

# *Science for Decisions*

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EMEP Conference  
Albany, New York  
October 8, 2003

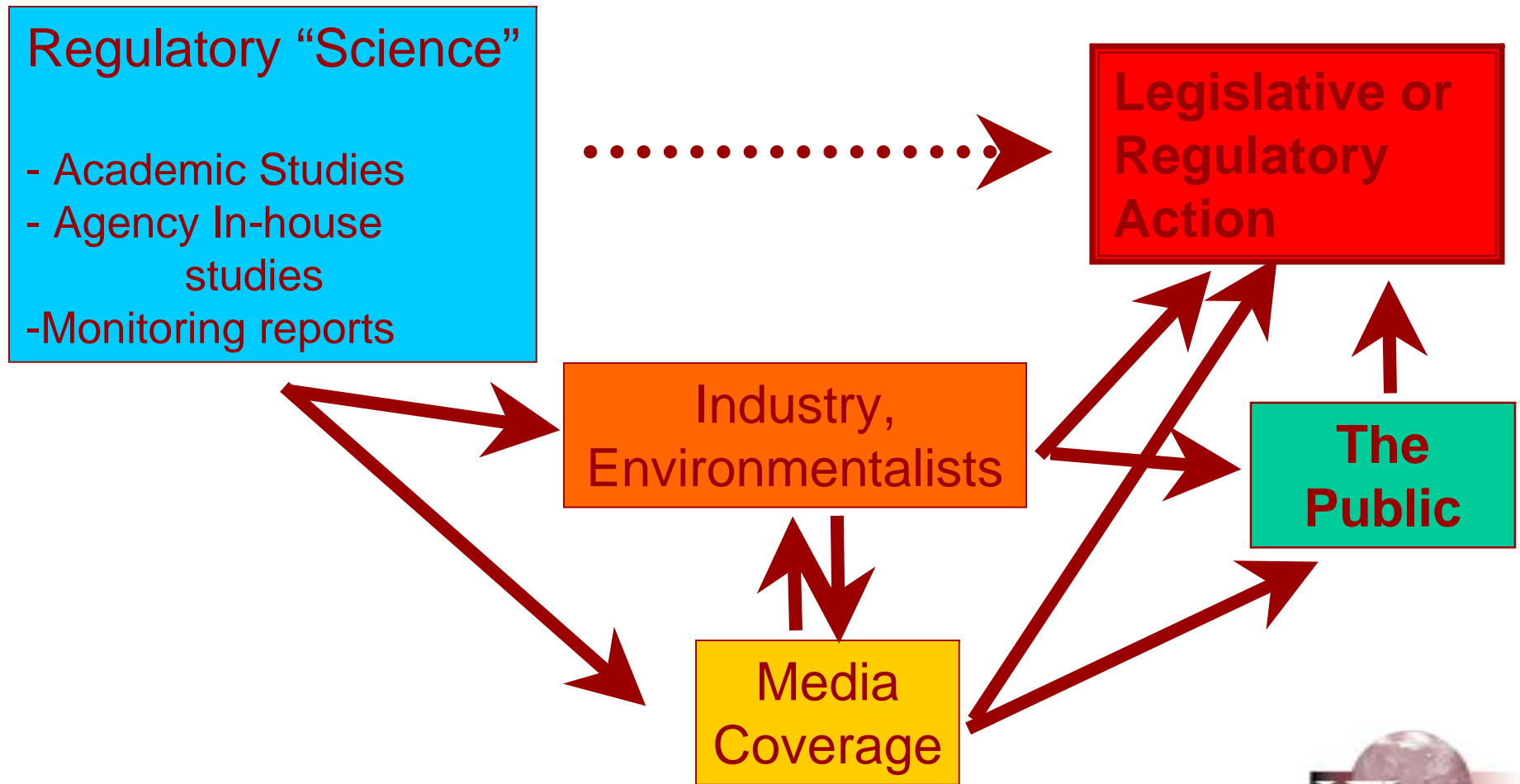


# Science for Decisions

- The Context – How science informs policy
- At the Edge: two very different worlds
- A few suggestions for the science community



