Understanding ISO 14051:2011 (MFCA) Standard Requirements

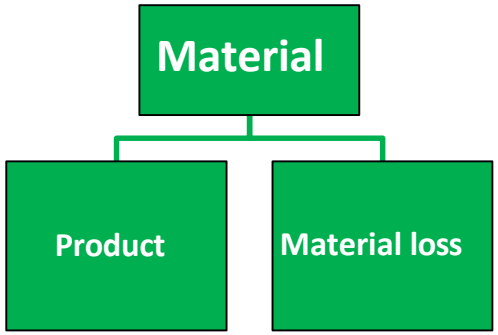
Contents

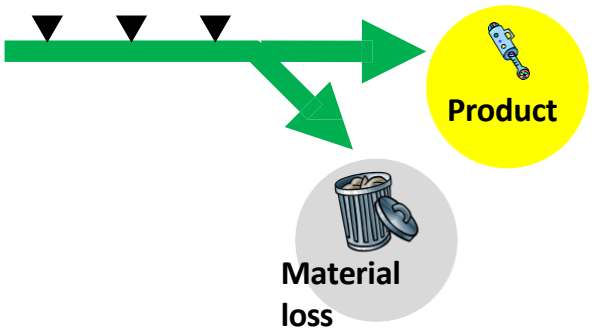
Module 1
General Concept of MFCA

What is MFCA ?

Material Flow Cost accounting

Material + Flow + Cost accounting





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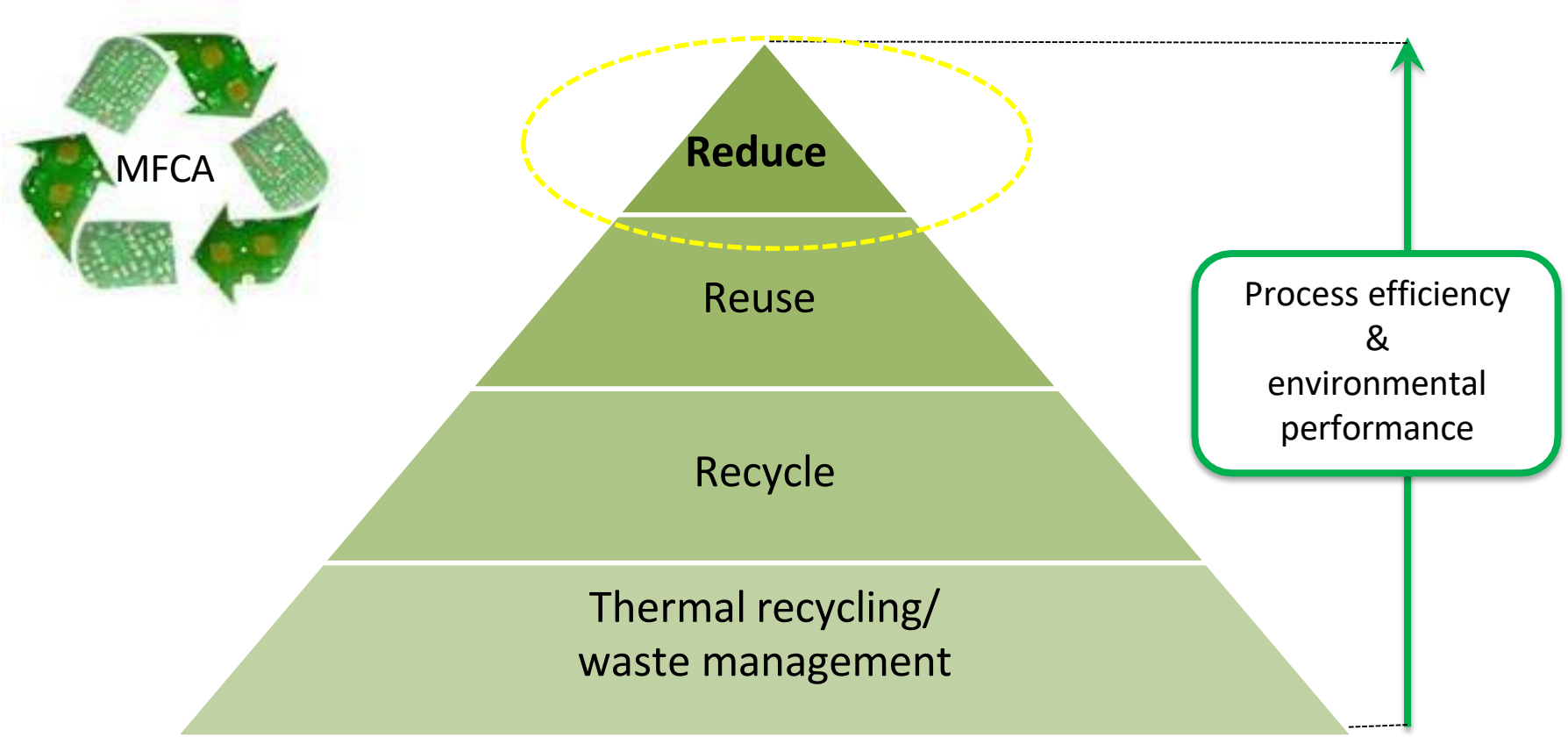
3 elements MFC(A) constitute MFCA

Reuse, recycle, or reduce (3Rs)



MFCA: 3 impacts

For your organization

For others (environment)

Improvement of material efficiency

What you can potentially achieve through MFCA

For others (environment)

For your organization

Improvement of energy efficiency

CO_2

Cost reduction

For your organization

Concept of MFCA

MFCA lets you consider waste. The photograph below shows production of apple fruit and apple skin.

MFCA considers both.
MFCA potentially enables you to have a bigger apple with thinner skin.
A paradigm change for waste.

http://www.acornadvisors.com/Kitchen%20Newsletters/2007-09-20_Apples/Peeling_Apple.jpg

MFCA concept: material balance

Input material

Input

Quantity center

Output

Product

Output

Material loss

MFCA concept: material balance

Input material

Input

Quantity center

Output

Product

Output

Material loss

Equivalent evaluation

Examples of material loss

End of coil

Edge material

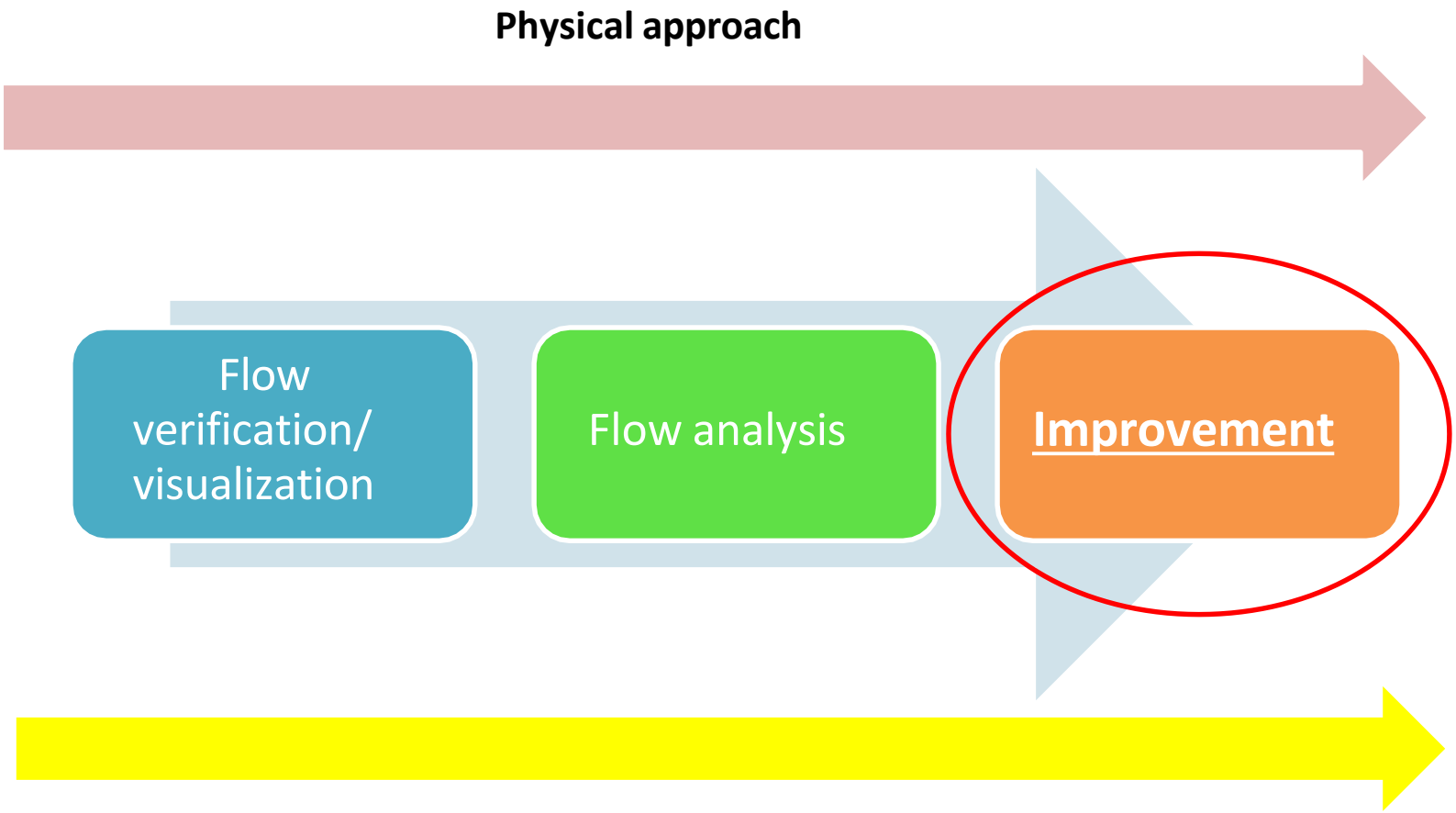
Characteristics of MFCA

Visualize material loss and costs → Identify problems → Encouraged to solve problems

Many companies generate more waste than they realize.

Knowing the amount of waste and its costs helps us recognize improvement opportunities.

Significance of MFCA



Module 1 Summary

- MFCA consists of three elements:
  1. Material (how input materials are used);
  2. Flow (behavior of material throughout the target process); and
  3. Cost accounting (calculation of cost for both products and material losses).

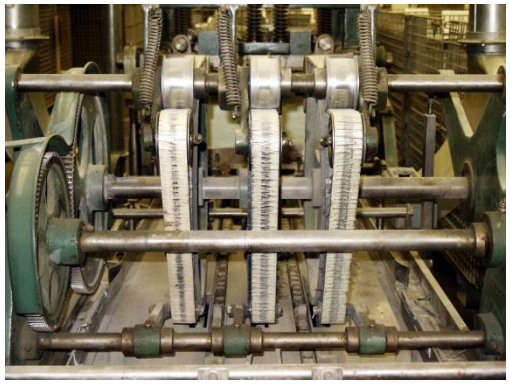
- MFCA provides dual (internal and external) benefits. Internal benefits include cost reduction and better environmental performance (e.g., improved corporate image as a green company), while external benefit includes less material extraction from the earth.

- In the context of the 3Rs, MFCA focuses on the potential for "reduction."

Module 2
Characteristics of MFCA

MFCA and conventional management

Example of conventional management



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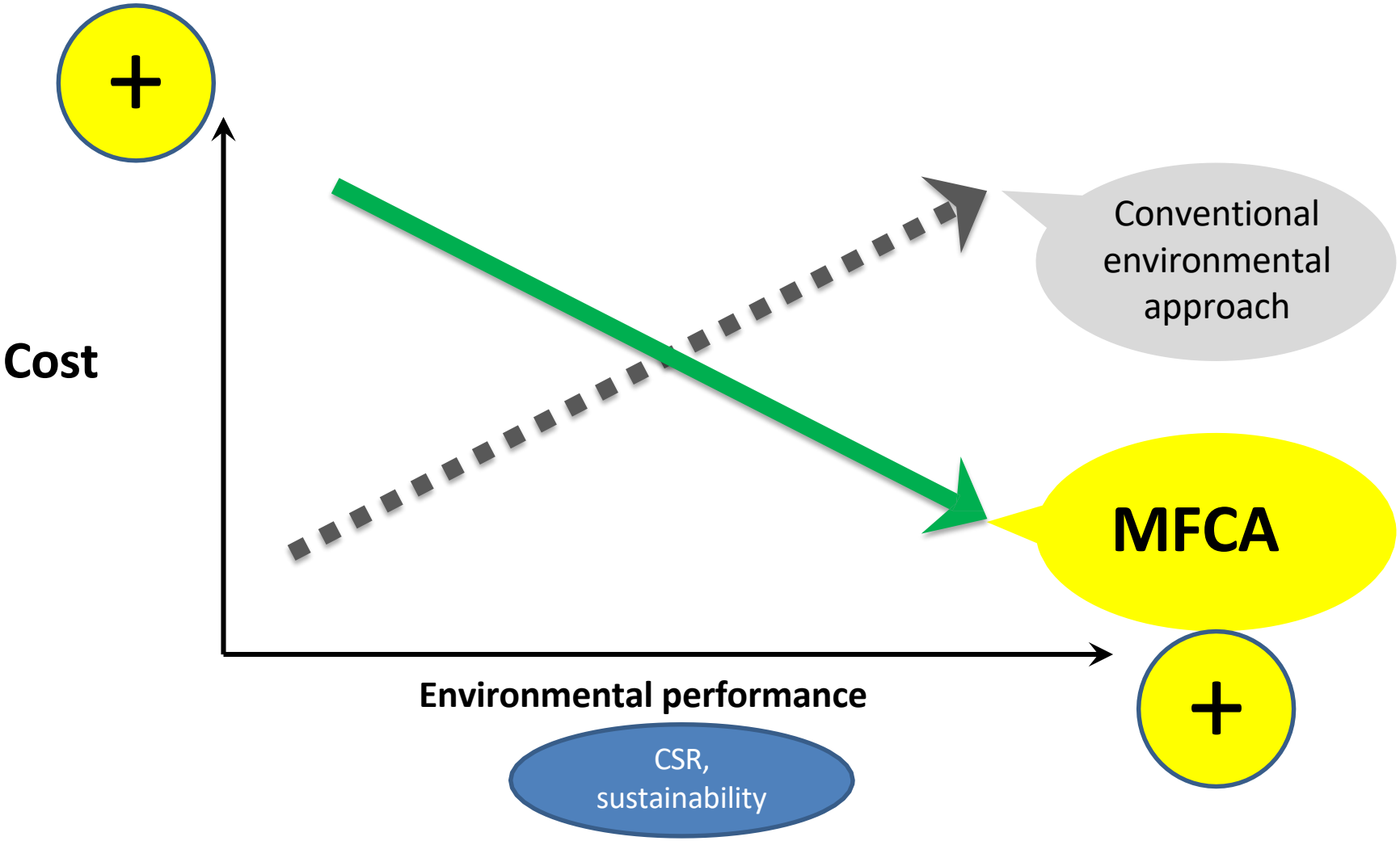
MFCA

Classification	Conventional management	MFCA
Management target	Facilities	Materials
Proposal	Improve processes	Cost-efficient, eco-friendly manufacturing
Goal	Increase production yield and reduced time	Maximization of resource productivity

MFCA combined with a conventional management system helps companies estimate costs incurred as a result of activities.

