

APPENDIX D - Presentation by Jin Kim, U.S. EPA

Co-control Benefits Analyses of GHG Mitigation in the U.S.

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Climate Change and Impacts

- 1) Ecosystems
- 2) Water Resources
- 3) Food Production
- 4) Coastal Systems
- 5) Human Health

Co-control Benefits Analysis

Quantifying/Monetizing the public health and environmental benefits of benefits of greenhouse gas reduction measures.

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Co-Benefits Overview

Fossil fuel combustion typically results in emissions of both carbon dioxide and other pollutants (e.g., SO₂, NO₂, CO, VOC, and PM). GHG mitigation policies reduce GHG emissions and other pollutants. Thus, greenhouse gas mitigation can lead to improvements in air and water quality.

1) Primary Benefits

- a) Human Health: Heat-related Mortality, Infectious Diseases.
- b) Water Supply and Quality
- c) Forest Composition
- d) Other Ecological Benefits

2) Secondary Benefits (Local Air Pollution Benefits)

- a) Human Health : Air Pollution Mortality (PM) and Morbidity (Ozone)
- b) Agricultural Crops : Increase in Yields
- c) Ecological Benefits

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Steps in Co-benefits Analysis

- 1) Simulate GHG mitigation policy's impact on fossil fuel consumption
(Emission Baseline)
- 2) Determine changes in emissions of conventional pollutants
(Emission Changes)
- 3) Assess changes in environmental quality
(Concentration)
- 4) Relate changes in environmental quality to changes in human health
(Health Effects Analysis)
- 5) Monetize health impacts
(Economic Valuation Analysis)

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Review of Health Effects Studies in U.S.

1) Mortality

- Cross-sectional studies
- Daily mortality studies
- Cohort mortality studies

2) Morbidity

- Clinical studies
- Daily morbidity studies
- Cohort morbidity studies.

Pope et. al.

Mortality averaged approximately 4-5% higher for each 50 ug/m³ increase in PM concentration.

EPA Report

The mean forecasted number for the avoided premature mortality in 1990 is 184,000.

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Review of Economic Valuation Studies in U.S.

1) Mortality

- Contingent Valuation Methods
- Cost of Death
- Wage-risk Studies (WTP)

2) Morbidity

- Contingent Valuation Methods
- Cost of Illness
- Medical Demand Approaches

EPA Report

Mortality: \$4.8 million per case
Morbidity: \$5 to 80 per case

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Review of Health Effects and Valuation Studies in U.S.

Recent OEE Co-benefit Analysis.

(Domestic stabilization of carbon emissions at 1990 levels in 2010)

1) Emissions

	Baseline	1990 Stabilization	Ratio
PM ₁₀	42,955 tons/year	37,125 tons/year	86.43%
No _x	777,012 tons/year	666,899 tons/year	86.27%

2) Health Effects

	Avoided Incidence	Monetary Benefits
Mortality (age 30+)	11,000 cases/year	51,000 millions
Morbidity (Resp. Sym)	5,000,000 cases/year	95 millions

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Discussion

- 1) Are Co-benefits useful?
- 2) Can Benefits Transfer?
- 3) Integrated Economic models

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