ Note other impacts not addressed
- **Simplicity**
 - ✓ Forms, process
- **Accountability**
 - ✓ Sign-offs at appropriate level of responsibility
- **Empowerment**
 - ✓ Explicit policy: spend money if necessary
- **Review**
 - ✓ Gradual progress ≠ failure

Cost of Noise



Cost of disability

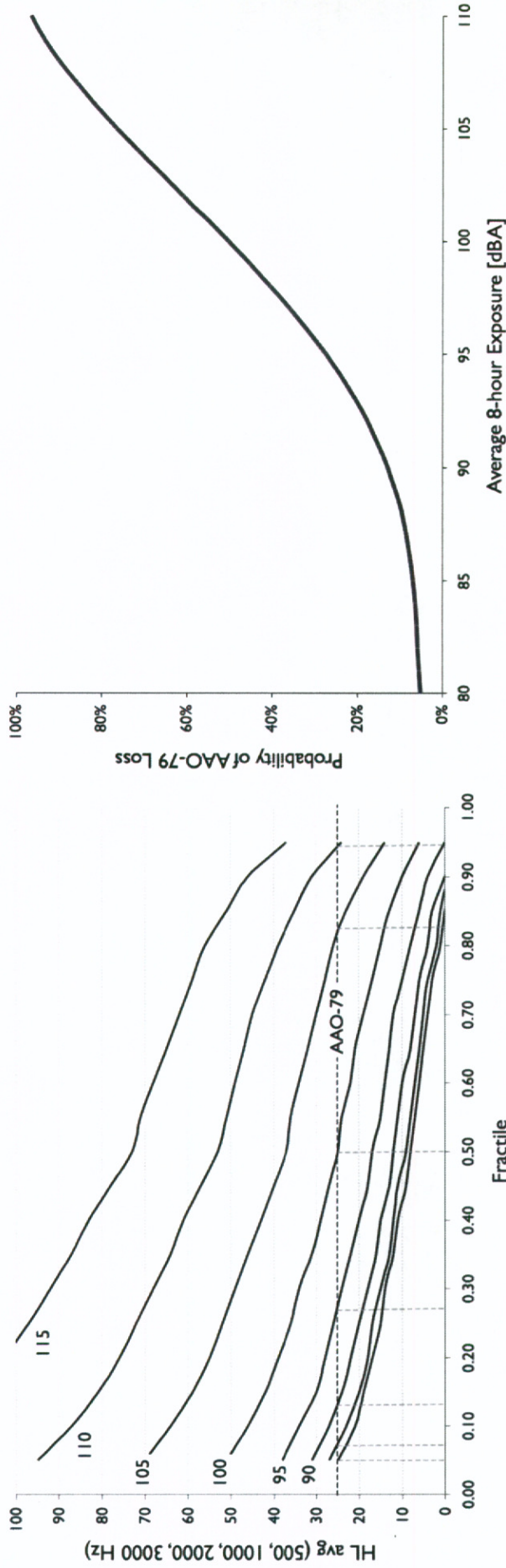
- Cost of Disability
 - ✓ Dual-ear disability claims
 - 30-yr exposure at $L_{AEQ,8hr}$
 - \$66k median (\$22k - \$110k)
 - ✓ Hearing Aids
 - 30 yrs, new every three years
 - Batteries
 - \$39k
 - ✓ Hearing Conservation Program
 - Assume net \$0
 - ✓ Total: \$61k - \$149k

Jurisdiction	1. Is occupational hearing loss compensable?		2. Is minimum noise exposure required for filing?		3. Schedule in weeks (one ear)		4. Schedule in weeks (both ears)		5. Maximum compensation (one ear)		6. Maximum compensation (both ears)	
	Yes	No	Yes	No	53	163	\$11,660	\$35,860				
Alabama	Yes	No	Yes	No	86	260	\$23,100	\$69,300				
Alaska	Yes	No	Yes	No	42	158	\$11,296	\$42,502				
Arizona	Yes	No	Yes	No	50*	311*	\$8,040*	\$58,863*				
Arkansas	Yes	No	Yes	No	35	139	\$5,250	\$20,850				
California	Yes	No	Yes	No	35	104	*	*				
Colorado	Yes	No	Yes	No	75	175	\$30,833	\$71,944				
Connecticut	Yes	No	Yes	No	39	150	\$34,880	\$134,170				
Delaware	Yes	No	Yes	No	18	105	\$8,892	\$51,870				
District of Columbia	Yes	No	Yes*	Yes*	NA	150	NA	NR				
Florida	Yes	No	Yes*	Yes*	NA	150	NA	NR				
Georgia	Yes	No	Yes*	Yes*	NA	150	NA	NR				

excerpt,
The Noise Manual, Berger et. al.



