“Smart Production”
Evolving to Stage IV

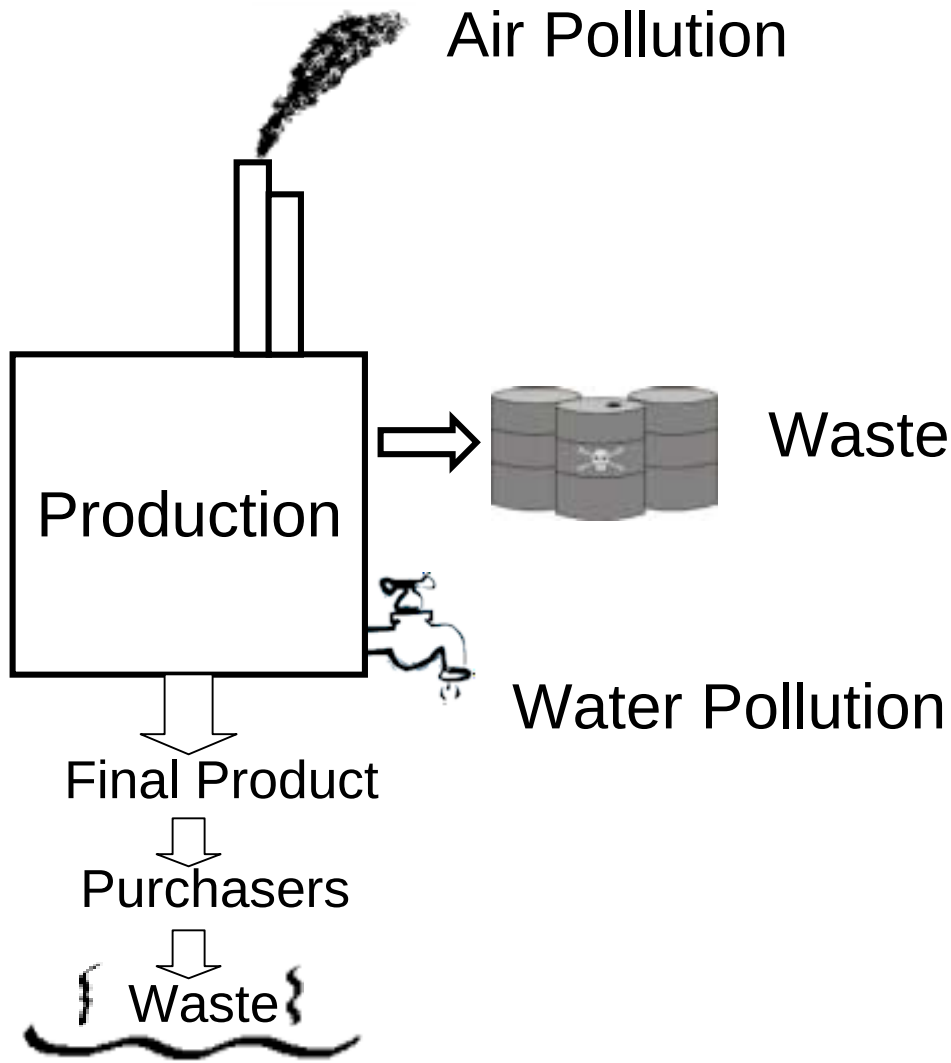
The Evolution to an Integrated Environmental Business Systems Approach to Sustainability

STAGE I

"Industrial"

Pre-1970

"Take-Make-Waste"



Characteristics:

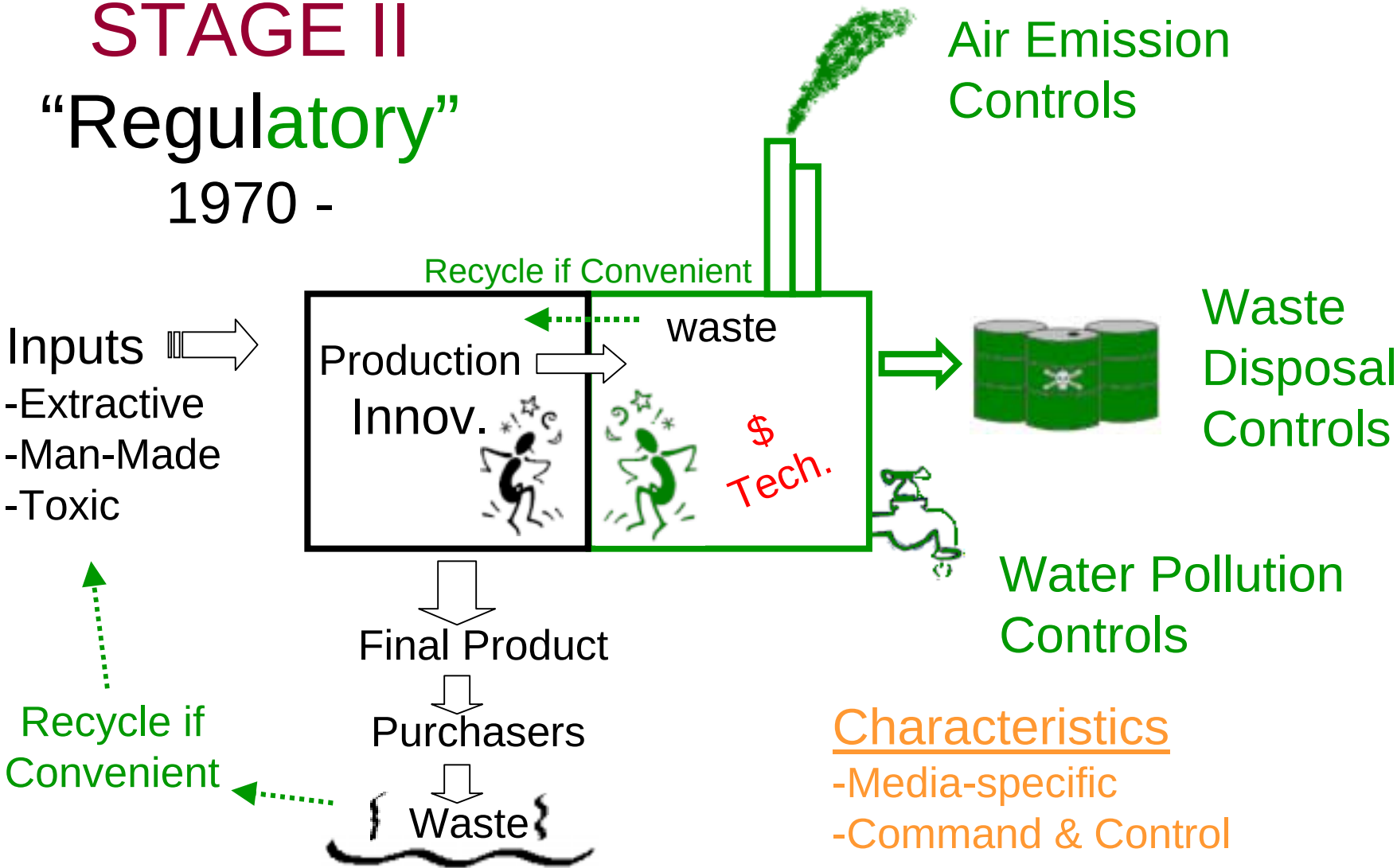
I=P x A x T

Environmental Costs externalized

STAGE II

"Regulatory"

