

LMI

GOVERNMENT CONSULTING

THE OPPORTUNITY TO MAKE A DIFFERENCE HAS NEVER BEEN GREATER



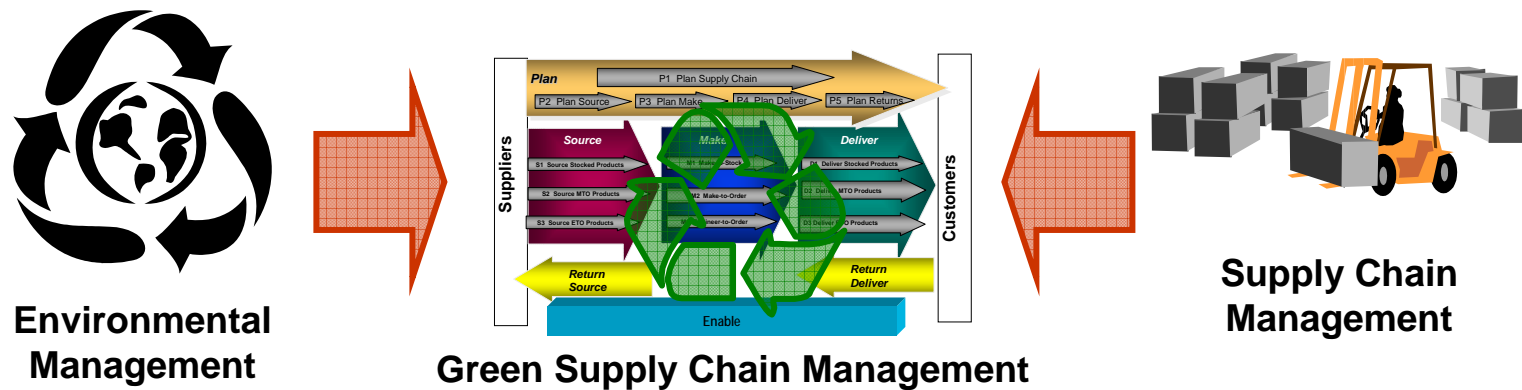
Best Practices in Implementing Green Supply Chains



April 5, 2005

Green SCM integrates *environmental* and *supply chain* management.

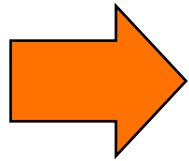
Green Supply Chain Management



Green SCM recognizes the disproportionate environmental impact of supply chain processes in an organization.



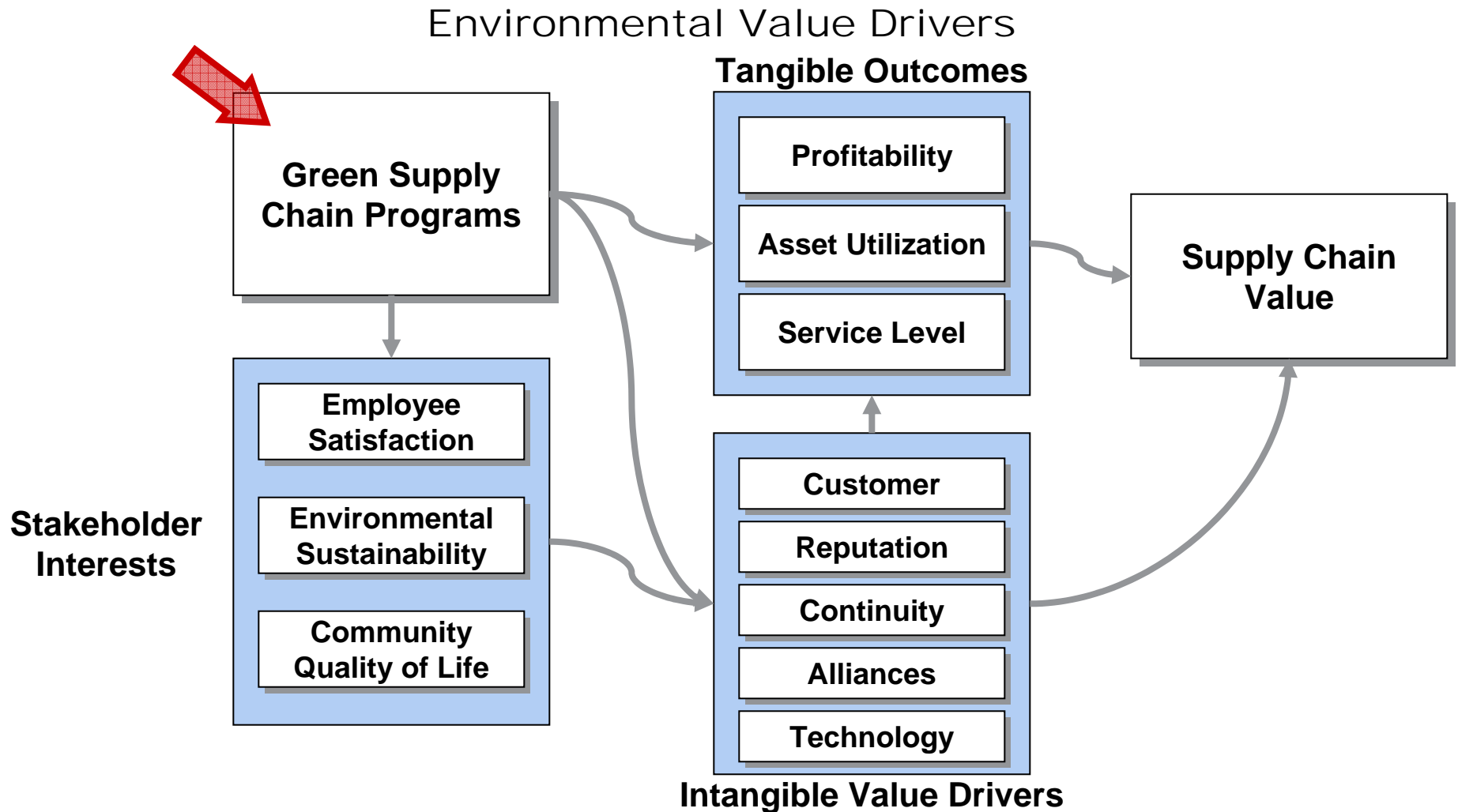
Contents



- What is Green Supply Chain Management?
- Green Supply Chain Management Principles
- Green Supply Chain Management Best Practices
- Implementing Best Practices
- Summary



Green SCM leverages the role of the environment in SC value creation.



