

*Advanced Materials: Lessons from Nano*

**Mark R. Wiesner**

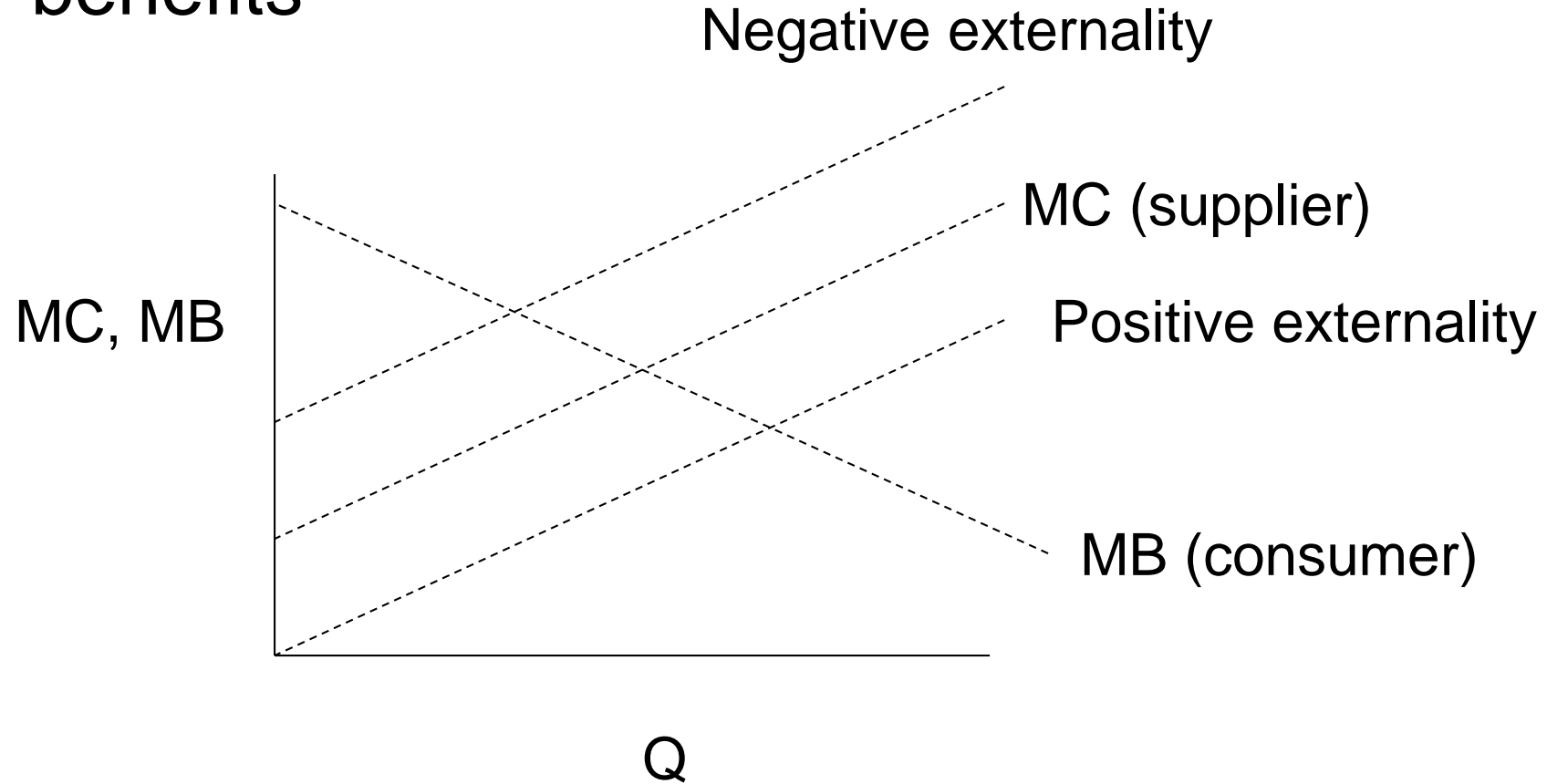
Director

[wiesner@duke.edu](mailto:wiesner@duke.edu)



