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CERTIFIED IN LOGISTICS,
TRANSPORTATION AND DISTRIBUTION

MODULE 8:
SUSTAINABILITY, REVERSE LOGISTICS, AND RISK MANAGEMENT

APICS

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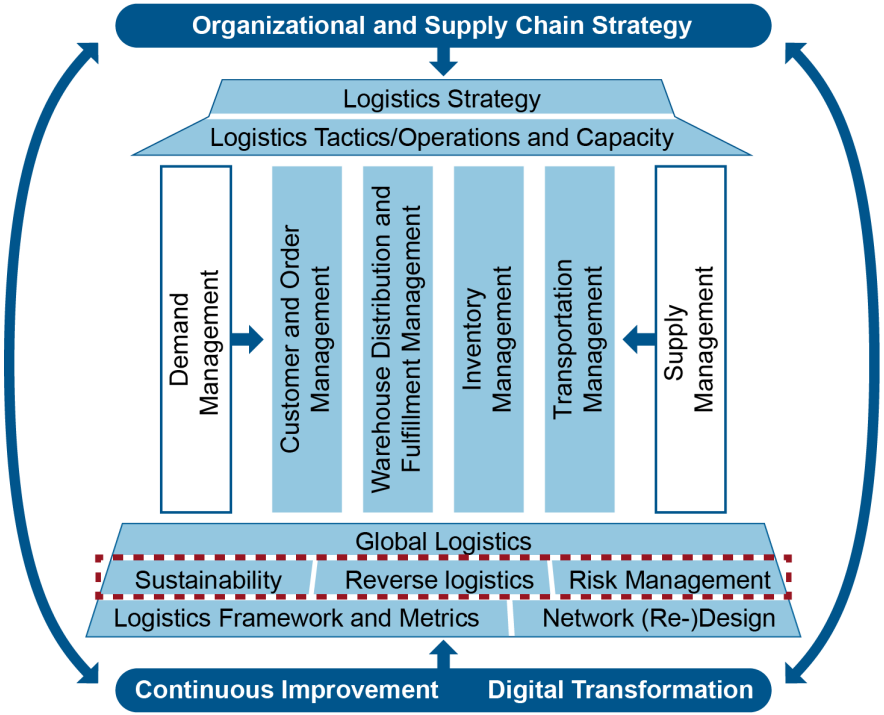
Module 8 Overview



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MODULE 8, SECTION A:
APPLY SUSTAINABILITY PRINCIPLES

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Sustainability

Social Responsibility

"Commitment by top management to behave ethically and to contribute to community development. This may also entail improving the workforce's quality of life."
(ASCM Supply Chain Dictionary)

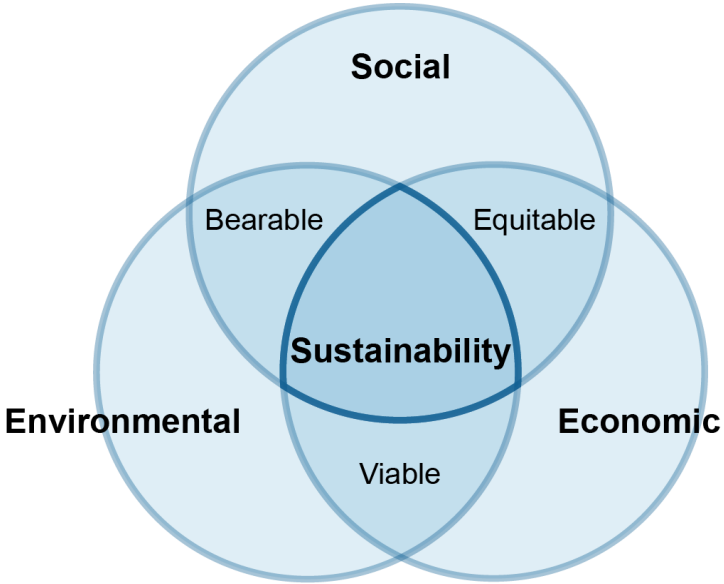
Social Responsibility Dimensions

Triple Bottom Line: Economic Perspective

Value created by organization after deducting cost of all inputs

Initiatives:

- Implement technologies to support sustainability and economic goals.
- Develop an eco-friendly reputation and environmental management strategies.
- Promote green products.
- Reduce packaging and detrashing.

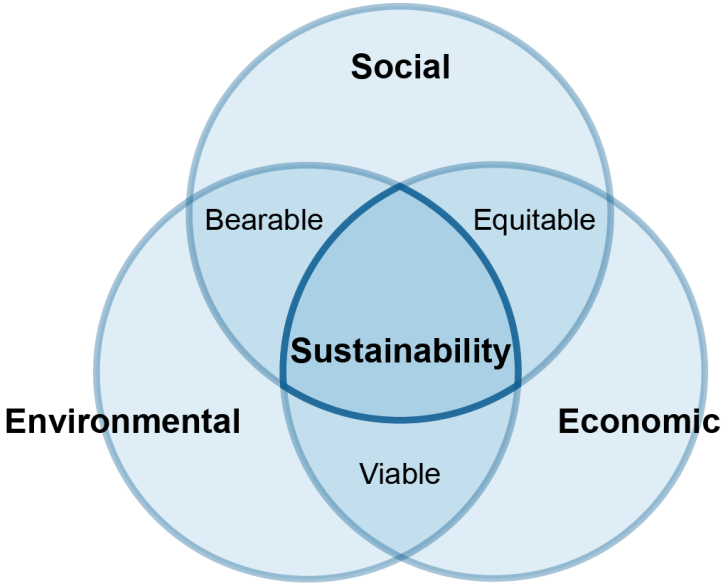


Triple Bottom Line: Environmental Perspective

Organization's ability to avoid harming environment and preserve scarce resources for future generations

Initiatives:

- Environmentally friendly manufacturing processes
- ISO 14000
- Regulatory considerations (example: RoHs)
- Energy-efficient transportation and warehouses

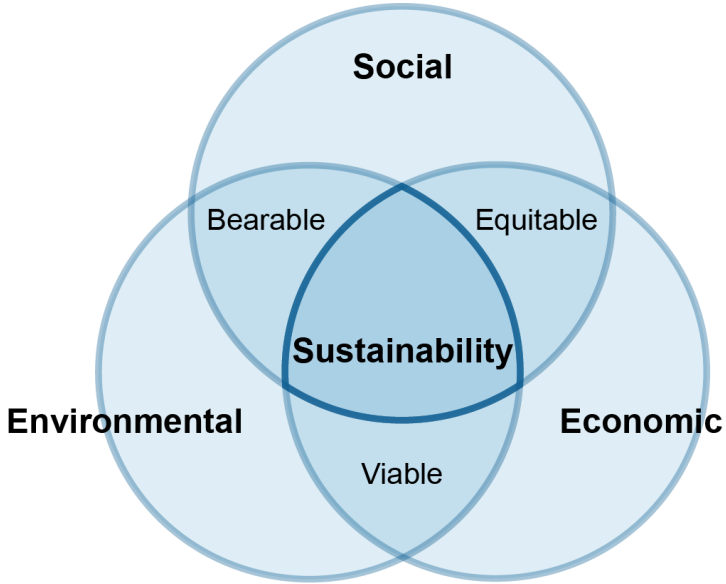


Triple Bottom Line: Social Perspective

How organization impacts employees, suppliers, and community at large

Initiatives:

- Promote human rights and fair labor practices.
- Develop socially responsible supply chain.
- Be positive role model.
- Treat stakeholders and environment with care and respect.



United Nations Global Compact

Areas	Principles
Human rights	**Principle 1:** Businesses should support and respect the protection of internationally proclaimed human rights; and **Principle 2:** make sure that they are not complicit in human rights abuse.

Source: © United Nations Global Compact, www.unglobalcompact.org.

United Nations Global Compact

Areas	Principles
Labour	**Principle 3:** Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining; **Principle 4:** the elimination of all forms of forced and compulsory labor; **Principle 5:** the effective abolition of child labour; and **Principle 6:** the elimination of discrimination in respect of employment and occupation.

