

THE MANY-FACETED NATURE OF THE PRECAUTIONARY PRINCIPLE

Science, Technology, Social Justice, and Accountability

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The Precautionary Principle

- Traditional Formulation: Where there are possibilities of large or irreversible : effects, scientific uncertainty should not prevent preventative actions from being taken (Brundtland).
- Alternative Formulation: Action should (must) be taken where there are possibilities of large or irreversible serious effects (~ risk averseness) e.g., climate disruption, cancer, reproductive system damage
- Missing in both formulations is the role that technological alternatives can play in providing a rationale process for implementation

Limiting the reach of the precautionary principle will limit societal protection/environmental restoration because scientific uncertainties can be trumped by potentially large costs for protection and restoration/remediation costs.

The principle was developed through the evolution of case law (~the US), or through national/international law codification.

A Brief History of the Precautionary Principle

- Origins in the US regulatory system in the 1970s
- Later formulation in International and European Code-driven Law
- Loss of precaution after the Reagan Revolution
- The triumph of Utilitarian Ethics (greatest good for the greatest number) over Equity Driven Decisions ~ Rawlsian Justice (ensuring that the least-advantaged are made relatively better off)
- Subsequent rediscovery and attempts to import it from EU/International Law

Making Decisions about Health, Safety, and the Environment

| EFFECTS Group | Economic Effects | Health/Safety Effects | Environmental Effects |
|--------------------------------|-------------------------|------------------------------|------------------------------|
| Producers | $C_{\$}$ | | |
| Workers | $C_{\$}$ | $B_{H/S}$ | |
| Consumers | $C_{\$}$ | $B_{H/S}$ | |
| Others | $C_{\$}$ | $B_{H/S}$ | $B_{ENVIRONMENT}$ |

The US Occupational Safety & Health Act of 1970

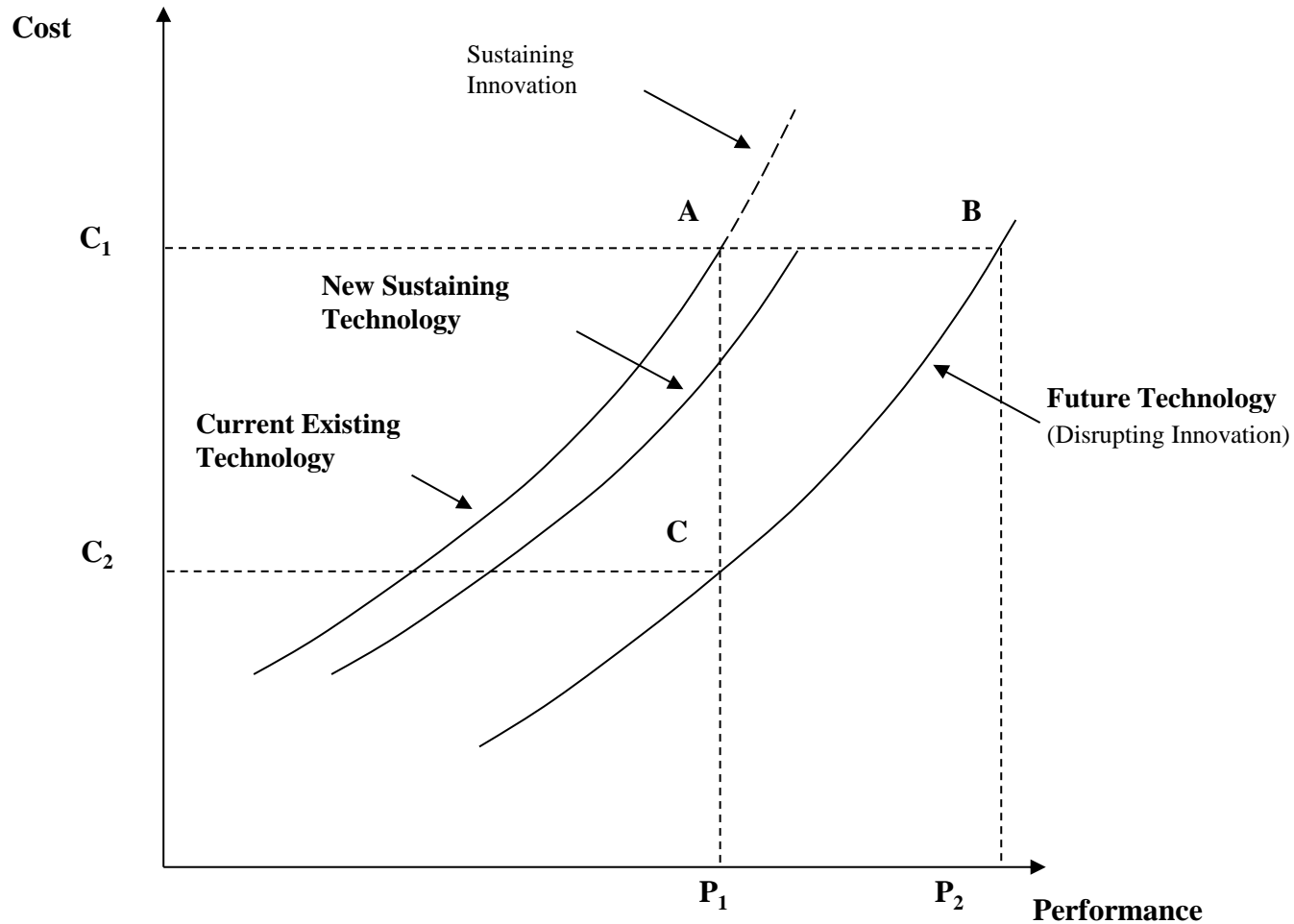
- The Secretary of Labor (i.e., the Assistant Secretary for OSHA) must set *permanent standards* that ensure that:
 - “no employee suffer material impairment, based on the best available evidence, to the extent feasible”
- The limits of protection are defined by feasibility
- Upon challenge, courts examine the standards to ensure they are based on “substantial evidence on the record as a whole” (the standard of judicial review) ~ satisfied by legislative policy judgments about issues that are “on the frontiers of scientific knowledge.” Courts endorse the principle of ‘erring on the side of caution’.