1970 -



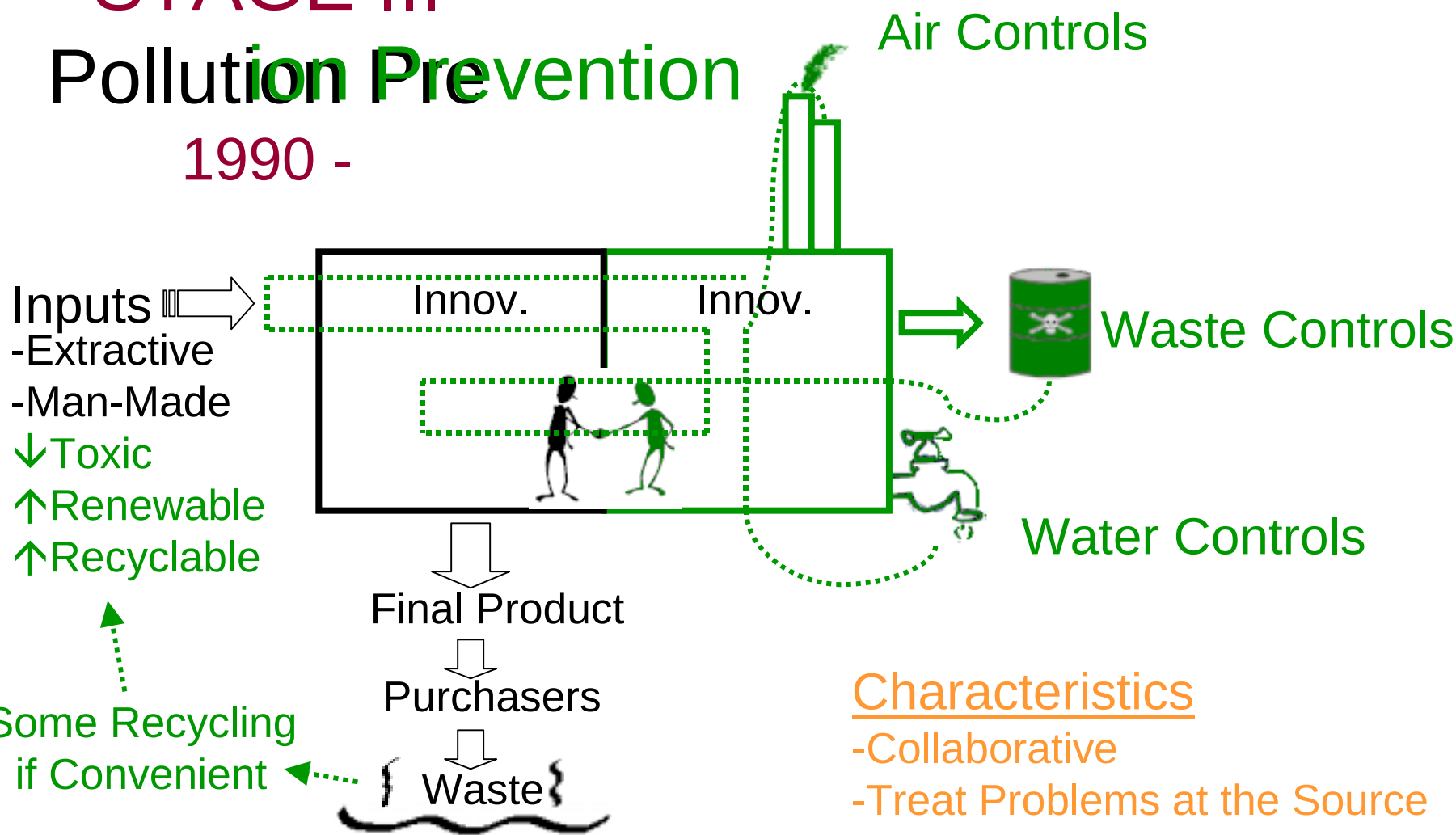
Characteristics

- -Media-specific
- -Command & Control
- -Liability Driven
- -Adversarial
- -Environment v. Economy