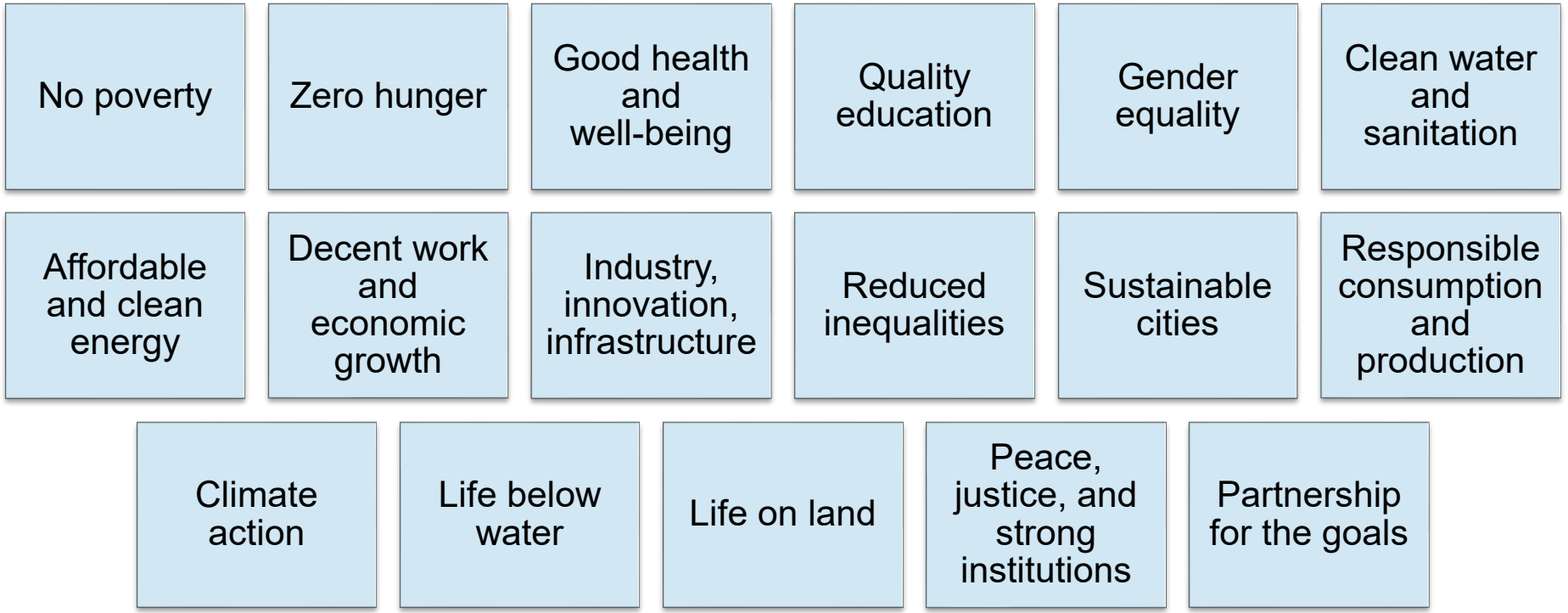
Source: © United Nations Global Compact, www.unglobalcompact.org.

United Nations Global Compact

Areas	Principles
Environment	**Principle 7:** Businesses should support a precautionary approach to environmental challenges; **Principle 8:** undertake initiatives to promote greater environmental responsibility; and **Principle 9:** encourage development and diffusion of environmentally friendly technologies.
Anti-corruption	**Principle 10:** Businesses should work against corruption in all its forms, including extortion and bribery.

Source: © United Nations Global Compact, www.unglobalcompact.org.

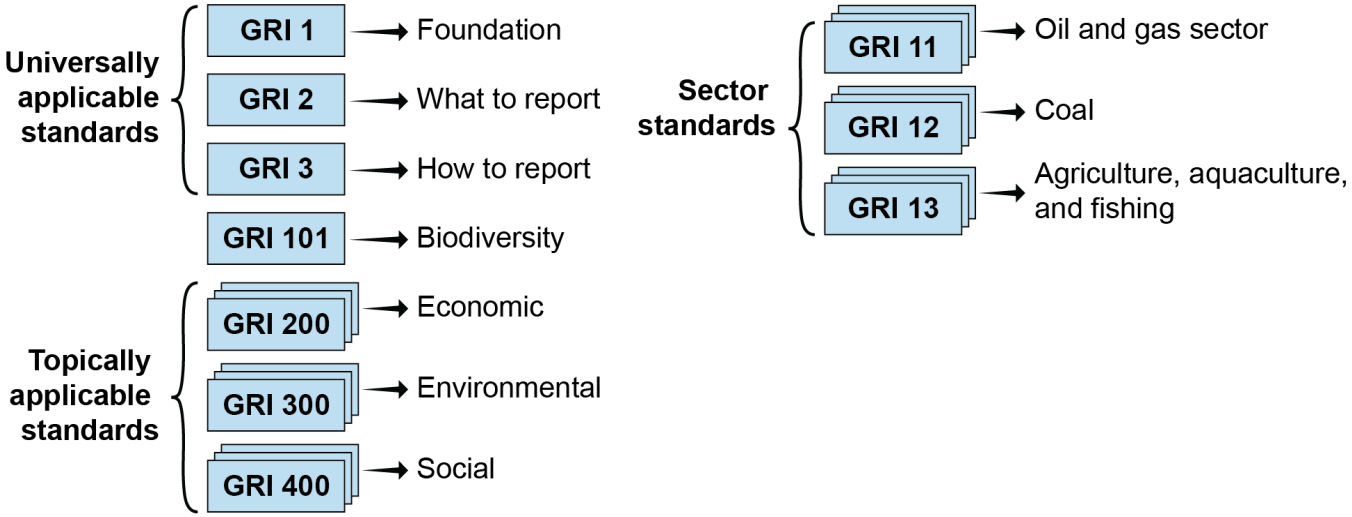
UN Sustainable Development Goals



Global Reporting Initiative (GRI)

GRI Standards

- Voluntary sustainability reporting
- Manage risks and optimize supplier performance



International Organization for Standardization

ISO Function

- Global federation (163 countries)
- Trusted in supply chain
- Voluntary
- Does not perform certification or issue certificates itself
  - Accredited external certification bodies
- Management standards

ISO Benefits

- Quality processes and products/services
- Waste reduction and process efficiency
- Customer satisfaction and loyalty
- Credibility and market access
- Morale and risk mitigation

ISO 14000 family of standards

- ISO 14001
  - Strategic, holistic approach to environmental policy, plans, and actions
  - Generic environmental management system requirements
  - ISO 14001 Amd 1: Climate action changes
- ISO 14004
  - Guidelines for environmental management systems
  - Implementation guide
  - Assurance and proof

Social Responsibility, Accountability, Sustainability

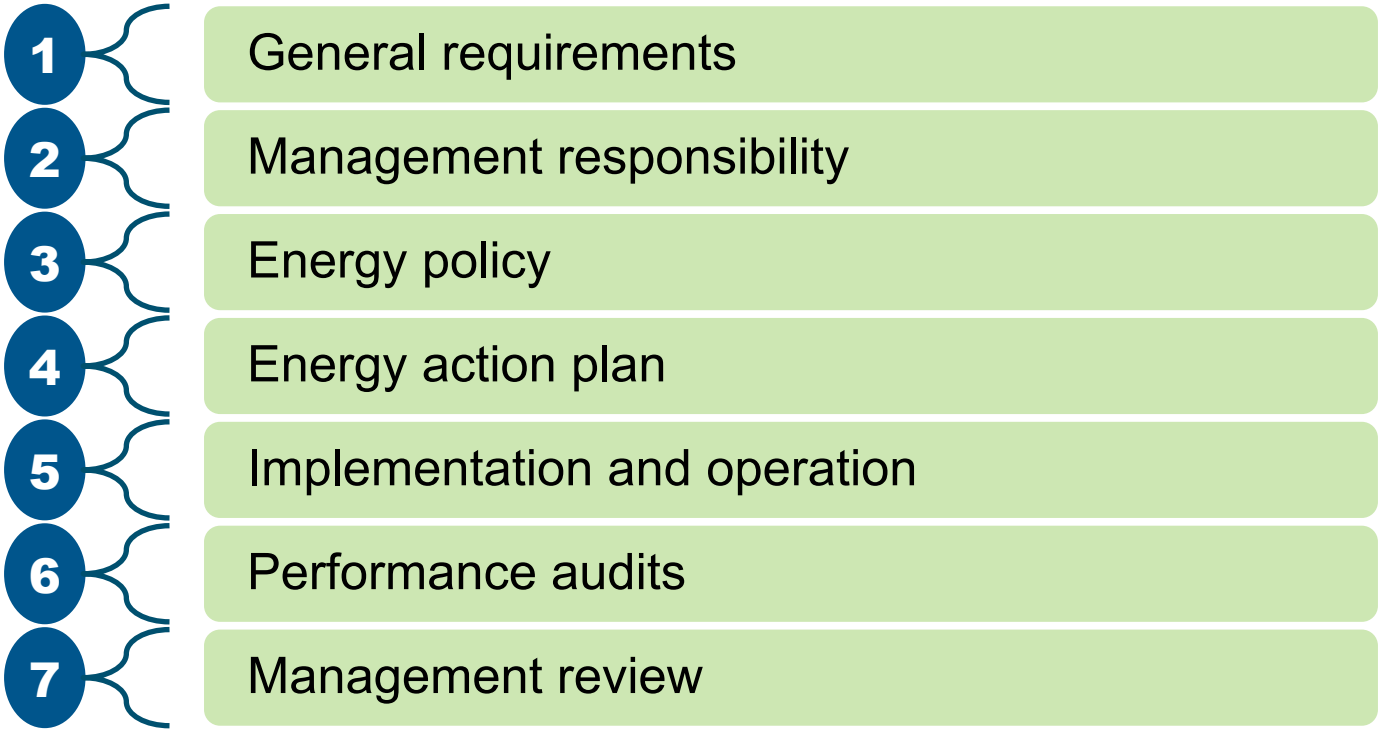
ISO 26000 Guidance for Social Responsibility

- Organizational governance
- Human rights
- Labor practices
- Environment
- Fair operating practices
- Consumer issues
- Community involvement and development

Accountability and Sustainability Standards

- Social Accountability International SA8000
- ASCM Enterprise Standards for Sustainability