Source: *Forging New Links*, GEMI, 2004



Commercial firms have had early success using Green SCM principles.

Texas Instruments: Saves \$8 million each year by reducing its transit packaging budget for its semiconductor business through source reduction, recycling, and use of reusable packaging systems (20% annual savings).

Commonwealth Edison: Produced \$50 million in financial benefits from managing materials and equipment with a life-cycle management approach.

Pepsi-Cola: Saved \$44 million by switching from corrugated to reusable plastic shipping containers for one liter and 20-ounce bottles, conserving 196 million pounds of corrugated material.

Dow Corning: Saved \$2.3 million by using reconditioned steel drums in 1995. Also conserved 7.8 million pounds of steel.



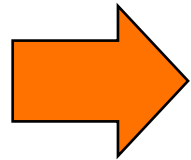
Green Supply Chain improves operations by employing an *environmental solution*.



- *Improves Agility*—Green supply chain management help mitigate risks and speed innovations.
- *Increases Adaptability*—Green supply chain analysis often lead to innovative processes and continuous improvements.
- *Promotes Alignment*—Green supply chain management involves negotiating policies with suppliers and customers, which results in better alignment of business processes and principles.



Contents



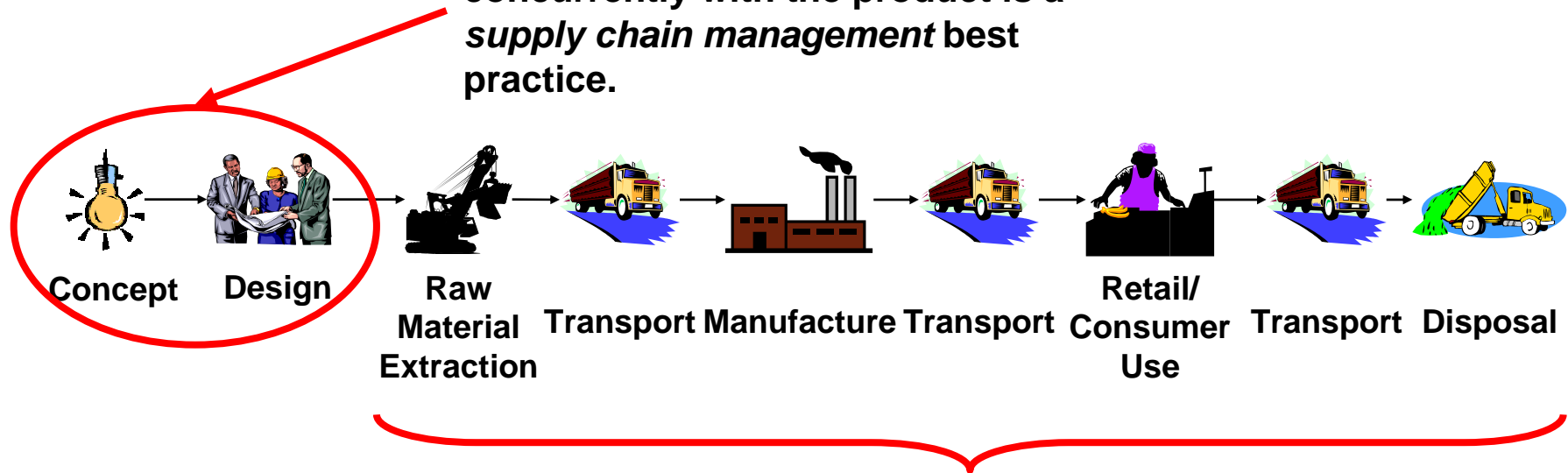
- What is Green Supply Chain Management?
- Green Supply Chain Management Principles
- Green Supply Chain Management Best Practices
- Implementing Best Practices
- Summary



The product life cycle is the basis of green supply chain management.

Supply Chain in the Environmental Life Cycle

Designing the supply chain concurrently with the product is a *supply chain management best practice*.

