

# **EPA's Clean Power Plan & PM<sub>2.5</sub>-related Co-benefits**

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Washington, DC**

**June 11, 2015**

# Major Points

1. Basic Facts about EPA's Clean Power Plan
2. Critique of 'PM<sub>2.5</sub> Co-Benefits' for CPP
3. Three Major Sources Promoting 'PM<sub>2.5</sub> Deaths'  
Pope Created & Defends 'PM<sub>2.5</sub> Deaths'  
Driscoll Exaggerates 'PM<sub>2.5</sub> Deaths' for CPP  
ACS Refuses Independent Analysis of CPS II
4. 'PM<sub>2.5</sub> Deaths' & Lysenko Pseudoscience
5. Conclusions About CPP and 'PM<sub>2.5</sub> Deaths'

# EPA's Clean Power Plan

By 2030, the CPP will: “Cut carbon emission from the power sector by 30 percent nationwide below 2005 levels . . .

Avoid up to 6,600 premature deaths, . . . providing up to \$93 billion in climate and public health benefits.”

<http://blog.epa.gov/blog/2014/06/our-clean-power-plan-will-spur-innovation-and-strengthen-the-economy/> June 2, 2014

The CPP “would govern the estimated 2,417 fossil-fuel-fired power plants in the United States that account for 39 percent of the nation’s CO2 emissions. . . coal makes up about 40 percent of the nation’s electric power. NERA Economic Consulting . . . estimated it would cost between \$366 billion and \$479 billion over the next 15 years to fully comply with the new regulations.”

<http://watchdog.org/218094/clean-power-plan/> May 13, 2015

# PM2.5-related Co-Benefits of EPA's Clean Power Plan

**June 2, 2014 EPA Regulatory Impact Analysis  
Deals with *Clean Air Act Section 111(d)***

(<http://www2.epa.gov/sites/production/files/2014-06/documents/20140602ria-clean-power-plan.pdf>)

*Section 4.3.2 Economic Valuation for Health Co-benefits :*

“Avoided premature deaths account for 98 percent of monetized PM-related co-benefits and over 90 percent of monetized ozone-related co-benefits.”

**Over Two Million Public Comments on CPP Received,  
Including December 1, 2014 Enstrom Comments**

(<http://www.scientificintegrityinstitute.org/JEECPP120114.pdf>)

# Fine Particulate Matter (PM<sub>2.5</sub>) Defined By Size ( $\leq 2.5 \mu\text{m}$ in Diameter)

PM<sub>2.5</sub> is defined by size ( $\leq 2.5 \mu\text{m}$  in diameter), not chemical composition. PM<sub>2.5</sub> is mainly from combustion. Sources: forest fires, agricultural dust, industrial & residential burning, diesel engines (about 5%), and China (up to 30% in CA).

PM<sub>2.5</sub> has been used to establish scientifically & legally contested regulations that have multi-billion dollar economic impacts in US:

- 1) 1997 & 2012 US EPA Annual National Ambient Air Quality Standard (NAAQS) for PM<sub>2.5</sub>:  $15 \mu\text{g}/\text{m}^3$  and now  $12 \mu\text{g}/\text{m}^3$
- 2) 2008 CARB Truck and Bus Regulation for Diesel Vehicles
- 3) 2014 EPA Clean Power Plan Justified by PM<sub>2.5</sub> Co-benefits

# Average US Adult Inhales About 1 Teaspoon of Invisible PM<sub>2.5</sub> in 80 Years

Amount of Air Inhaled by an Adult Breathing at Rest:  
~ 10,000 liters/day = 10 m<sup>3</sup>/day ~ 292 M m<sup>3</sup>/80 years

PM<sub>2.5</sub> Inhaled at NAAQS level of 15 µg/m<sup>3</sup>:  
292 M m<sup>3</sup>/80 years x 15 µg/m<sup>3</sup> ~ 4.38 grams/80 years  
4.38 grams/80 years = 0.88 teaspoons/80 years

Diesel PM Inhaled, Assuming 5% of total PM<sub>2.5</sub>  
0.22 grams/80 years = 0.044 teaspoons/80 years