MFCA vs. conventional environmental approach



Approach of MFCA

System cost
energy cost (electricity)

Material
(100 tons)

Input

Factory

Output

Product
(70 tons)

Output

Material loss
(30 tons)

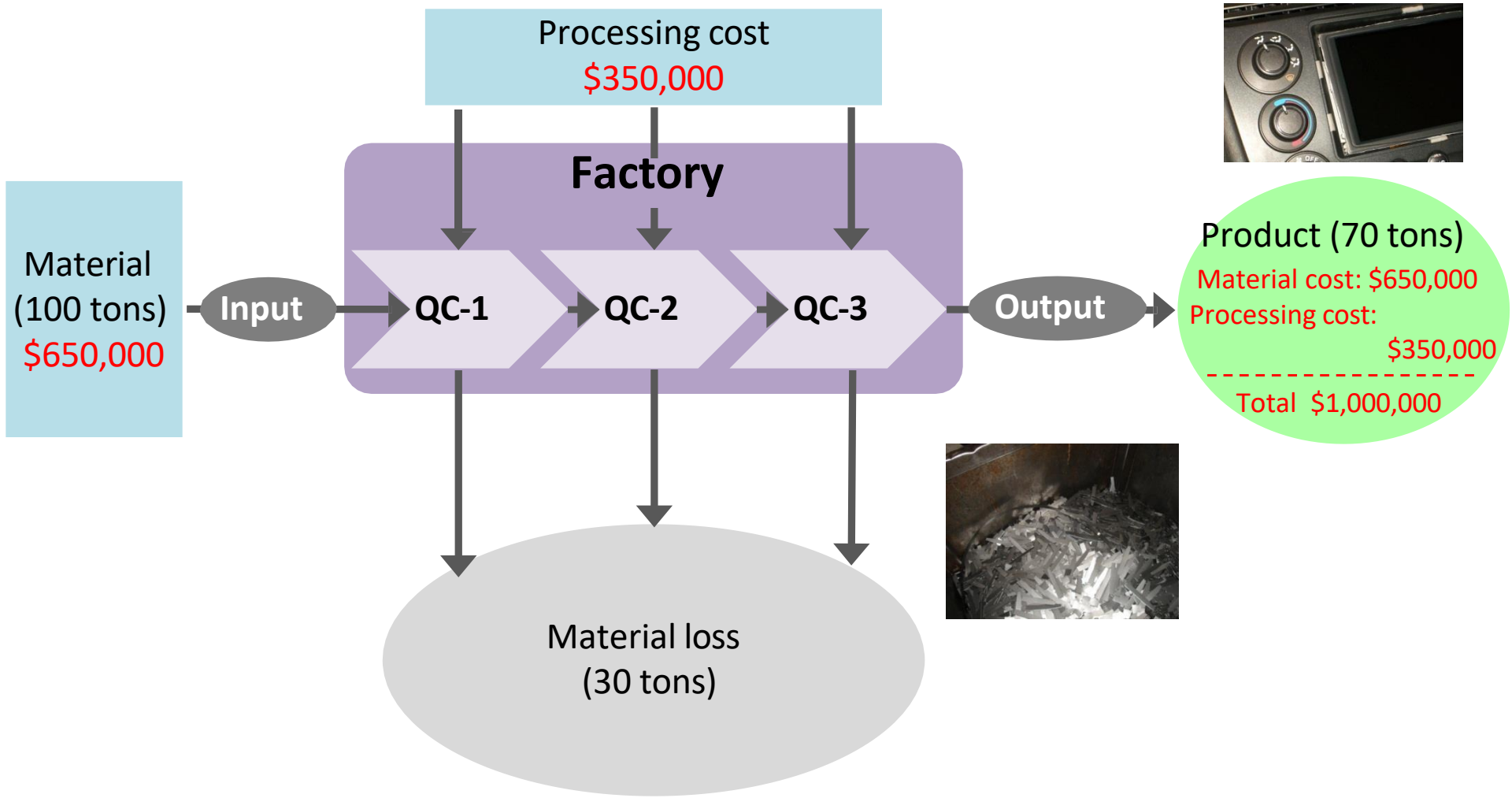
Wastewater

Waste

Emissions to
air

Carbon
emissions

Conventional management



Point of MFCA evaluation

System cost (e.g., labor, deprecation) and energy cost*

Material (100 tons)

Input

Factory

Output

Product (70 tons)

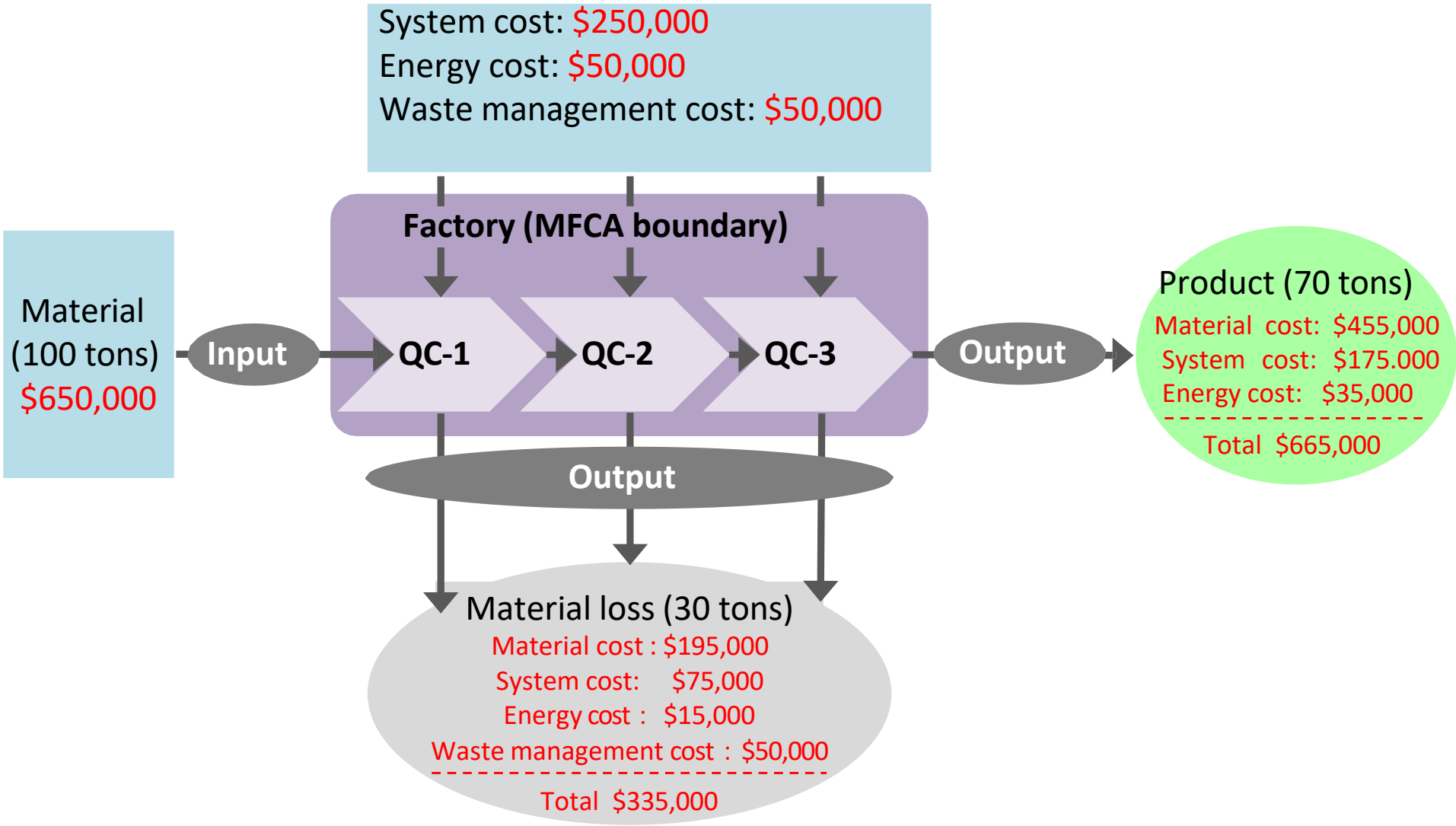
Output

Equivalent cost evaluation

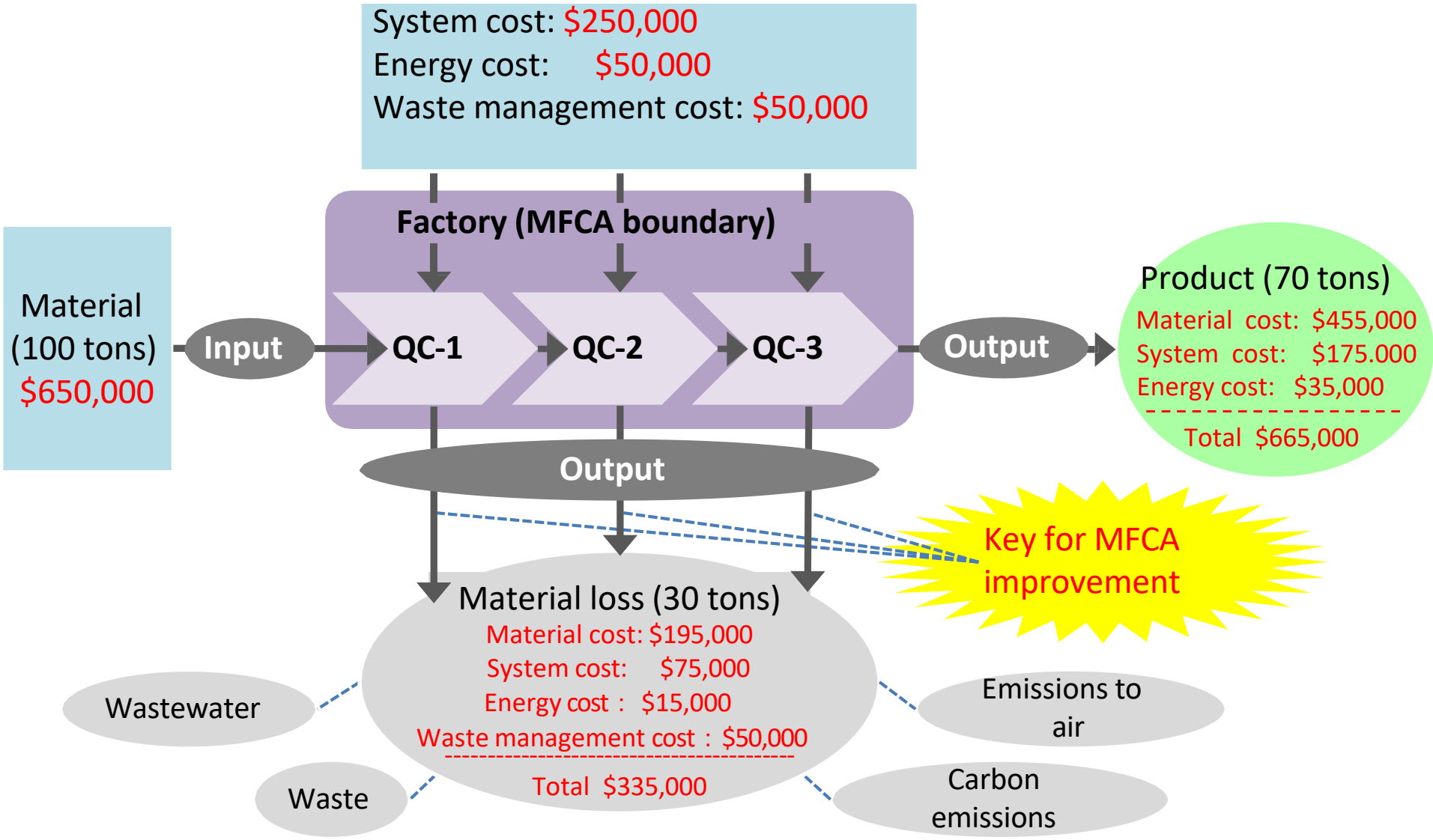
Material loss (30 tons)

*Details will be provided later.

