

Cost Benefit Analysis and the Implementation of SI Units: “Is the Juice Worth the Squeeze?”

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Overview of Cost Benefit Analysis

- What is Cost-Benefit Analysis (CBA)?
 - Role of social benefit and costs in evaluating public programs
 - Methodological framework
 - Defining and measuring social costs
 - Concept of social opportunity cost
 - Defining and measuring social benefits
 - Concept of “willingness-to-pay”
- CBA vs. traditional business or financial analysis
- Role in Federal rule-making
 - Executive branch agencies
 - Independent agencies and commissions
 - NRC

CBA and Switching to SI Units

- Applying CBA to Proposed Implementation of SI Units
 - Social costs of implementation
 - Social benefits of implementation
- Measuring social costs and benefits in practice

(Social) Costs of Implementing the Use of SI Units

- Account for the use of all resources used to implement the switch to the use of SI units (Panel 3 presentations)
 - Changes in instrumentation
 - Staff time
 - Cost of errors in transition
- One-time nature of transition costs

Benefits per 1980 NRC Report

1. Coordination of the United States with international practice by the use of common, world-wide units. This concept, which underlies the whole metric conversion, is particularly important in the radiation field where international cooperation and scientific understanding are of crucial importance.
2. Consistency of units. The aim of the SI system is to provide for ready convertibility of units and a self-consistent use of dimensions. Though this is usually less significant in radiation applications in the medical and radiation-protection fields than in industrial use, it still will be helpful in many computations.
3. Clearer distinction between radiation quantities. The use of the gray and sievert and their numerical separation from any exposure unit, which were numerically similar for x- and gamma-rays for largely historical reasons, will emphasize once and for all the essential differences between the concepts of dose, dose equivalent and exposure. This should be helpful in education and training where in the past the concepts tended to be blurred despite the effort of various national and international commissions to clarify these concepts.

Benefits per Panels 2 & 3 on 9/29/2016

- Expected costs avoided of human errors due to mistakes in converting current units
- Expected costs avoided from being able to provide better/more timely products (maps) in the event of an occurrence
- Benefits from harmonizing U.S. units with International units
- Benefits of better risk communication?

Measuring Costs and Benefits

- Costs
 - Measurement relatively easy
 - Use of budget and other administrative data
 - Surveys of stakeholders
- Benefits
 - Much more challenging
 - Estimates of the non-monetized “deltas” associated with switching to SI
 - Changes in probabilities of occurrence
 - Changes in behavior
 - Conditional on obtaining deltas, need to translate deltas into \$.
 - Example from benefits cost analysis of launching wind lidar system by NOAA

Financing the Transition

- Options
 - Unfunded mandate on private and public sectors
 - Added budgetary resources
 - Appropriations for federal stakeholders
 - Federal grants
 - Tax incentives
 - Tax credits
 - Accelerated write-offs for new equipment