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Breakout Session: Group 1

Economic benefits for the environment, e.g., use for economical cleanup impact on superfund, efficient manufacturing (Mark Eads (Lead), Stephen Gould (Recorder))

Group one dealt with the economic aspects of nanotechnology

In looking at the metrics of potential benefits, there are six aspects to be considered.

- Economic locus -- is the application of nanotechnology in a particular sector? Are some sectors lacking?
- Mechanism of benefits -- how is the benefit physically manifest?
- Media affected -- is the effect in the land, on water, or in the air? Are the effects in these media being under or overspent?
- Occurrence of benefits -- are the benefits now, in the future, or continuous?
- Magnitude of benefits -- what is the environmental magnitude that can be measured, e.g., what number of species benefit; what is the dollar value of benefits, for example, can the technologies solve a \$10 billion problem in crop loss? Where is the biggest bank for the buck?
- Distribution of benefits -- what is the scope or scale of the problem? Is it regional, within a habitat, single municipality, sector? Does it affect a broad segment of the economy? Is it global? Is it scalable?

Economic benefits can accrue to the environment as potential positive benefits across many industrial and economic sectors. For example, taking a backward look, nanotechnology can result in improved remediation like nanoscale reactions that can reduce cleanup costs. Nanotechnology can result in improved sensors and better analytical tools to improve site or waste stream characterization. Nanotechnology can also lead to a reduction in materials usage and improve industrial engineering. Its used can lead to improved risk assessment and improved agricultural productivity with reduced pollution.

It was suggested that nanotechnology be subject to industrial ecology tools and that there be direct design intention or a corollary outcome.