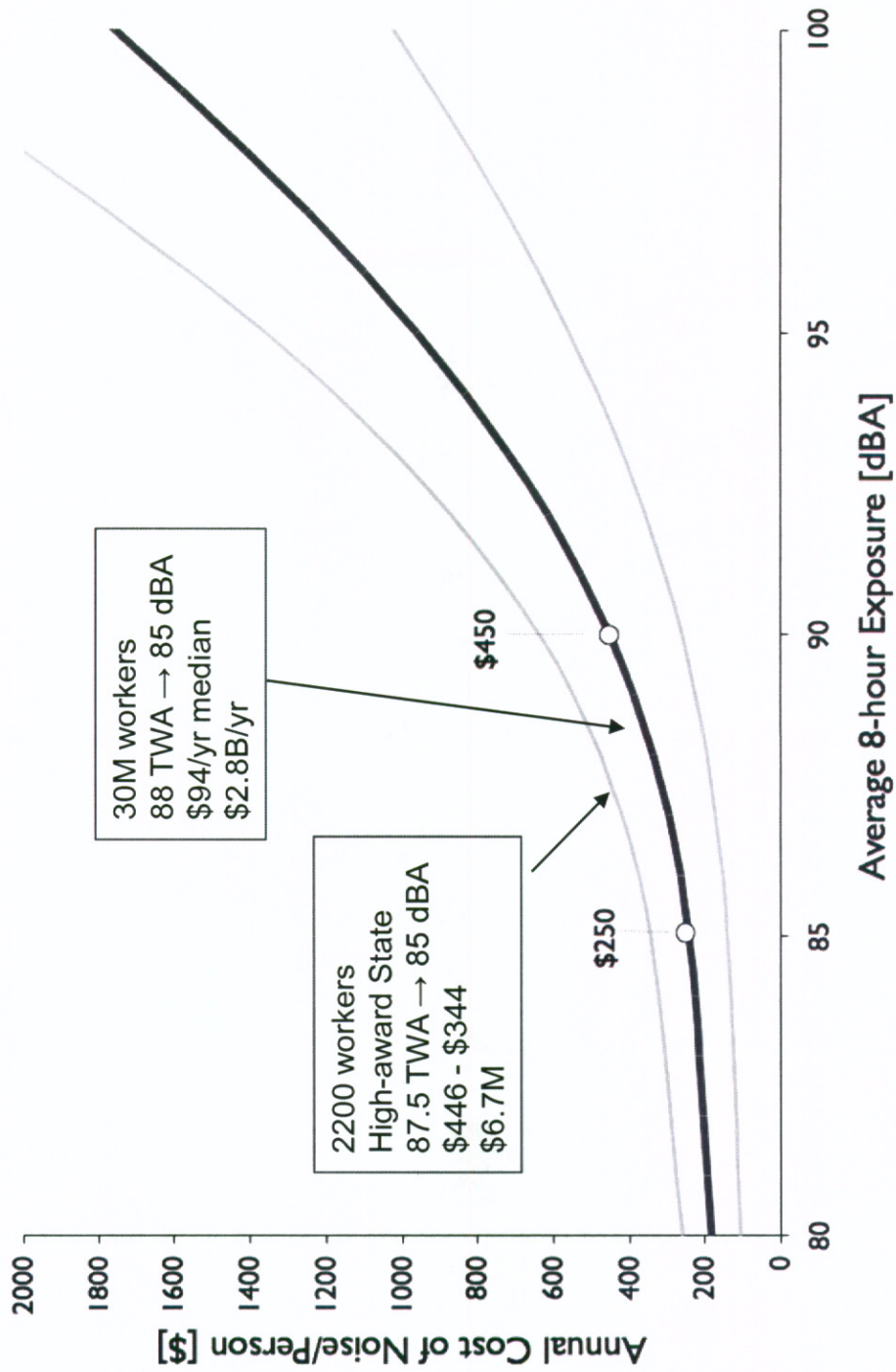
Probability of Disability



- Using ISO 1999
- Compute average HL at 500, 1000, 2000, 3000 Hz
- For various $L_{AEQ,8}$
- Find fractile that gives 25 dB HL
- Polynomial curve fit