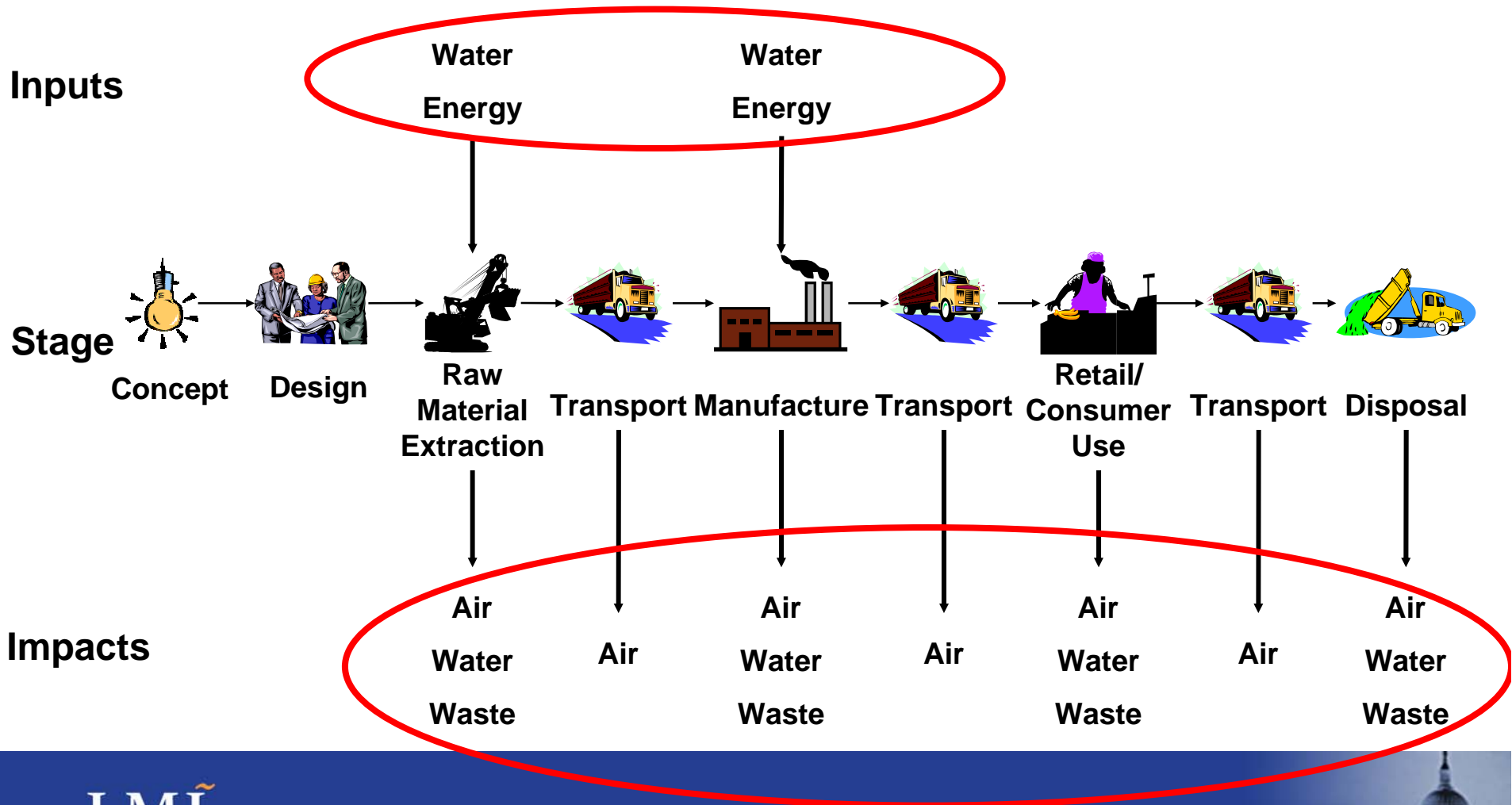


Typical Supply Chain Scope



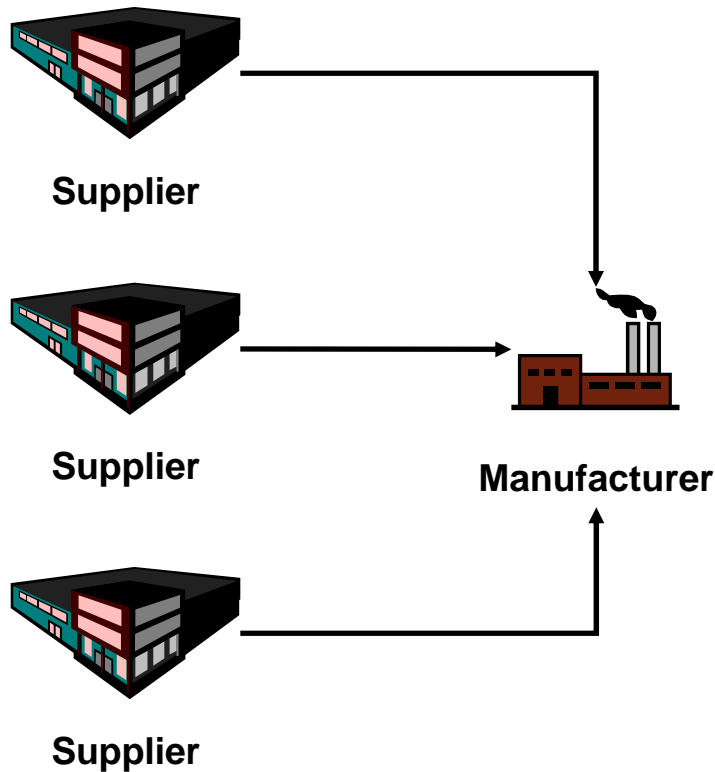
The environmental impacts of each LC stage are examined for reduction.

Environmental Life Cycle



Historically, GSC management focused on the upstream supply chain.