PM<sub>2.5</sub> Inhaled from 1 Cigarette ~ 0.04 grams

PM<sub>2.5</sub> Inhaled from 100 Cigarettes ~ 4.0 grams

# Evidence of 'PM<sub>2.5</sub> Premature Deaths' Based on 'Secret Science' Since 1993

**Dockery, Pope, et al. NEJM 1993** “An association between air pollution and mortality in six U.S. cities” (H6CS)

**Pope, Thun, et al. AJRCCM 1995** “Particulate air pollution as predictor of mortality in prospective study of U.S. adults” (CPS II)

**Laura Johannes Wall Street Journal April 7, 1997**

“Pollution study sparks debate over secret data”

**SCIENCE July 25, 1997** “Showdown Over Clean Air Science”  
& “Researchers and Lawmakers Clash Over Access to Data”

**Lamar Smith Wall Street Journal July 30, 2013**

“The EPA’s Game of Secret Science”

# EPA PM<sub>2.5</sub> Regulations Largely Justified by Assumed \$10 Million 'Value of Statistical Life' for Each 'PM<sub>2.5</sub> Premature Death'

A relative risk (RR) greater than 1.0 for epidemiologic relationship between PM<sub>2.5</sub> and total mortality is basis for EPA claim that PM<sub>2.5</sub> **causes** 'premature deaths.'

Because EPA assumes a 'value of statistical life (VLS)' of \$10 million for each 'premature death,' there are health benefits associated with EPA PM<sub>2.5</sub> regulations only if PM<sub>2.5</sub> actually **causes** 'premature deaths.'

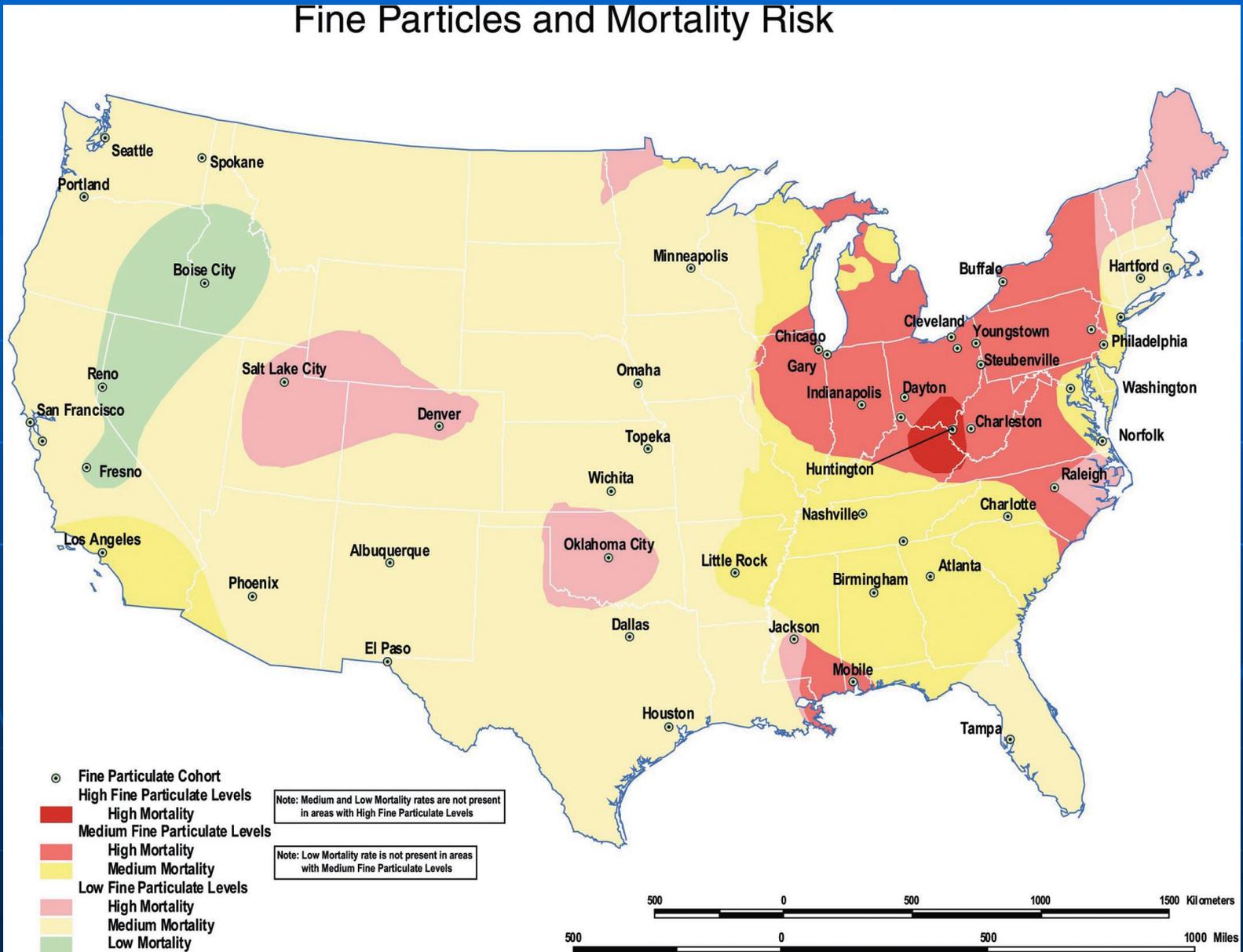
# Problems with 'PM<sub>2.5</sub> Premature Deaths'

