



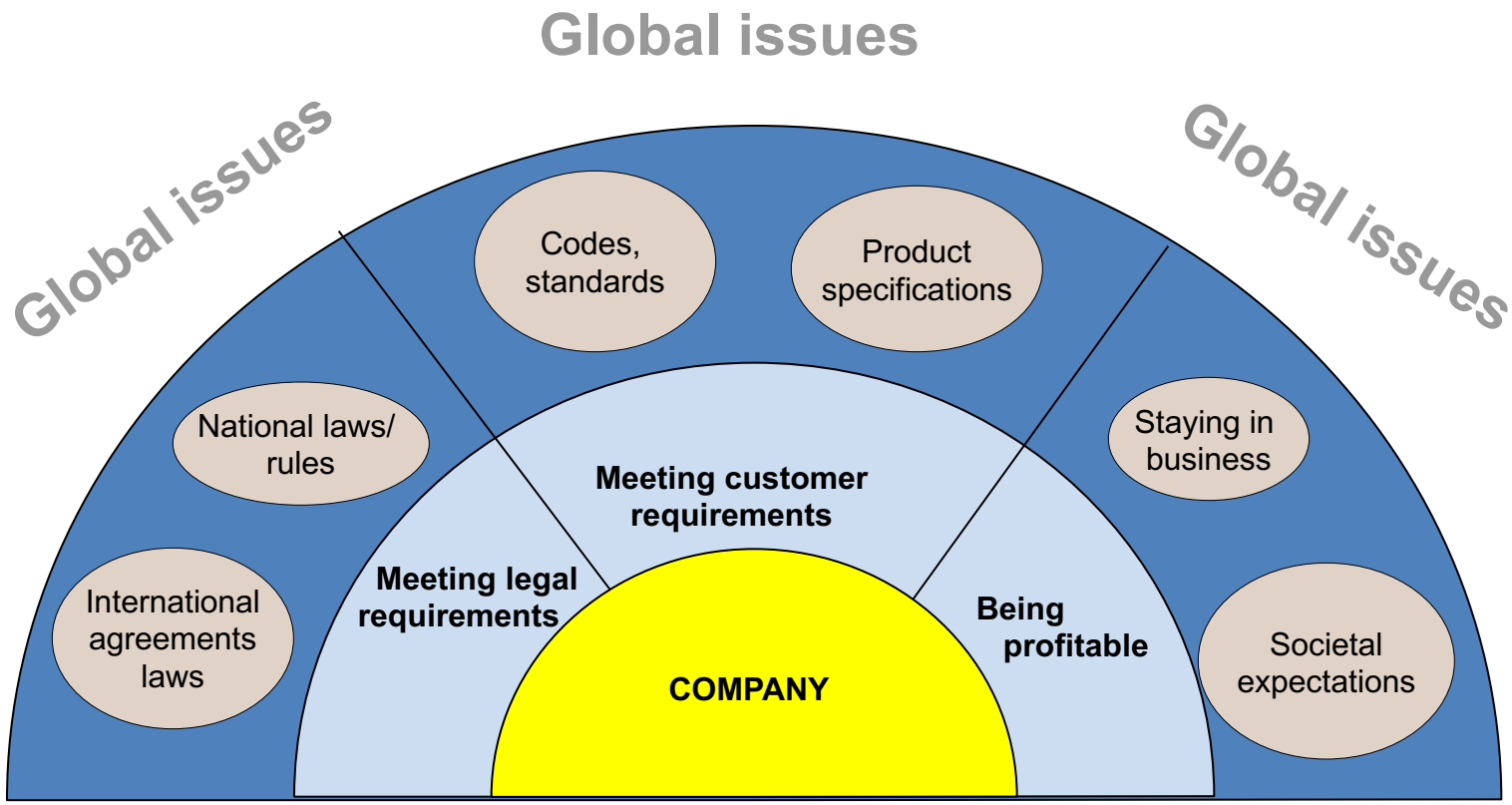
Overview

RESOURCE EFFICIENT MANAGEMENT OF ENERGY (REME)