Annual Cost

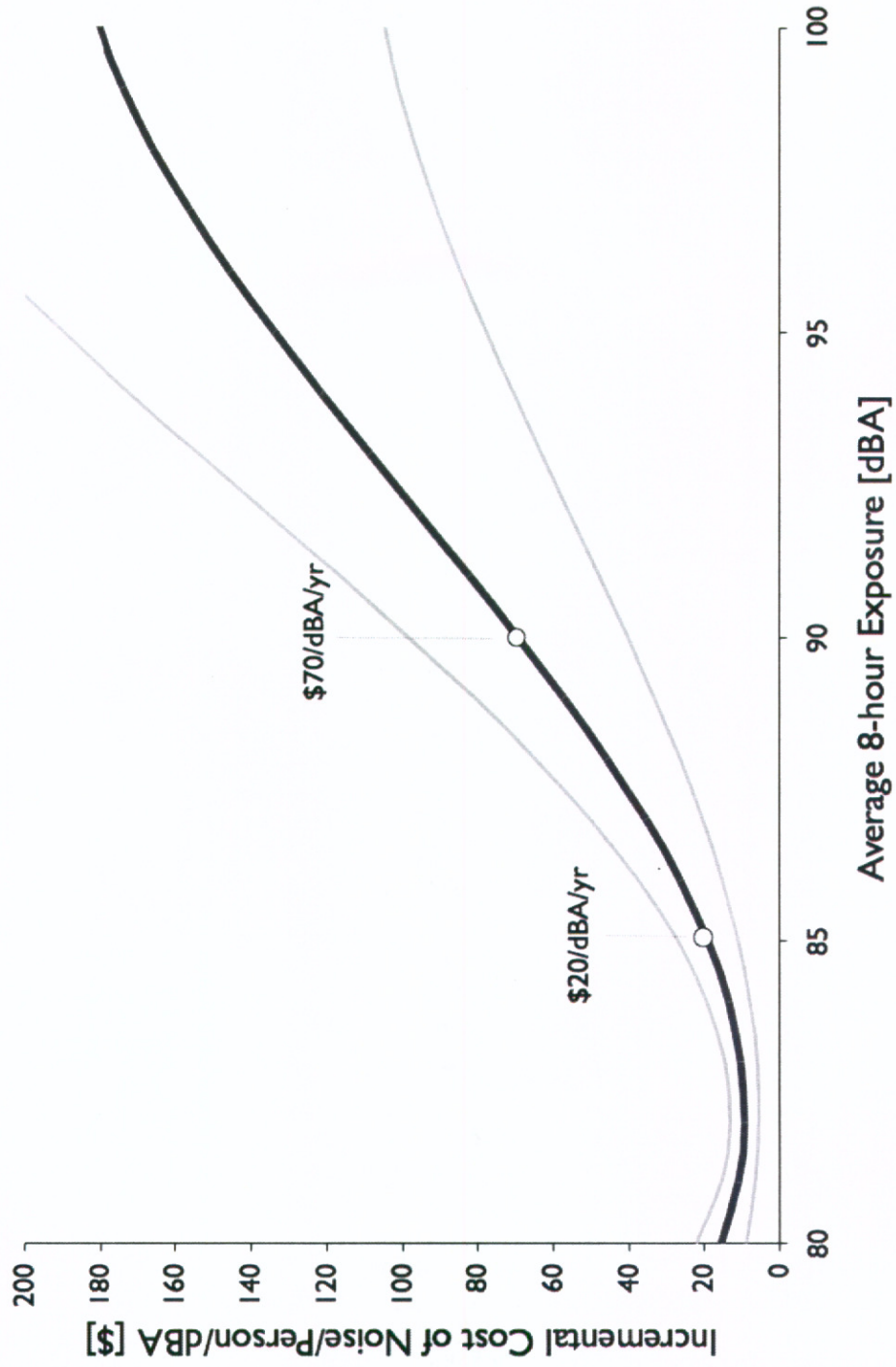


30M workers
88 TWA → 85 dBA
\$94/yr median
\$2.8B/yr

2200 workers
High-award State
87.5 TWA → 85 dBA
\$446 - \$344
\$6.7M

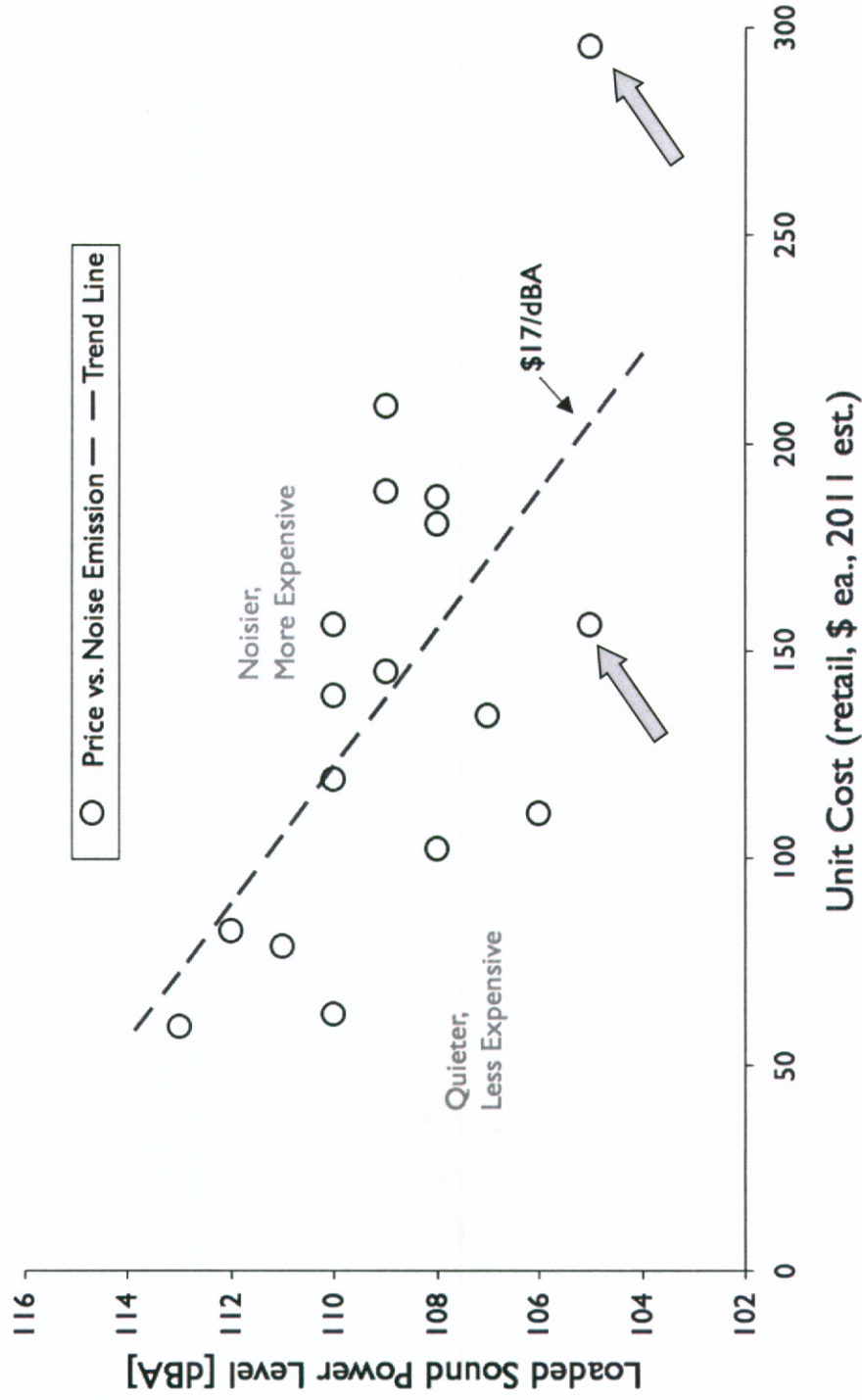


Marginal Cost

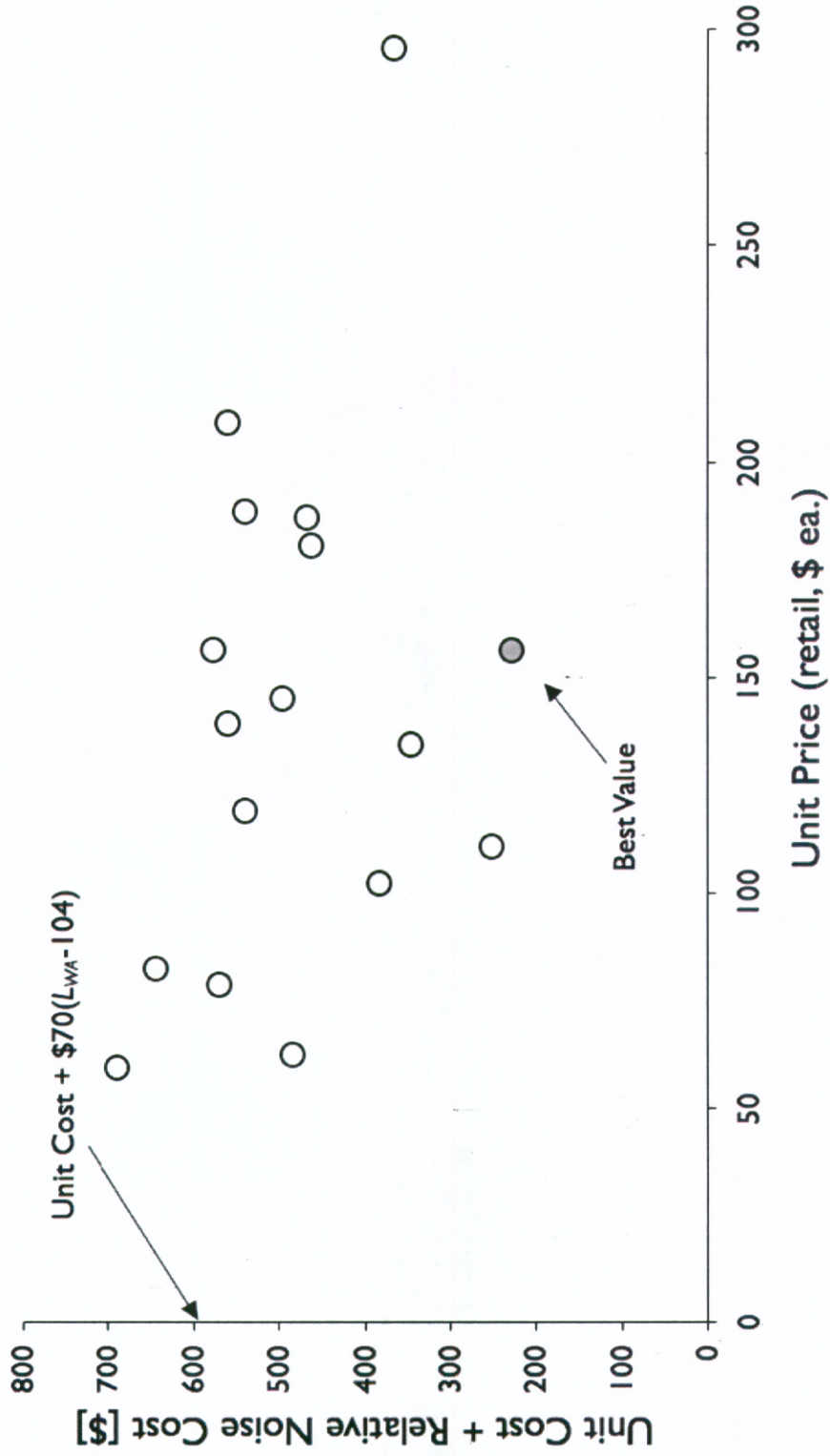


Circular Saws

Price vs. Noise Emission



Best Value Analysis



Buy-Quiet Process Policy Review

Firm: _____
 Date: _____

1. Cycle just completed

- Hearing disability claims
- Accidents involving hearing loss
- Dosimeter trends
- Noisy equipment retired
- Noisy equipment needing retirement
- "Quiet" equipment purchased