ISO 50001 Energy Management

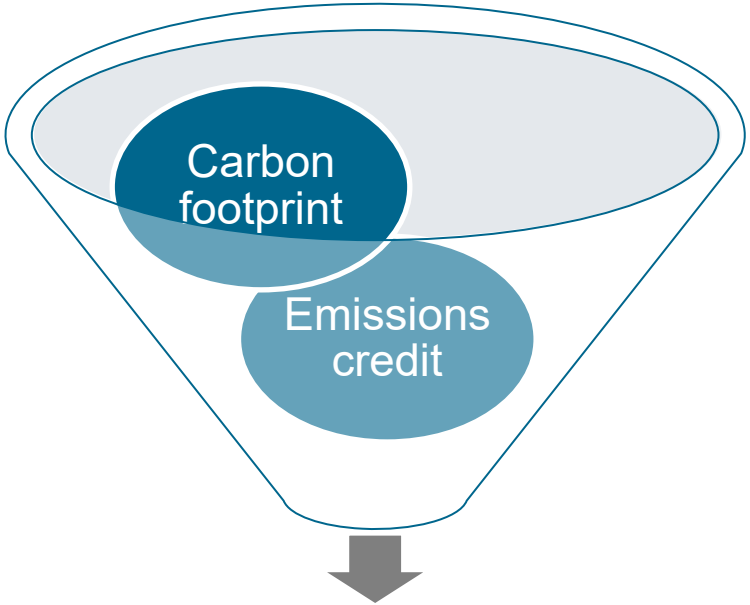


ISO 45001 Occupational Health & Safety (OH&S)

- OH&S management systems
  - Leadership commitment to worker health and safety is a form of social responsibility.
- Objectives and policies
- Emergency planning
- Investigating incidents

Support Sustainability in the Supply Chain

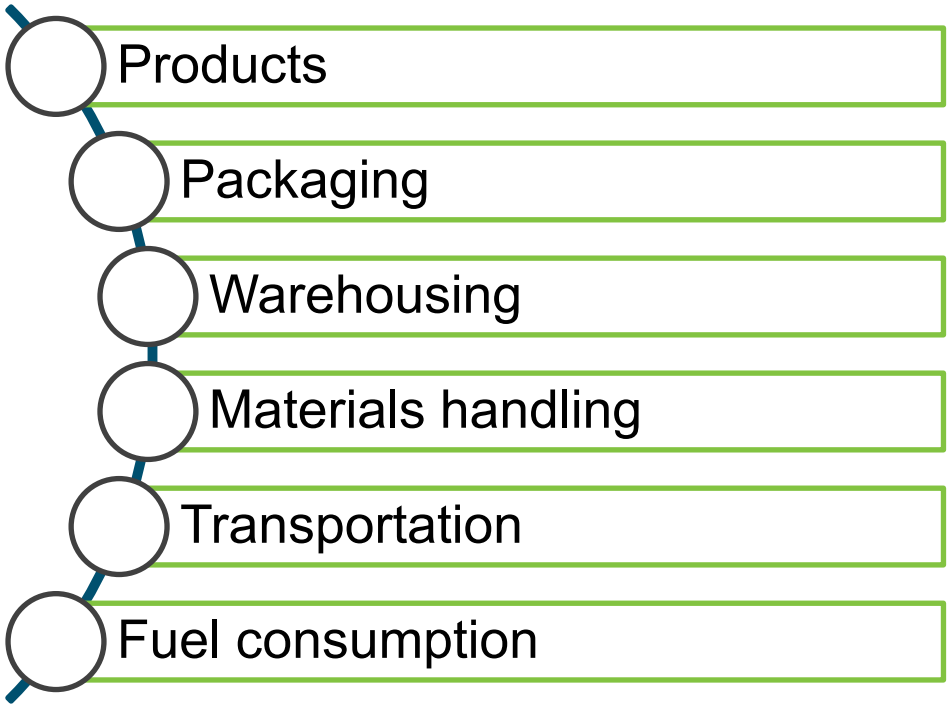
Greenhouse Gas Emissions



Goal: lower logistics emissions

Support Sustainability in the Supply Chain

Sustainability Initiatives (Green Logistics)



Support Sustainability in the Supply Chain

Hazardous Substance Release and Hazardous Waste

- Hazardous substance release
  - Reportable quantity
- Hazardous waste
  - Hazardous to humans or animals
  - Requires special handling
  - Prevent escape from container in storage
  - Allow transfer only to authorized party
  - Written information identifying contents

Support Sustainability in the Supply Chain

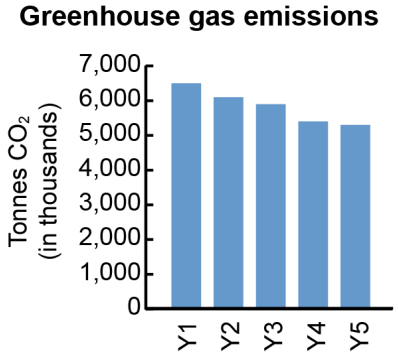
Monitoring and Measurement

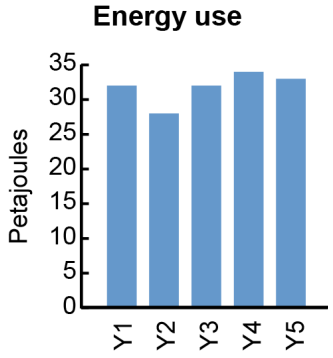
Sustainability scorecard

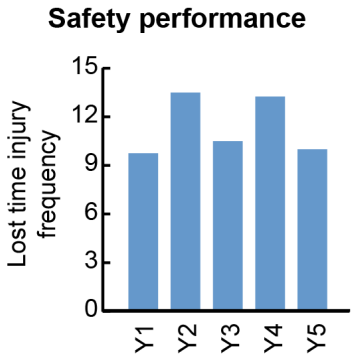
- Compare year-over-year results.
- Track opportunities for improvement.
- Demonstrate continuous progress.

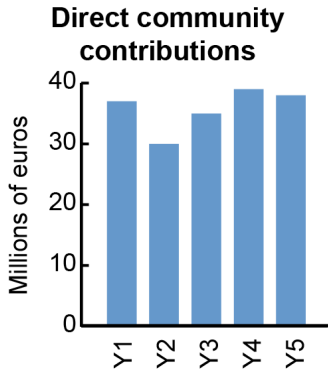
SCOR DS environmental metrics

- Materials
- Energy
- Water
- GHG
- Waste









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MODULE 8, SECTION B:
INCORPORATE REVERSE LOGISTICS

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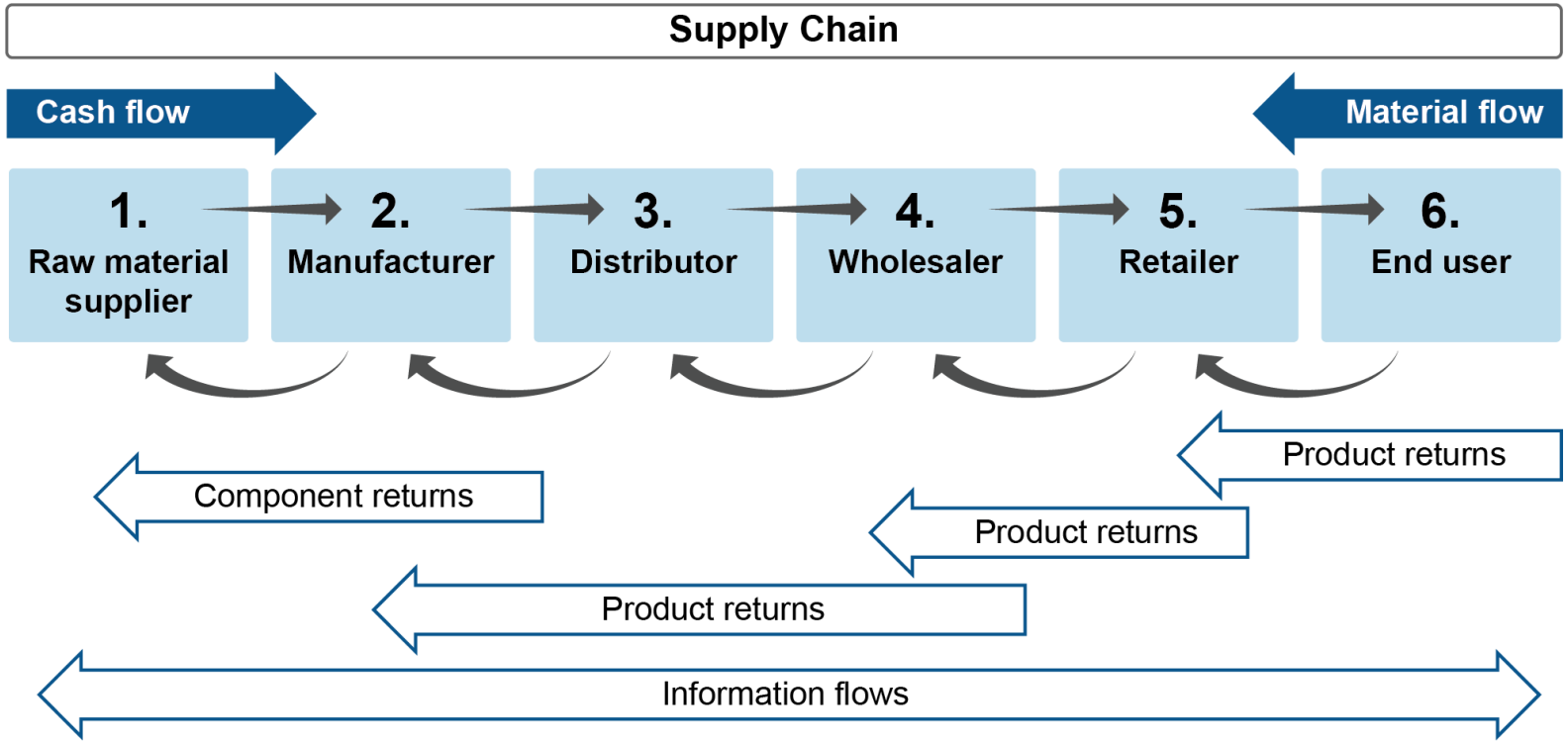
Reverse Logistics Process Flow



Source: *APICS CSCP Learning System*.