Typical Green Supply Chain Analysis

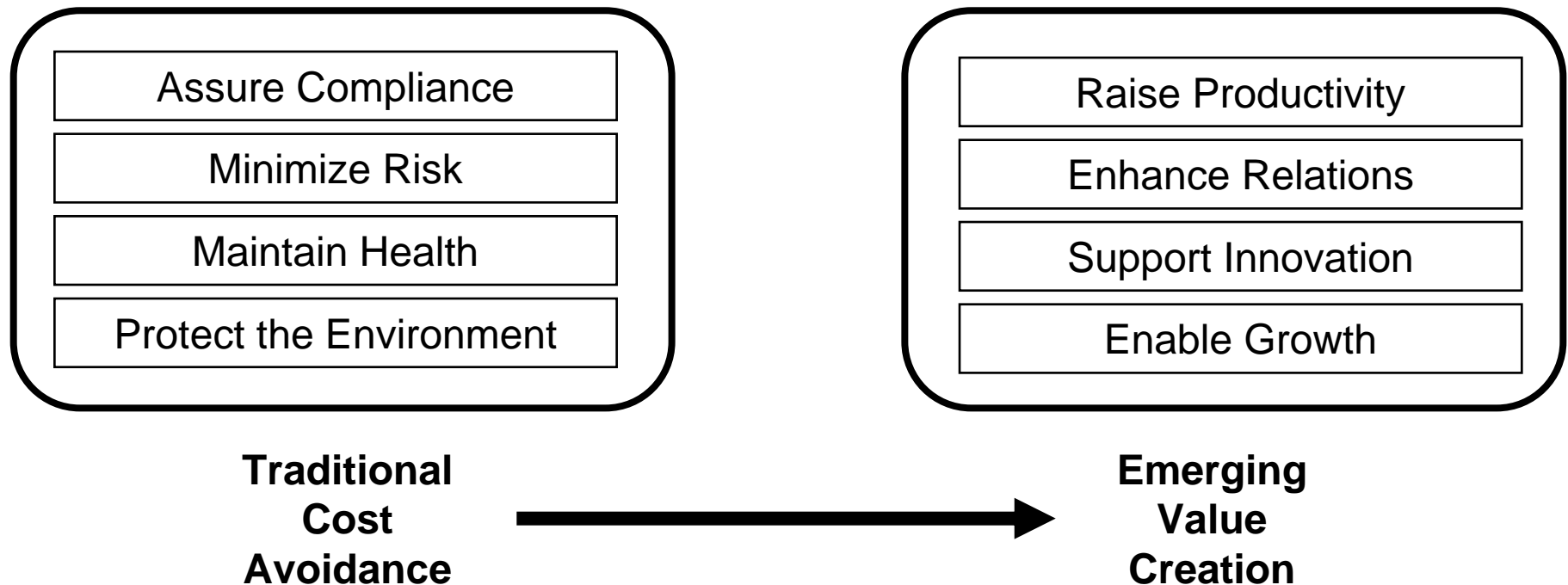


- Manufacturer encourages suppliers to adopt green practices, environmental management systems, etc.
- Focus is on the material content and environmental practices of suppliers.



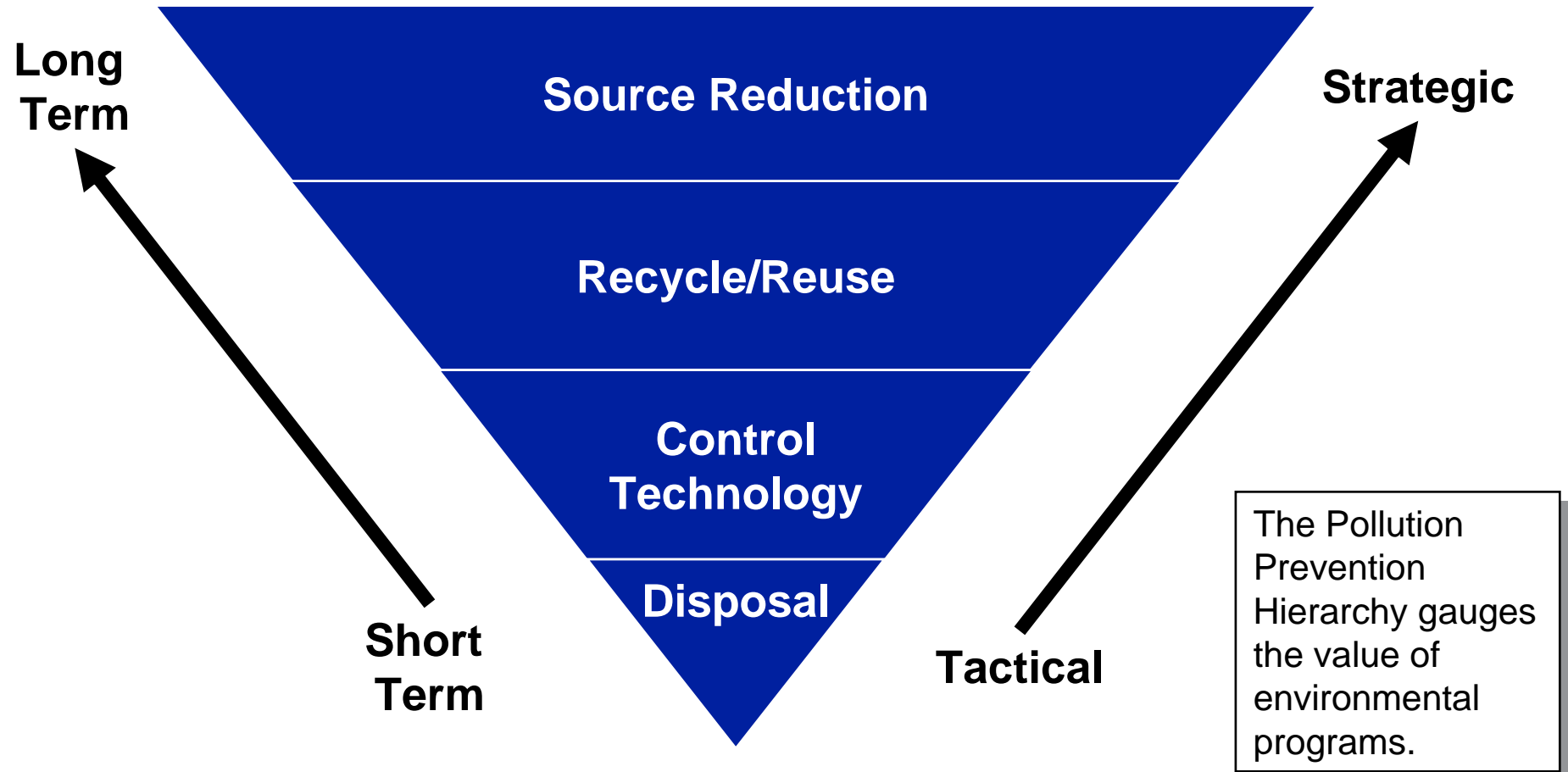
Now, GSC programs are moving from compliance to value creation.