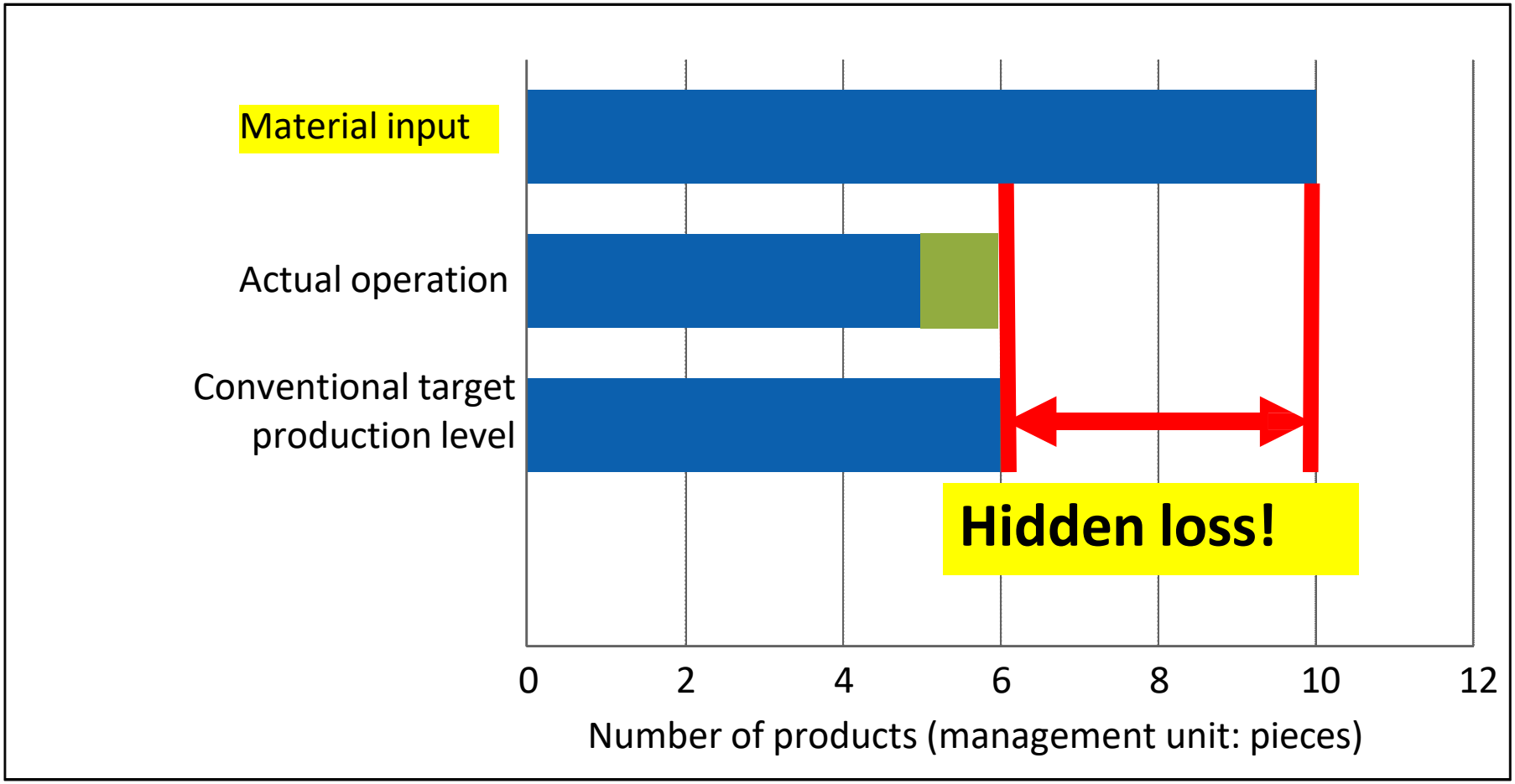
Cost calculation based on MFCA-1



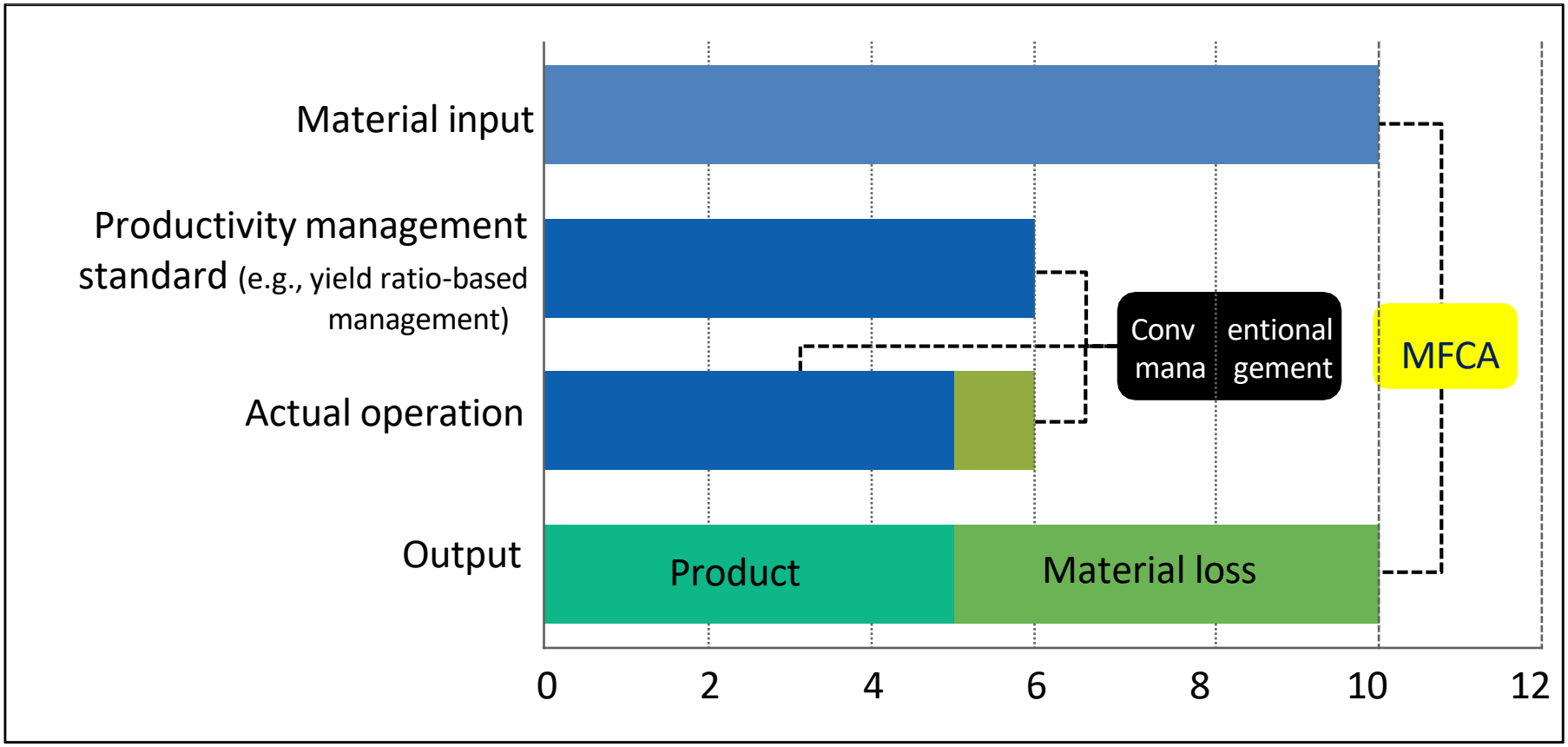
Cost calculation based on MFCA-2



MFCA and conventional production management-1



MFCA and conventional production management-2



MFCA focuses on material inputs, not on yield ratios.

Comparison of profit and loss (P/L)-1

MFCA-based profit and loss		Conventional profit-and-loss statement	
Sales	15,000,000	Sales	15,000,000
Product cost	3,000,000	Cost of sales	4,500,000
Material loss (waste) cost	1,500,000	N/A	N/A
Gross profit	10,500,000	Gross profit	10,500,000
Sales, general, and administrative expenses*	8,000,000	Sales, general, and administrative expenses*	8,000,000
Operating Profit	2,500,000	Operating profit	2,500,000

Potential outcome: MFCA gives new insights into your P/L for better business performance.

Comparison of P/L-2

MFCA-based profit and loss		Conventional profit-and-loss statement	
Sales	15,000,000	Sales	15,000,0
Product cost	3,000,000	Cost of sales	4,500,0
Material loss (waste) cost	1,000,000		
Gross profit	10,500,000	Gross Profit	10,500,0
Sales, general, and administrative expenses*	8,000,000	Selling, general and administrative expenses*	8,000,0
Operating profit	3,500,000	Operating profit	2,500,0

1. Implementation of MFCA analysis

2. Reduction of waste and energy

3. Leads to increased profit

Potential outcome: MFCA gives new insights into your P/L for better business performance.

Module 2 Summary

- MFCA can significantly contribute to a company's sustainable performance by reducing operating costs and waste generation.

- MFCA differs from conventional accounting systems because it highlights hidden losses that are generally overlooked in conventional management activity.

Module 3
ISO 14051
Scope, Terms, and Definitions

Why is an international standard important?

- Practitioners have different cultures and backgrounds
- Technical terminology is defined
- Guidance on fundamental elements is given

ISO TC207 WG8: International Standardization Group for MFCA

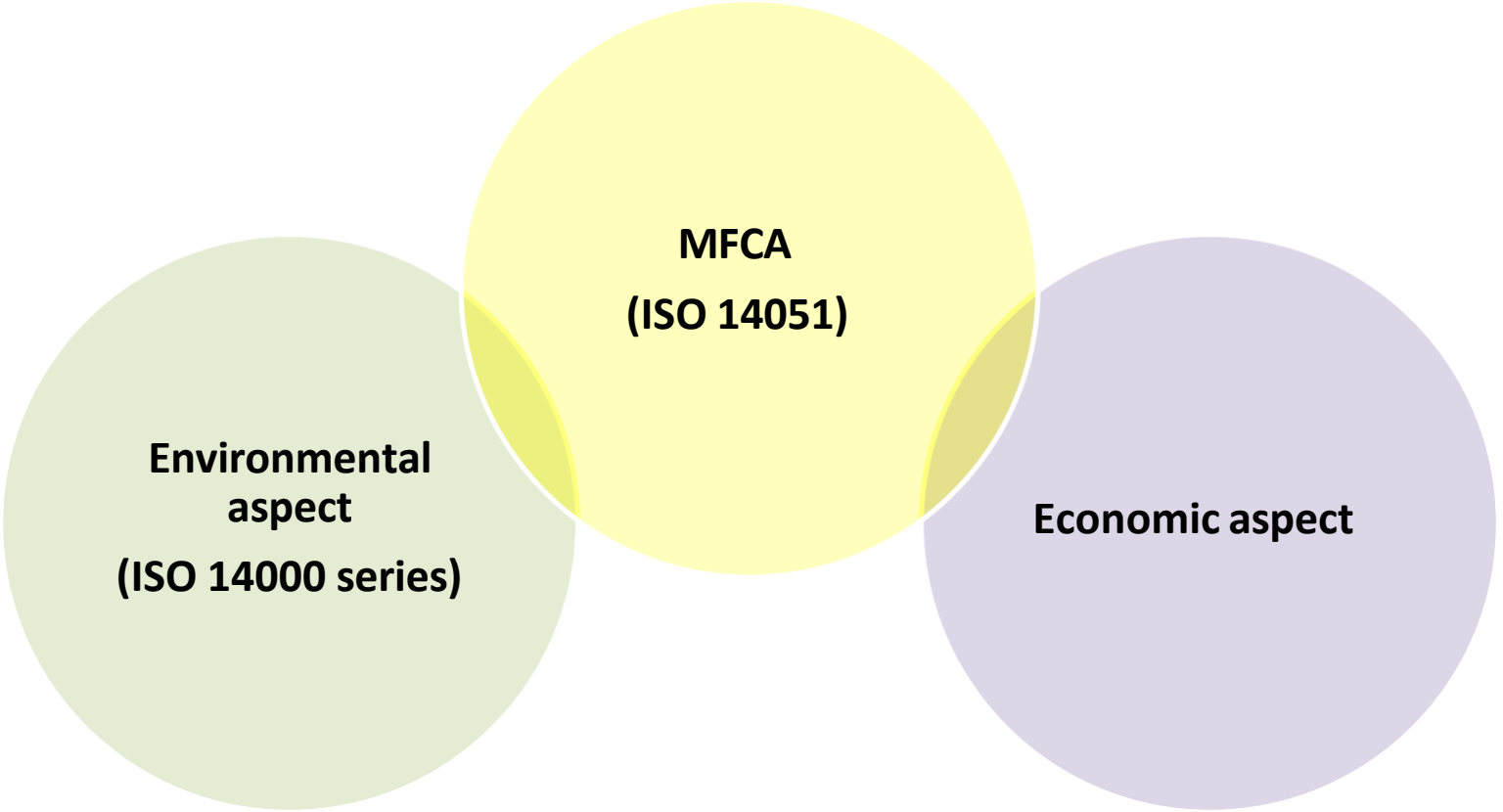
WG 8 overview

- Convener: Katsuhiko Kokubu (Japan) Co-
  Convener: Marcelo Kos (Brazil)
  Secretary: Y. Furukawa (Japan)
  Assistant Secretary/Expert: H. Tachikawa (Japan)

- Experts: 62 experts from 28 countries

- Participating countries: Argentina, Austria, Belgium, Brazil, Canada, China, Colombia, Denmark, Finland, France, Germany, Ghana, Italy, Japan, Malaysia, Mexico, Pakistan, Portugal, Singapore, South Africa, South Korea, Sri Lanka, Sweden, Switzerland, Thailand, the Czech Republic, the United Kingdom, and the United States.

Significance of ISO 14051 in the ISO 14000 series



ISO 14051 strengthens the linkage between the ISO 14000 series and economic aspect.

History of MFCA International Standardization

Date	Action
2007	Submission of NWIP by Japanese Industrial Standards Committee
June 2008	1st WG 8 meeting in Bogotá, Colombia
Nov 2008	2nd WG 8 meeting in Tokyo, Japan
June 2009	3rd WG 8 meeting in Cairo, Egypt
Sep-Dec 2009	CD circulation for voting and approved
Jan 2010	4th WG 8 meeting in Prague, Czech Republic
May-Oct 2010	DIS circulation for voting and approved
Jan 2011	5th WG 8 meeting in Berlin, Germany
Jan 2011	FDIS circulation for voting and approved (100% positive votes!)
Sep 2011	ISO 14051 standardization
As of Sept 2013	Next standard for MFCA under discussion

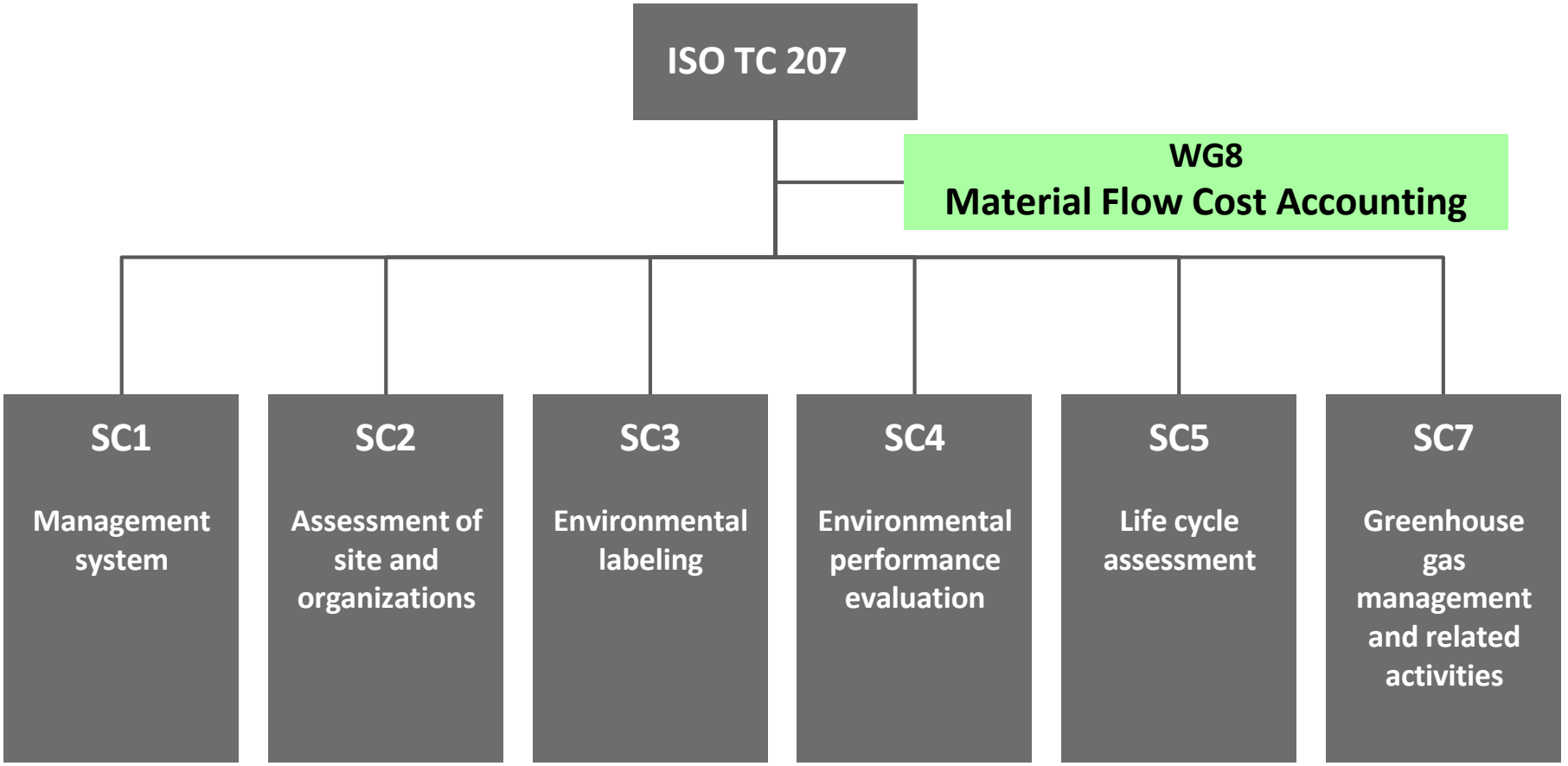
MFCA is now a global standard that everyone can implement anywhere.

- MFCA became an international standard in September 2011 (ISO 14051). Further dissemination of MFCA is expected.

- Many industries (e.g., Malaysia, Vietnam, Thailand) have started to apply MFCA and achieved significant environmental and cost reductions.

Overview of the ISO 14000 series and WG8 (ISO 14051)

MFCA is currently managed directly under TC 207 as MFCA covers environmental, quality, and accounting aspects together.



Structure of ISO 14051

Item	Contents
Title	Environmental management — material flow cost accounting — general framework
Content	1. Scope 2. Normative references 3. Terms and definitions 4. Objective and principles of MFCA 5. Fundamental elements of MFCA 6. Implementation steps of MFCA Annex A (informative): Difference between MFCA and conventional cost accounting Annex B (informative): Cost calculation and allocation in MFCA Annex C (informative): Case examples of MFCA

Scope (Clause 1)

- ISO 14051 provides a general framework:
  - ✓ defines common terminologies,
  - ✓ sets the objective and principles,
  - ✓ identifies key fundamental elements, and
  - ✓ explains the implementation steps.

Scope (Clause 1)

MFCA creates a material flow model that :

- ✓ traces and quantifies the flows and stocks of materials within an organization in physical units and
- ✓ evaluates the costs associated with those material flows.

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Scope (Clause 1)

- ISO 14051 (MFCA) can be:

  ✓ widely applicable to all industries that use materials and energy regardless of their products, size, existing environmental management and accounting systems, etc.

  ✓ extended to supply chains to help improve material and energy efficiency.

- ISO 14051 is:

  — not intended for the purpose of third-party certification.

Normative References (Clause 2)

For terms and definitions, the standard refers to

- ISO 14050, *Environmental management — Vocabulary*

Terms and definitions-1 (Clause 3)

Item	Term
Terms quoted from other standard/source	From IFAC document: Environmental management accounting From ISO 14040: 2006: process, product, and waste
Terms defined in ISO 14051	Cost accounting, cost allocation, energy cost, energy loss, environmental management accounting, input, inventory, material, material balance, material distribution percentage, material cost, material flow, material flow cost accounting, material loss, output, quantity center, system cost, waste management cost

The following pages explain some of the representative terms considered to be important for effective implementation of MFCA.