STAGE III

Pollution Prevention

1990 -



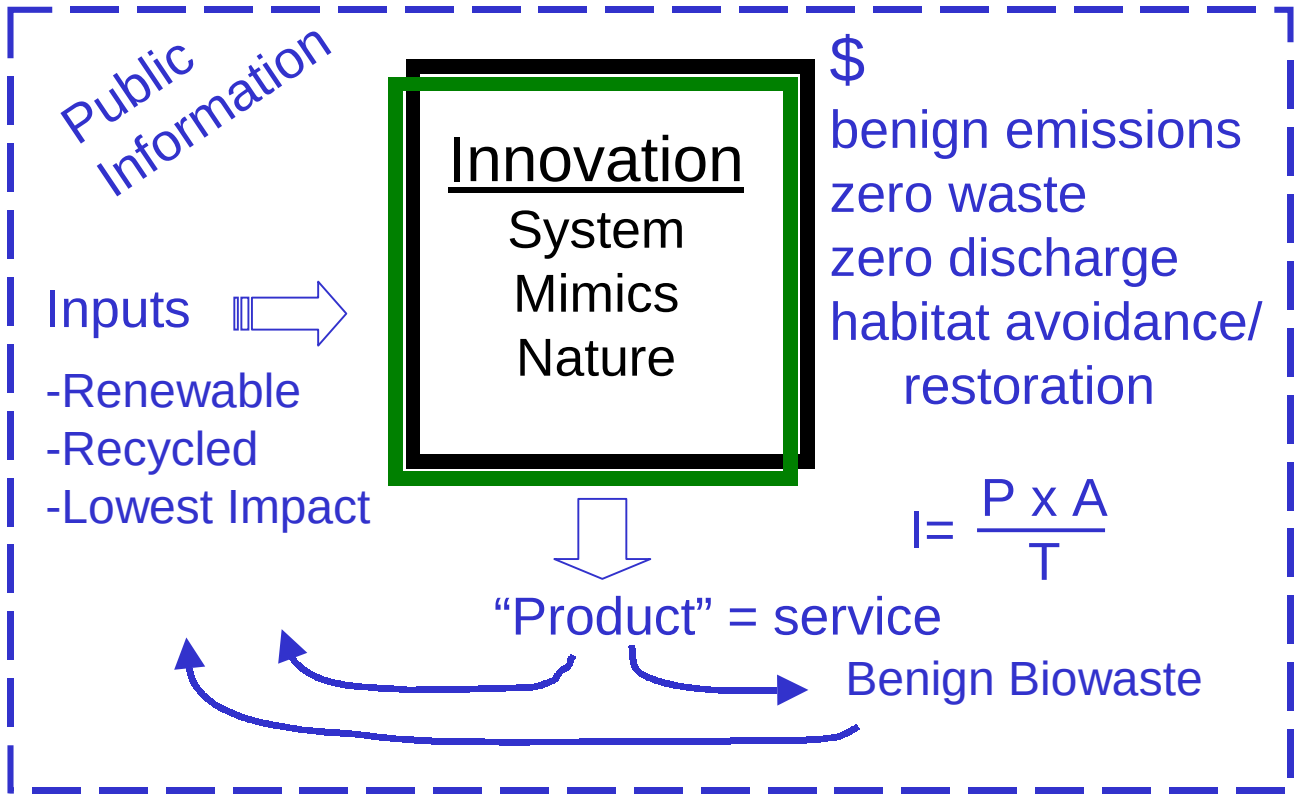
Characteristics

- -Collaborative
- -Treat Problems at the Source
- -Economy + Environment
  $ savings
- -Operational, not systemic

STAGE IV

Designing Integrated Ecological Business Systems

2000 & Beyond



-Societal Values
-Corporate Commitment
-From Product to Service
-Outcome Based
-Resource Efficiency

