

TABLE V.E-5.—ADDITIONAL, NON-MONETIZED BENEFITS OF THE PROPOSED NONROAD DIESEL ENGINE AND FUEL STANDARDS—Continued

Pollutant	Unquantified effects
Nitrogen and Sulfate Deposition Welfare.	Impacts of acidic sulfate and nitrate deposition on commercial forests. Impacts of acidic deposition to commercial freshwater fishing. Impacts of acidic deposition to recreation in terrestrial ecosystems. Reduced existence values for currently healthy ecosystems. Impacts of nitrogen deposition on commercial fishing, agriculture, and forests. Impacts of nitrogen deposition on recreation in estuarine ecosystems. Damage to ecosystem functions.
CO Health	Premature mortality. ^a Behavioral effects.
HC Health ^b	Cancer (benzene, 1,3-butadiene, formaldehyde, acetaldehyde).
HC Welfare	Direct toxic effects to animals. Bioaccumulation in the food chain. Damage to ecosystem function. Odor.

Notes:

^a Premature mortality associated with ozone and carbon monoxide is not separately included in this analysis. In this analysis, we assume that the ACS/Krewski, *et al.* C-R function for premature mortality captures both PM mortality benefits and any mortality benefits associated with other air pollutants. A copy of Krewski, *et al.*, can be found in Docket A-99-06, Document No. IV-G-75.

^b Many of the key hydrocarbons related to this rule are also hazardous air pollutants listed in the Clean Air Act.

F. Economic Impact Analysis

An Economic Impact Analysis (EIA) was prepared to estimate the economic impacts of this proposal on producers and consumers of nonroad engines and equipment and related industries. The Nonroad Diesel Economic Impact Model (NDEIM), developed for this analysis, was used to estimate market-level changes in price and outputs for affected engine, equipment, fuel, and application markets as well as the social costs and their distribution across economic sectors affected by the program. This section presents the results of the economic impact analysis. A detailed description of the NDEIM, the model inputs, and several sensitivity analyses can be found in chapter 10 of the Draft Regulatory Impact Analysis prepared for this proposal.

1. What Is an Economic Impact Analysis?

Regulatory agencies conduct economic impact analyses of potential regulatory actions to inform decision makers about the effects of a proposed regulation on society's current and future well-being. In addition to informing decision makers within the Agency, economic impact analyses are conducted to meet the statutory and administrative requirements imposed by Congress and the Executive office. The Clean Air Act requires an economic impact analysis under section 317, while Executive Order 12866—Regulatory Planning and Review requires Executive Branch agencies to perform benefit-costs analyses of all rules it deems to be "significant" (typically over \$100 million annual social costs) and submit these analyses

to the Office of Management and Budget (OMB) for review. This economic impact analysis estimates the potential market impacts of the proposed rule's compliance costs and provides the associated social costs and their distribution across stakeholders for comparison with social benefits (as presented in Section V.E).

2. What Is EPA's Economic Analysis Approach for This Proposal?

The underlying objective of an EIA is to evaluate the effect of a proposed regulation on the welfare of affected stakeholders and society in general. Using information on the expected compliance costs of the proposed program as presented in the preceding discussion, this EIA explores how the companies that produce nonroad diesel engines, equipment, or fuel may change their production behavior in response to the costs of complying with the standards. It also explores how the consumers who use the affected products may change their purchasing decisions. For example, the construction industry may reduce purchases if the prices of nonroad diesel equipment increase, thereby reducing the volume of equipment sold (or market demand) for such equipment. Alternatively, the construction industry may pass along these additional costs to the consumers of their final goods and services by increasing prices, which would mitigate the potential impacts on the purchases of nonroad diesel equipment.

The conceptual approach of the NDEIM is to link significantly affected markets to mimic how compliance costs will potentially ripple through the economy. The compliance costs will be

directly borne by engine manufacturers, equipment manufacturers, and petroleum refineries. Depending on market characteristics, some or all of these compliance costs will be passed on through the supply chain in the form of higher prices extending to producers and consumers in the application markets (*i.e.*, construction, agriculture, and manufacturing). The NDEIM explicitly models these linkages and estimates behavioral responses that lead to new equilibrium prices and output for all related markets and the resulting distribution of costs across stakeholders.

The NDEIM uses a multi-market partial equilibrium approach to track changes in price and quantity for 60 integrated product markets, as follows:

- 7 diesel engine markets (less than 25 hp, 26 to 50 hp, 51 to 75 hp, 76 to 100 hp, 101 to 175 hp, 176 to 600 hp, and greater than 600 hp; the EIA includes more horsepower categories than the standards, allowing more efficient use of the engine compliance cost estimates developed for this proposal).
- 42 diesel equipment markets (7 horsepower categories within 7 application categories: agricultural, construction, general industrial, pumps and compressors, generator and welder sets, refrigeration and air conditioning, and lawn and garden; there are 7 horsepower/application categories that did not have sales in 2000 and are not included in the model, so the total number of diesel equipment markets is 42 rather than 49).
- 3 application markets (agricultural, construction, and manufacturing).
- 8 nonroad diesel fuel markets (2 sulfur content levels of 15 ppm and 500 ppm for each of 4 PADDs; PADDs 1 and