Center for the Environmental  
Implications of NanoTechnology

When externalities occur, the price does not capture all costs or benefits



Producers, consumers, workers, general public as stakeholders

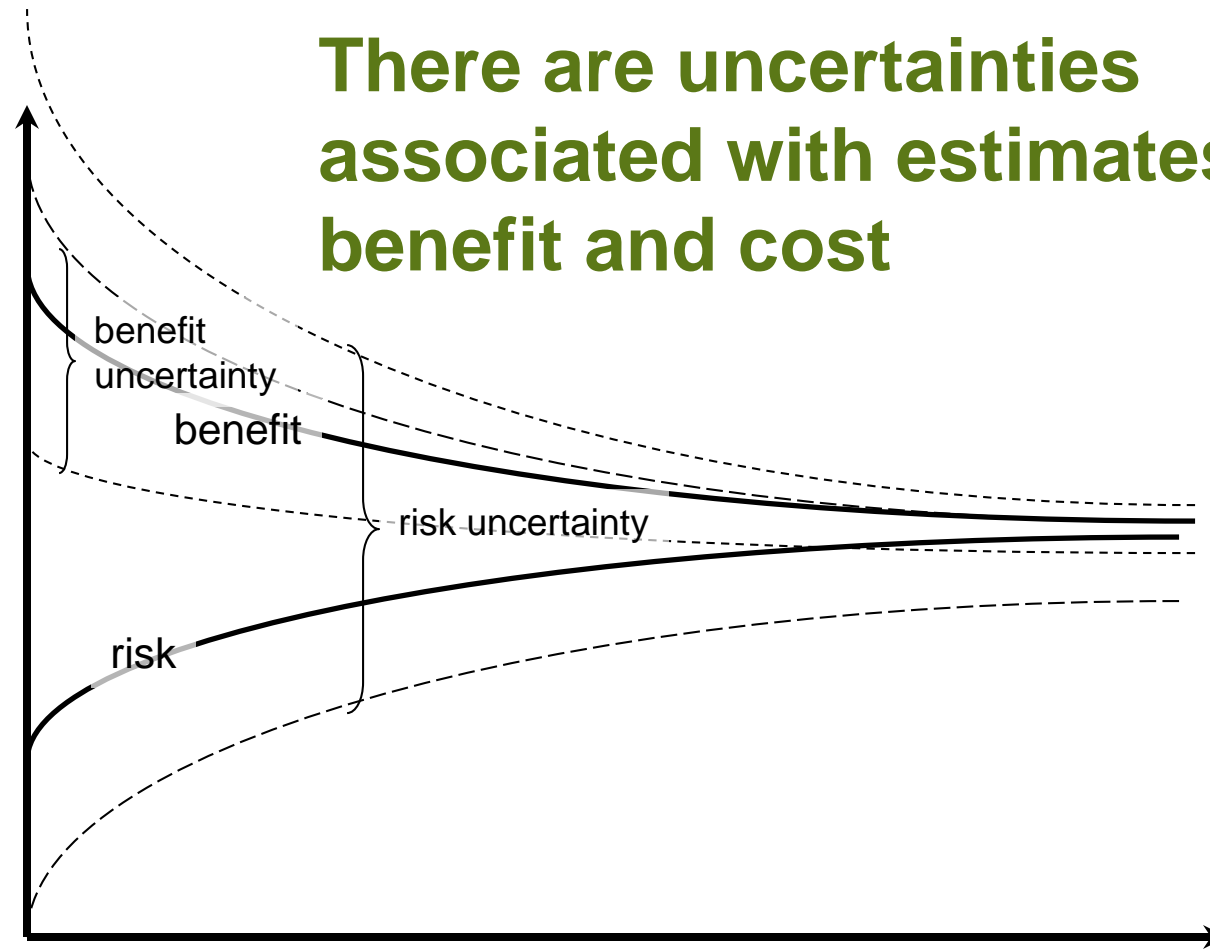
# EHS research is a public good

A public good is a good that individuals cannot be effectively excluded from use and where use by one individual does not reduce availability to others.