The US Clean Air Act of 1990

- EPA must set standards for substances that:
 - for the “criteria pollutants” “**protect public health with an adequate margin of safety**” **through ambient standards without taking costs into account.**
 - for “hazardous air pollutants” set technology-based emission standards” of best ‘average’ performance of top 12% of the industry. Eventually carcinogenic chemicals can not present a risk greater than 10⁻⁶].

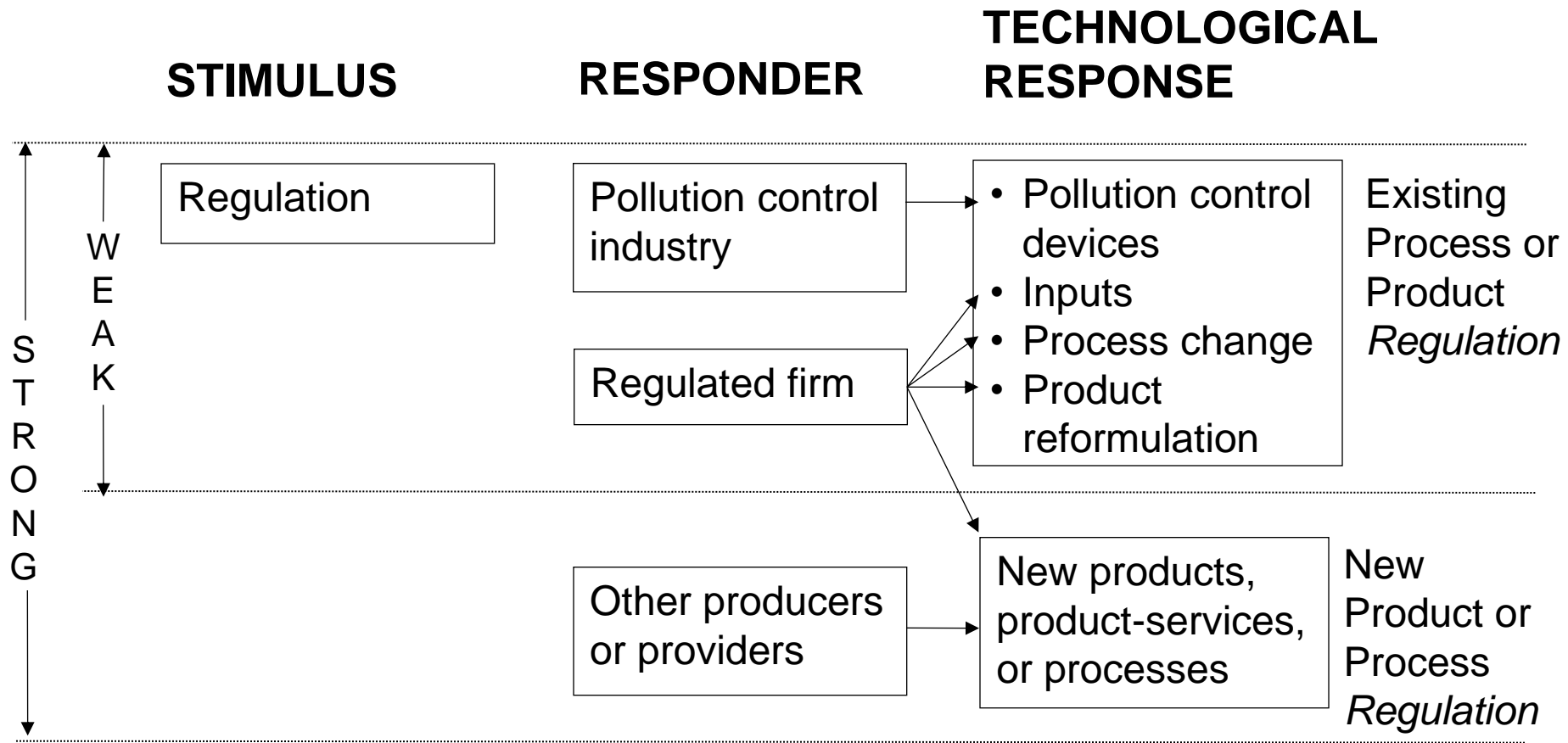
In 1980, the DC Circuit Court of Appeals opined in the setting of a new ambient standard for lead dust:

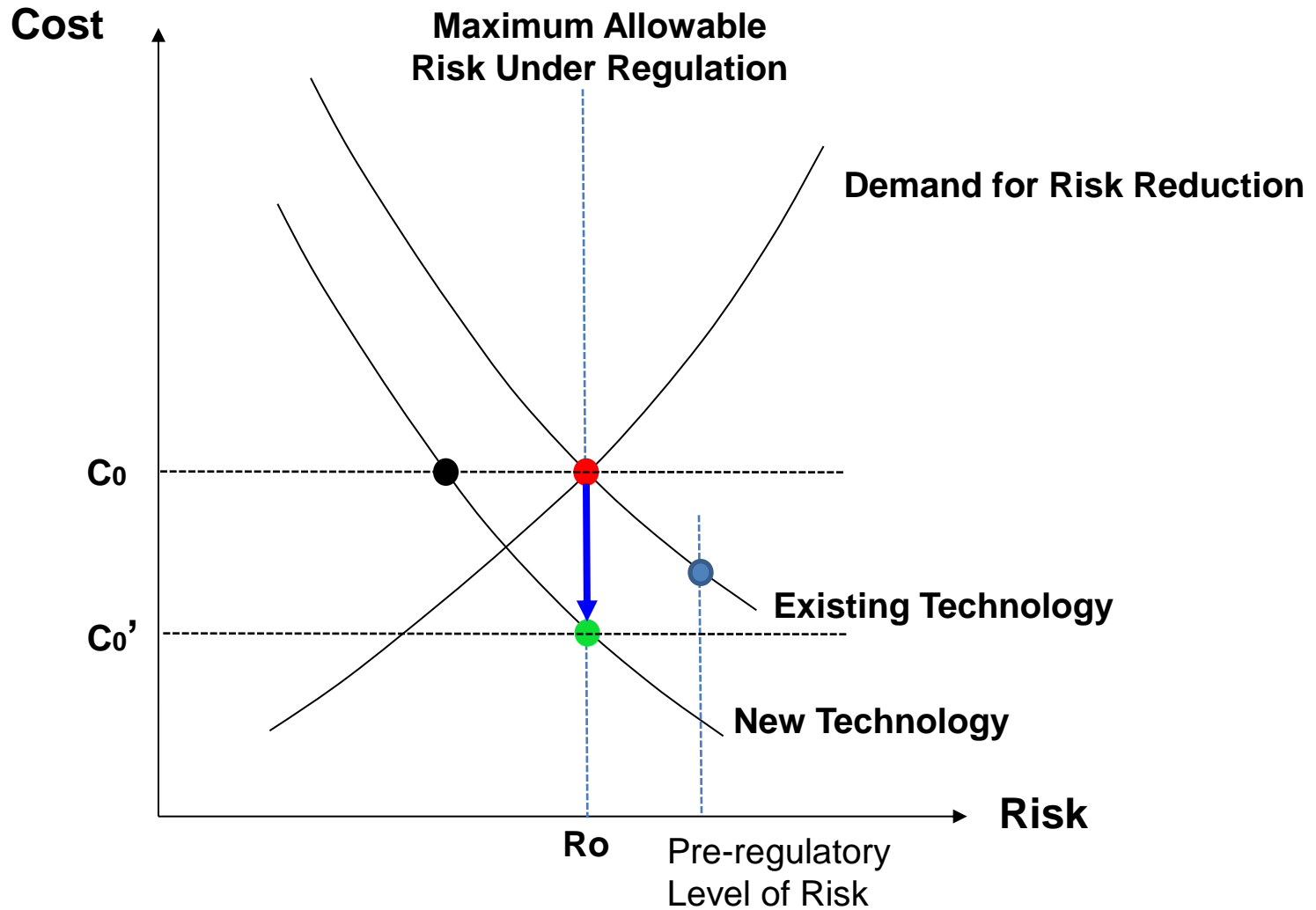
- Congress...directed [the EPA Administrator] to err on the side of caution in making these judgments.
- First, Congress made it abundantly clear that considerations of economic or technological feasibility are to be subordinated to the goal of protecting the public health by prohibiting any consideration of such factors.
- Second, it specified that the air quality standards must also protect individuals who are particularly sensitive to the effects of pollution.
- Finally, **Congress specifically directed the Administrator to allow an adequate margin of safety in setting primary air quality standards in order to provide some protection against effects that research has not yet uncovered.**