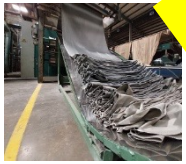


Energy Management – Business perspective









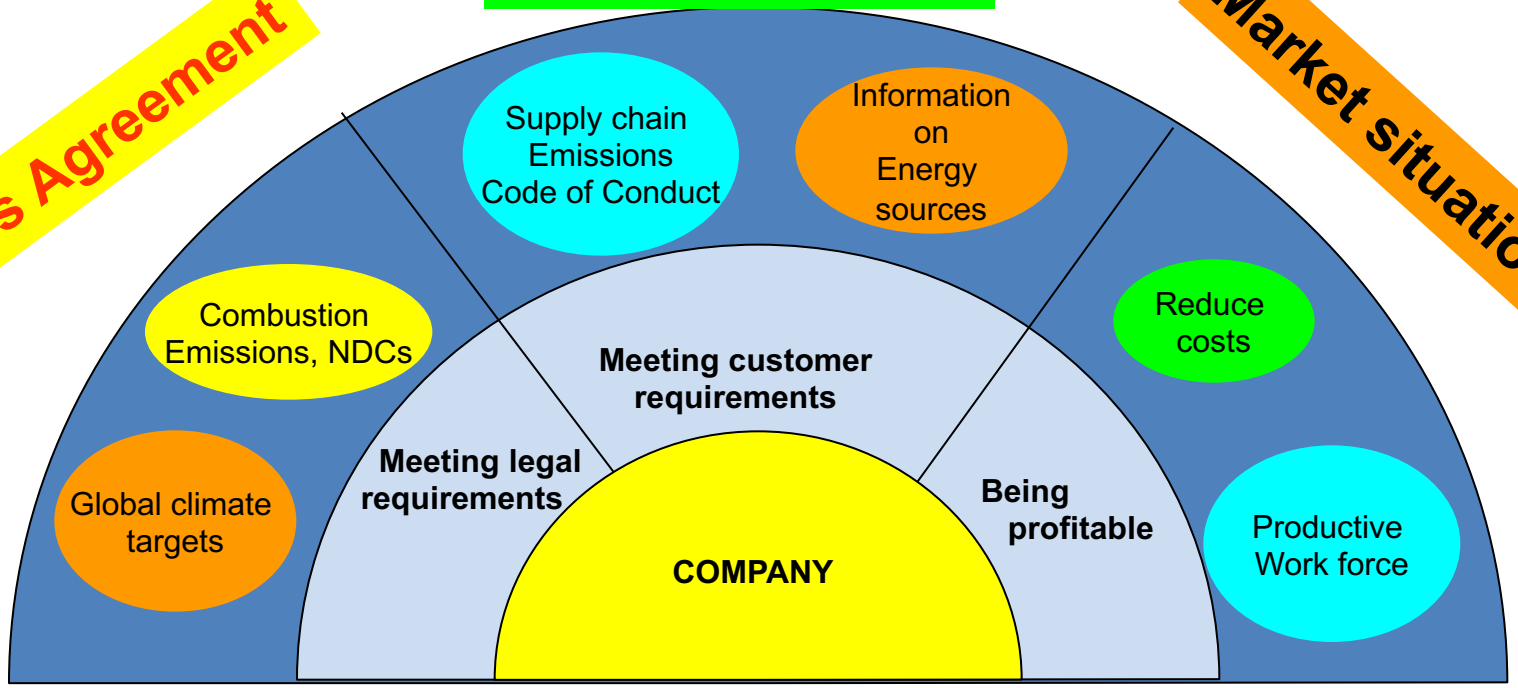
Energy Management – Business perspective

Examples

Client, End-user expectations

Paris Agreement

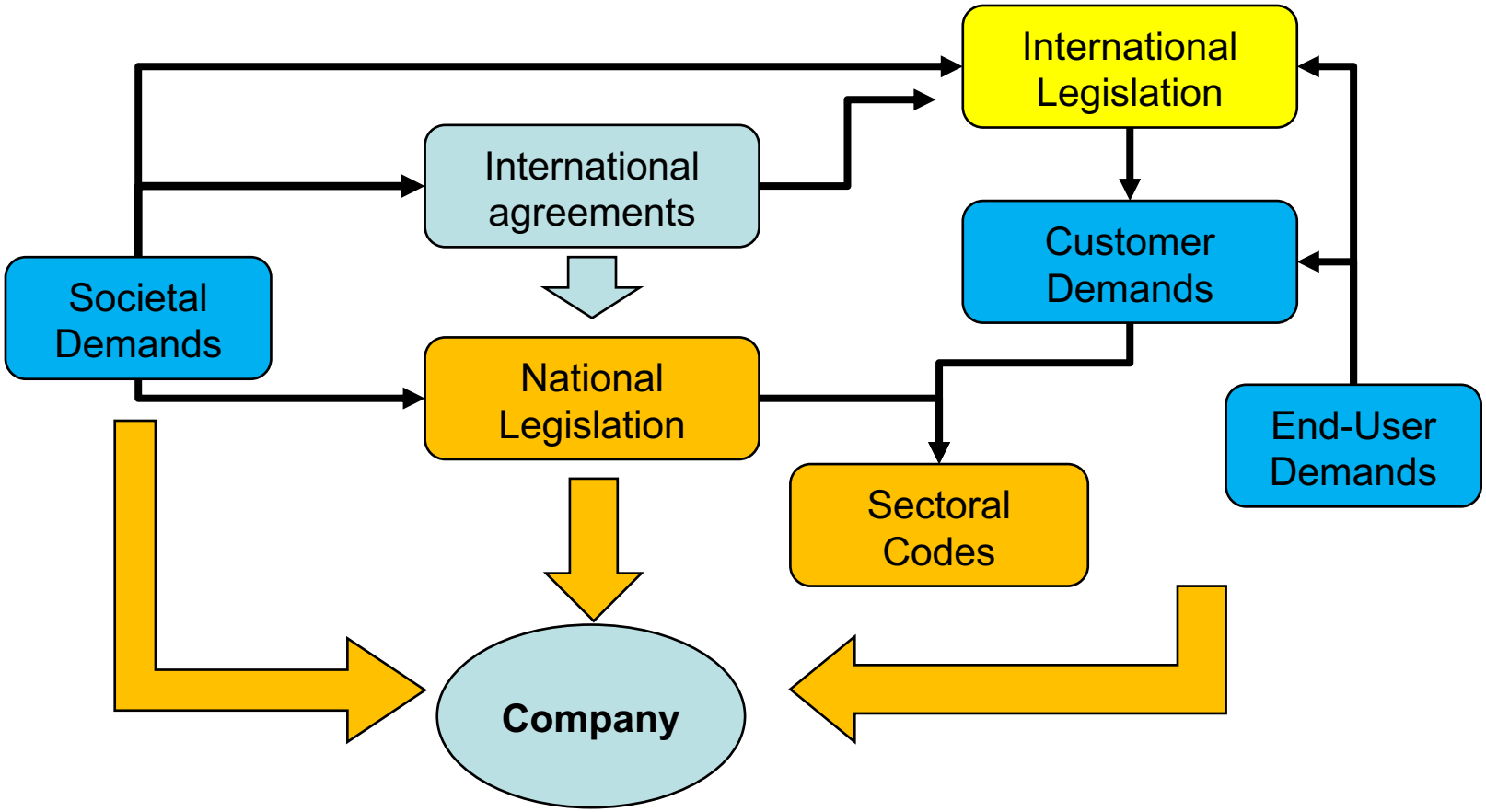
Market situation







Reference framework for energy management







Reference framework for energy management

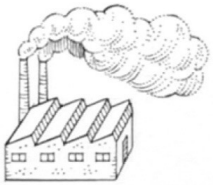
Conventions and international agreements

