

considerable value to the public of the benefits that could not be monetized. A full listing of the benefit categories that could not be quantified or monetized in our estimate are provided in Table V.E–5.

In summary, EPA's primary estimate of the benefits of the rule are approximately \$81 + B billion in 2030. In 2020, total monetized benefits are approximately \$43 + B billion. These estimates account for growth in real gross domestic product (GDP) per capita

between the present and the years 2020 and 2030. As the table indicates, total benefits are driven primarily by the reduction in premature fatalities each year, which account for over 90 percent of total benefits.

TABLE V.E–1.—REDUCTIONS IN INCIDENCE OF PM-RELATED ADVERSE HEALTH EFFECTS ASSOCIATED WITH THE PROPOSED NONROAD DIESEL ENGINE AND FUEL STANDARDS

Endpoint	Avoided incidence ^a (cases/year)	
	2020	2030
Premature mortality ^b —Base estimate: Long-term exposure (adults, 30 and over)	5,200	9,600
Chronic bronchitis (adults, 26 and over)	3,600	5,700
Non-fatal myocardial infarctions (adults, 18 and older)	9,200	16,000
Hospital admissions—Respiratory (adults, 20 and older) ^c	2,400	4,500
Hospital admissions—Cardiovascular (adults, 20 and older) ^d	1,900	3,800
Emergency Room Visits for Asthma (18 and younger)	3,600	5,700
Acute bronchitis (children, 8–12)	8,400	14,000
Lower respiratory symptoms (children, 7–14)	92,000	150,000
Upper respiratory symptoms (asthmatic children, 9–11)	77,000	110,000
Work loss days (adults, 18–65)	650,000	960,000
Minor restricted activity days (adults, age 18–65)	3,900,000	5,700,000

Notes:

^a Incidences are rounded to two significant digits.

^b Premature mortality associated with ozone is not separately included in this analysis.

^c Respiratory hospital admissions for PM includes admissions for COPD, pneumonia, and asthma.

^d Cardiovascular hospital admissions for PM includes total cardiovascular and subcategories for ischemic heart disease, dysrhythmias, and heart failure.

TABLE V.E–2.—EPA PRIMARY ESTIMATE OF THE ANNUAL QUANTIFIED AND MONETIZED BENEFITS ASSOCIATED WITH IMPROVED PM AIR QUALITY RESULTING FROM THE PROPOSED NONROAD DIESEL ENGINE AND FUEL STANDARDS

Endpoint	Monetary Benefits ^{a, b} (millions 2000\$, adjusted for income growth)	
	2020	2030
Premature mortality ^c Long-term exposure (adults, 30 and over)	\$39,000	\$74,000
Chronic bronchitis (WTP valuation; adults, 26 and over)	1,600	2,600
Non-fatal myocardial infarctions	750	1,300
Hospital Admissions from Respiratory Causes ^d	38	74
Hospital Admissions from Cardiovascular Causes ^e	40	80
Emergency Room Visits for Asthma	1	2
Acute bronchitis (children, 8–12)	3	5
Lower respiratory symptoms (children, 7–14)	2	3
Upper respiratory symptoms (asthmatic children, 9–11)	2	3
Work loss days (adults, 18–65)	90	130
Minor restricted activity days (adults, age 18–65)	210	320
Recreational visibility (86 Class I Areas)	1,200	1,900
Total Monetized Benefits ^f	43,000 + B	81,000 + B

Notes:

^a Monetary benefits are rounded to two significant digits.

^b Monetary benefits are adjusted to account for growth in real GDP per capita between 1990 and the analysis year (2020 or 2030).

^c Valuation assumes the 5 year distributed lag structure described earlier. Results reflect the use of two different discount rates; a 3% rate which is recommended by EPA's Guidelines for Preparing Economic Analyses (US EPA, 2000a), and 7% which is recommended by OMB Circular A–94 (OMB, 1992).

^d Respiratory hospital admissions for PM includes admissions for COPD, pneumonia, and asthma.

^e Cardiovascular hospital admissions for PM includes total cardiovascular and subcategories for ischemic heart disease, dysrhythmias, and heart failure.

^f B represents the monetary value of the unmonetized health and welfare benefits. A detailed listing of unquantified PM, ozone, CO, and NMHC related health effects is provided in Table V.E–5.

The estimated social cost (measured as changes in consumer and producer surplus) in 2030 to implement the final rule from Table V.F–2 is \$1.5 billion (2000\$). Thus, the net benefit (social

benefits minus social costs) of the program at full implementation is approximately \$79 + B billion. In 2020, partial implementation of the program yields net benefits of \$42 + B billion.

Therefore, implementation of the final rule is expected to provide society with a net gain in social welfare based on economic efficiency criteria. Table V.E–3 presents a summary of the benefits,