Environmental, Safety, and Health Business Contributions



Companies are starting to view GSC as a strategic analysis tool.

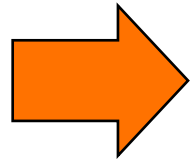
Pollution Prevention Hierarchy



Source: U.S. Environmental Protection Agency



Contents



- What is Green Supply Chain Management?
- Green Supply Chain Management Principles
- Green Supply Chain Management Best Practices
- Implementing Best Practices
- Summary



Green supply chain best practices focus on the business results first.

Green Supply Chain Best Practices

- Align green supply chain goals with business goals
- Evaluate the supply chain as a single life cycle system
- Use green supply chain analysis as a catalyst for innovation
- Focus on source reduction to reduce waste



Aligning GSC improvements with your business goals creates strategic value.

- Before embarking on green supply chain improvements, you need to determine the role of the environment in your business.
 - Product Differentiation?
 - Managing Competitors?
 - Cost Reduction?
 - Risk Management?
 - Redefining Markets?
- When green supply chain programs are properly aligned to corporate goals, successes become leading indicators of business success.
 - Environmental indicators on the Balanced Scorecard
 - Greater drive for innovation
 - Stakeholder support

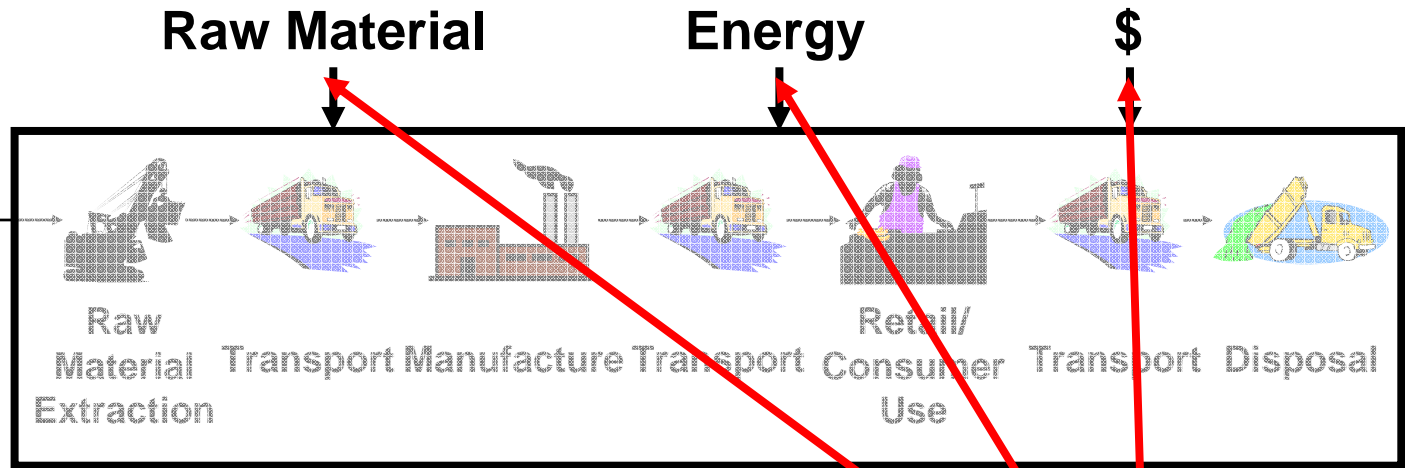
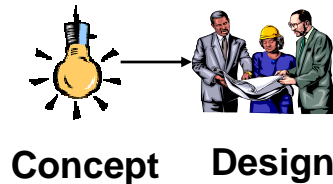


Evaluating the supply chain as a system leads to life cycle optimization.

System View of Environmental Life Cycle

Inputs

Stage



Outputs

Product

Waste

\$

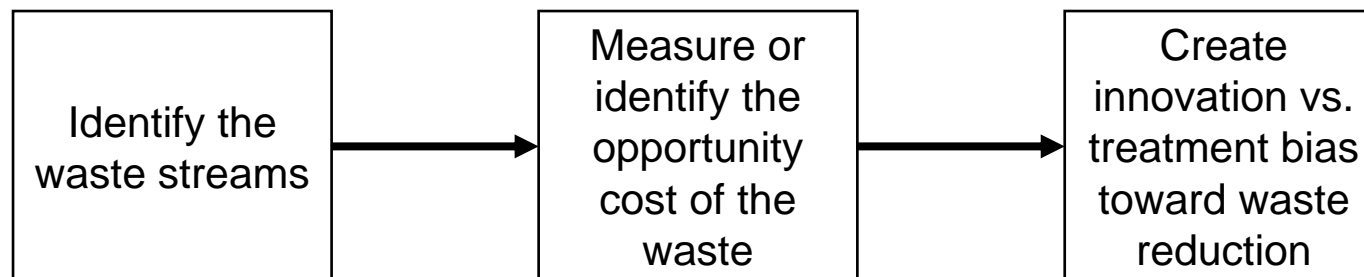
Maximize the "good" outputs.

Minimize the "bad" inputs and outputs.