- 1) Ecological Fallacy:** PM<sub>2.5</sub> measurements from monitoring stations are assumed to apply to all nearby individuals
- 2) Confounding Variables:** numerous confounders & pollutants weaken PM<sub>2.5</sub>-mortality relationship in cohort studies
- 3) Secret Data:** investigators controlling major PM<sub>2.5</sub> databases (ACS and Harvard) refuse to allow independent analysis
- 4) Definition of PM<sub>2.5</sub>:** PM<sub>2.5</sub> is defined as particles  $\leq 2.5 \mu\text{m}$  in diameter, but its composition varies greatly across US
- 5) Geographic Variation:** extensive evidence of geographic variation across US in PM<sub>2.5</sub>-mortality risk, with no risk in CA
- 6) Temporal Variation:** extensive evidence of temporal variation in PM<sub>2.5</sub>-mortality risk, with most risk before 1990 and little since

# 2000 Krewski Jerrett HEI Report Figure 21

## 1982-1989 CPS II PM<sub>2.5</sub> Mortality Risk <1.0 in CA

Fine Particles and Mortality Risk



# PM<sub>2.5</sub> & Total Mortality in California: RR (95% CI)

(<http://www.scientificintegrityinstitute.org/ASAS092812.pdf>)

McDonnell 2000 (9 air sheds)	AHSMOG	RR ~ 1.03 (0.95-1.12)	1976-1992
Krewski 2000 (4 MSAs, reported in 2010)	CA CPS II	RR = 0.87 (0.81-0.94)	1982-1989
Enstrom 2005 (11 cos & 25 cos)	CA CPS I	RR = 1.00 (0.98-1.02)	1983-2002
Zeger 2008 (CA + OR + WA)	MCAPS "West"	RR = 0.99 (0.97-1.01)	2000-2005
Krewski 2010 (4 MSAs)	CA CPS II	RR = 0.96 (0.92-1.00)	1982-2000
Jerrett 2010-11 (Nine Model Average)	CA CPS II	RR = 1.00 (0.99-1.01)	1982-2000
Lipsett 2011	CA Teachers	RR = 1.01 (0.95-1.09)	2000-2005
Jerrett 2013 (Conurbation LUR Model Only)	CA CPS II	RR = 1.06 (1.00-1.12)	1982-2000
Enstrom 2015	CA NIH AARP	RR ~ 1.03 (1.00-1.06)	1997-2010

# 2009 Krewski Jerrett Pope HEI Report 140: Follow-up of ACS CPS II National Cohort During 1982-2000 for PM<sub>2.5</sub> and Total Mortality (Table 33)