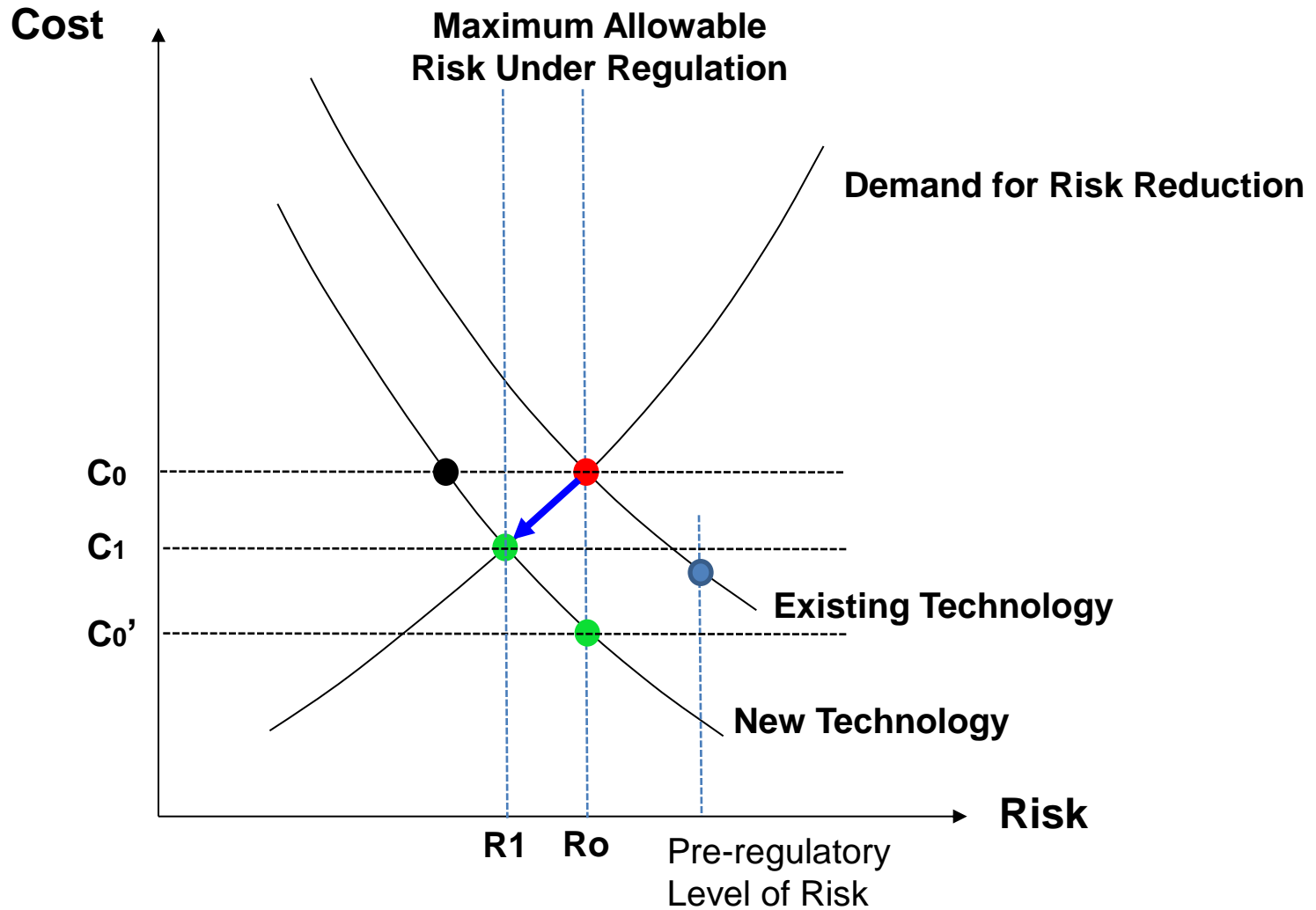
The Efficient Frontier for Current and Future Technology Contrasting Sustaining and Disrupting Innovation