Agenda 21
Paris Agreement 2015
2021 Leaders' Climate Summit

National legislation

Factory act, rules, regulations
Environmental legislation…

Company level



Policies
Procedures
Practices
Supplier codes
….





Climate conventions and agreements

- **Earth Summit of Rio in 1992**
  - Agenda 21 refers to energy in multiple chapters.
- **Kyoto Protocol**
  - an international treaty to the United Nations Framework Convention on Climate Change setting binding obligations on industrialized countries to reduce emissions of greenhouse gases, approved 2005
- **Paris Agreement 2015**
  - The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties at COP 21 in Paris, on 12 December 2015 and entered into force on 4 November 2016.
  - Its goal is to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels
  - Nationally determined contributions (NDCs) are at the heart of the Paris Agreement and the achievement of these long-term goals.





Other references and initiatives

- **Non-government initiatives e.g. Greenpeace**
  - Campaign launched in July 2011; lobbying for 100% renewable energy adoption
  - ISO standards for Energy Management
- **Industry initatives**
  - SAC Higg FEM





Selected players and initiatives

Sustainable Apparel Coalition (SAC)

- leading alliance for sustainable production in the apparel, footwear, and textile industry, based in San Francisco, with around 200 global members within the apparel, footwear, and textile industry, in energy management contributing through Facility Environment Module (FEM) Self-assessment and Verification

Partnership for Sustainable Textiles (PST)

- multi-stakeholder initiative with about 150 representatives from five different actor groups (German Federal Government, business, non-governmental organizations, unions, standards organizations) initiated in 2014 by German Federal Ministry for Economic Cooperation and Development, located in Bonn, Germany, GIZ acting as secretariat, with focus on take more responsibility for sustainability in supply chain and striving to improve the conditions in the global textile production – from the production of raw goods for textile production to the disposal of textiles.





Selected players and initiatives

United Nations Framework Convention on Climate Change (UNFCCC)

- The UNFCCC entered into force on 21 March 1994. Today, it has near-universal membership. The 197 countries that have ratified the Convention are called Parties to the Convention. Preventing “dangerous” human interference with the climate system is the ultimate aim of the UNFCCC.

The Intergovernmental Panel on Climate Change (IPCC)

- Created in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP), the objective of the IPCC is to provide governments at all levels with scientific information that they can use to develop climate policies.
- According to IPCC report Global Warming of 1.5 ºC — (ipcc.ch), Human activities are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels, with a likely range of 0.8°C to 1.2°C. Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate.