Combining CPS II results from Pope 1995, Pope 2002, and Krewski 2009 shows PM<sub>2.5</sub>-mortality relationship is very weak since 1990 with no relationship since 1999, and ACS refuses to analyze deaths since 2000

<u>Author-year Reference</u>	<u>Follow-up</u>	<u>RR (95% CI)</u>
Pope 1995 equivalent	1982-1989	1.048 (1.022 - 1.076)
Pope 2002 equivalent	1982-1998	1.031 (1.015 - 1.047)
Krewski 2009	1982-2000	1.028 (1.014 - 1.043)
Pope 1995 equivalent	1982-1989	1.048 (1.022 - 1.076)
Pope 2002 latest years	1990-1998	1.021 (1.002 - 1.041)
Krewski 2009 latest years	1999-2000	1.014 (0.980 - 1.049)

# August 1, 2013 US House Science Committee Subpoena of “Secret Science” Data Used by EPA for Deaths Related to PM<sub>2.5</sub> & Ozone

## Seven Subpoenaed Papers Based on Original Two Papers

1993 Dockery Pope NEJM Paper (H6CS has 1% of Data)

1995 Pope Thun AJRCCM Paper (ACS CPS II has 99% of Data)

Jerrett et al. 2009 NEJM 360:1085-1095 (CPS II)

Krewski et al. 2000 Health Effects Institute Report (H6CS+CPS II)

Pope et al. 2002 JAMA 287:1132-1141 (CPS II)

Pope et al. 2009 NEJM 360:376-386 (Public Data)

Laden et al. 2006 AJRCCM 173:667-672 (H6CS)

Krewski et al. 2009 Health Effects Institute Report 140 (CPS II)

Lepeule et al. 2012 EHP 120(7):965-970 (H6CS)

# **“Secret Science Reform Act of 2015”**

**Initiated by US House Science Committee in 2014 after  
2011-2013 Letters to EPA and 2013 Subpoena of EPA failed**

**“To prohibit the Environmental Protection Agency from  
proposing, finalizing, and disseminating regulations  
or assessments based upon science that is  
not transparent or reproducible.”**

**H.R. 1030 Approved by US House 241 to 175  
on March 18, 2015**

**S. 544 Approved by US Senate Environment &  
Public Works Committee 11 to 9 on April 28, 2015,  
with a vote in the full Senate expected**

# C. Arden Pope, Ph.D., BYU Economics

(“World’s Leading Expert on the Effects of Air Pollution on Health”)

Cited Enstrom 2005 in Pope & Dockery 2006, but not since

Ignored July 2008 CARB teleconference re CA findings

Ignored serious criticism of 2008 CARB Tran Report

Ignored 2010 CARB PM2.5 Symposium re CA findings

Refused to debate Enstrom at 2011 NorAm Epi Congress

Ignored serious criticism of Jerrett 2011 Report for CARB

Ignored Aug 1, 2013 House Science Committee Subpoena

Omitted null findings in Sep 1, 2013 Jerrett AJRCCM paper

Ignored Nov 15, 2013 evidence of his scientific misconduct  
(<http://www.scientificintegrityinstitute.org/Pope111513.pdf>)

# Charles T. Driscoll, Ph.D., Syracuse U Engineering

May 4, 2015 *Nature Climate Change* paper “US power plant carbon standards and clean air and health co-benefits”

## False Claims in Paper

“The results underscore that carbon standards to curb global climate change can also provide immediate and local and regional health benefits . . .”

“The greatest health co-benefits occur under scenario 2, which results in 3,500 estimated premature deaths avoided annually by 2020 (Table 2) [out of 2,600,000 annual US deaths].”