## Who are the consumers of this good?

# There are uncertainties associated with estimates of benefit and cost

Risks,  
benefits



Time, information



Contents lists available at ScienceDirect

Comptes Rendus Physique

www.sciencedirect.com



A risk forecasting process for nanostructured materials, and nanomanufacturing

*Un processus de prévision des risques pour les nanomatériaux et la nanofabrication*

Mark R. Wiesner<sup>a,c,d,\*</sup>, Jean-Yves Bottero<sup>a,b,c,d</sup>

# Reducing Uncertainty Through Data Sharing: Example- The NanoInformatics Knowledge Commons



# Data in the CEINT Nanoinformatics Knowledge Commons (NIKC)

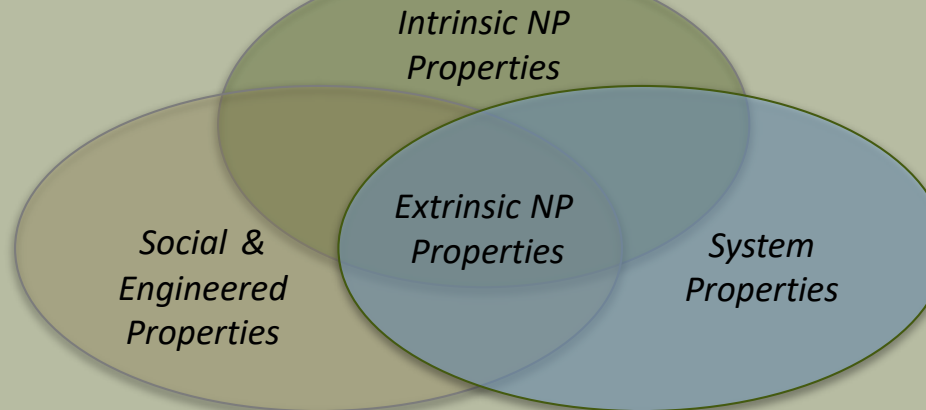
## Meta-Data

Bibliometrics

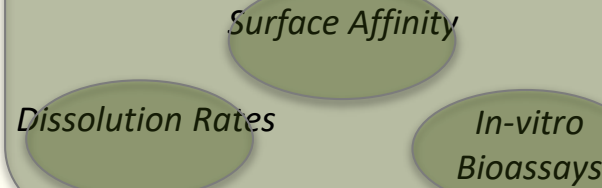
Analytical Protocols  
(e.g. equipment, methods, temporal and spatial data)

Experimental Protocols  
(e.g. methods, temporal and spatial data)

## Characterization

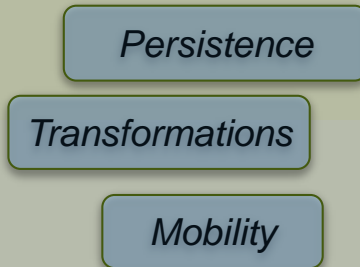


## Functional Assays

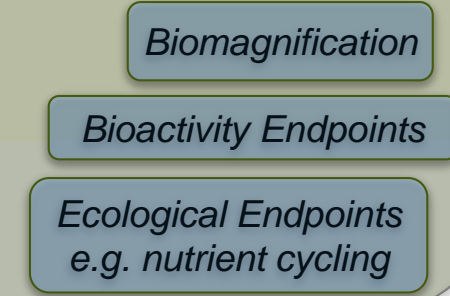


Intermediary, semi-empirical parameters that bridge the gap between nanomaterial properties and potential outcomes

## Exposure Endpoints



## Hazard Endpoints



# Populating Measurement Table

## Accumulation of Nanosilver by Plant