# The Context: How “Science” Becomes Rules



# At the Edge:

## *The Two Very Different Worlds of Science and Policy*

- **Scientists** seek long-term, robust “findings” (always with caveats)
  - **Policy Makers** want “answers.” NOW.
- **Scientists:** value objectivity, facts
  - **Policy Makers:** see facts as advocacy tools
- **Scientists:** prefer “basic” science
  - **Policy Makers:** need “applied” science
- **Science:** at its best in controlled laboratory conditions
  - **Policy makers:** want “real-world” effects on humans and ecosystems
- **Scientists:** want science at the center of decisions
  - **Policy makers:** science one among technical, political, economic factors



# Two Worlds in Action:

## *The 1997 PM NAAQS Debate*

- **The Science:**
  - Growing number of epidemiology studies associate health with PM levels
  - Little toxicological evidence of mechanism
- **The Proposal from EPA:**
  - New, more stringent NAAQS for PM<sub>2.5</sub>
- **The Debate:**
  - Some science: No data for PM<sub>2.5</sub>, No mechanism,
  - Hot issue: “Hidden” data (Harvard Six Cities Study)
- **The Hearings: Science and Policy collide**



# Two Different Worlds

- Substantial Differences in approach and needs
- Further complicated by other interpreters
  - Stakeholders, media
- What can the science community do?
  - A few suggestions



# Suggestion:

## *Strategic Science*

- Good science requires a long lead time
- The key policy questions will be shaped by many:
  - Legislators, regulators, environmentalists, industry
- Science needs to better understand what is coming up in the policy world
  - Input from all key parties
- Science started strategically now
  - with a target 5-10 years in the future



# Strategic Science Planning

- NRC Committee on PM Research Needs
  - Created in wake of 1997 debate
  - Developed 14-year “portfolio” of priority research
  - EPA now implementing multi-year research plans
- HEI Strategic Plan
  - Every five years
  - Extensive consultation with decision makers, stakeholders
  - Targeted at major upcoming decisions at 5- and 10- year time frames



# Example: HEI Strategic Plan

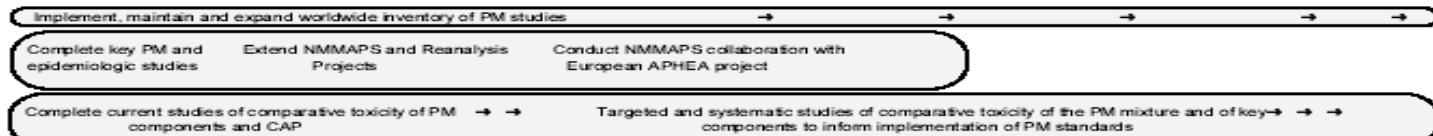
Table 3. Implementing the Strategic Plan

	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005
<b>Major Upcoming Regulatory Events</b>	<ul style="list-style-type: none"> <li>US PM NAAQS Criteria Document</li> <li>Tier 2 Standards</li> <li>EU Heavy-Duty Diesel Standards</li> </ul>	<ul style="list-style-type: none"> <li>Mobile-Source Air Toxics Rules</li> <li>EU Clean Air for Europe</li> <li>US decisions on diesel fuel</li> </ul>	<ul style="list-style-type: none"> <li>US PM NAAQS review</li> </ul>	<ul style="list-style-type: none"> <li>EU PM Limit Values review</li> </ul>	<ul style="list-style-type: none"> <li>US and EU Heavy-Duty Diesel Rules take effect</li> </ul>	<ul style="list-style-type: none"> <li>Looking Ahead</li> <li>State plans for PM</li> <li>2007 Rules for Heavy-Duty Diesel</li> <li>EU/US Auto/Fuel Standards</li> </ul>