Facilitate Reverse Logistics and Returns Handling

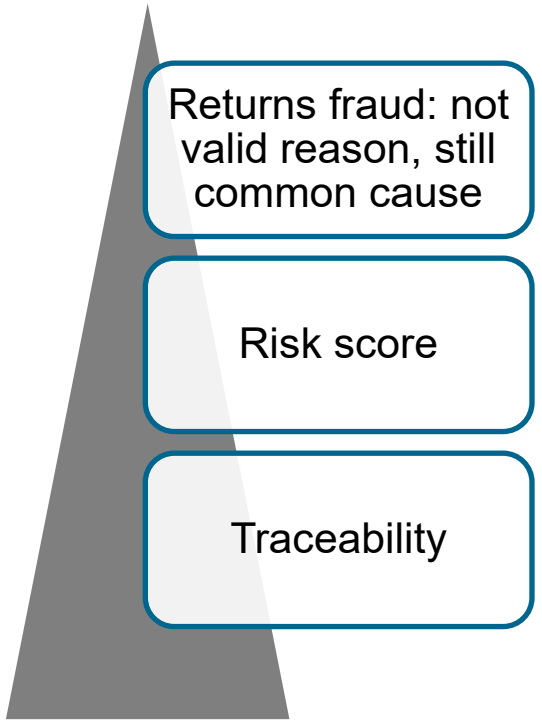
Key Product Factors for Assessing Reverse Logistics

Desirability	Feasibility	Viability	Ethicality
• Delight customer • Confident purchasing? • Charge for returns? • Circular?	• Capable to final dispositions at volume • Profitable enough • Compliant	• Liberal returns policy • Marginal increases in sales plus returns expenses	• Design and make products with acceptable emissions, end of life • Fraudulent returns

Facilitate Reverse Logistics and Returns Handling

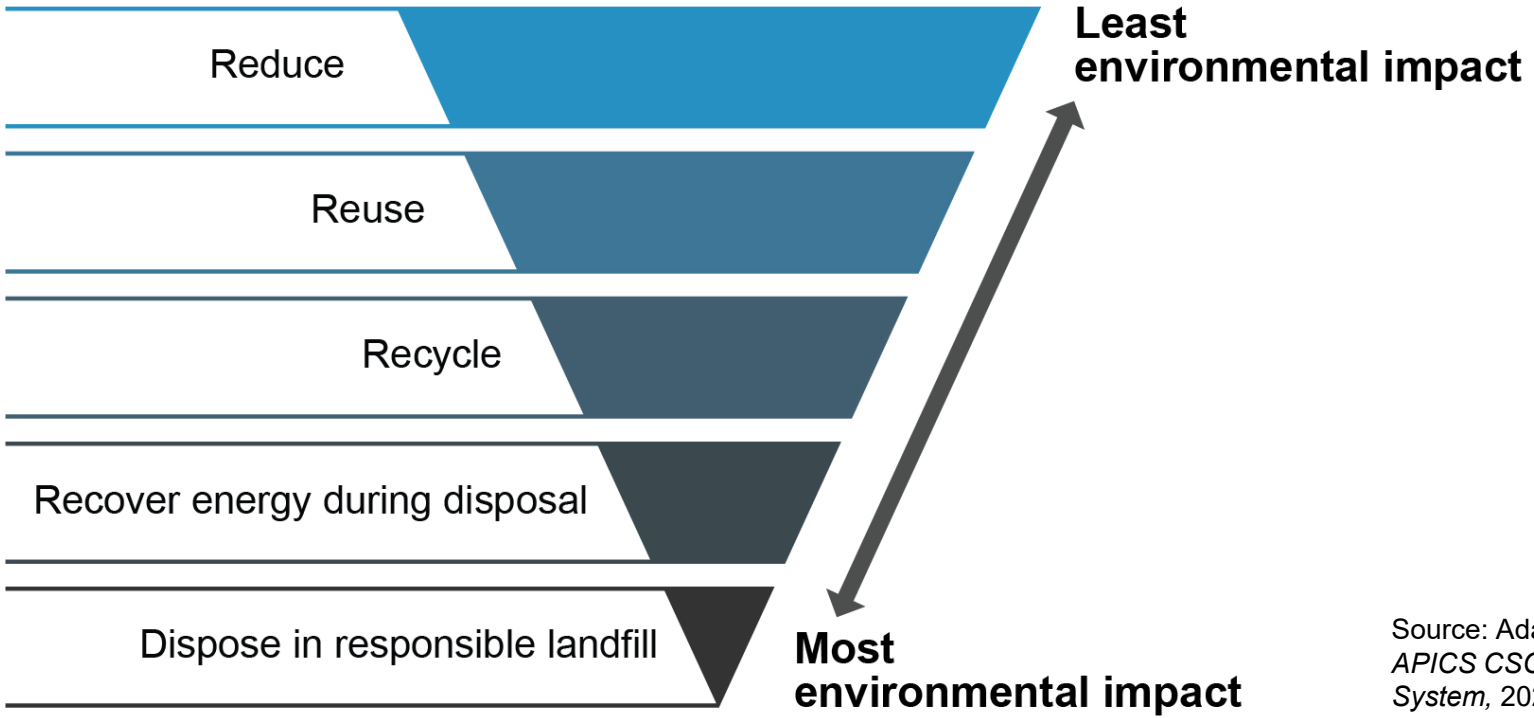
Reasons for Returns

- Preference changes or misunderstandings
- Recalls
- Defective goods
- Distressed: Damaged, expired, cosmetic
- Excess: Overstocks, out of season, obsolete
- Repairs
- End-of-life returns



Develop and Execute a Reverse Logistics Process

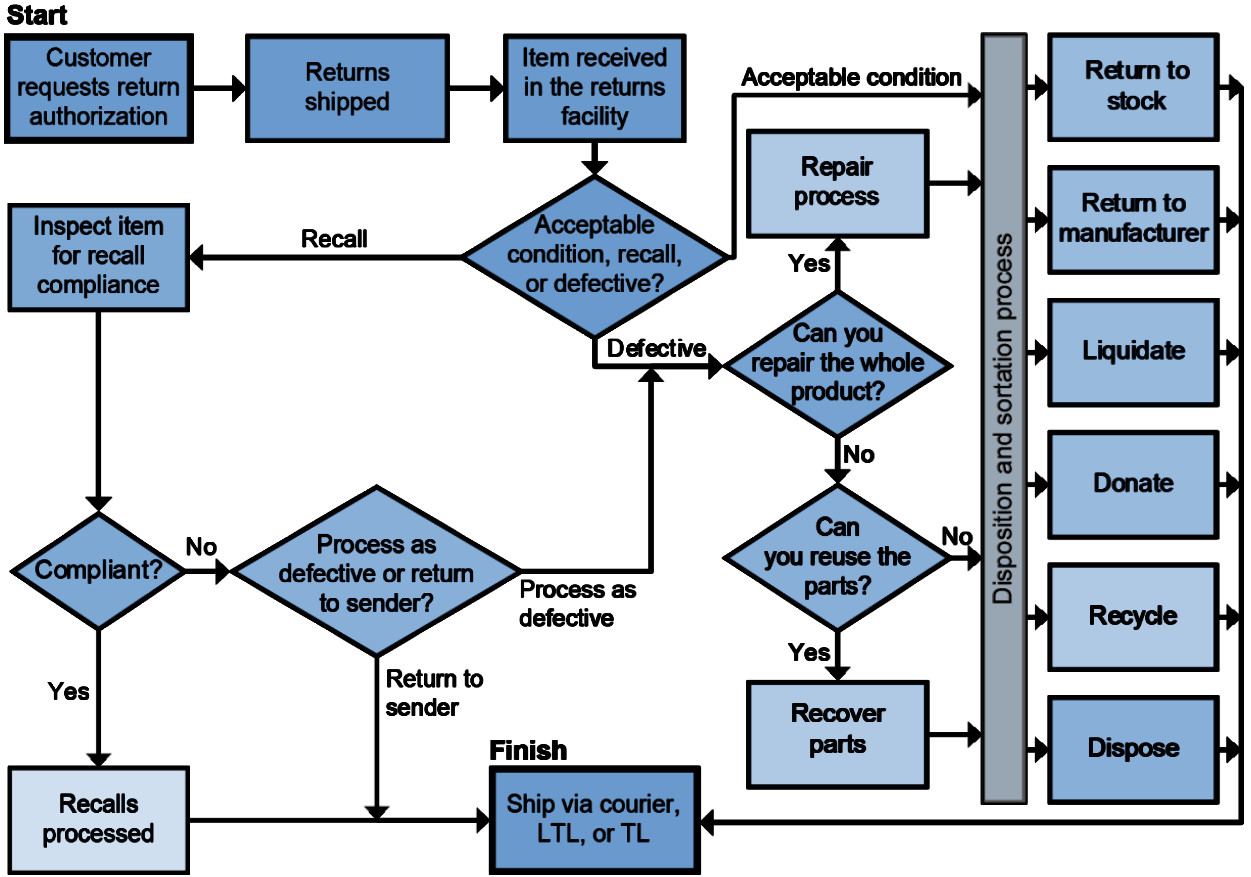
Reverse Logistics Hierarchy



Source: Adapted from *APICS CSCP Learning System,* 2024 Edition.