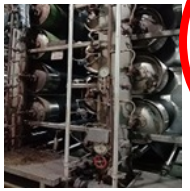


Selected players and initiatives

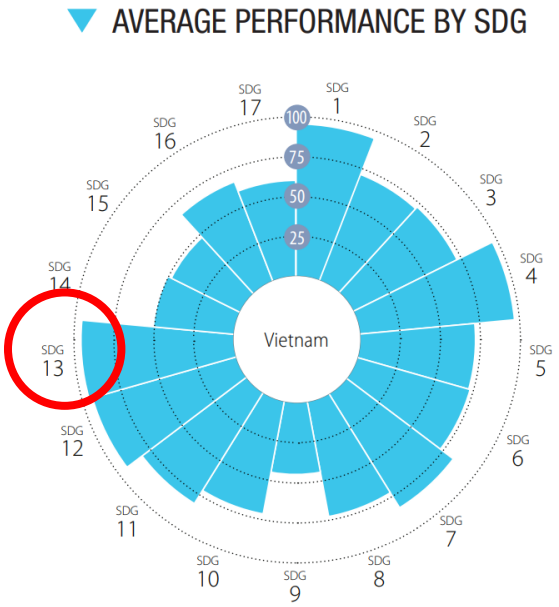
ISO

- ISO is an independent, non-governmental international organization with a membership of 165 national standards bodies that develops voluntary standards that support innovation and provide solutions to global challenges.
- Major standards for energy management;
  - ISO 50001:2018 ENERGY MANAGEMENT SYSTEMS — REQUIREMENTS WITH GUIDANCE FOR USE
  - ISO 50002:2014 ENERGY AUDITS — REQUIREMENTS WITH GUIDANCE FOR USE
  - ISO 50004:2020 ENERGY MANAGEMENT SYSTEMS — GUIDANCE FOR THE IMPLEMENTATION, MAINTENANCE AND IMPROVEMENT OF AN ISO 50001 ENERGY MANAGEMENT SYSTEM
  - ISO 50005 ENERGY MANAGEMENT SYSTEMS — GUIDELINES FOR A PHASED IMPLEMENTATION [UNDER DEVELOPMENT]
  - ISO/CD 50006.3 ISO 50006 ENERGY MANAGEMENT SYSTEMS — EVALUATING ENERGY PERFORMANCE USING ENERGY BASELINES AND ENERGY PERFORMANCE INDICATORS [UNDER DEVELOPMENT; Older version ISO 50006:2014]
  - ISO/TS 50008:2018 ENERGY MANAGEMENT AND ENERGY SAVINGS — BUILDING ENERGY DATA MANAGEMENT FOR ENERGY PERFORMANCE — GUIDANCE FOR A SYSTEMIC DATA EXCHANGE APPROACH
  - ISO 50015:2014 ENERGY MANAGEMENT SYSTEMS — MEASUREMENT AND VERIFICATION OF ENERGY PERFORMANCE OF ORGANIZATIONS — GENERAL PRINCIPLES AND GUIDANCE
  - ISO 50047:2016 ENERGY SAVINGS — DETERMINATION OF ENERGY SAVINGS IN ORGANIZATIONS
  - ISO 52127-1:2021 ENERGY PERFORMANCE OF BUILDINGS — BUILDING MANAGEMENT SYSTEM — PART 1: MODULE M10-12
  - ISO 23045:2008 BUILDING ENVIRONMENT DESIGN — GUIDELINES TO ASSESS ENERGY EFFICIENCY OF NEW BUILDINGS
  - ISO 11011:2013 COMPRESSED AIR — ENERGY EFFICIENCY — ASSESSMENT




NDCs of Vietnam



SDG13 – Climate Action

CO_2 emissions from fossil fuel combustion and cement production (tCO_2/capita)	2.6	2019	↓
CO_2 emissions embodied in imports (tCO_2/capita)	0.2	2015	↑
CO_2 emissions embodied in fossil fuel exports (kg/capita)	41.3	2019	●

Source: SDR-2021-vietnam.pdf (sdgindex.org)





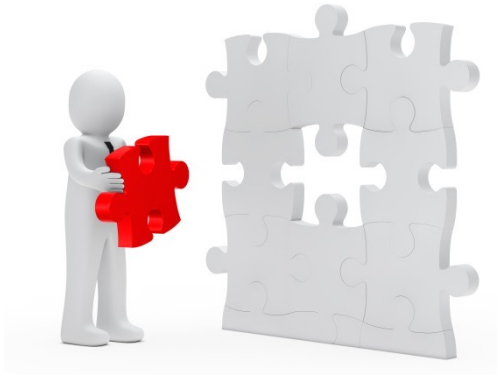
What to expect from energy management





What to expect from energy management

- Maintain a license to operate
- Access to global markets
- Maintain a competitive advantage
- Minimize repetitive changes to energy mix
- Reduction in cost by reducing energy wastage
- Reduce downtime by improving energy reliability
- Stop potential losses before they become issues
- Ensure compliance with standards and customer requirements
- Traceability of energy and GHG in the processes and supply chain
- Embed energy management into organizational culture