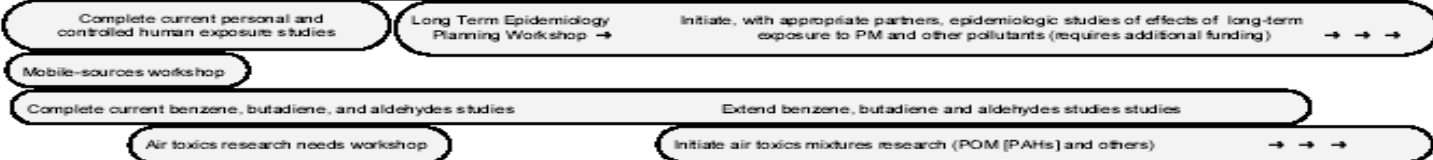
## HEI Strategic Plan 2000–2005

### Air Pollution Mixture

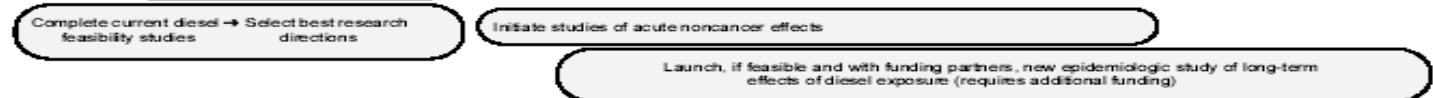
#### • PM and Gases



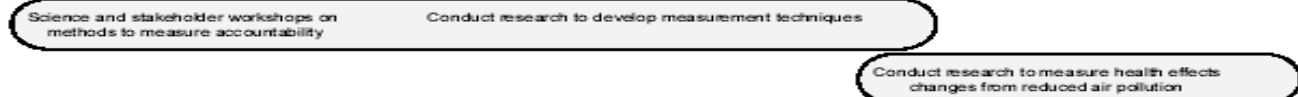
#### • Air Toxics



#### • Diesel Exhaust



### Effects of Regulation (Accountability)



### Emerging Technologies



# Suggestion:

## *Science to Maximize Credibility*

- Individual Scientists Produce Individual Results
  - Some scientists attempt to advocate based on them
  - Stakeholders, Media overemphasize individual studies
- ***Result:***
  - The public, and decision makers, left to choose among conflicting scientific views;



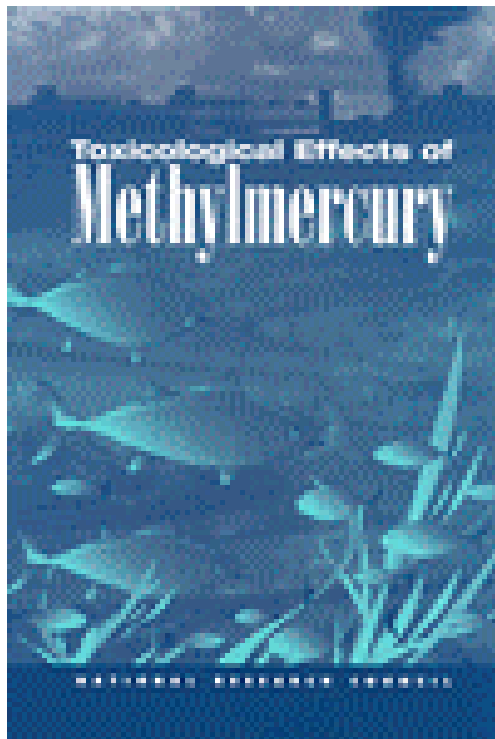
# Suggestion:

## *Science to Maximize Credibility*

- *An Alternative:*
  - Panels of scientists drawing from entire literature
  - Intensive, independent peer review
- *Examples:*
  - Intergovernmental Panel on Climate Change (IPCC)
  - NRC and HEI reports



# *Scientific “consensus” builds credibility*



# Suggestion:

## *Improved Translation, Communication*

- Science and Policy speak different languages
- Science translated for policy makers by many:
  - Agency staff, legislative aides
  - Stakeholders, media
- There are some good translators out there
  - But adversarial nature of process lends itself to distortion, “cherry-picking” the results
- Science Communication will never be perfect
  - But scientists could do a better job



# Thoughts for better communication by scientists

- Recognize that communication **STARTS** (rather than ends) with the publication of the report
  - Be prepared to engage in briefings, hearings, etc. to help get the “story” right
- Learn to write plain English abstracts and summaries
  - Don’t let advocates, media, write them for you
  - Don’t hide behind jargon (e.g. “heart attacks” vs. MI)
- Make clear what we *know*...
  - and what we *don’t know*



# Summary:

## *Improving the way science informs policy*

- Science has a real and important role to play in improving policy
- But it is - and will never be - easy
  - Policy making is a complex and contentious world quite different from the world of science
- Scientists can improve their chances of informing decisions:
  - ***Thinking Ahead***: strategic science planning
  - ***Working Together***: building scientific consensus
  - ***Speaking Plainly***: communicating better



# Thank You

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