Driscoll is not an expert in epidemiology or statistics. Co-authors Jonathan I. Levy & Joel D. Schwartz “derived concentration–response functions” from Roman 2008 and Fann 2012 and exaggerated current PM<sub>2.5</sub> mortality risk. JIL & JDS advised on discredited 2008 CARB Tran Report<sub>16</sub>

**American Cancer Society Officials  
(Otis Brawley, M.D., Susan Gapstur, Ph.D.,  
Michael Thun, M.D., and Alpa Patel, Ph.D.)  
Refuse to Clarify CPS II Findings re PM<sub>2.5</sub>**

**ACS Refused to Comply with 2013 House Subpoena and  
has provided NO CPS II Data for Independent Analysis**

**ACS Refused to Cooperate with Qualified Ph.D.-level PM<sub>2.5</sub>  
Critics, including Drs. Enstrom, Young, and Briggs**

**ACS Violated CPS II Subject Confidentiality by Allowing  
Home Addresses for Use in Jerrett 2013 AJRCCM Paper**

**ACS is Directly Involved with EPA Regulatory Policy on  
an Issue Unrelated to Cancer and ACS Will NOT Back Off**

**(<http://www.scientificintegrityinstitute.org/GapsturEns092013.pdf>)**

**(<http://www.scientificintegrityinstitute.org/Patel112513.pdf>)**

**May 29, 2015 Enstrom Email Request to Key 'PM<sub>2.5</sub>' Scientists Asking for Response (Attendance at ICC-10 Panel 8 or Email Message) Regarding PM<sub>2.5</sub>-related Co-benefits for EPA's Clean Power Plan**

- 1) Do you believe that PM<sub>2.5</sub> currently causes premature deaths in the U.S.?**
- 2) Do you believe that EPA should continue to defy the Secret Science Reform Act of the U.S. Congress?**
- 3) Are concerned about the April 11, 2015 Lancet Comment by Editor Richard Horton?**

# **‘Congress’s Attacks on Science-Based Rules’**

**Insights by UCS Andrew A. Rosenberg & 14 Others**

**May 29, 2015 SCIENCE Vol 348 Pages 964-966**

**“There is a growing and troubling assault on using credible scientific knowledge in U.S. government regulation that will put science and democracy at risk if unchecked. . . .**

**Further, public trust in science increases when we all have access to the same base of knowledge. To that end, we must improve and fully implement conflict of interest and disclosure standards and strengthen peer review while increasing the public accessibility of scientific information. The stakes are high, as our collective well-being and the strength of our democracy depend upon our success.”**<sup>19</sup>

# **‘Science Has Taken A Turn Toward Darkness’**

**Lancet Comment by Editor Richard Horton**

**April 11, 2015 The Lancet Vol 385 Page 1380**

**“‘A lot of what is published is incorrect.’ . . . one of the most sensitive issues in science today: the idea that something has gone fundamentally wrong with one of our greatest human creations.**

**The case against science is straightforward: much of the scientific literature, perhaps half, may simply be untrue. Afflicted by studies with small sample sizes, tiny effects, invalid exploratory analyses, and flagrant conflicts of interest, together with an obsession for pursuing fashionable trends of dubious importance, science has taken a turn towards darkness.”**

# **‘Scientists Who Cheat’**

**June 1, 2015 New York Times Editorial**

**“Cheating in scientific and academic papers is a longstanding problem, but it is hard to read recent headlines and not conclude that it has gotten worse.**