- Vendor cooperation
- Marketing successes

2. Next Cycle Commitment

A: Just Do It B: Show Me the Money C: Hold that Line

	Database Low + 2	Database Low + 5	Database Low + 5
No Data (Inventory)	Retire		
dBA Limit	Inv. Low + 2	Inv. Low + 5	Inv. High
Retire	If > Limit	Cost-benefit	N/A
No Data (New)	Reject	Inventory High	Reject
NC Options	Always	Cost-benefit	Always
\$/dBA	N/A	<input type="checkbox"/> \$20/dBA/person/yr <input type="checkbox"/> \$40/dBA/person/yr <input type="checkbox"/> \$60/dBA/person/yr <input type="checkbox"/> \$80/dBA/person/yr <input type="checkbox"/> \$100/dBA/person/yr	N/A
Cost-benefit			
Select:	Quietest	Best Value	No noisier than present

3. Authorization

Purchasing employees are hereby authorized to invest time, effort, and money in the pursuit of low-noise purchases, in accordance with the foregoing instructions.

Signatures _____

4. Date of Next Review: _____



Conclusion

- Buy-Quiet
 - ✓ Temporary “necessary evil”
 - ✓ Goal: “*Just Do It*”
- Noise control “at the source”
 - ✓ Profit motive driving vendors
 - ✓ Will require reliable test methods
- Cost-benefit analysis
 - ✓ Can lower exposure AND save money
- Availability of product data is critical
 - ✓ Comprehensive labeling

Thank you