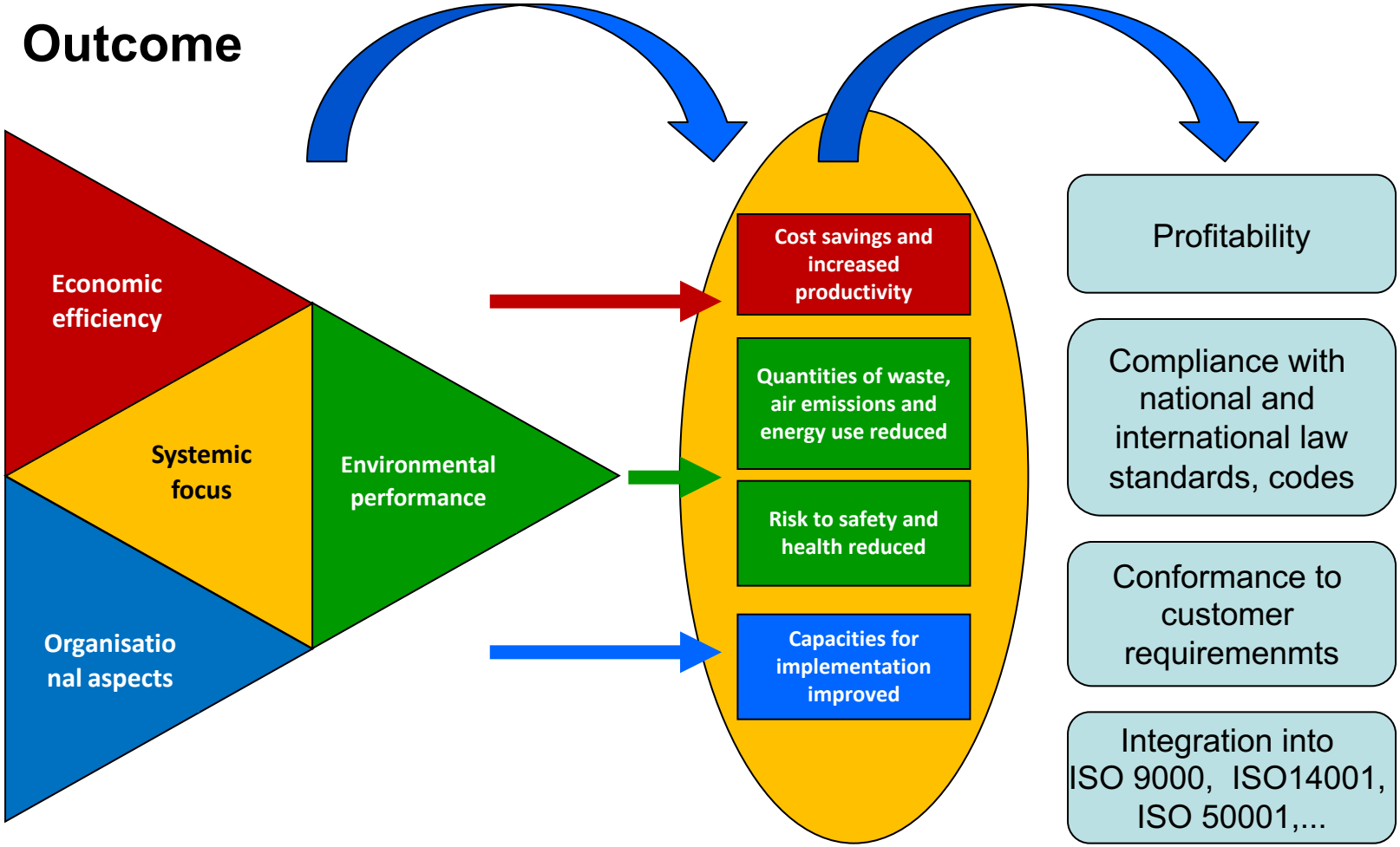






Energy management business case

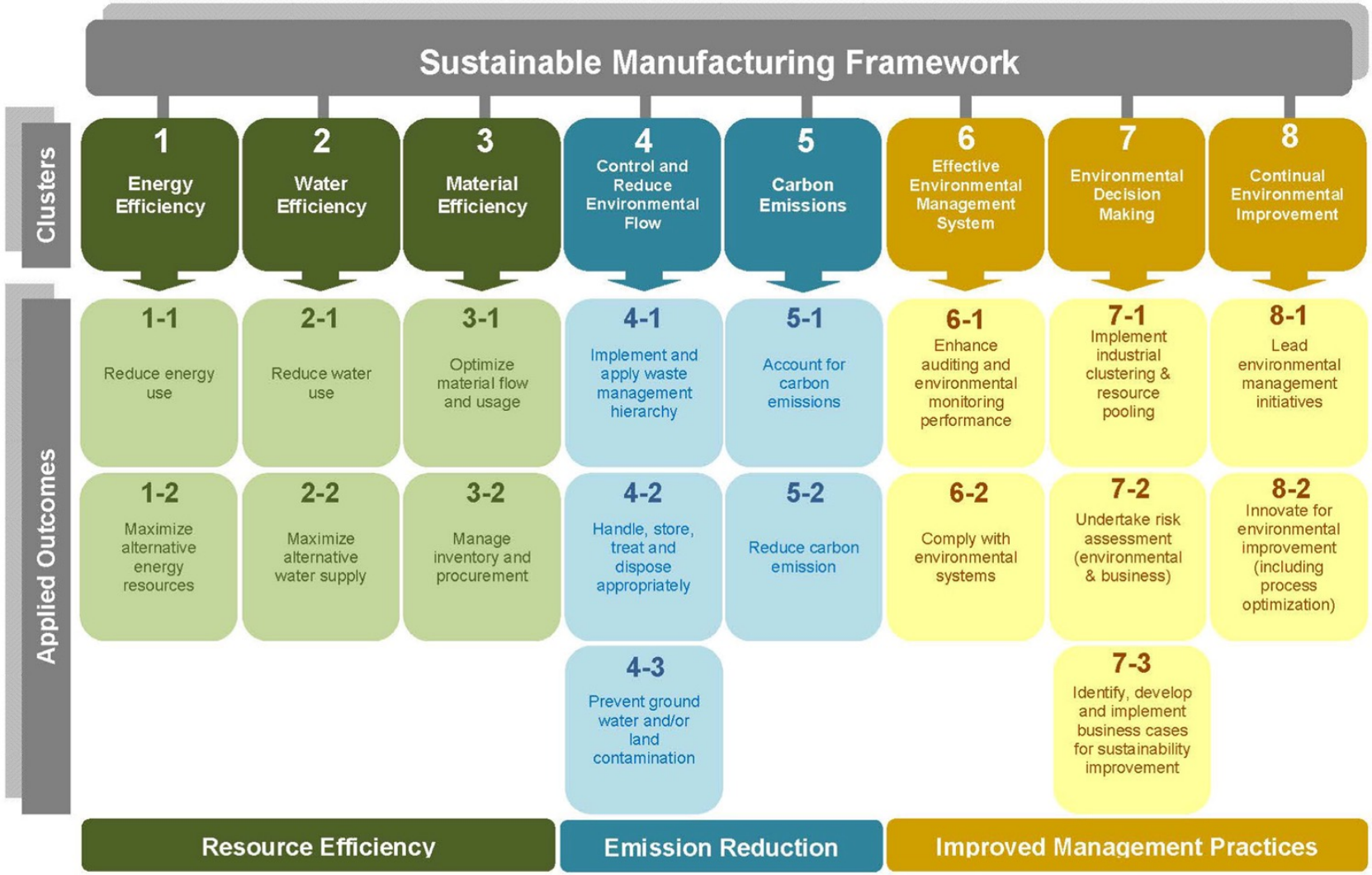
Outcome







Integration into sustainable production



Source: RMIT University, Australia, Capability Framework for Sustainable Manufacturing of Sports Apparel and Footwear, 2012, Sustainability, http://www.mdpi.com/2071-1050/4/9/2127/htm





International buyers requirements Example – Higg FEM

Level - 1 Requirements

- Track all energy sources
- Track and measure its energy use from the sources
- Standardize methods and frequency to track each energy source