Develop and Execute a Reverse Logistics Process

Disposition of Returns



Source: © "Reverse Logistics Process Flow," Greve and Davis. Used with permission.

Develop and Execute a Reverse Logistics Process

Closed-Loop (Circular) Supply Chains

- Both forward and reverse flows.
- Reuse or recycle every component.

Advantages:

- Capture some of original value.
- Less landfill.
- Balance supply and demand.

- Redesign: rethink the system
- Reduce waste: design for efficiency
- Reuse: extend life cycle
- Recycle: close loop

Facilitate Reverse Logistics and Returns Handling

Return Policies

Processes	Approaches
▪ Set policies. ▪ Communicate policies to all customers.	▪ Zero returns policy ▪ Return rate allowance ▪ Discount offers ▪ Defective returns only ▪ Return allowed with receipt/card ▪ B2B: Lot-size returns ▪ After gatekeeper approval ▪ Shipping and repair costs

Facilitate Reverse Logistics and Returns Handling

Best Practices

- Retailers deduct returns costs from manufacturer outstanding payables.
- Manufacturers do not accept or credit retailer noncompliant returns.
- For defective or recalled products, manufacturer typically pays freight.
- High tech strict conditions for returns; may not pay handling/consolidation fees.
- Liquidators may provide carriers or pay third-party shipper costs.

Facilitate Reverse Logistics and Returns Handling

Key Considerations for Reverse Logistics Management

Internal or outsourced?

- Space
- Resources
- Trained personnel

Why develop core competencies?

- Greater competitive advantage than outsourced alternatives
- Monetize efforts better
- Demand for recyclable, reusable products is high enough to justify investment.

Optimize Reverse Logistics

Forward Flow Analyses and Costs Plus Handling Charges

Detailed costs for transportation

Averages of historical ton-mile costs

Add to all handling expenses

Total Cost of Reverse Logistics

+ Returned product liquidation revenue
+ Recycling revenue
+ Repair revenue
+ Restocking charges and warranty/service program fees
+ Increase in sales from warranties, remanufacture, green reputation...
+ Capture of tax savings or incentive program benefits
− Returned product cost of goods sold
− Inventory carrying costs
− Transportation costs
− Repair and spare parts costs
− Warranty expenses and returns credits

Optimize Reverse Logistics

Benefits and Challenges

Benefits

- Customer satisfaction
- Brand protection
- Tracking and cost recovery
- Creation of new jobs
- Decreased use of landfills
- Recovery of materials
- Extended warranties and service contracts

Challenges

- Forecasting volumes
- Storage
- Costs
- Traceability

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CERTIFIED IN LOGISTICS,
TRANSPORTATION AND DISTRIBUTION

MODULE 8, SECTION C: INCORPORATE RISK MANAGEMENT PRINCIPLES

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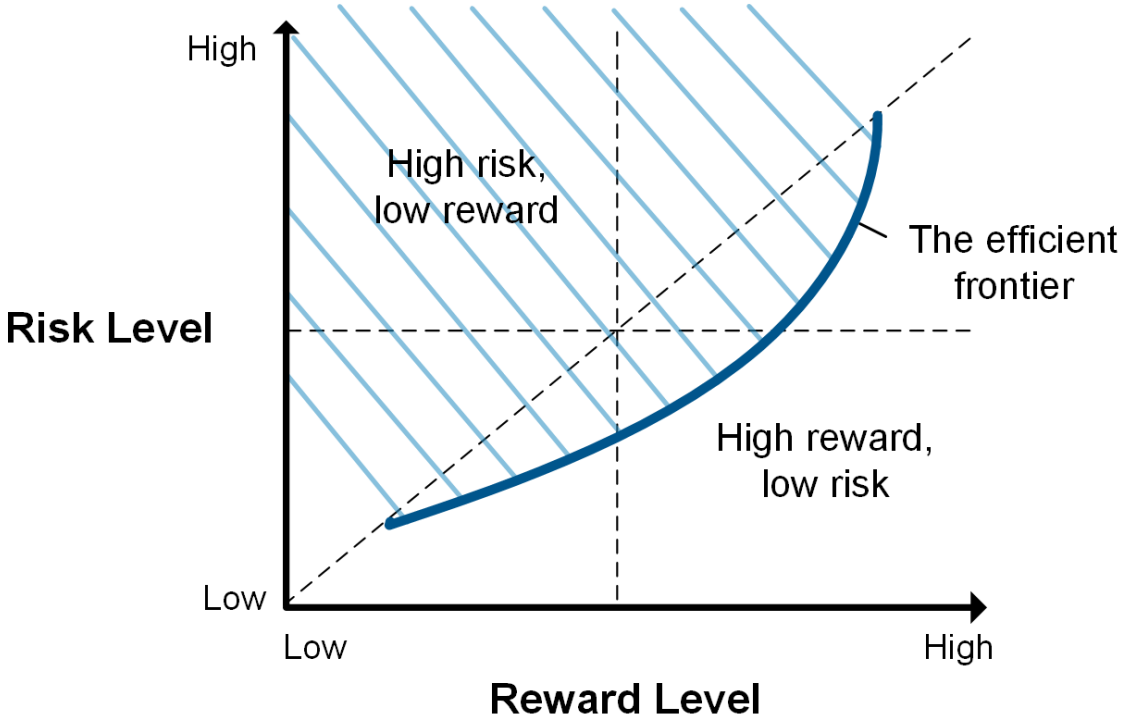
Consider Strategic Risk Management

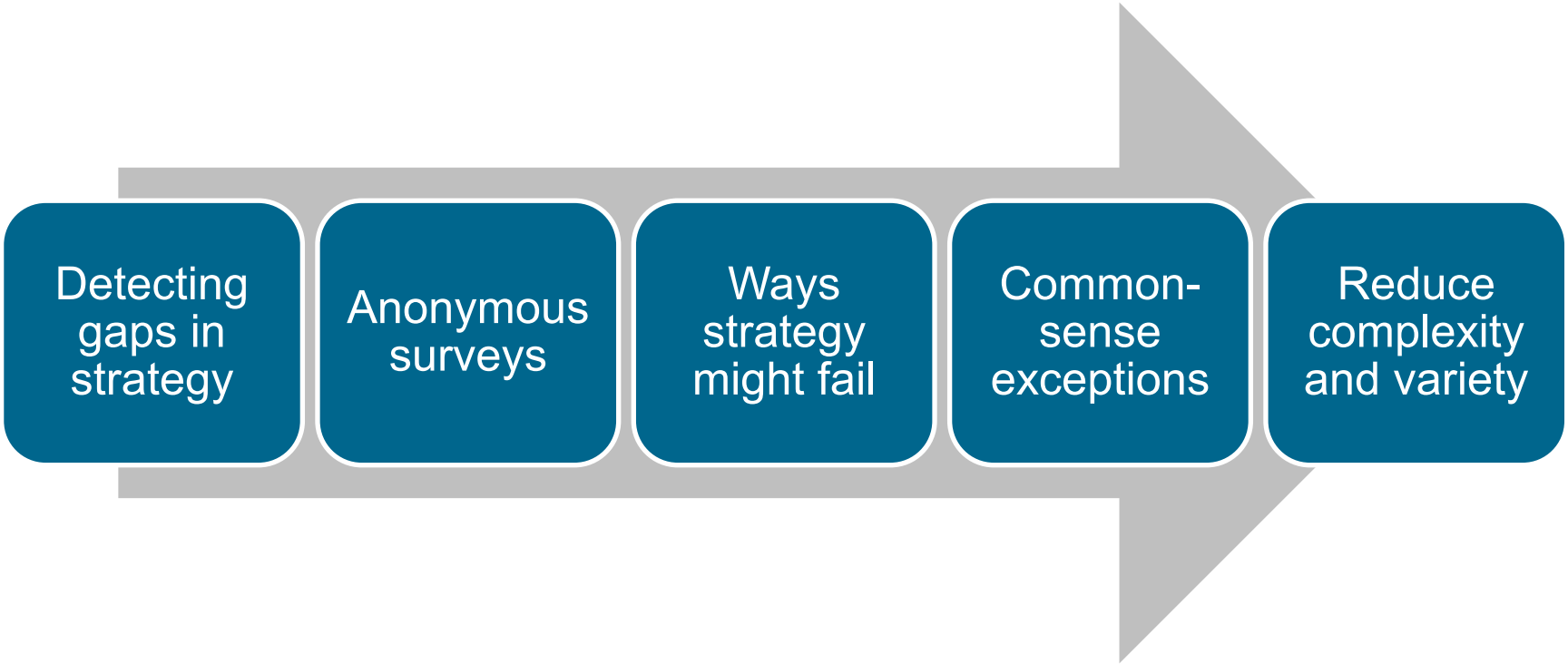
Strategic Risk

- Strategic risk inevitable
  - New strategies
  - New markets
- Risk tolerant
- Risk averse