Terms and definitions-2 (Clause 3)

Environmental management accounting (EMA)

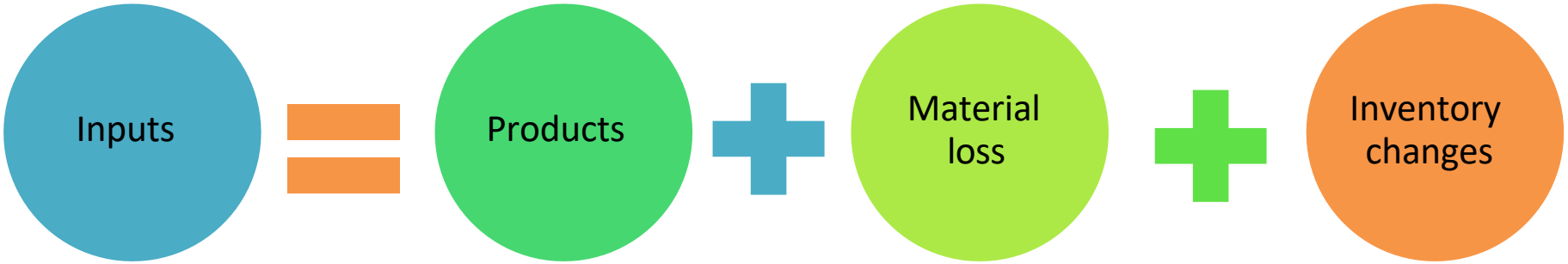
- Refers to the identification, collection, and analysis of the following information to enhance decision-making within an organization:
  - — Use and flow of materials and energy.
  - — Environment-related costs and savings.

For further details of EMA, please refer to IFAC website available at: http://www.ifac.org/

Terms and definitions-3 (Clause 3)

Material balance

Refers to the comparison of inputs, products, and material losses and inventory changes in a quantity center over a specified data collection period.



Terms and definitions-4 (Clause 3)

System Costs

Any other production-related costs except material, energy, and waste management costs. Examples include:

- Depreciation costs
- Labor costs
- Transportation costs

Terms and definitions-5 (Clause 3)

Energy costs

Energy costs include the following:

- electricity,
- fuel,
- heat,
- steam, and
- compressed air.

Module 3 Summary

- ISO 140151:2011 has the following scope:
  - MFCA can be widely applied to any product, organization, etc.
  - MFCA can be extended to the supply chain as well as a single entity.
  - MFCA is not a separate approach from other existing environmental management approaches. MFCA can complement other environmental approaches (e.g., ISO 14001)
  - MFCA provides organizations with information for internal decision-making.
  - ISO 14051 is not intended for the purpose of third-party certification.

Module 4
ISO 14051
Objectives and Principles of MFCA

Objectives and Principles of MFCA-1 (Clause 4.1)

The objectives of MFCA are:

to motivate and support organizations' efforts to enhance both environmental and financial performance through improved material and energy use practices.

Financial performance

Environmental performance

Objectives and Principles of MFCA-2 (Clause 4.1)

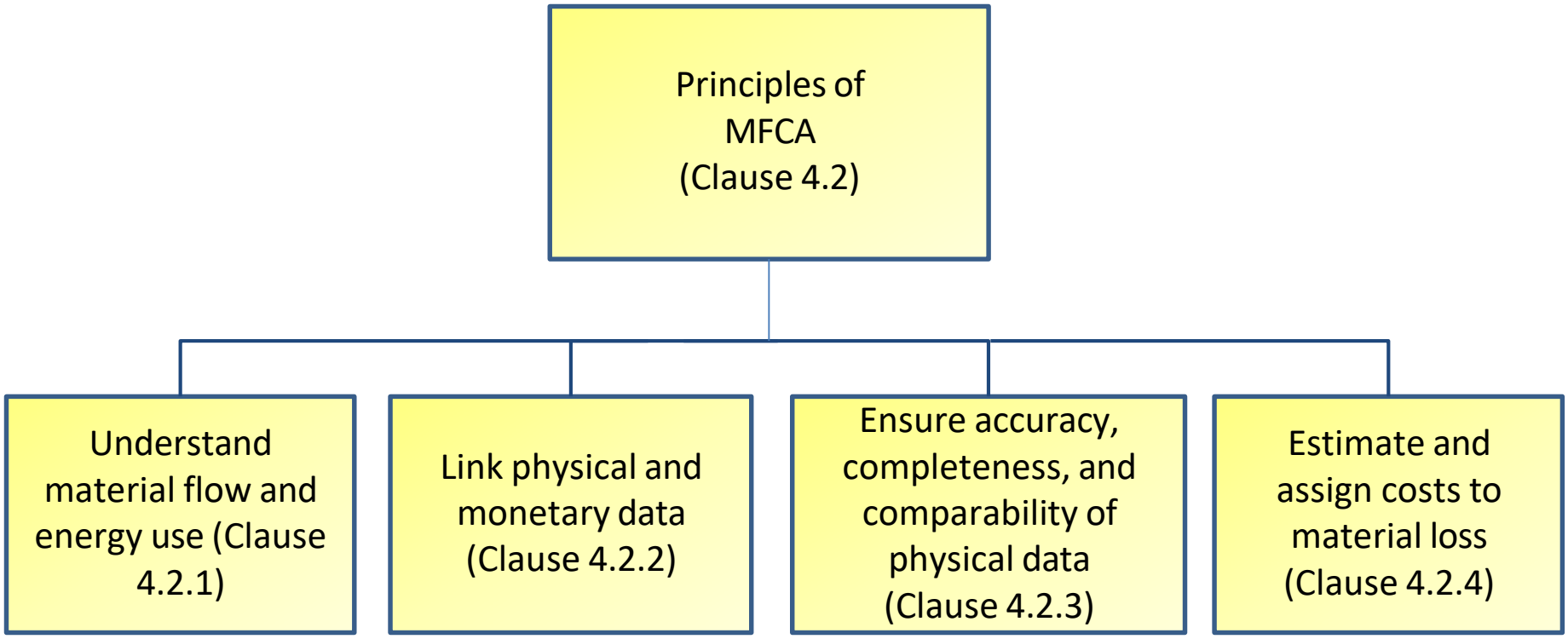
The objectives of MFCA are achieved by:

— increasing the transparency of material flows and energy use, the associated costs, and environmental impacts;

— supporting organizational decisions through information obtained from MFCA; and

— improving communication and performance on material and energy use practices.

ISO 14051 4.2
Principles of MFCA-1



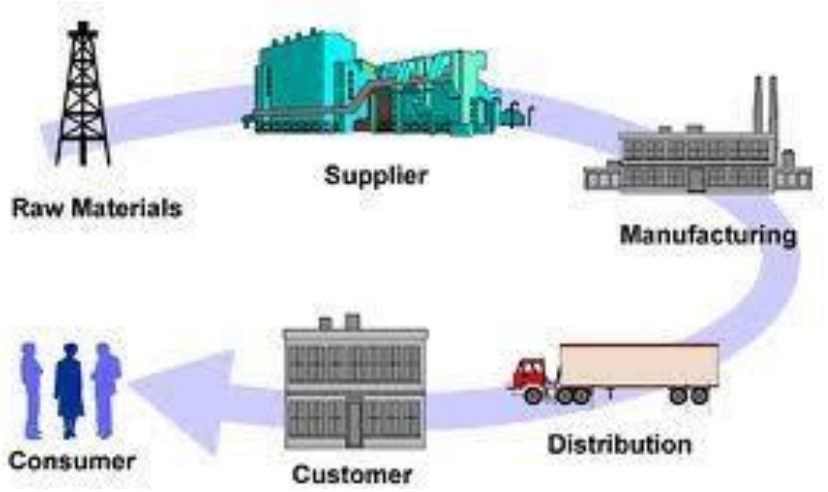
ISO 14051 4.2
Principles of MFCA-2

Understand material flow and energy use (Clause 4.2.1)

Material flow is defined as:

movements of a material or group of materials between multiple quantity centers within an organization or along the supply chain.

OR



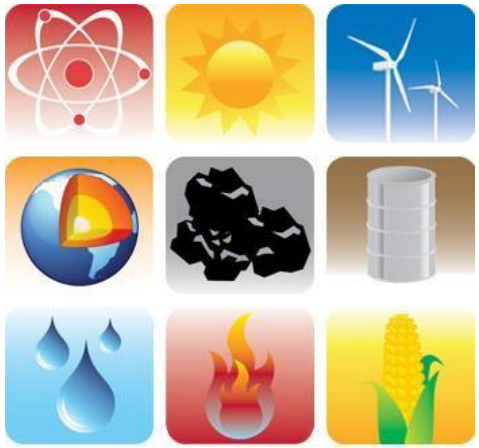
http://organizations.weber.edu/sascm/

ISO 14051 4.2
Principles of MFCA-3

Understand material flow and energy use (Clause 4.2.1)

For every quantity center where materials are stocked, handled, used, or transformed a **material flow model** should be established, which is based on an understanding of:

- movements of materials (i.e., either products or material loss)
- energy use



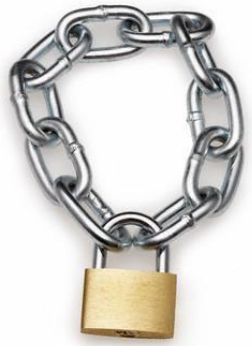
http://www.energy4me.org/energy-facts/energy-sources/

ISO 14051 4.2
Principles of MFCA-4

Link physical and monetary data (Clause 4.2.2)

In an organization, the decision-making in terms of environmental and financial factors should be connected through:

- collection of data on the physical quantities of material and related energy use, and
- data on the costs associated with physical quantity and energy use



These data should be clearly incorporated in the material flow model.

ISO 14051 4.2
Principles of MFCA-5

Ensure accuracy, completeness, and comparability of physical data (Clause 4.2.3)

Physical data on material flows should be collected in consistent measurement units.

To do so, conversion factors should be considered and used. For example,
if the materials are generally measured in pieces, the unit weight of each piece should be calculated for conversion into kilograms.

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ISO 14051 4.2
Principles of MFCA-6

Estimate and assign costs to material loss (Clause 4.2.4)

Material loss: all material outputs generated in a quantity center, except for intended products. Recycling and reprocessing are considered material loss because they increase production costs.

Costs created by or relevant to material losses should be allocated to those material losses that caused the costs and not to the products. Estimation of material loss costs should be accurate and practicable to the extent possible.

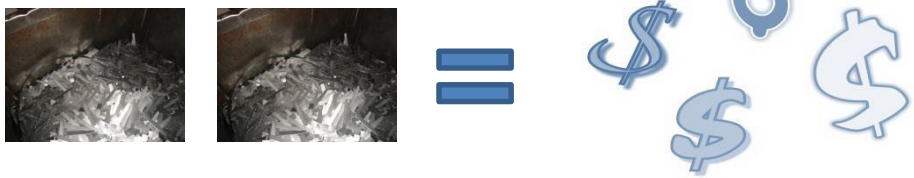
ISO 14051 4.2
Principles of MFCA-7

Estimate and assign costs to material loss (Clause 4.2.4)

Material loss includes air emissions, wastewater, and solid waste, even if these material outputs can be reworked, recycled, or reused internally or have market value.

By-products can be considered as either material losses or products, depending on the organization.

Material loss



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Module 4 Summary

- Clause 4 of ISO 14051:2011 indicates that MFCA can help an organization:
  - Increase transparency by linking the use of raw materials and material losses with their associated costs
  - Control the generation of waste and its management for further reduction
  - Improve organizational and supply chain coordination and communication on material and energy use

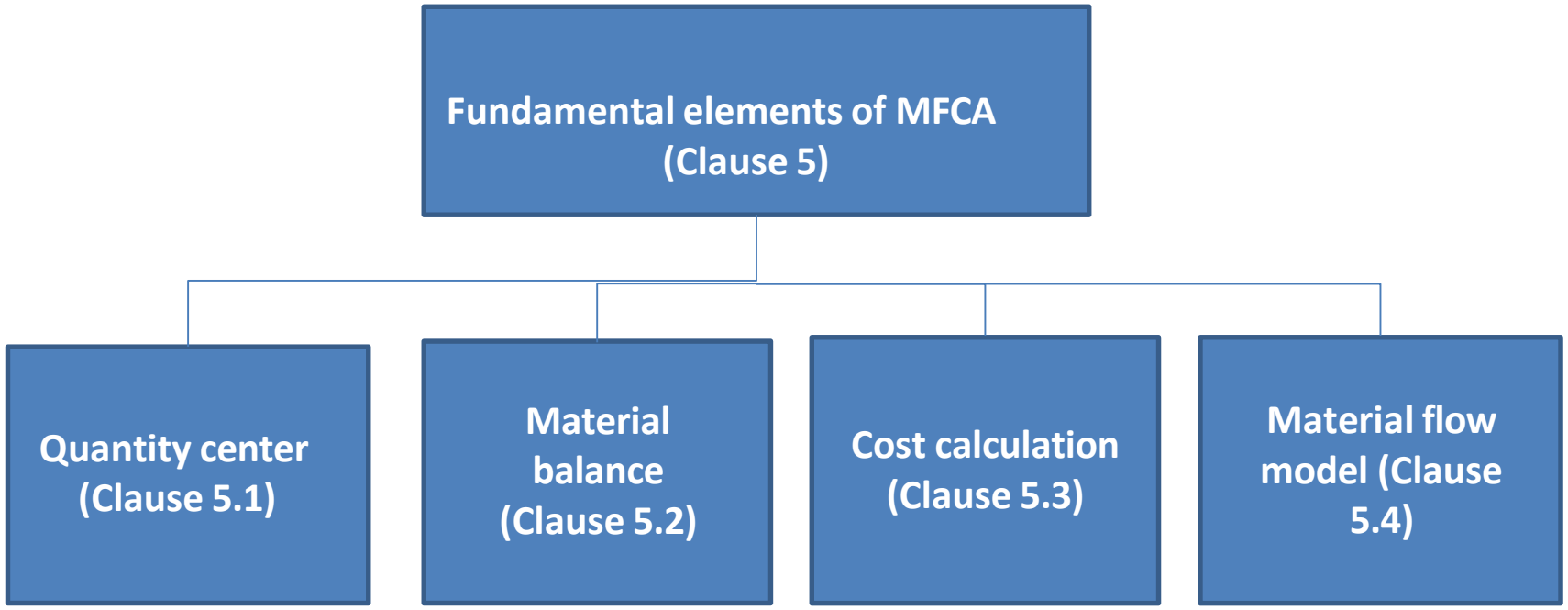
Module 5
ISO 14051
Fundamental elements of MFCA

What represents “fundamental elements” of ISO 14051?

- Fundamental elements are considered as essential elements that need to be considered for effective MFCA implementation.

- The level of detail at which each element is followed varies from organization to organization. With limited resources, some of the elements should be the focus, while others may be neglected to some extent.