Level - 2 Requirements

- Establish energy baselines
- Identify energy intensive processes or operations
- Set targets for improving energy use
- Set targets for reduction of GHG emissions (Scope-1 and Scope-2)
- Develop implementation plan to improve energy use and reduce GHG emissions
- Demonstrated continual improvements compared to baselines

Level - 3 Requirements (not mandatory)

- Calculate and report Scope 3 emissions
- Develop Science-Based Targets





Targets set by international buyers

De-carbonization: Eliminating coal and other fossil fuel use in whole supply chain

Renewable energy: Increase renewable energy in energy mix

Emission Reduction: Reduce GHG emissions across supply chain



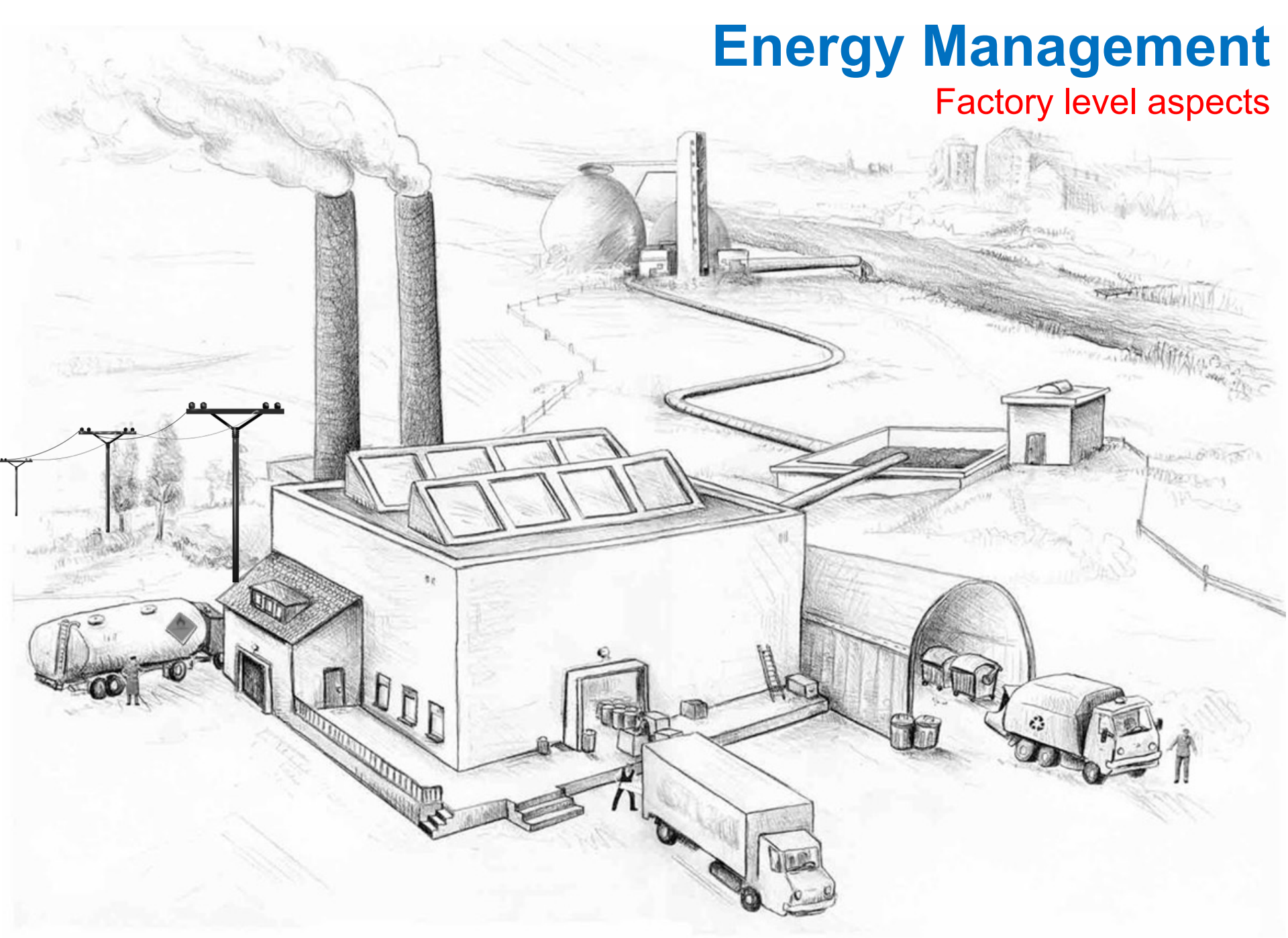


What to look at factory level?