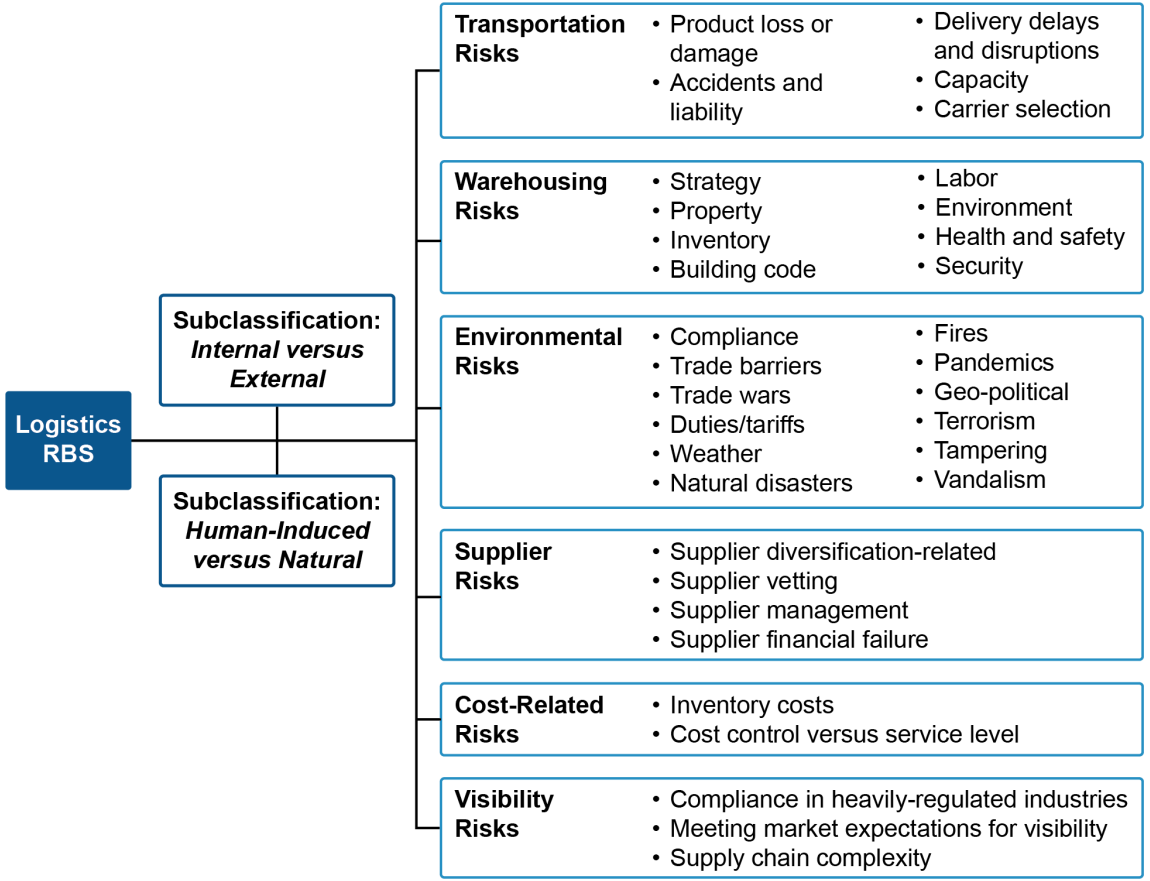
Consider Strategic Risk Management

Strategic Risk Tools: Identify and Manage Exceptions

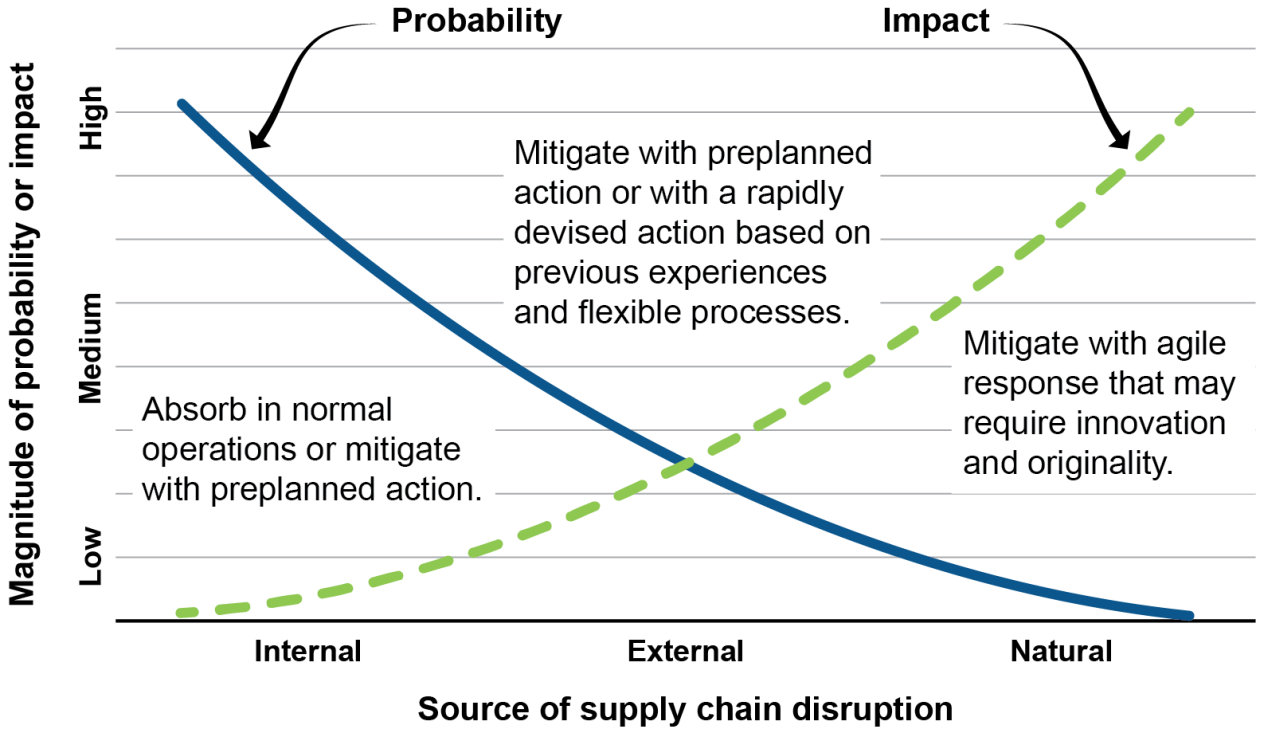


Identify Types of Risk

Risk Breakdown Structure (RBS)



Risk Types and Reponses by Probability and Impact



Internal versus External Supply Chain Risks

Internal	External
▪ Levels – Expected, minor operations risks – Anticipated, moderate disruption risks – Difficult-to-predict major disruption risks ▪ Forecast error is important tactical internal risk.	▪ The economy ▪ Competitors ▪ Technology ▪ Outsourcing ▪ Governments, laws, regulations ▪ Society ▪ War ▪ Natural risks (next slide)

Human-Induced versus Natural Risks

Human-Induced Risks	Natural Risks
▪ Malfeasance, poor-faith dealing ▪ Poor process or insufficient skill ▪ Process risks – Forecast bias – Poor information systems – Over-reliance on facilities, equipment, staff – Loss of intellectual property	▪ Natural disasters, extreme weather ▪ Damaged transport infrastructure or equipment ▪ Delivery delay/reroute ▪ Cargo spoilage ▪ Pandemic ▪ Panama Canal drought

Identify Types of Risk

Transportation Risks

- Product loss or damage (theft, hijacking, jettison, etc.)
- Accidents and liability
- Delivery delays and supply chain disruptions
- Capacity risk
- Carrier selection

Identify Types of Risk

Warehousing Risks

- Location selection/design
- Property
- Inventory
- Compliance
- Health and safety

Identify Types of Risk

Environmental Risks

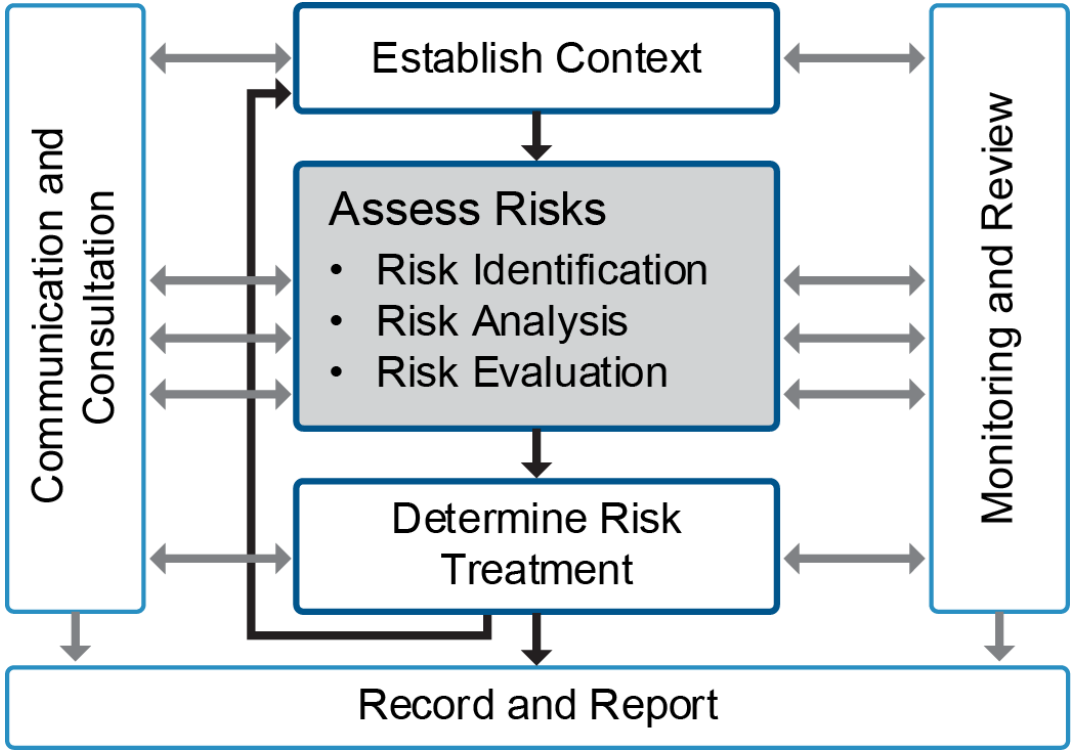
- Geo-political
- Regulatory compliance
- Trade barrier, trade war, and duty/tariff
- Terrorism, product tampering, and vandalism
- Natural risks (addressed earlier)