ISO 14051
Fundamental Elements of MFCA-1



ISO 14051
Fundamental Elements of MFCA-2

Quantity Center (Clause 5.1)

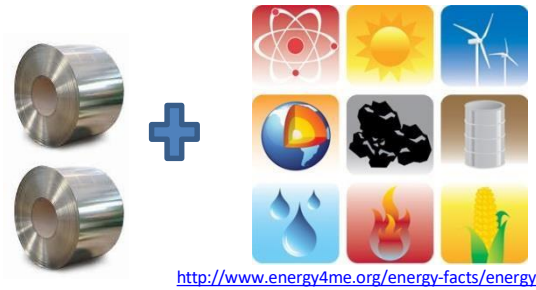
A quantity center is defined as:

- a selected part or series of processes where inputs and outputs are quantified in physical and monetary units
- areas like storage, production units, and shipping points are typically considered to be quantity centers

ISO 14051 5
Fundamental Elements of MFCA-2-1

Quantity Center (Clause 5.1)

1. Quantify material flows and energy use in physical units



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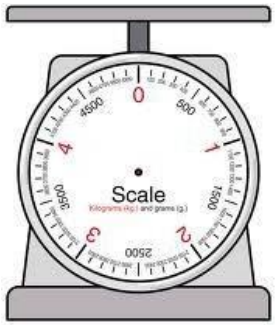

2. Quantify material, energy, system, and waste management costs (monetary units)

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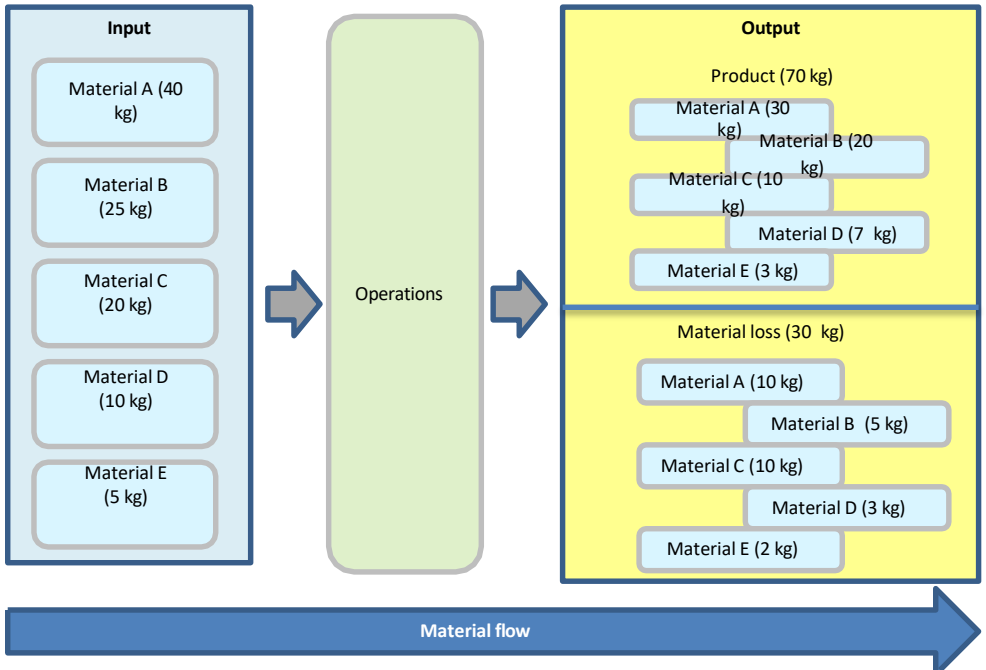
http://www.dreamstime.com/calculate-free-stock-image-imagefree46006

ISO 14051
Fundamental elements of MFCA-2-2

(Clause 5.2) Material balance

Material balance refers to: the quantification of material flows to ensure that total inputs and total outputs of the process are balanced. This enables organizations to:

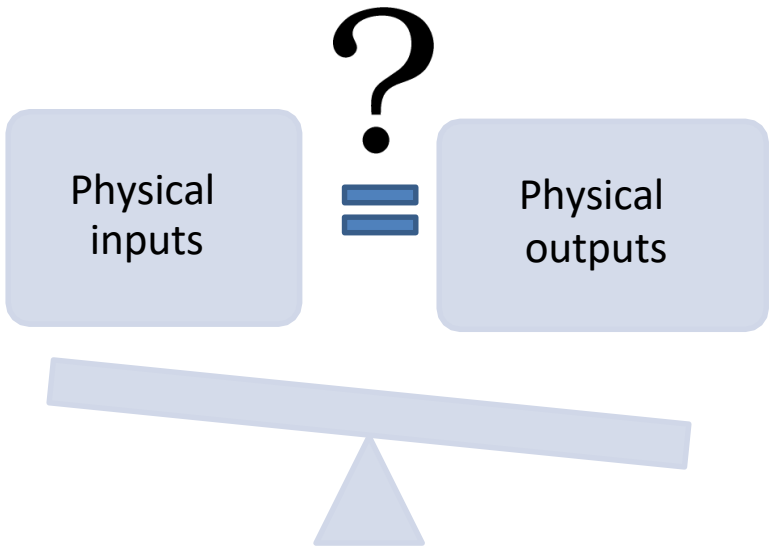
- ensure that all inputs and outputs are understood
- identify any material loss or gaps



ISO 14051
Fundamental elements of MFCA-2-3

(Clause 5.2) Material balance

MFCA encourages organizations to investigate the cause of any significant imbalance. Some examples of imbalances can be measurement errors or missing information.



ISO 14051 5
Fundamental elements of MFCA-3-1

(Clause 5.3) Cost calculation

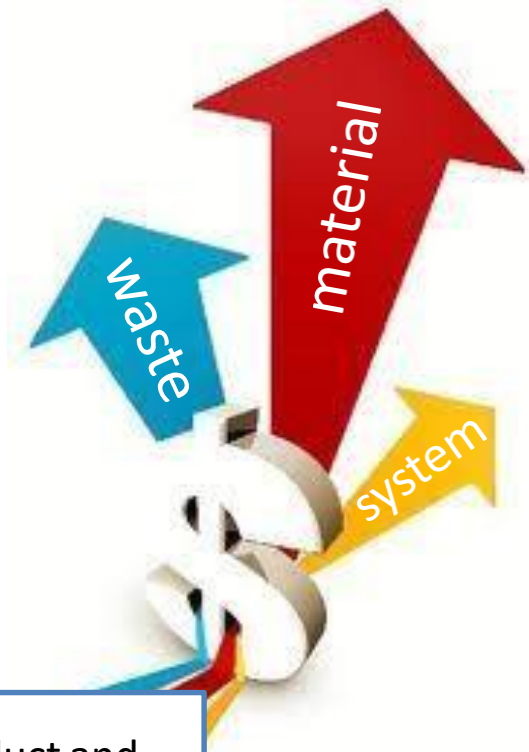
- Physical material flow data should be transformed into monetary units to support MFCA analysis.
- Costs relevant or due to the material flows of a quantity center should be quantified. Cost information should be attributed to the material flows.

ISO 14051
Fundamental elements of MFCA-3-2

Cost calculation (Clause 5.3)

Four types of costs should be quantified:

1. Material costs
2. Energy costs
3. System costs
4. Waste management costs



According to the proportion of material input that flows into product and material loss, the calculated costs are allocated to each quantity center's outputs.

ISO 14051
Fundamental elements of MFCA-4-1

Cost calculation: conventional calculation

Input

Material (145 kg)

Material costs **$1450**

http://www.dreamstime.com/fifties-stock-image-imagefree64981

Production process

Processing costs* $ 1400

Initial inventory of material (35 kg) $350	Final inventory of material (20 kg) $200

Output

Product (120 kg)

Material costs	**$1600**
Processing costs	**$1400**
Total costs	**$3000**

Waste (40 kg)

*Processing costs consist of energy costs, system costs, and waste management costs in this case.

ISO 14051
Fundamental Elements of MFCA-4-2

Cost calculation: MFCA-based calculation

Input

Material (145 kg)

Material costs	**$1450**

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Production process

Energy costs	$80
System costs	$1200
Waste management costs	$120

Initial inventory of material (35 kg) $350	Final inventory of material (20 kg) $200

Output

Product (120 kg)

Material costs	**$1200**
Energy costs	**$60**
System costs	**$900**
Total costs	**$2160**

Material loss (40 kg)

Material costs	**$400**
Energy costs	**$20**
System costs	**$300**
Waste management costs	**$120**
Total costs	**$840**

ISO 14051 5
Fundamental elements of MFCA-5-1

(Clause 5.4) Material flow model

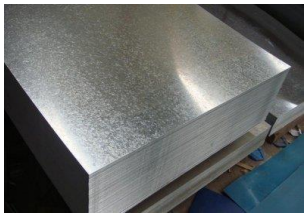
The material flow model represents the overall flow of materials within the boundary selected for MFCA analysis, describing all inputs and outputs from each quantity center.

Input

Material flow

Quantity center

Product



Material loss

ISO 14051 5
Fundamental elements of MFCA-5-2

(Clause 5.4) Material flow model

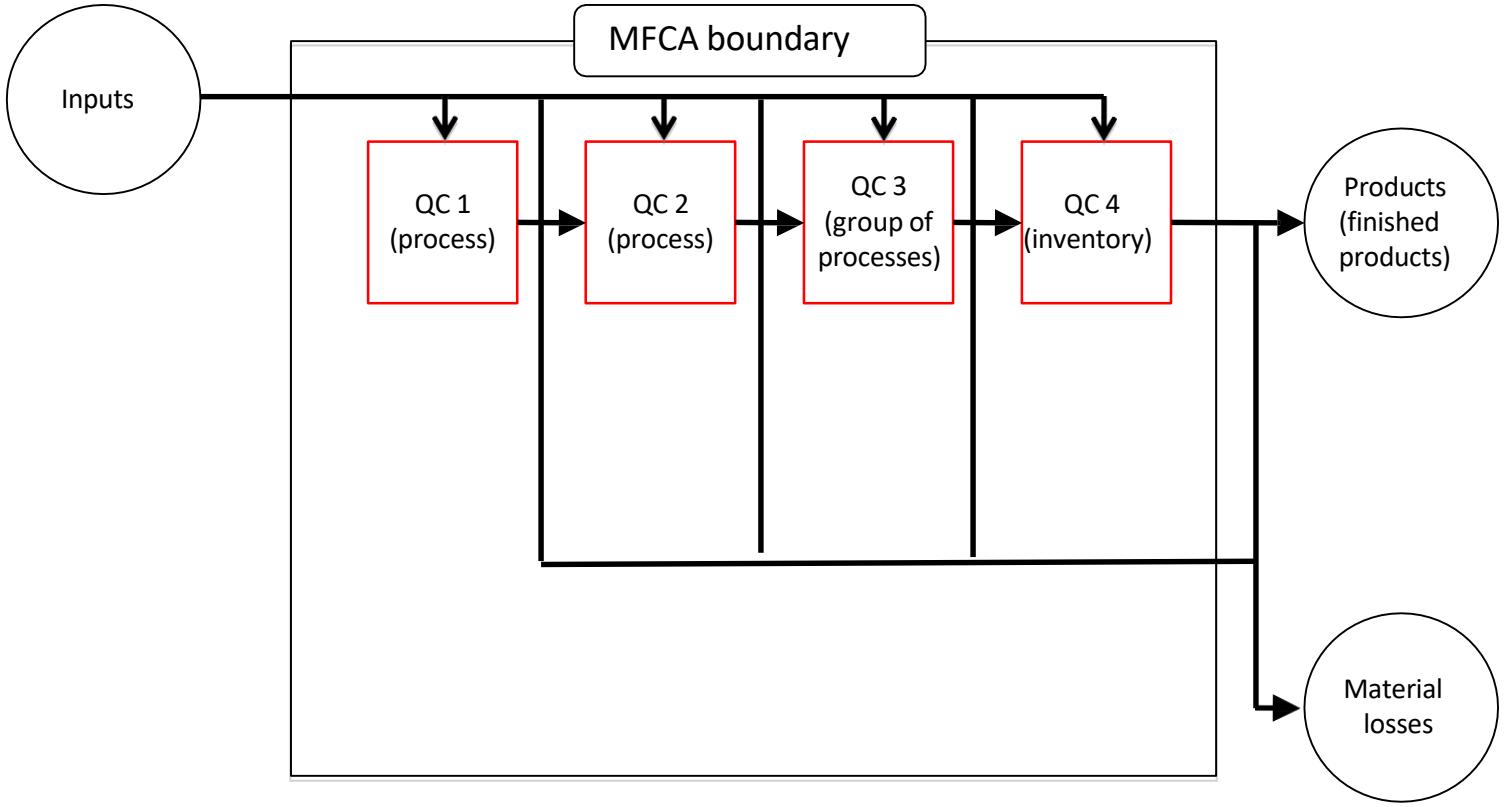
Create a visual model where the quantity centers are linked and also where production, recycling, and other systems are illustrated:

1. multiple quantity centers in which materials are stocked, used, or transformed as well as

2. movements of materials between those quantity centers

ISO 14051
Fundamental Elements of MFCA-5.3
Material flow model

Example of (Clause 5.4) material flow model



Module 5 Summary

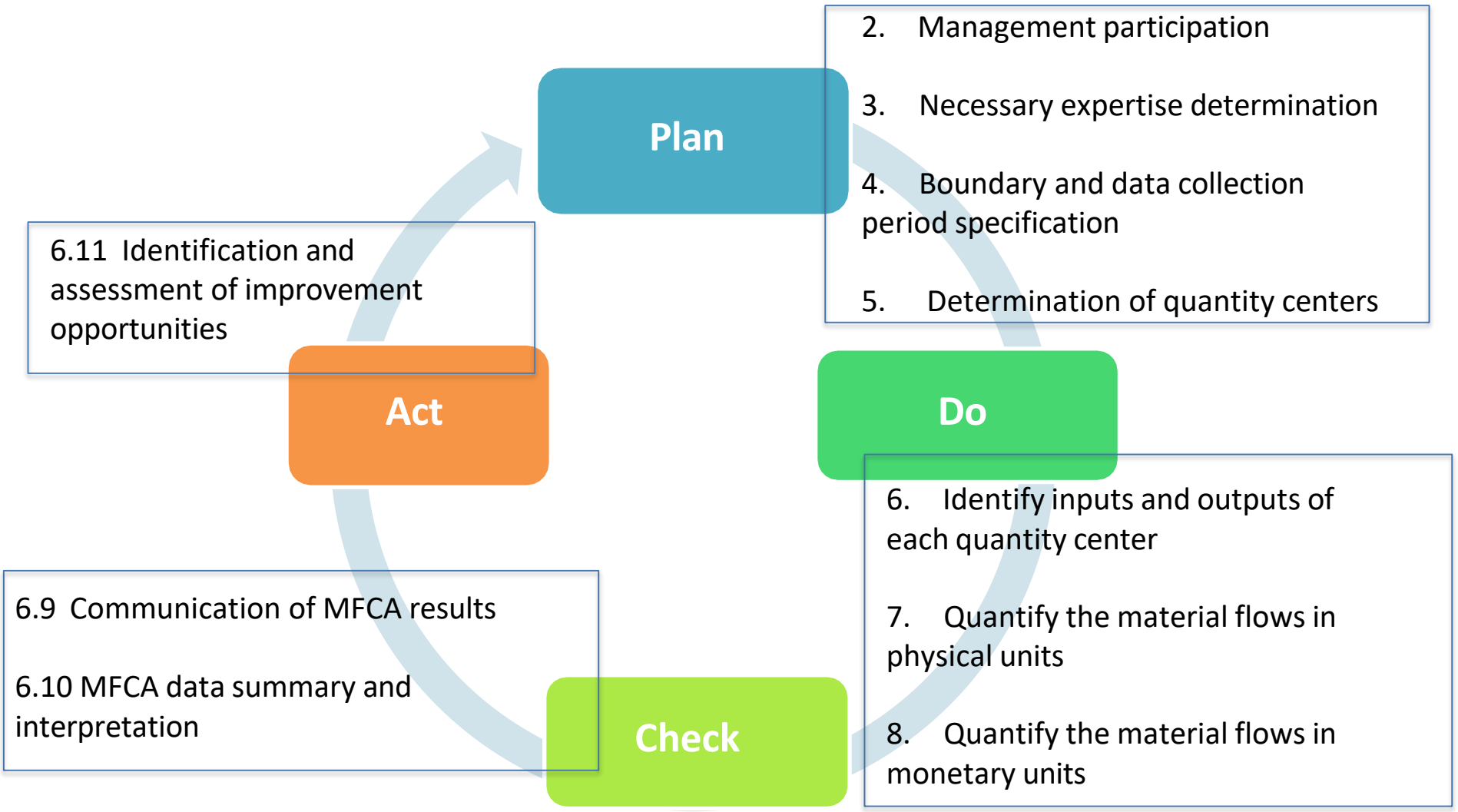
- The fundamental elements of MFCA are:
  1. Quantity center;
  2. Material balance;
  3. Cost calculation; and
  4. Material flow model.

- The material flow model should be an accurate and complete representation of the overall flow of materials within the MFCA boundary.

- Costs should be allocated to all outputs (products and material losses).