ENERGY MANAGEMENT

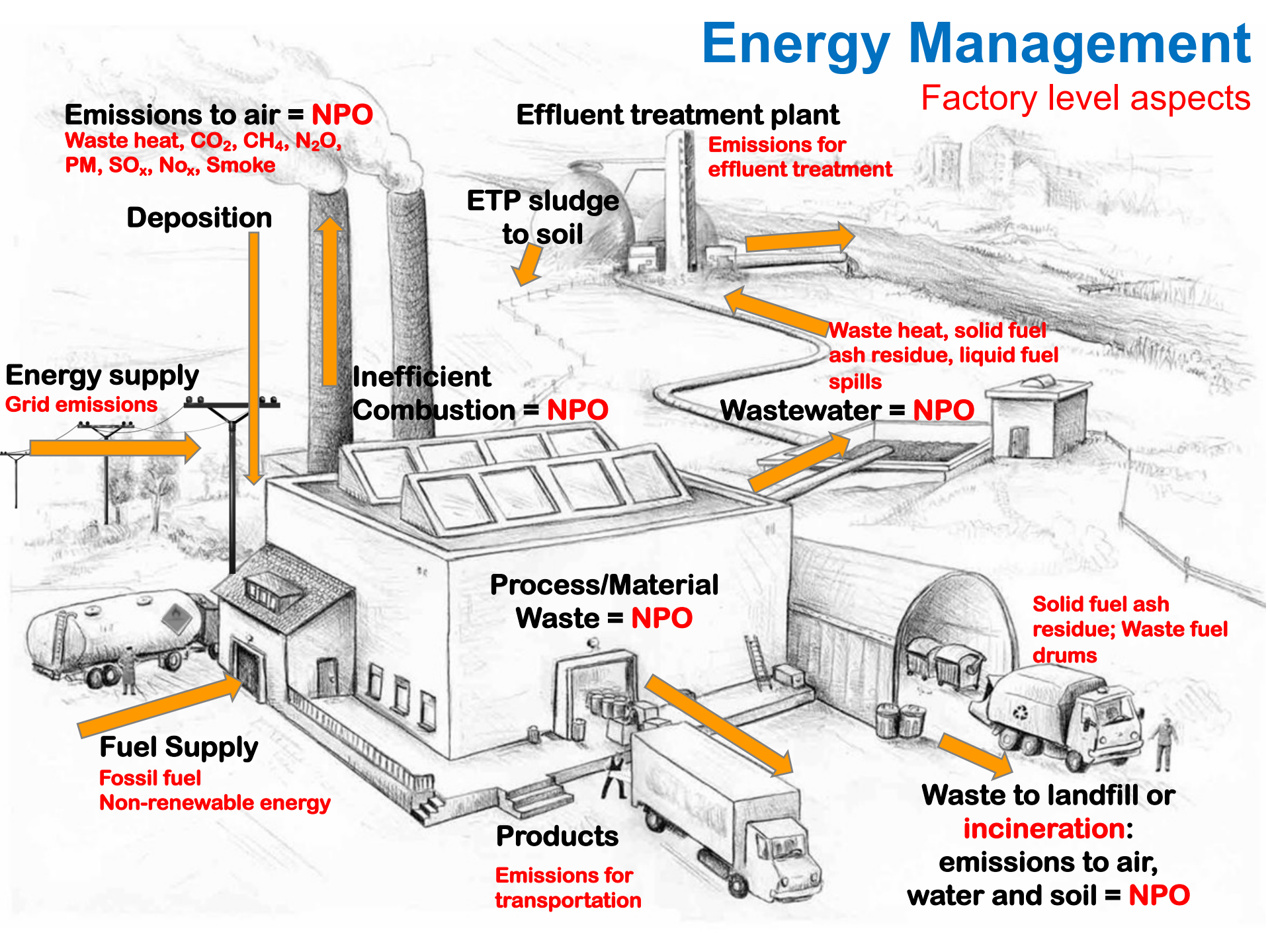
Energy Management

Factory level aspects



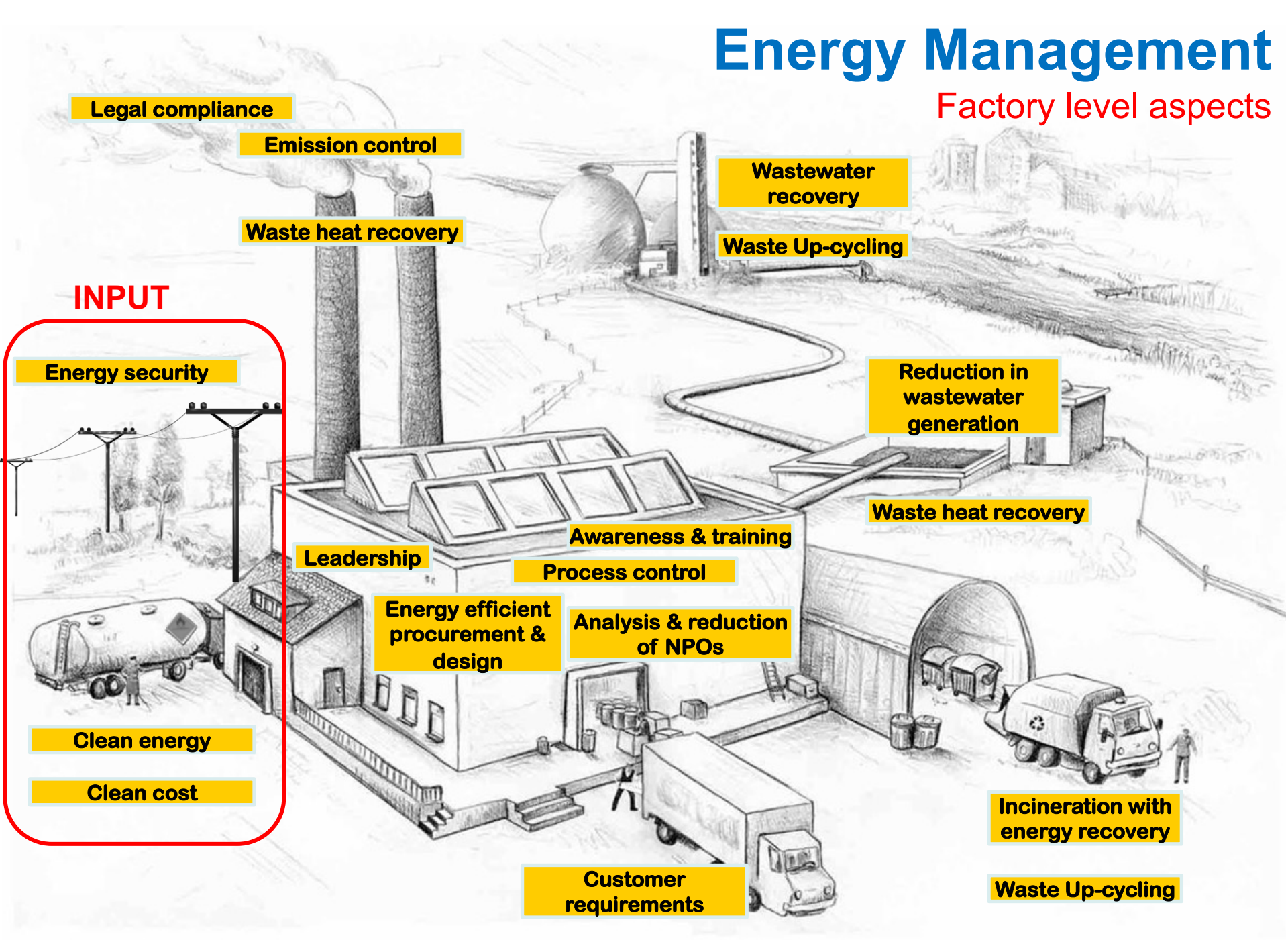