Green supply chain management is a driver for process improvements.

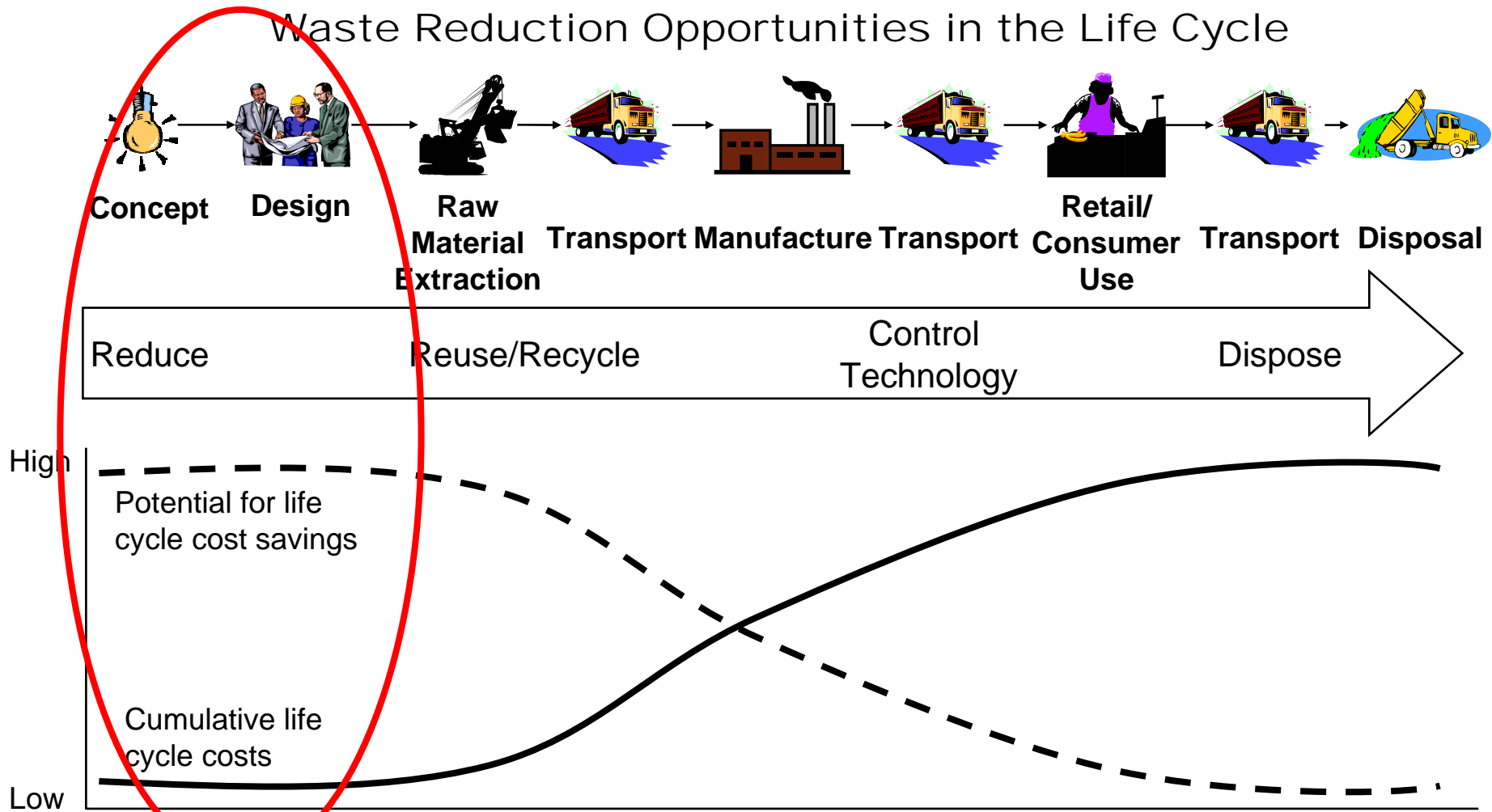
- In general, pollution and waste represent incomplete, ineffective, or inefficient use of raw material.
- Green supply chain analysis provides an opportunity to review processes, materials, and operational concepts.
- As with continuous improvement programs, green supply chain analysis targets:
 - Wasted material
 - Wasted energy or effort
 - Under-utilized resources

Green Process Improvement Approach



Focusing on source reduction programs drives higher value improvements.

Waste Reduction Opportunities in the Life Cycle



The Army looked to using hybrid HMMWVs to reduce the fuel SC footprint.

HMMWV Fuel Supply Chain

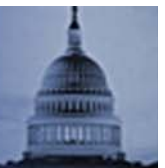
- Army reviewed acquisition, maintenance, and fuel costs associated with conventional and hybrid HMMWV.
 - Fuel costs included cost of supply chain.
 - Evaluation based on military operations.
- Costs are break even for the two platforms
 - Hybrid technology lowers fuel cost but has greater maintenance requirements.
 - However, hybrid platforms can also serve as power generators in theater and can offer some operating advantages (e.g., silent operation).