Module 6
Implementation steps of MFCA

Implementation steps of MFCA-1



Implementation of MFCA is based on the PDCA cycle.

Implementation steps of MFCA-2

<PLAN 6.2> Involvement of management includes:

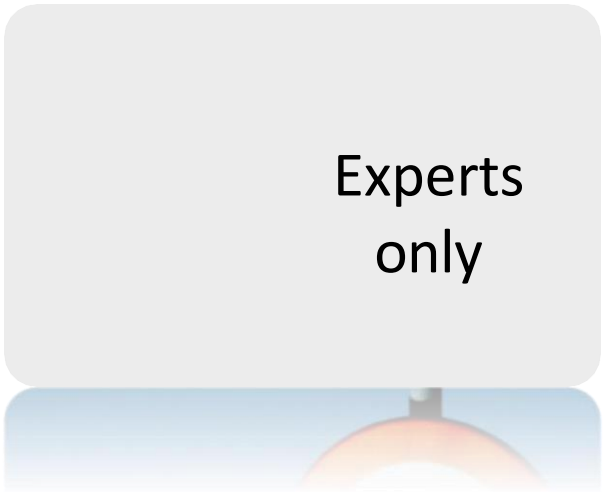
1. Leading the implementation;
2. Assigning roles and responsibilities (e.g., setting up of an MFCA task force);
3. Providing resources;
4. Monitoring progress;
5. Reviewing the results; and
6. Deciding on improvement measures based on MFCA results.

Implementation steps of MFCA-3-1

<PLAN 6.3> Determination of necessary expertise

- **Operational expertise** is necessary for:
  design, procurement, and production regarding the flow of materials and energy use throughout the organization.

- **Engineering and/or technical expertise** is necessary for:
  material balance implications of processes, including combustion and other chemical reactions.



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Implementation steps of MFCA-3-2

<PLAN 6.3> Determination of necessary expertise:

- **Quality control-related expertise** is necessary for:
  material loss-related information such as product reject frequency, causes, and rework activities;

- **Environmental expertise** is necessary for:
  Environmental aspects and impacts, waste types, and waste management activities; and

- **Accounting expertise** is necessary for:
  Cost accounting data and relevant practices.

Photographs of MFCA analysis and presentation to management

Implementation steps of MFCA-4-1

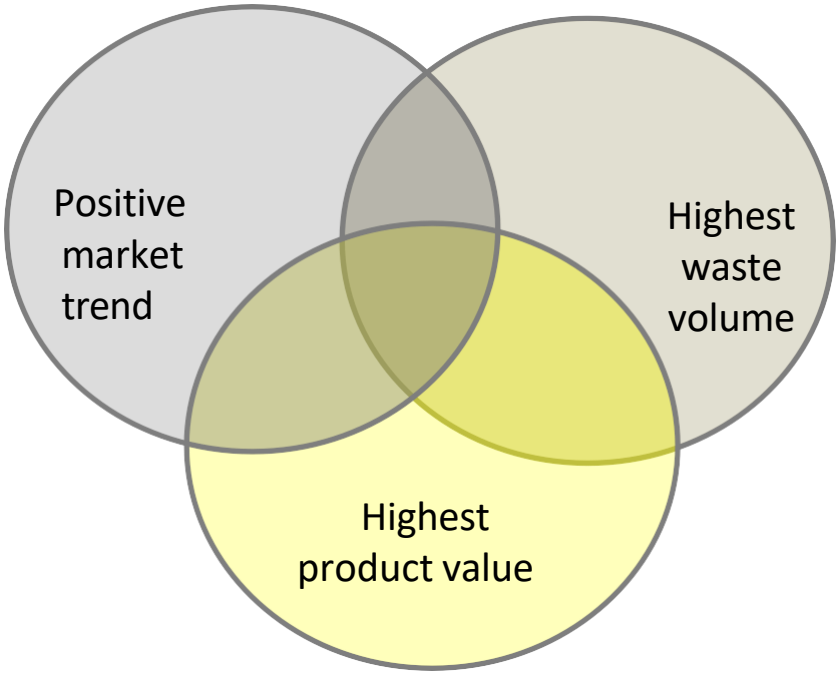
<PLAN 6.4> Specification of a boundary and a data collection period

-Determine the target product-

Material flow planning

- Product
- Boundary
- Data collection period
- Establishment of quantity centers

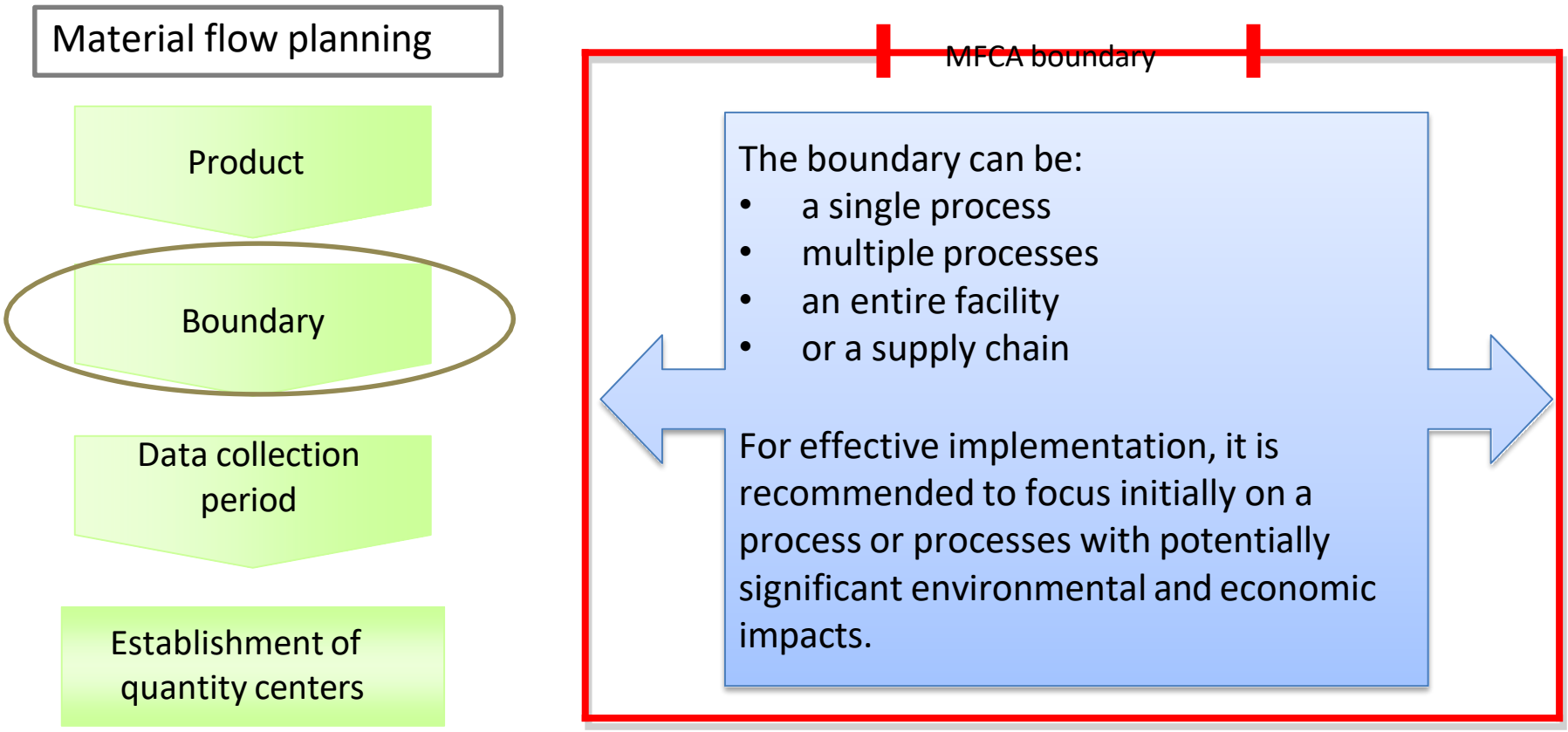
Example of criteria for selection of products appropriate for MFCA analysis



Propharm Japan

Implementation steps of MFCA-4-2

<PLAN 6.4> Specification of a boundary and data collection period



Implementation steps of MFCA-4-3

<PLAN 6.4>
Specification of a boundary and data collection period:
Determine the data collection period

Material flow planning

- Product
- Boundary
- Data collection period
- Establishment of quantity centers

→ Full operation period or production lot

- 1 week
- 1 month
- 3 months
- 6 months
- 1 year
- 1 batch
- 1 lot

- The data collection period should be long enough to allow meaningful data to be collected.
- It is important to consider any significant process variations, e.g., seasonal fluctuations or inherent process variances, that can affect the reliability and usability of the data.

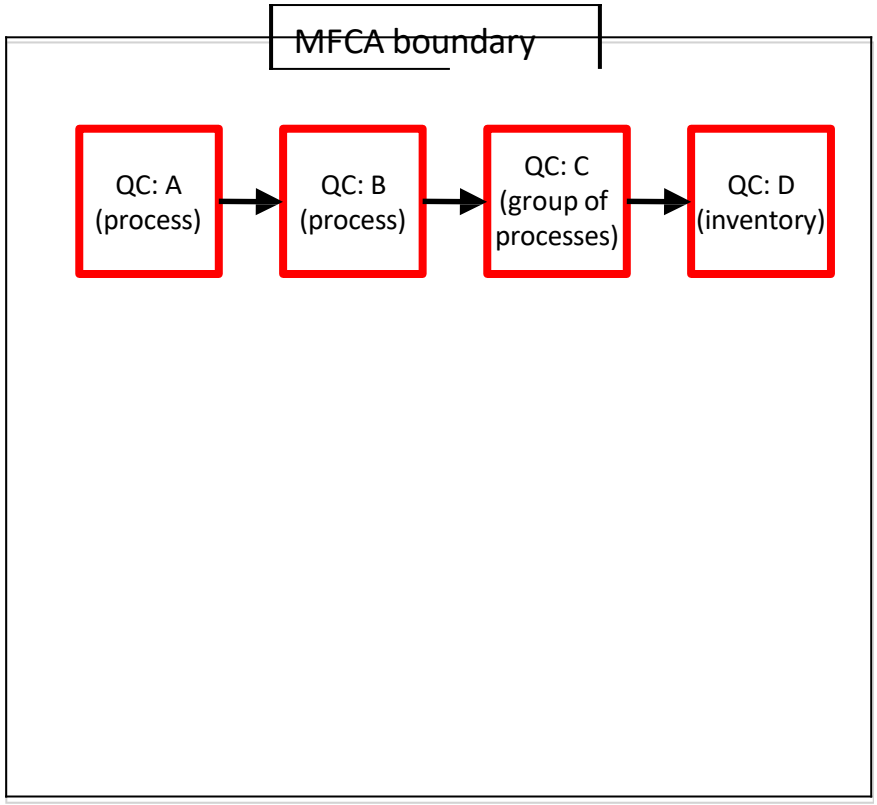
Implementation steps of MFCA-4-4

<PLAN 6.4> Specification of a boundary and data collection period

Determine the material flow model/quantity centers

Material flow panning

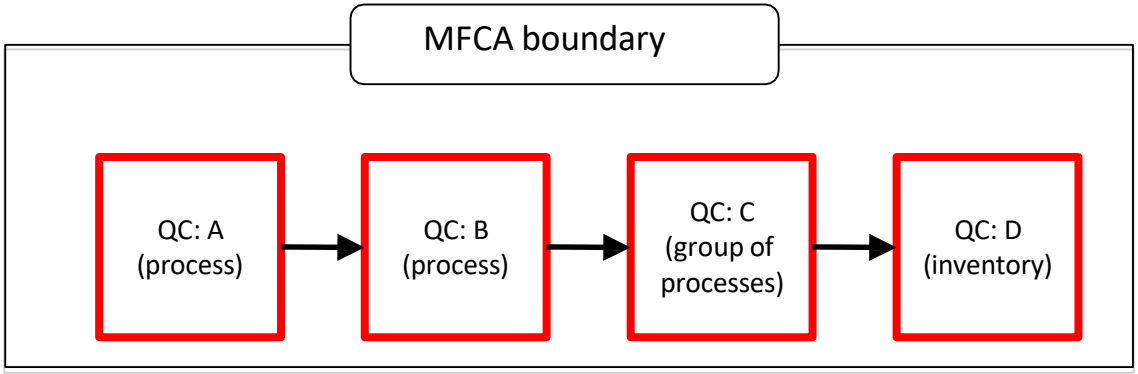
- Product
- Boundary
- Data collection period
- Establishment of quantity centers



Propharm Japan

Implementation steps of MFCA-5

<PLAN 6.5> Establishment of quantity centers



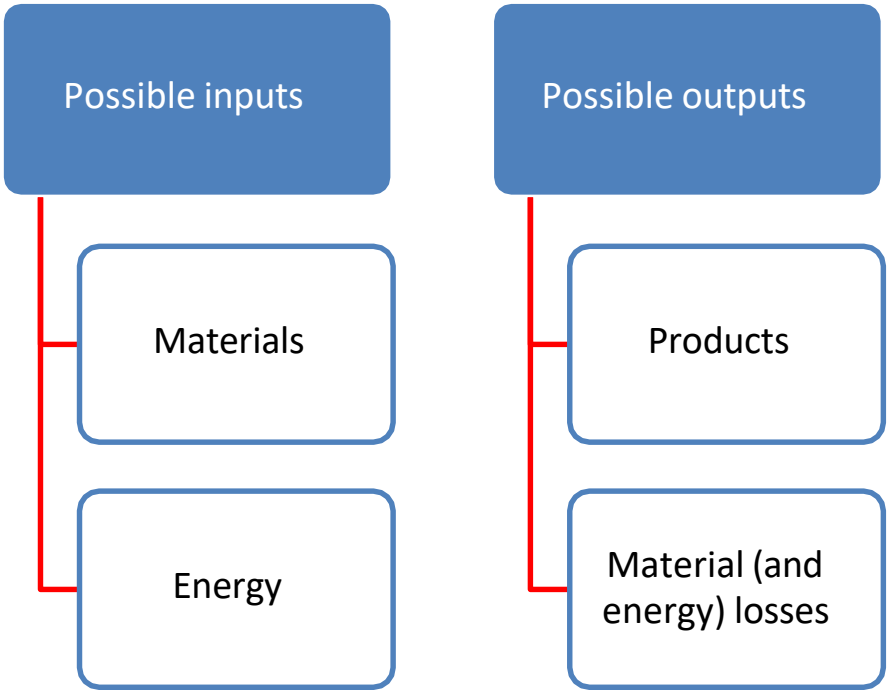
Quantity centers:

Processes such as receiving, cleaning, cutting, mixing, assembling, heating, packing, inspecting shipping, and material storage

Quantity centers can be determined from process information, cost center records, and other existing information.

Implementation steps of MFCA-6

<DO 6.6> Identification of inputs and outputs for each quantity center



Inputs and outputs at each quantity center should be understood to link the quantity centers inside the MFCA boundary so that data from the quantity centers can be connected and evaluated throughout the entire system under consideration.