Identify Types of Risk

Supplier Risks

- Supplier selection and diversification-related
- Supplier management related
- Supplier financial red flags
  - Quality, long lead times
  - Few investments
  - Payment terms
  - Layoffs, turnover

ISO 31000 Process Framework for Implementation

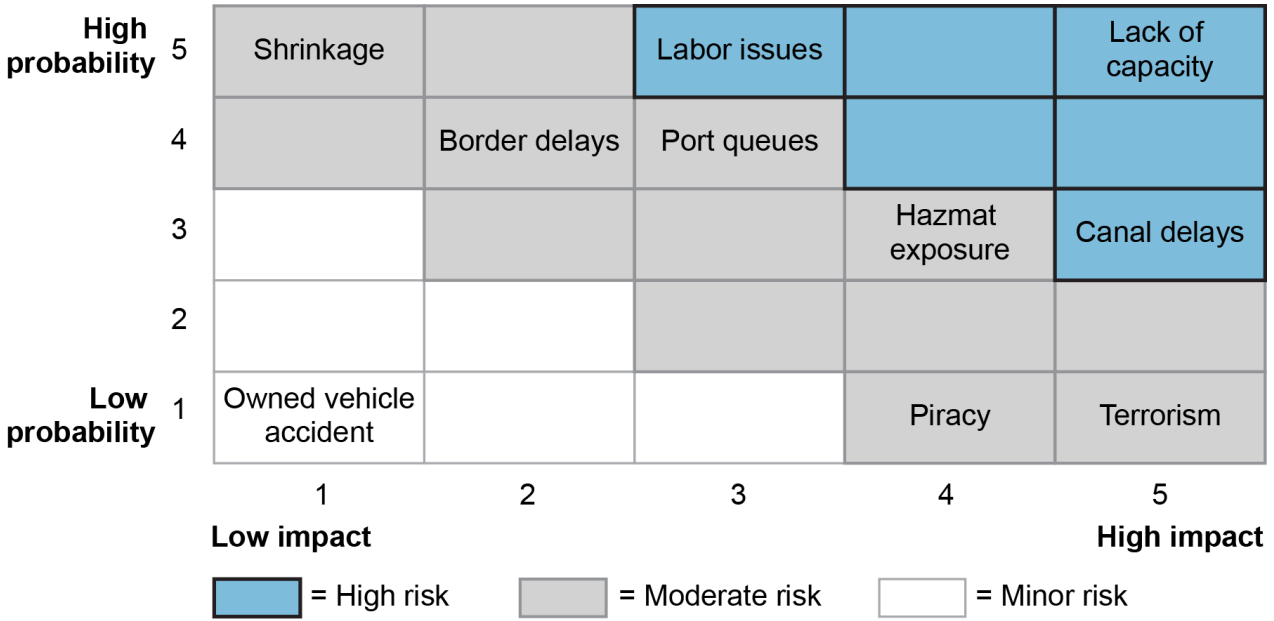


Risk Management Process

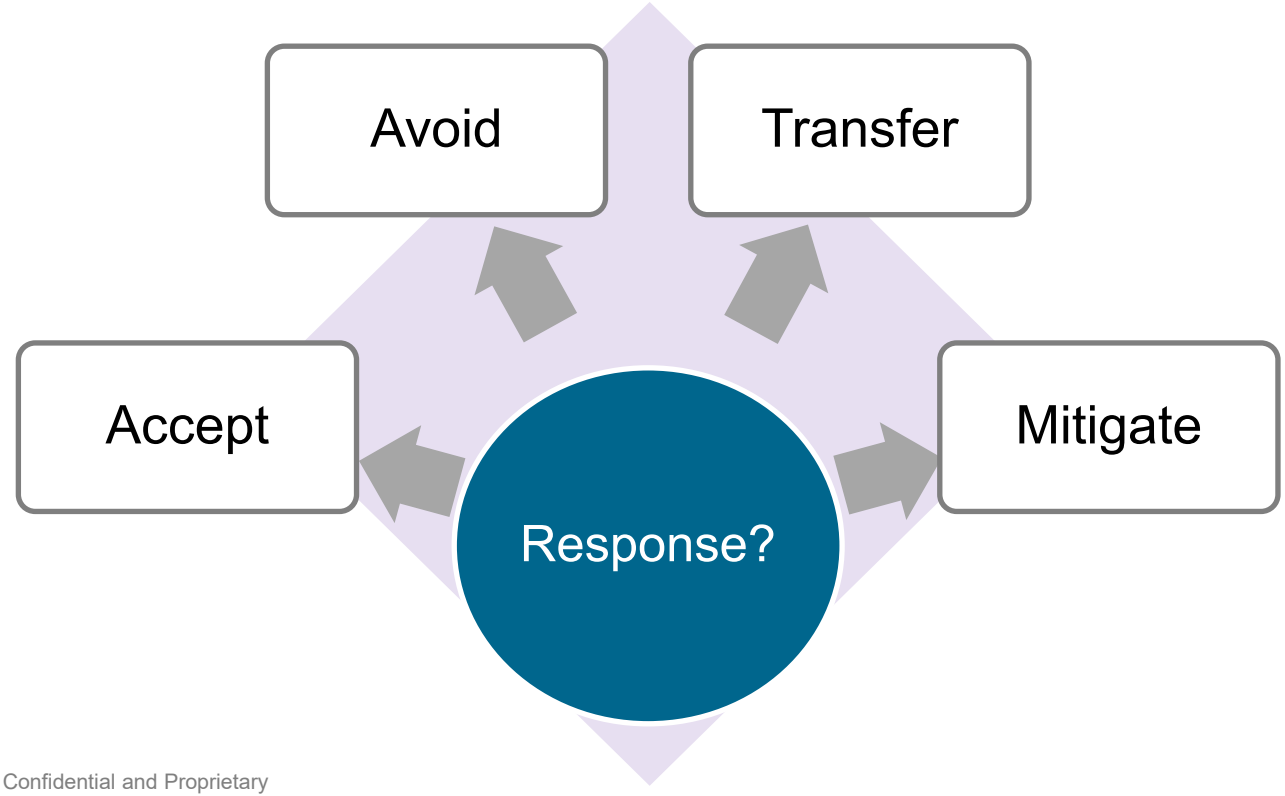
1. Identify and document risks.
2. Categorize and prioritize risks.
3. Quantitatively analyze risk if desired.
   - EMV = Probability × Monetary Impact
4. Pick a basic risk response.
5. Develop preventive and contingent action plans.
6. Get funding and assign roles.
7. Implement preventive action plans.
8. Regularly meet to review risks and risk response status.