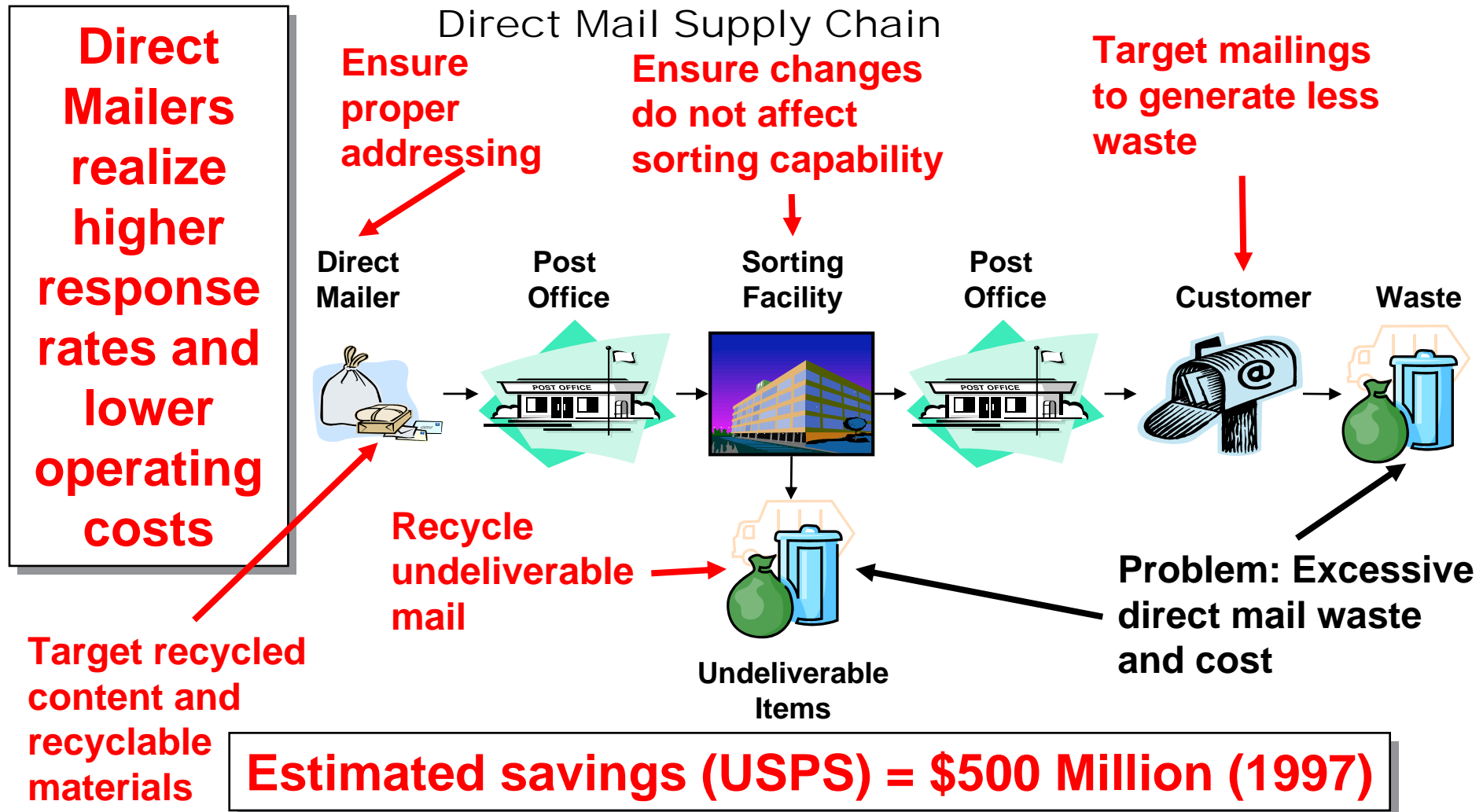
Hybrid HMMWV



Source: *Economics of Hybrid Electric Technology: Military Vehicles*, 2002, LMI
Resource Costs of Supplying Power to a Battlefield, 2004, LMI Research Institute



USPS worked with direct mail vendors to reduce supply chain cost and waste.



Source: *Greening the Mail*, 1999, LMI



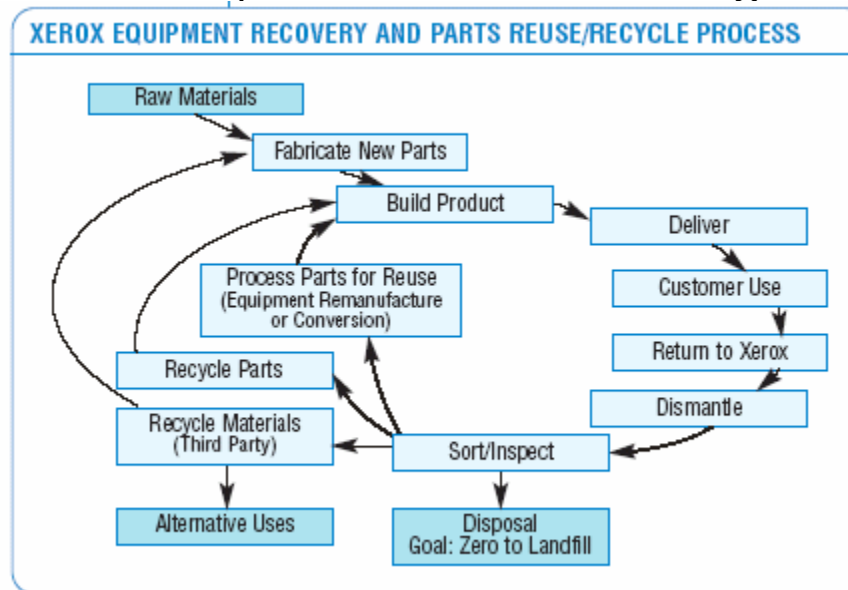
The Dutch flower industry *greened* its production to increase throughput.

- Netherlands produces 65% of the world's cut flowers, yet has limited land.
 - Mass cultivation in a confined area resulted in fertilizer, herbicide, and pesticide contamination.
- To correct the problem, growing was shifted to rock wool and water vs. soil.
 - Fertilizer in the water is recycled through the system to reduce waste.
 - Water based growth also reduces the risk of infestation by weeds and pests, reducing the need for chemical treatments.
 - The new system also greatly reduced variations in growth conditions, greatly improving the predictability of output.
- Producers were able to increase output per space and further innovate to reduce costs (e.g., new harvesting methods).