Implementation steps of MFCA-7-1

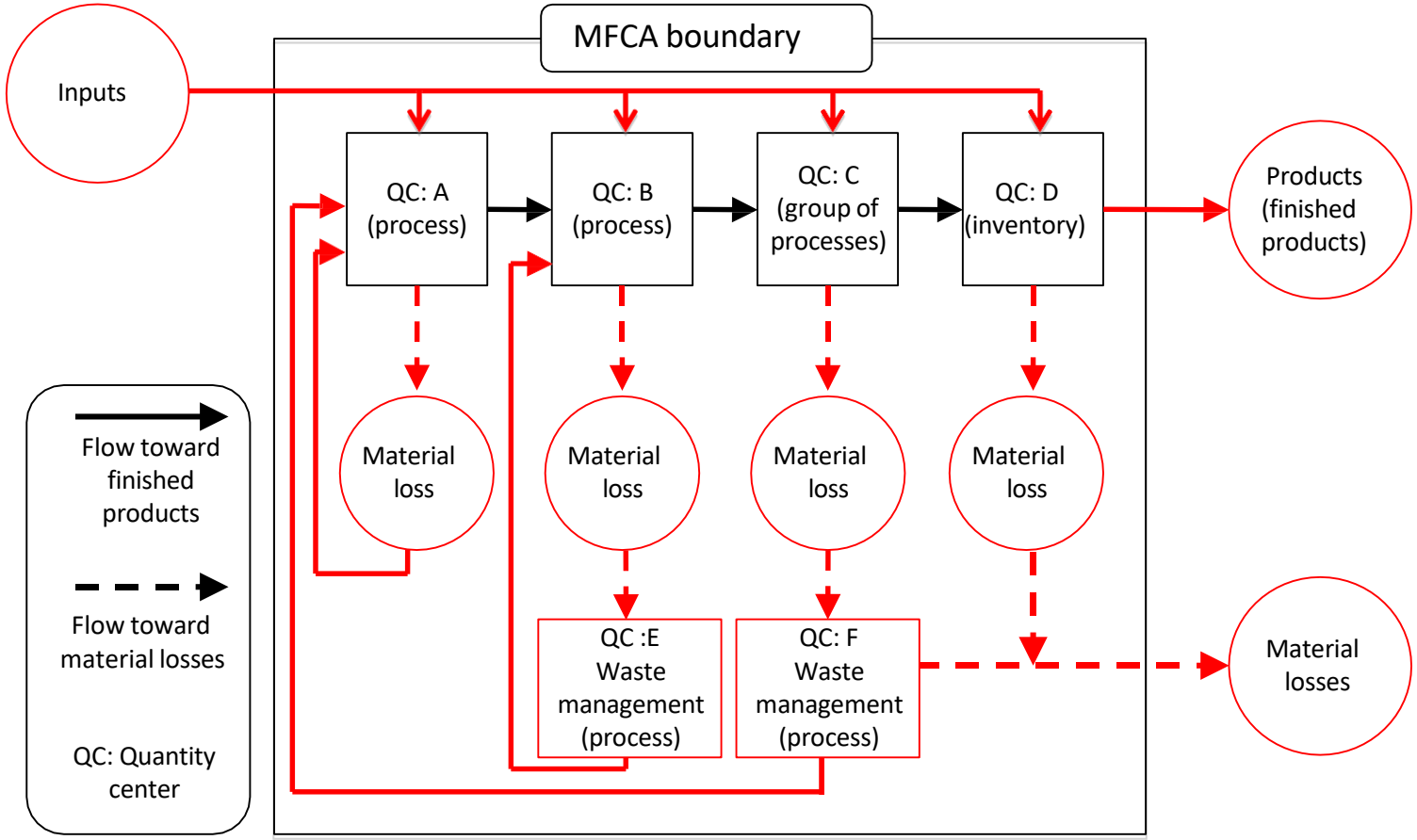
<DO 6.7> Quantification of the material flows in physical units

- Inputs and outputs at every quantity center should be quantified, relevant to the type of material, in physical units:
  - mass
  - length
  - number of pieces
  - or volume

- All physical units used should be convertible to a single standardized unit (e.g., mass) to determine the material balances for every quantity center.

Implementation steps of MFCA-7-2

Example of a material flow model



Implementation steps of MFCA-8-1

<DO 6.8> Quantification of the material flows in monetary units

- **Material costs:**
  - — can be quantified in a number of different ways, e.g., historical cost, standard cost, replacement cost.
  - — For quantification, the physical amount of the material flow should be multiplied by the unit cost of the material over the data collection period chosen for the analysis.

When quantifying the material costs for the outputs, also quantify the material costs related to any changes in the inventory of the material inside the quantity center.

Implementation steps of MFCA-8-2

<DO 6.8> Quantification of the material flows in monetary units

Steps to quantify energy costs:

1. Quantify energy costs for each quantity center.

2. Allocate energy costs to each product and material loss.

When energy costs for each quantity center are difficult to calculate or estimate, it is necessary to divide the total energy costs of specific processes among all quantity centers.

Implementation steps of MFCA-8-3

<DO 6.8> Quantification of the material flows in monetary units

Steps to quantify system costs*:

1. Quantify system costs for each quantity center.

2. Allocate energy costs to each product and material loss.

If costs for individual quantity centres are not known and are difficult to measure or estimate, it will be necessary to allocate the total respective costs of the selected processes to the quantity centres.

*System costs are the costs related to in-house handling of the material flows except for material, energy, and waste management costs. Examples of system costs are the costs of labur, depreciation, maintenance, transport, etc.

Implementation steps of MFCA-8-4

<DO 6.8> Quantification of the material flows in monetary units

Steps to quantify waste management costs*:

1. Quantify waste management costs for each quantity center.

2. Allocate waste management costs to each material loss.

If costs for each quantity center are unknown and difficult to calculate or estimate, it is necessary to distribute the total costs of the specific processes among all quantity centers.

*Waste management costs are the costs for handling material losses generated in a quantity center.

Implementation steps of MFCA-9-1

<CHECK 6.9 > MFCA data summary and interpretation

The data obtained should be summarized in a format appropriate for further interpretation. Data summary can take various forms (e.g., table, graph).

Example of MFCA data expression (MFCA calculation in physical, monetary units)

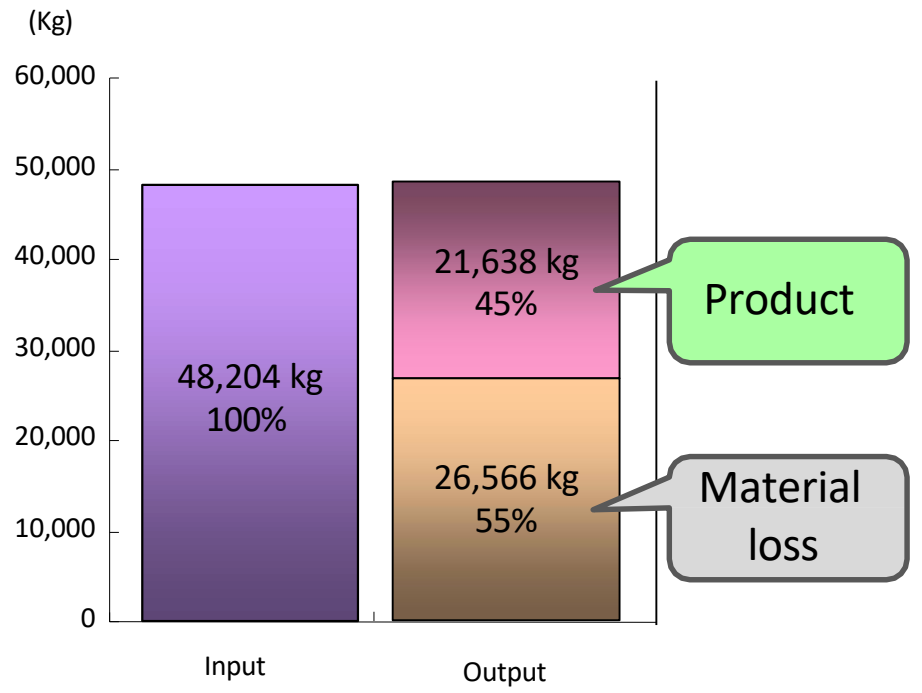
	Mass (kg)	Material costs ($)	Energy costs ($)	System costs ($)	Waste management costs ($)	Total costs ($)
Total inputs	100	1 000	50	800	80	1 930
Product	70 (70 %)	700 (70 %)	35 (70 %)	560 (70 %)	0 (0 %)	1 295 (67 %)
Material loss	30 (30 %)	300 (30 %)	15 (30 %)	240 (30 %)	80 (100 %)	635 (33 %)
Total outputs	100	1 000	50	800	80	1 930

Implementation steps of MFCA-9-2

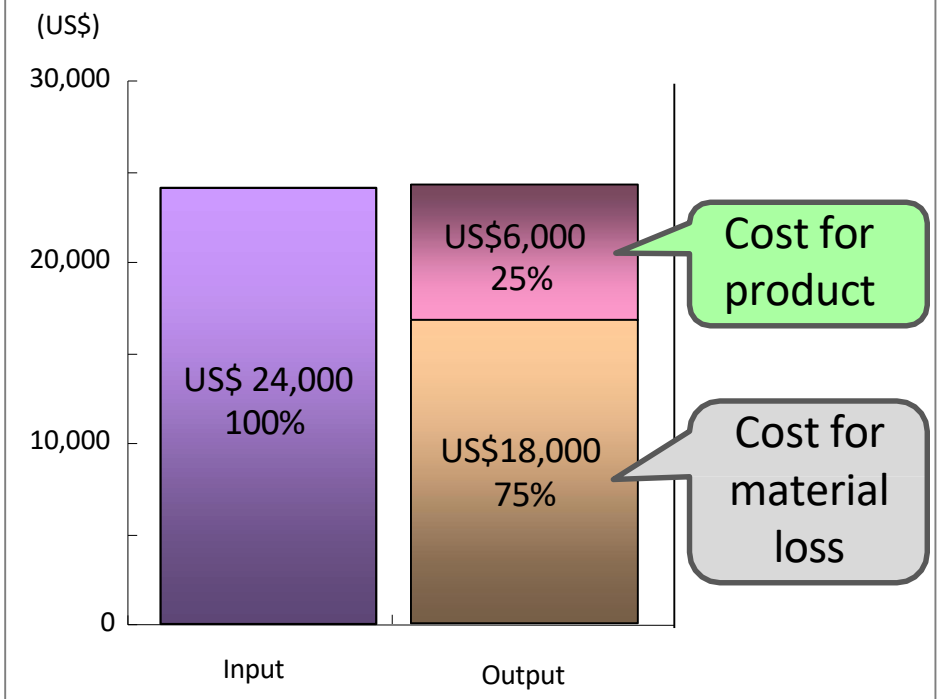
<CHECK 6.9 > MFCA data summary and interpretation

Another example of MFCA data expression
(MFCA calculation in physical, monetary units)

MFCA calculation in physical units



MFCA calculation in monetary units



Implementation steps of MFCA-10

<CHECK 6.10 > Communication of MFCA results

Once the MFCA analysis is completed, the results should be communicated to relevant stakeholders. This will include internal (within your organization) and external communication (outside of your organization).

Source:t-tisa.blogspot.com

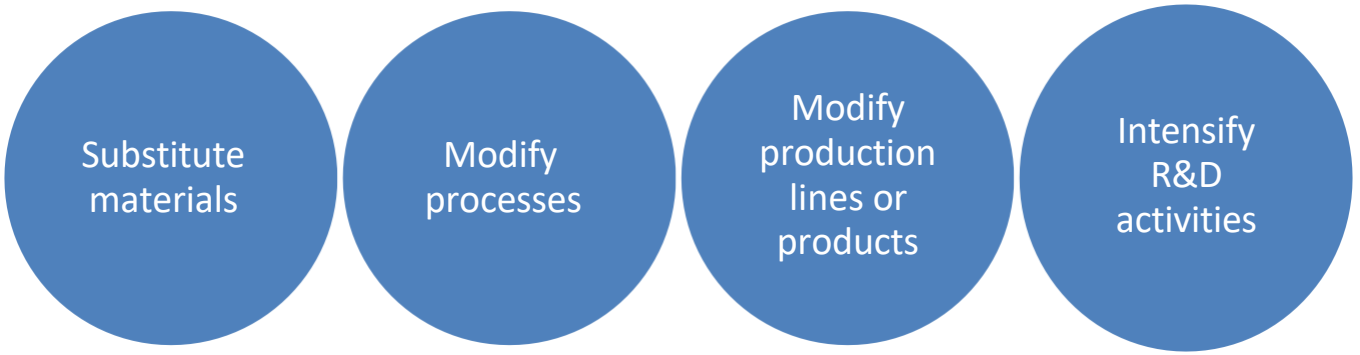
Implementation steps of MFCA-11

<ACT 6.11 >Identification and assessment of improvement opportunities

Through MFCA analysis, an organization can :

- better understand the magnitude, consequences, and drivers of material use and loss, and then
- search for opportunities to improve environmental and financial performance.

Improvement activities generally include the following elements



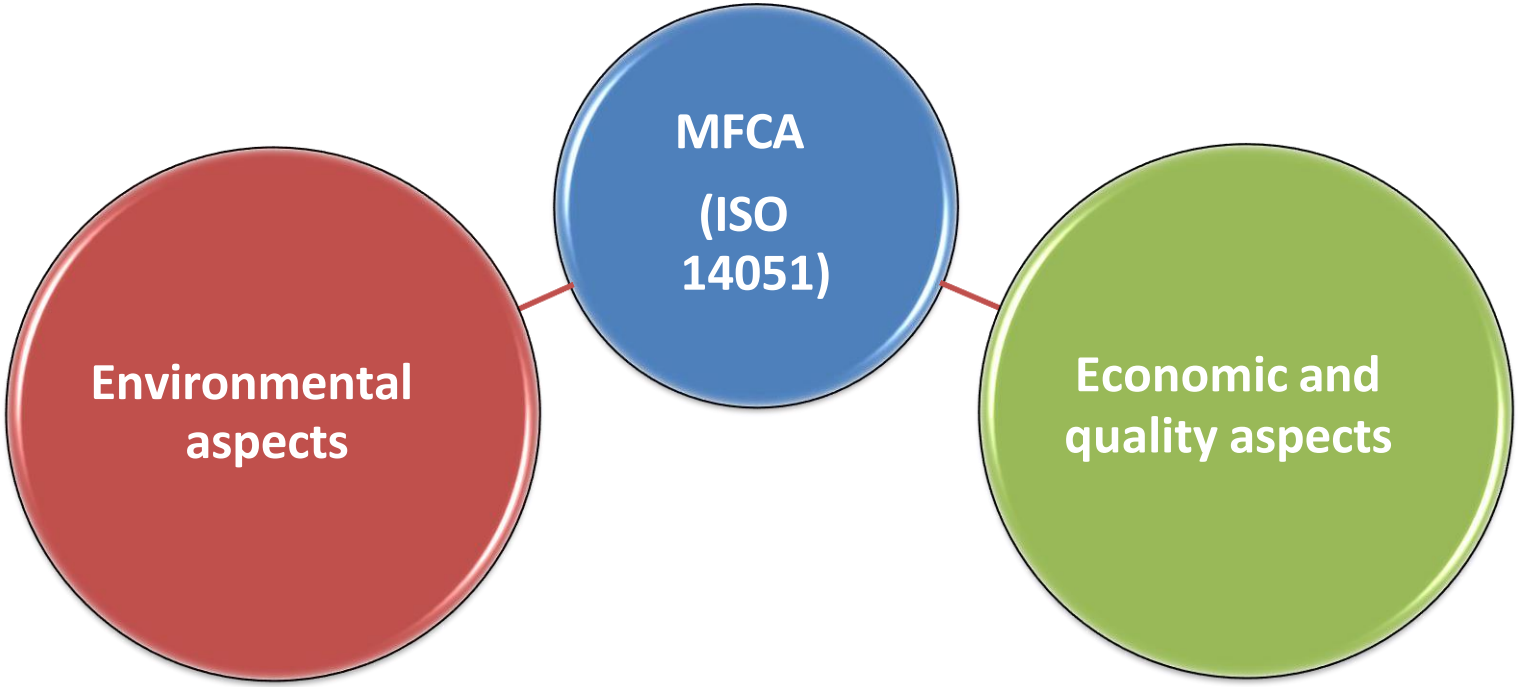
Module 6 Summary

- MFCA follows the PDCA cycle and can provide significant information during various stages of the continuous improvement cycle.