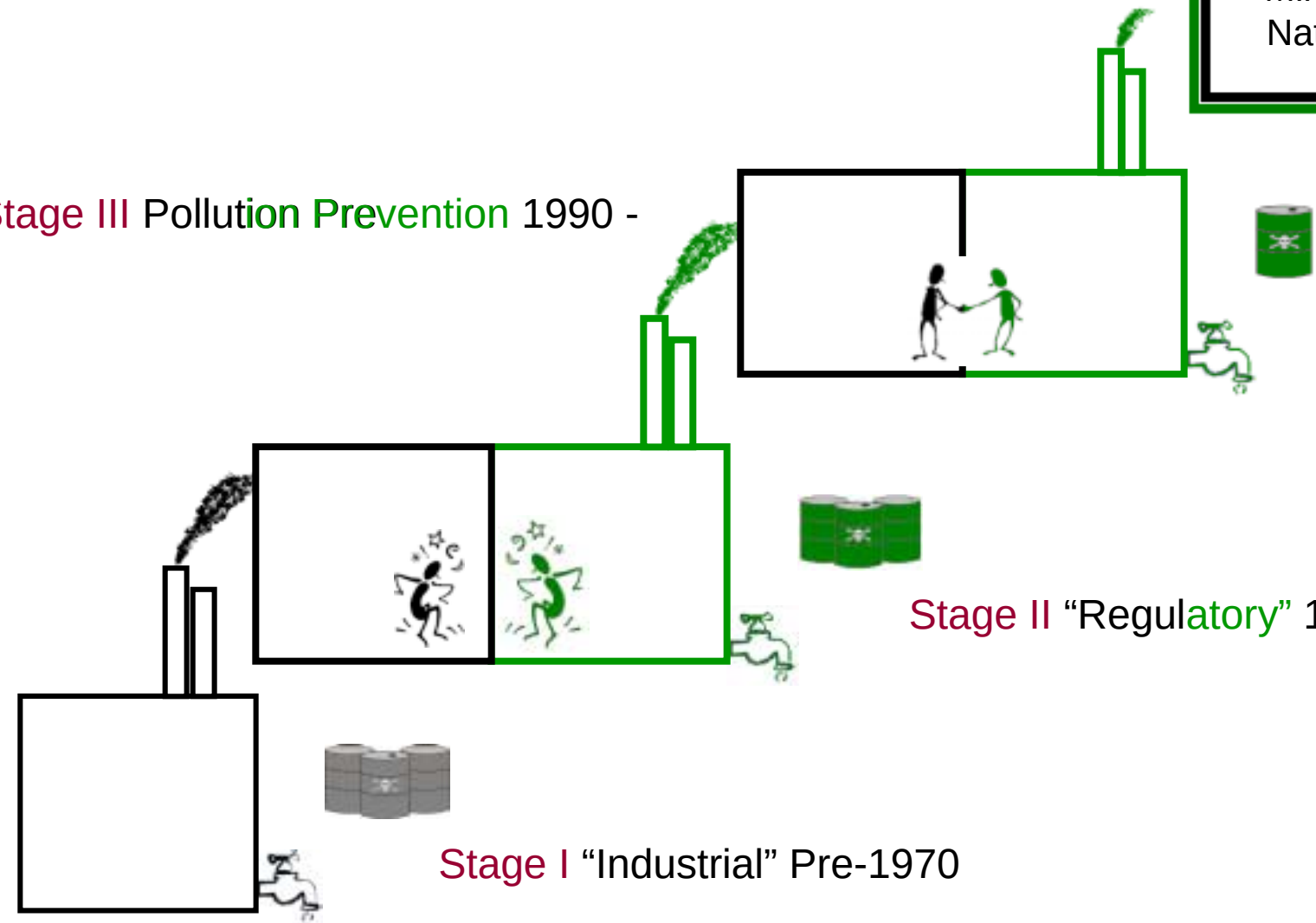
-Market Driven
-Real Time Data
-Power of Individual
-Globalization

Changing role of Government
-Facilitator /Catalyst
-Technology Clearing House
-Information Collector - Provider
-Set Performance Standards
-Enforcement

Stage IV Designing Integrated Ecological Business Systems
2000 & Beyond

Innovation
System
Mimics
Nature

Stage III Pollution Prevention 1990 -



Stage II “Regulatory” 1970 -

Stage I “Industrial” Pre-1970