Xerox implemented a take-back program redefined customer's expectations.

Xerox Copier Take-back Program



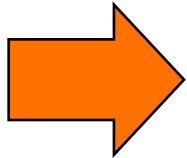
- 70-90% (by weight) of machines reused
- 144 million pounds diverted from landfills (2003)

- In early 1990s Xerox launched a new initiative to take back used copiers as a source of material for new machines.
- Customers like the program because they no longer worry about machine disposal.
- Xerox estimates “several hundred million” dollar savings annually.



Contents

- What is Green Supply Chain Management?
- Green Supply Chain Management Principles
- Green Supply Chain Management Best Practices
- Implementing Best Practices
- Summary



Green supply chain efforts need to rise above the *cost center* view.

- Green supply chain projects need to be clearly defined in terms of the *business* value to the organization.
 - Clear value will gain senior management support.
 - Clear value will help secure buy-in from other organizations
- Environmental programs are viewed as business cost centers.
 - Environmental, safety, and health (ESH) resources are often scarce in an organization.
 - ESH offices are targeted early during cost cutting programs.
- ESH offices have difficulty articulating their business value.
 - The inability to articulate the value of green supply chain effort in business terms lowers their profile.
 - Many executives have misconceptions of how green supply chain efforts will impact their operations.
 - Without a clear business value proposition, it is difficult to get executive support for projects.



Consider the existing business model when planning GSC projects.

- Many businesses have internal hurdles that must be overcome for any improvement effort.
 - Inconsistency in supply chain operations (by unit, region, product, etc.)
 - Business viewed through existing operations—resistance to change
 - Focus on short term goals and short term results
 - Limited partnership experience—especially in the environmental office.
- To be successful, the project manager needs to understand the organization and plan for the applicable hurdles.
 - Develop communication/evangelization plan.
 - Build a project team with broad functional representation.
 - Clearly articulate project business value.
 - Use outside experts where in-house expertise doesn't exist.



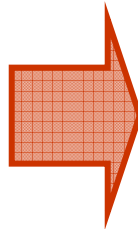
Use tools such as GreenSCOR to help define and analyze GSC problems.

GreenSCOR Concept

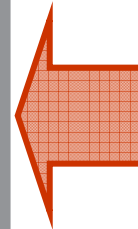


Environmental Management

Managing the environmental impacts of operations, including compliance, emissions, and remediation

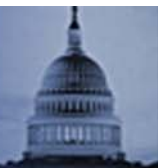


GreenSCOR Model



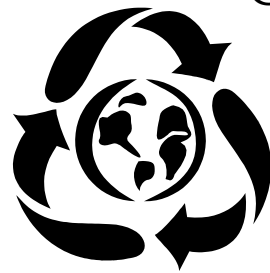
Supply Chain Management

Managing the flow of material from supplier to end customer, including procurement, transportation, inventory management, and production

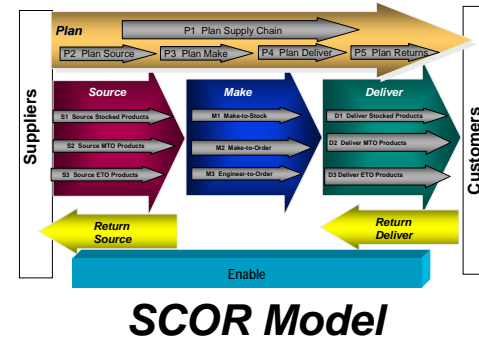


GreenSCOR is a modification of the SCOR model that includes environmental elements.

GreenSCOR Content

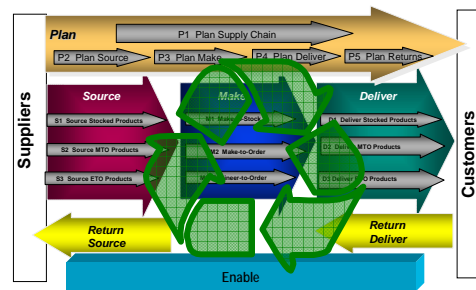


Environmental Management



SCOR Model

GreenSCOR modifies the existing SCOR structure to include environmental processes, metrics, and best practices.



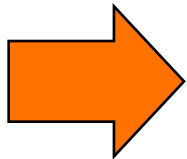
GreenSCOR Model

GreenSCOR maintains the integrity of the current SCOR model by adding to the existing elements.



Contents

- What is Green Supply Chain Management?
- Green Supply Chain Management Principles
- Green Supply Chain Management Best Practices
- Implementing Best Practices
- Summary



Implementing Green supply chain properly will drive *real* business value.

- Green supply chain concepts manage environmental impacts where they occur—ideally before they occur.
- Best practices focus on the business, not social, value that green supply chain management creates.
 - Align green supply chain goals with business goals
 - Evaluate the supply chain as a single life cycle system
 - Use environmental analysis as a catalyst for innovation
 - Focus on source reduction to reduce waste
- Successful implementation requires raising the profile and perceived value of environmental projects.
 - Articulate project value in terms of business value
 - Create the project to work within the organizational culture
 - Use effective tools (e.g., GreenSCOR) to enable project execution





THE OPPORTUNITY TO MAKE A DIFFERENCE HAS NEVER BEEN GREATER

Taylor Wilkerson
twilkerson@lmi.org

ACQUISITION • FACILITIES & ASSET MANAGEMENT • FINANCIAL MANAGEMENT •
INFORMATION & TECHNOLOGY • LOGISTICS • ORGANIZATIONS & HUMAN CAPITAL