- MFCA implementation is divided in the following four steps:
  - Plan
    - Management participation
    - Necessary expertise determination
    - Boundary and data collection period specification
    - Determination of quantity centers
  - Do
    - Recognize inputs and outputs of each quantity center
    - Quantification of the material flows in physical units
    - Quantification of the material flows in monetary units
  - Check
    - MFCA data summary and interpretation
    - Communication of MFCA results
  - Act
    - Identification and assessment of improvement opportunities

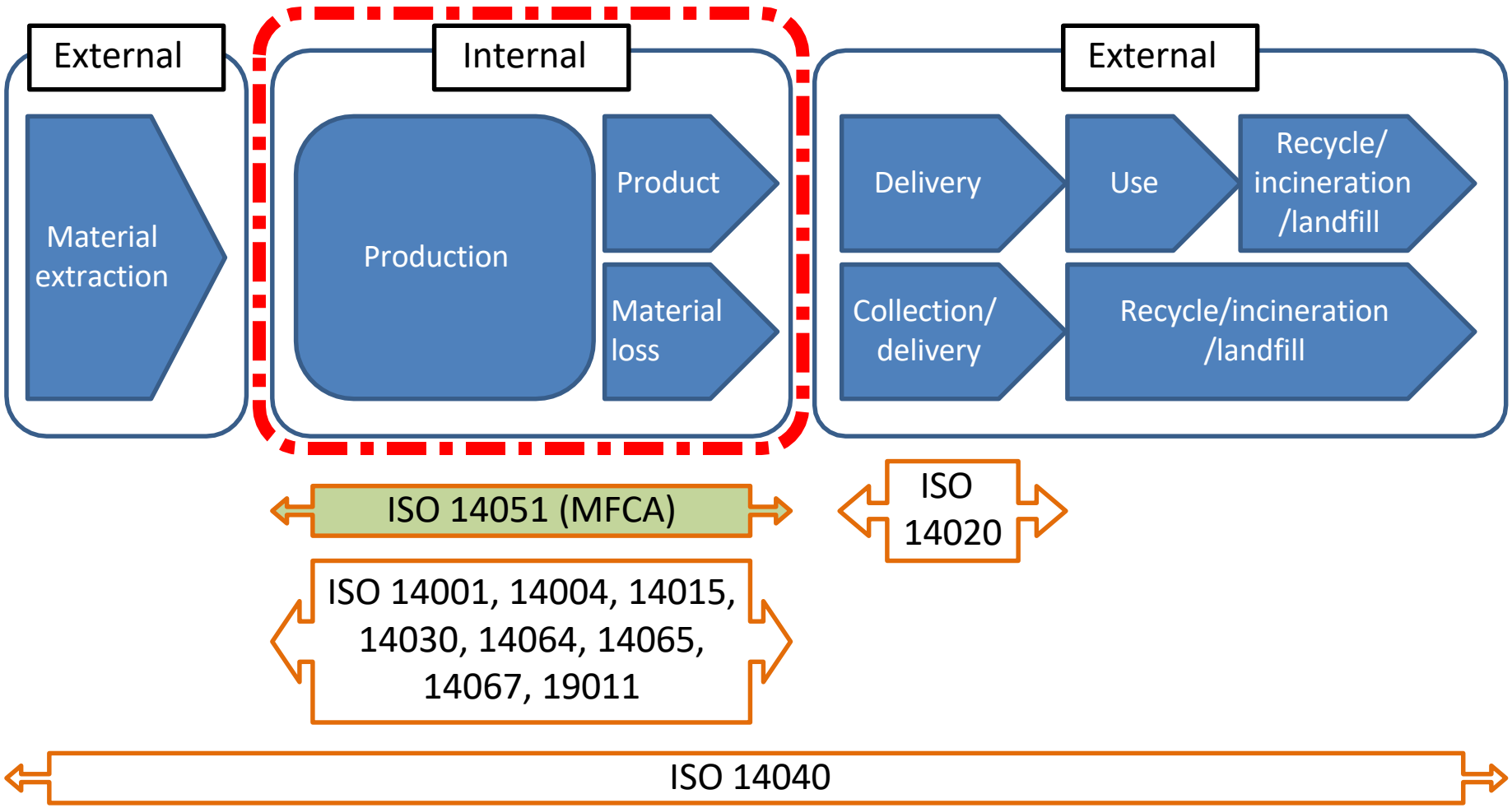
Module 7
MFCA (ISO 14051) Linkage with ISO 14001

Overview of the relationship between MFCA and other management standards



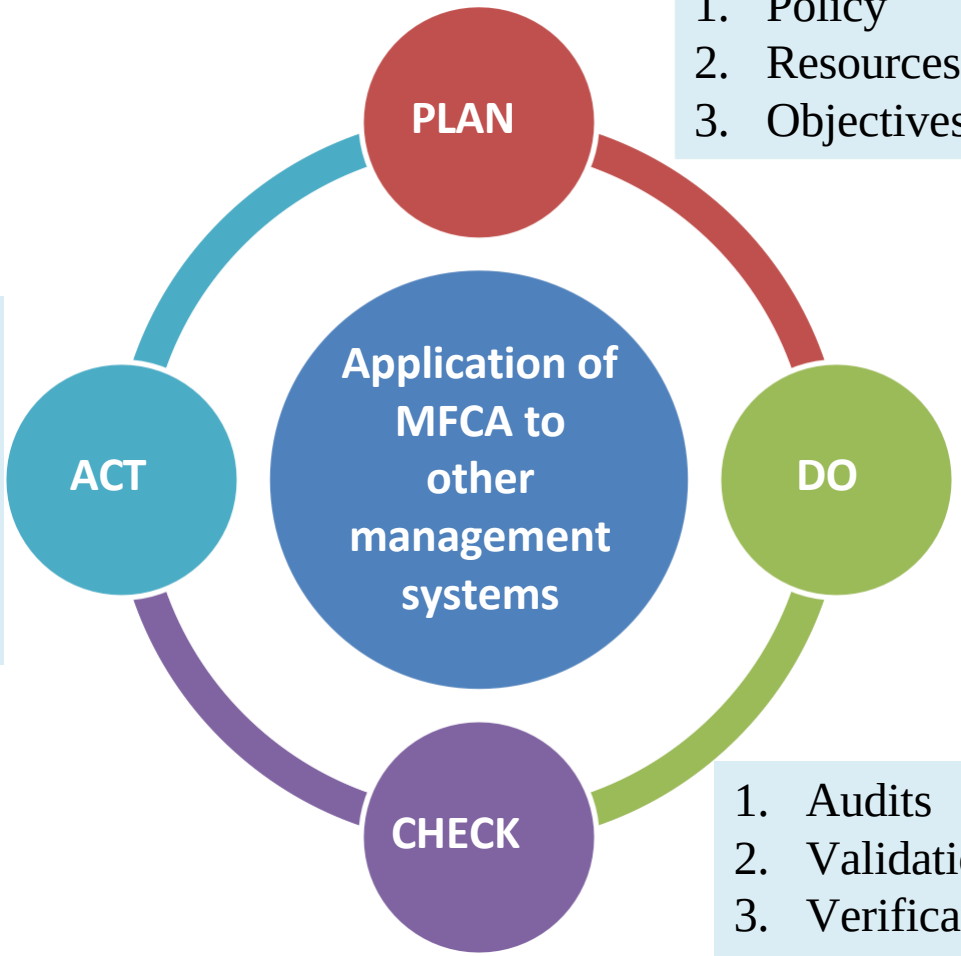
MFCA complements other management activities, especially in highlighting Economic, quality and environmental aspects.

Relationship between ISO 14051 and other ISO 14000 series



MFCA is complementary to other ISO 14000 standards.

ISO 14051 in the context of an environmental management system



1. Policy
2. Resources
3. Objectives

1. Processes
2. Indicators
3. Product realization

1. Audits
2. Validations
3. Verifications

1. Continual improvement
2. Preventive actions
3. Corrective actions

ISO 14051
in the context of an environmental management system
Plan-1

- Identification of significant environmental aspects (ISO 14001:2004, 4.3.1 and Annex A.3.1)

- Examples of significant environmental aspects include:
  - Use of raw materials and natural resources
  - Generation of waste and its management

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http://www.dreamstime.com/stacked-stock-photo-imagefree87430

ISO 14051
in the context of an environmental management system
Plan-2

- MFCA adds value to organizations by:
  - Increasing transparency and financially evaluating the use of raw materials and natural resources
  - Controlling and financially evaluating the generation of waste and its management
  - Other aspects (e.g., odors, air emissions) can be considered through MFCA as long as they are related to materials used at the site.

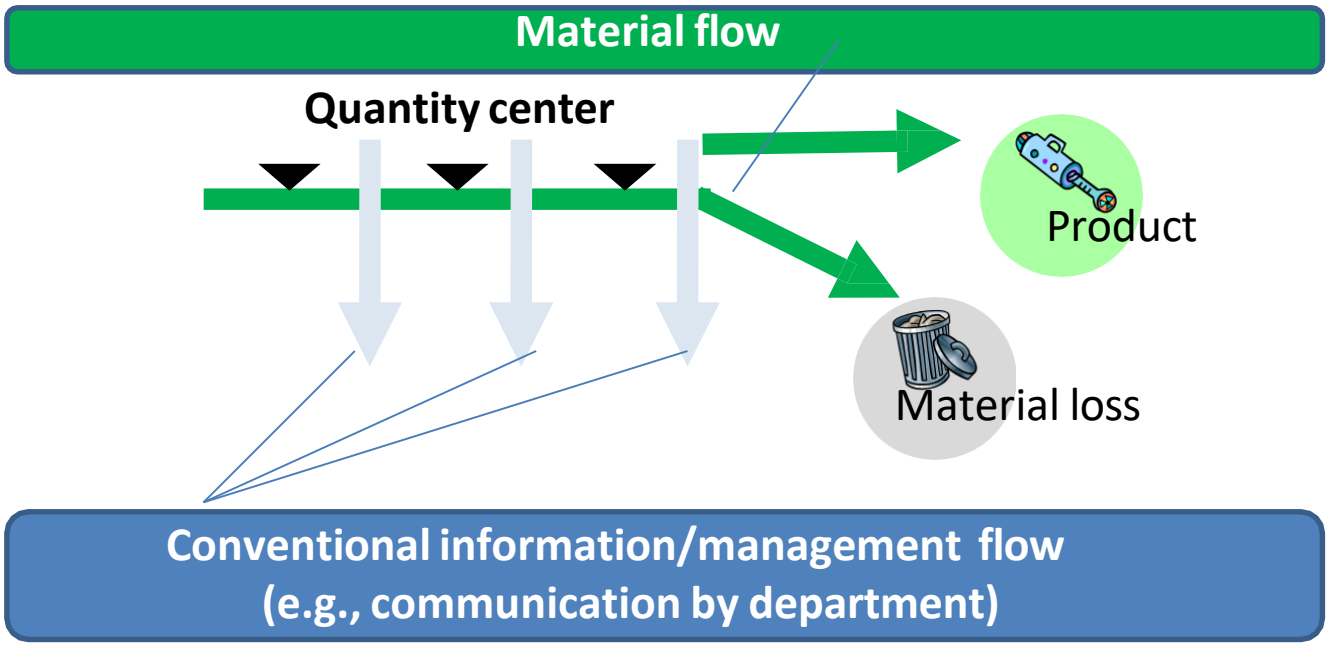
ISO 14051
in the context of an environmental management system
Plan-3

MFCA can be effectively used for the following activities in the plan phase of the PDCA cycle:

- Setting objectives and targets
- Determining effective environmental indicators
- Adding monetary value to environmental activities through MFCA
- Knowing about potential environmental and financial impacts can enhance the quality of the evaluation, providing useful information for the decision-making process.

ISO 14051
in the context of an environmental management system Do

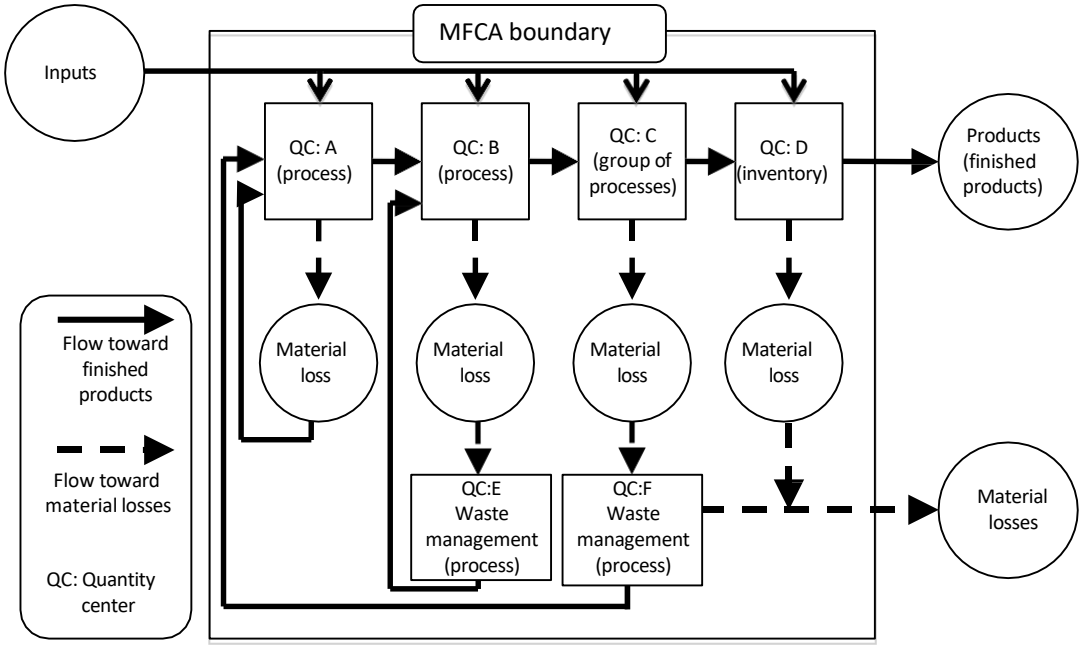
- Communication (ISO 14001:2004, 4.4.3)
  - Internal communication



ISO 14051 supports an organization in improving coordination and communication on its material and energy use practices.

ISO 14051
in the context of an environmental management system
Check

Internal audit (ISO 14001:2004, 4.5.5)



Data accuracy, completeness and comparability are one of the principles of ISO 14051. Accurate, complete, comparable data enable organizations to identify potential noncompliant items in their ISO 14001 cycle.

ISO 14051
in the context of an environmental management system
Act

Management review (ISO 14001:2004, 4.6)

Example of material flow cost matrix

Cost	Material	Energy	System	Disposal	Total
Product	2,499,944 (68.29%)	57,354 (68.29%)	480,200 (68.29%)	N/A	3,037,498 (67.17%)
Material loss	1,160,830 (31.71%)	26,632 (31.71%)	222,978 (31.71%)	74,030 (100%)	1,484,470 (32.83%)
Total	3,660,774 (100%)	83,986 (100%)	703,178 (100%)	74,030 (100%)	4,521,968 912 pcs (100%)

ISO 14051 provides useful information for management review in physical and monetary terms. In addition, an organization's continual improvement activities can be monitored in physical and monetary terms through the application of ISO 14051.

Module 7 Summary

- Through the PDCA cycle, MFCA can be introduced in any organization even if there is an existing management system (especially those compliant with other management systems such as ISO 9001 and ISO 14001.)

- According to the PDCA cycle, MFCA implementation should be continuous rather than a one-time effort.

Exercise 1

Jupiter Textiles limited (hereafter referred to as “JTL”) is an apparel maker that manufactures various products including men's. ladies and children and is located in Atodra in Gujarat (about 25 km from Surat). As of March 31st, 2019, the number of employees were numbered 141 on a consolidated basis. The company’s sales were 58.2 crores on a consolidated basis as of March 2019. The company’s assets were valued at 40.8 crores.

Exercise 1 (contd.)

Consider implementation of standard ISO 14051 (MFCA) at JTL for product line - garments for children, which is about one tenth of the total capacity. The company's manufacturing process covers all the clothes-producing processes from weaving of original yarn to dyeing, cutting, and sewing. The major portion of the sewing process is conducted at several outsourced facilities. All materials input into the process such as original yarn, parts, wrapping paper, colorant, and chemicals should be subjects for MFCA calculations.

List the basic data that you will need for MFCA calculations, and it shall be provided to you.

Apply the MFCA approach and make recommendations>


Thank
you