A Model for 'Weak' (Porter) and 'Strong' (MIT) Forms of the Regulation-induced Hypothesis





An Innovative Response to Regulation



An Innovative Response to Regulation

How is stringency measured?

- Compliance is very expensive using existing technologies.
- Compliance requires the development of new technology (=> innovation).
- Compliance requires a dramatic reduction in acceptable exposures or emissions.

Do Environmental policies Matter for productivity growth?

Joint project

OECD Economics Department
and Environmental Directorate

Conclusions (part 1)

Stringent environmental policies are necessary for addressing wellbeing objectives, nevertheless:

- Environmental policy stringency **does not have detrimental effects** on aggregate productivity.
- **A temporary boost** in productivity growth materialise for technologically advanced firms and countries, especially if policies rely on more flexible instruments (e.g. taxes):
 - They may be best suited to grasp new opportunities, innovation, improvements, but may also relocate and trim down activity
- Low-productivity firms experience a **temporary fall** in productivity growth:
 - May be more in need of investment to comply, less able to adjust,
 - Part of the adjustment may be due to entry/exit.

Conclusions (part 2)

Achieving both economic and environmental objectives requires new ideas, technologies and business models.

Environmental policies should do the most not to prevent these to enter and develop – i.e. avoid increasing barriers to entry and competition.

- There is **no evident trade-off** between stringency of environmental policies and competition-friendliness.
- Ensuring swift reallocation of resources can help assure economic outcomes are in line with productivity gains.

The Precautionary Principle applies to situations where

- there are large uncertainties or indeterminacies or ignorance about the serious, irreversible harm to health or the environment
 - e.g., persistent, bio-accumulative chemicals
- the benefits and costs of intervention span greatly different time periods, rendering CBA an inappropriate decision-making rule
- the distributional effects of health, safety, and environmental initiatives are of concern
- **Risks continue from production and product technologies that have remained static for some time – and therefore there are opportunities to change technology through innovation.**

Trade-off Analysis in Decisions about Health, Safety, and the Environment

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Essential Elements of the Precautionary Principle

- Trade-off analysis vs. CBA
 - Accountability versus accounting
- Technology Options (Alternatives) Analysis
- A *sliding scale* for the *burden of proof*, i.e., the strength of data/information needed to justify taking (or stopping) action, depending on the hazard, extent of protection desired, and action taken (notification, regulation, compensation, etc.)
 - ~ *linking causality to level of desired protection*
- Presumptions and shifts in the *burden of persuasion*
- Linked with the Polluter Pays Principle
- Going beyond risk reduction to sustainable development

Elements of the Precautionary Principle, cont'd

- Minimizing Uncertainty
 - through refinement of (comparative) Risk Analysis
 - through undertaking (comparative) Technology Options Analysis
 - Safer inputs, production methods, and final products
- Attitudes towards Error Avoidance (*whether and to what extent to intervene*)
 - Risk avoidance (Type I vs. Type II errors regarding requirements for the reduction of risk)
 - Policy Analysis/ and Choices may focus on the wrong problem (a Type III error)
 - Cost avoidance (Type I vs. Type II errors regarding requirements for changes in technology)

A JUSTICE-FOCUSED APPROACH vs. RATIONALE CHOICE THEORY

- makes explicit the rational tenets of the Precautionary Principle *within an analytical framework as rigorous as uncertainties permit* – and one that mirrors democratic values embodied in regulatory, compensation, and common law.
- argues that risk assessment *can* be used, but within the formulation of trade-off analysis.
- provides a rationale for replacing CBA (a formulaic, decision algorithm) in environmental decision-making by an alternative decision-making paradigm based on equity and justice.