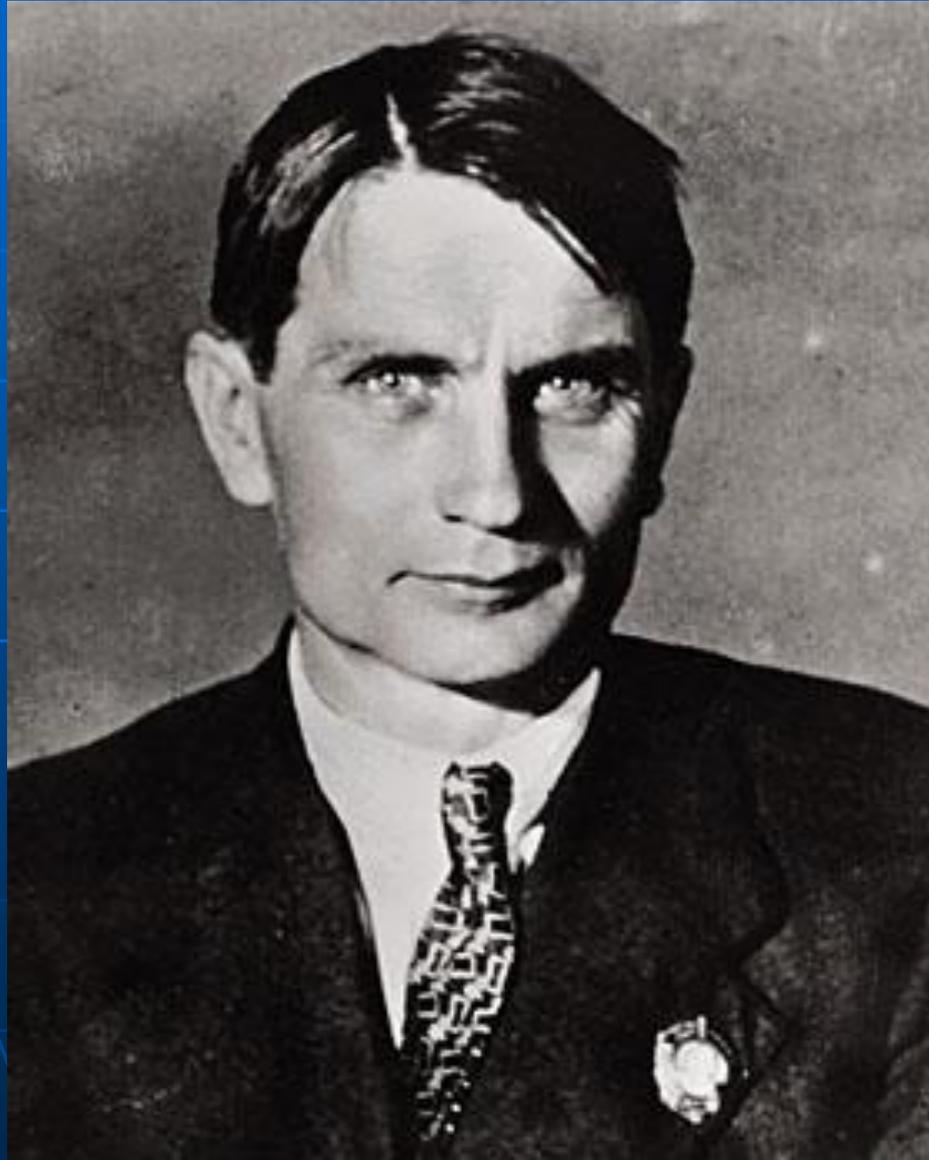
**The scientific community clearly needs to build a better safety net.**

**It can start by ensuring that scientists, especially peer reviewers, are allowed to see the underlying data of a paper, which researchers are typically reluctant to share.”**

# Nikolai I. Vavilov (1887-1943)



# Trofim D. Lysenko (1898-1976)



# Lysenko Pseudoscience

Lysenko, non scientist, gained favor of Stalin

Made false crop claims & used phony plant genetics

Ignored genuine Mendelian plant genetics

Purged opposing scientists, like Vavilov

Famines resulted and Soviet citizens starved

Soviet agriculture was set back decades

# Particulate Matter Pseudoscience

A few activist scientists publish most major papers

Dissenting scientists are poorly funded & ignored

ACS 'secret science' findings cannot be checked

Activists from ALA, UCS, NRDC file demand lawsuits

EPA, CARB, local agencies exaggerate health effects

Unproven 'PM<sub>2.5</sub> Premature Deaths' used to justify

strict EPA regulations which hurt general public

# Conclusions About Clean Power Plan & PM<sub>2.5</sub>-related Co-benefits

- 1) CPP should not be implemented if a proper cost-benefit analysis shows that it is not scientifically & economically justified
- 2) CPP should not be implemented if it will not have a measurable impact on Global Climate Change
- 3) CPP should not be implemented if PM<sub>2.5</sub>-related co-benefits are minimal based on independent analysis of 'secret science' data