CLOSING THE LOOP IN SUPPLY CHAINS

Regulatory and Business Aspects

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Regulatory Aspects: EPR Concept

- post consumer waste
- environmental concerns
- Extended Producer Responsibility

- principle: Polluter Pays!
- goals:
  - ✓ decrease environmental impact
  - ✓ provide design incentives
USA States With E-Waste EPR Laws

- 25 states have e-waste recycling laws.
- 65% of US population is covered.
Washington Implementation

- Washington Materials Management and Financing Authority
- A state-run standard recycling plan
- Total volume of electronic collected: 157,097,576 pounds

A sample of 50 collection points in WA

Major processors in WA
Washington Implementation

- Consumers
  - electronic products
  - product flow
  - financial flow

- Authority
  - pay
  - pay or be paid

- Collectors
  - valuable parts and materials

- Consolidators
  - pay

- Processors
  - pay
  - other parts/materials

- Manufacturers
  - pay

- Downstream Recyclers & Brokers

- Recycled
Washington Implementation

• Typical elements of EPR legislation:

  ✓ The environmental objective is landfill diversion through recycling.

  ✓ There is a central, government run entity ensuring targets are met.

  ✓ The financial responsibility is shared among the producers in the state.
Research Aspects

- **methods:**
  - LP
  - game theory

- **challenge:**
  - understand the stakeholder perspectives and objectives
  - develop tractable representative mathematical models

- **goals:**
  - efficient and effective business and environmental outcomes
Business Aspects

- Reuse
- Refurbish: minor cleaning/parts replacement
- Remanufacture: using a mix of used and new products to make products
- Recycle: processing used materials & remaking them into the same material
HP Product Returns Management

- Over 50,000 units returned = $157 million revenue lost and $50 million spent for handling

- Reasons for return:
  - Defective product 20%
  - Could not install 28%
  - Convenience (better price elsewhere, remorse etc.) 12%
  - Not compatible with user needs 40%

→ Need to develop a comprehensive strategy
  - To reduce the losses due to returns
  - To recover maximum value from returns
  - To develop competitive advantage
HP Product Returns Management

• **Goals:**
  - To minimize the returns
  - To reduce the cost of handling returns

• **What has been done:**
  - Started centralized reverse logistic system
  - Developed decision models for used good evaluation

• **What to do next?**
  - To change the return policy
  - To create demand for the remanufactured product
Kodak Single-Use Cameras

- Two-stage program:
  1) New designs facilitating the reuse of parts and components
  2) Forced agreements for returning the used cameras to Kodak
IBM Global Asset Recovery

- App 4% of IBM’s revenue and 11% of IBM’s pre-tax profit (2006)
- Annual collection volume > 1M machines
- 85% are utilized, refurbished, resold
- Sold more than $1.6 billion pre-owned equipment in 2006
- End-of-life + Waste processed > 50,000 metric tons, only 1.25% to landfill
Take - Aways

• Possible to obtain **Win – Win** situations for the environment and businesses

• We are part of this systems!
THANK YOU!