Probability and Impact Matrix: Heat Map

Risk Rating = Probability × Impact



Risk Responses



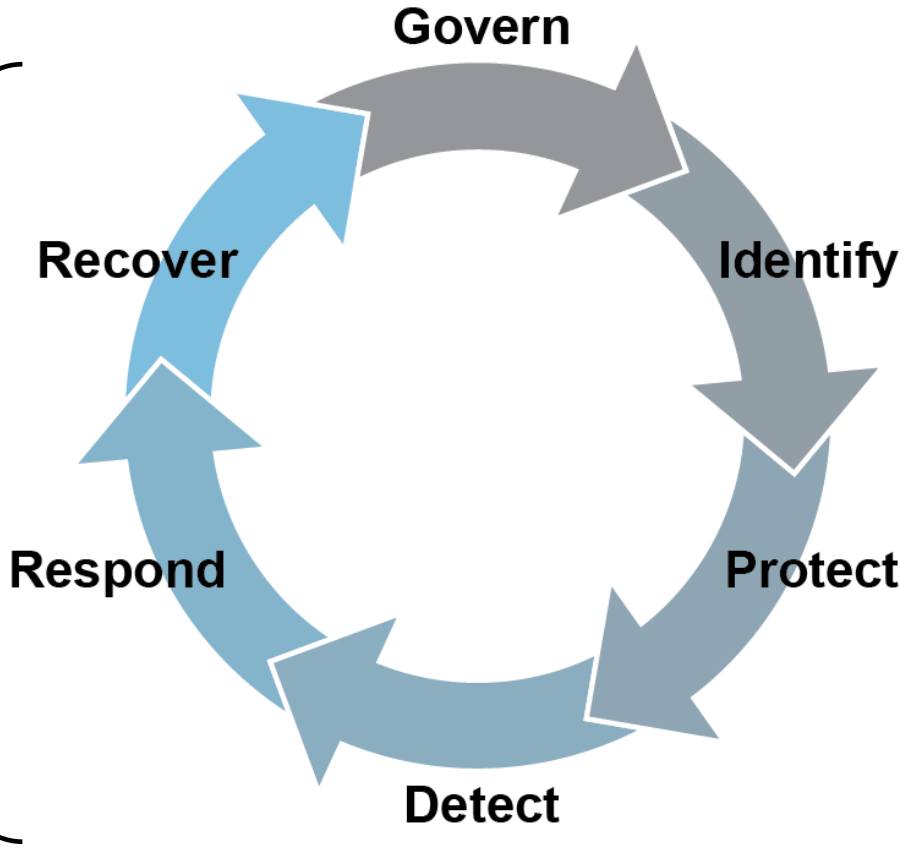
Reactive versus Proactive Responses

Reactive	Proactive
▪ Low redundancy – New carrier after disruption – New DC after flooding ▪ Little visibility – Expedite shipment ▪ Low consideration for packaging – Freight claims – Returns and resupply	▪ Redundancy – Backup carriers, routes – Share DC space with other supply chains ▪ Visibility – Supply chain control tower for real-time rerouting ▪ Packaging – Test dunnage, cushioning, moisture resistance for mode – Accelerometers in containers

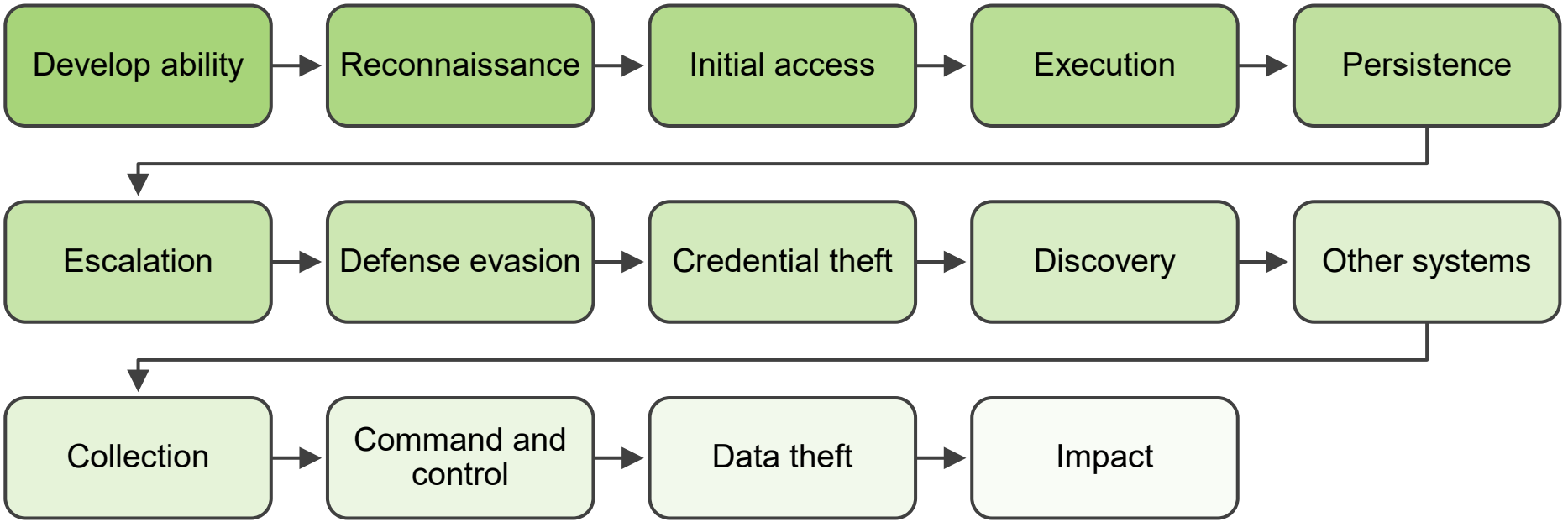
Identify and Use Security Measures for Mitigating Risk

Cybersecurity Measures

- Standards may be regulatory requirement
- Cyber insurance
- ISO 27001
- NIST Cybersecurity Framework:



MITRE ATT&CK: Life Cycle of a Cyber Threat



Physical Security Measures

- Basics covered?
  - Secure zones
  - Entry controls
  - Equipment, utilities security
  - Audits and reviews
  - Training, certification
- Security checks and balances
- Transportation security
- Warehouse security

Product Traceability

- Traceability
  - "1) The attribute allowing the ongoing location of a shipment to be determined. 2) The registering and tracking of parts, processes, and materials used in production, by lot or serial number" *ASCM Supply Chain Dictionary.*
  - National origins and production facilities through distribution points
  - Chain of custody
  - Lot/serial number control

Blockchain Technology

- Use case: Low trust in supply chain
- Reliable evidence of goods transfer between parties for chain of custody for freight payment, safety, recalls, origin.
- Automate capture, distribution of IOT data (e.g., temperature).
- Serial number authenticity for counterfeit prevention.
- All parties see relevant and authorized transactions.
- Smart contracts: Validate virtual documentation

Transfer Risk Using Insurance

Insuring Against Loss

Risk transfer

- Transfers the risk to a third party, usually an insurance company

Self-insurance

- Risk retention strategy that requires setting aside sufficient funds to cover the loss

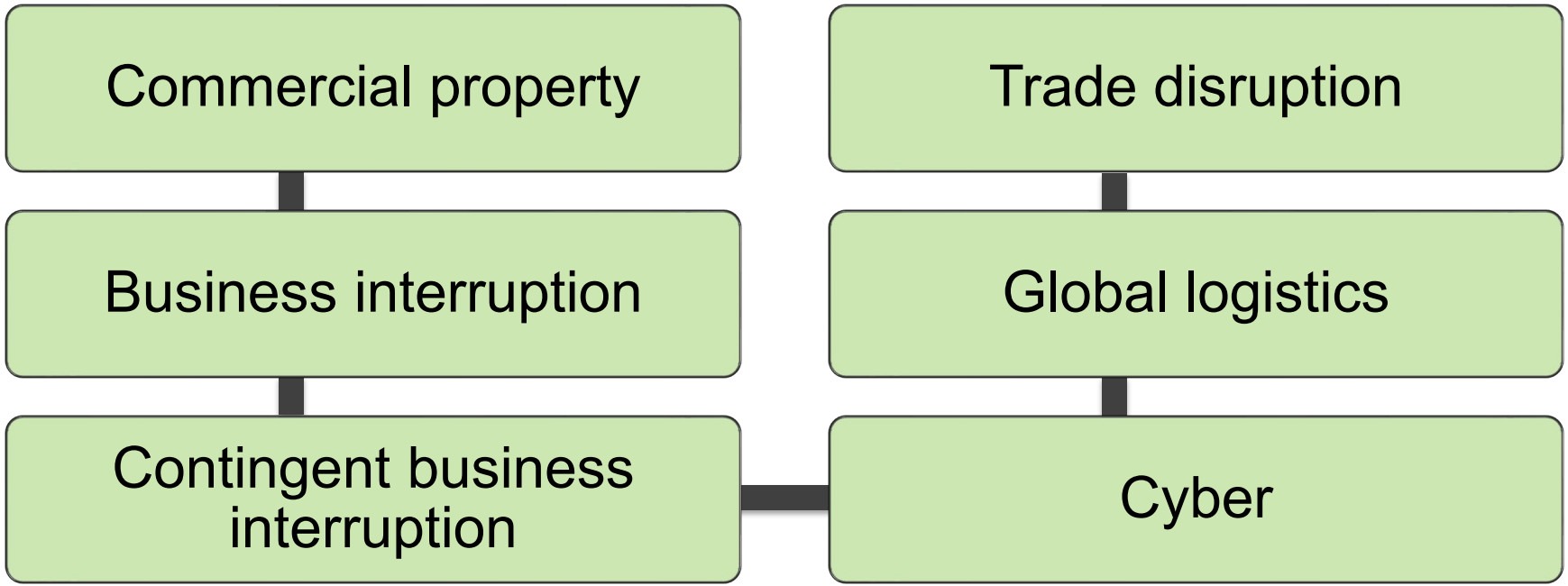
Transfer Risk Using Insurance

Cargo Insurance

- Domestic terms or Incoterms® 2020 assign who insures.
  - Carrier liability exemptions/low carrier liability limits.
  - Marine cargo insurance clauses A or C.
- IMF special drawing rights (SDRs): carrier liability per kg
  - Air 2 SDR per kg
  - Road 8.33 SDR per kg
  - Sea depends on country where carriage contract signed.
- Carrier liability limited and insufficient; responsible party should always insure (cost of premium is small).
- General average losses.

Transfer Risk Using Insurance

Types of Insurance for Supply Chain



Business Continuity Management

Process	Logistics' role
1. Conduct a business impact analysis (BIA). 2. Conduct a risk assessment (RA). 3. Define organization's business continuity strategy. 4. Develop procedures for business continuity. 5. Test procedures and continuously improve.	▪ Emergency roles and supplier replacement plans ▪ Know that inventory buffers are vulnerable. ▪ Order for restoring services – Logistics information systems restoration ▪ Business continuity insurance