Energy Management

Factory level aspects



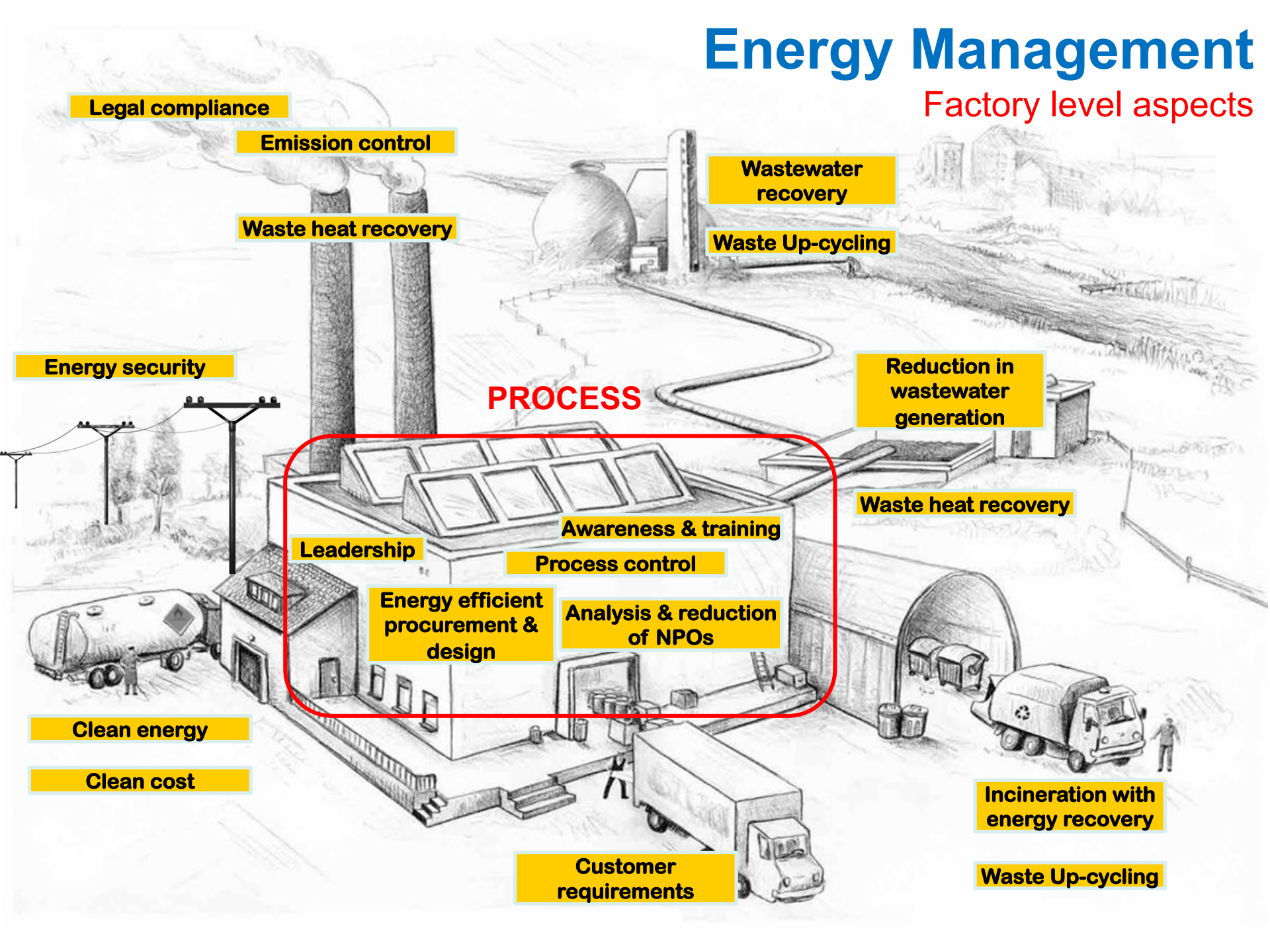
Energy Management

Factory level aspects



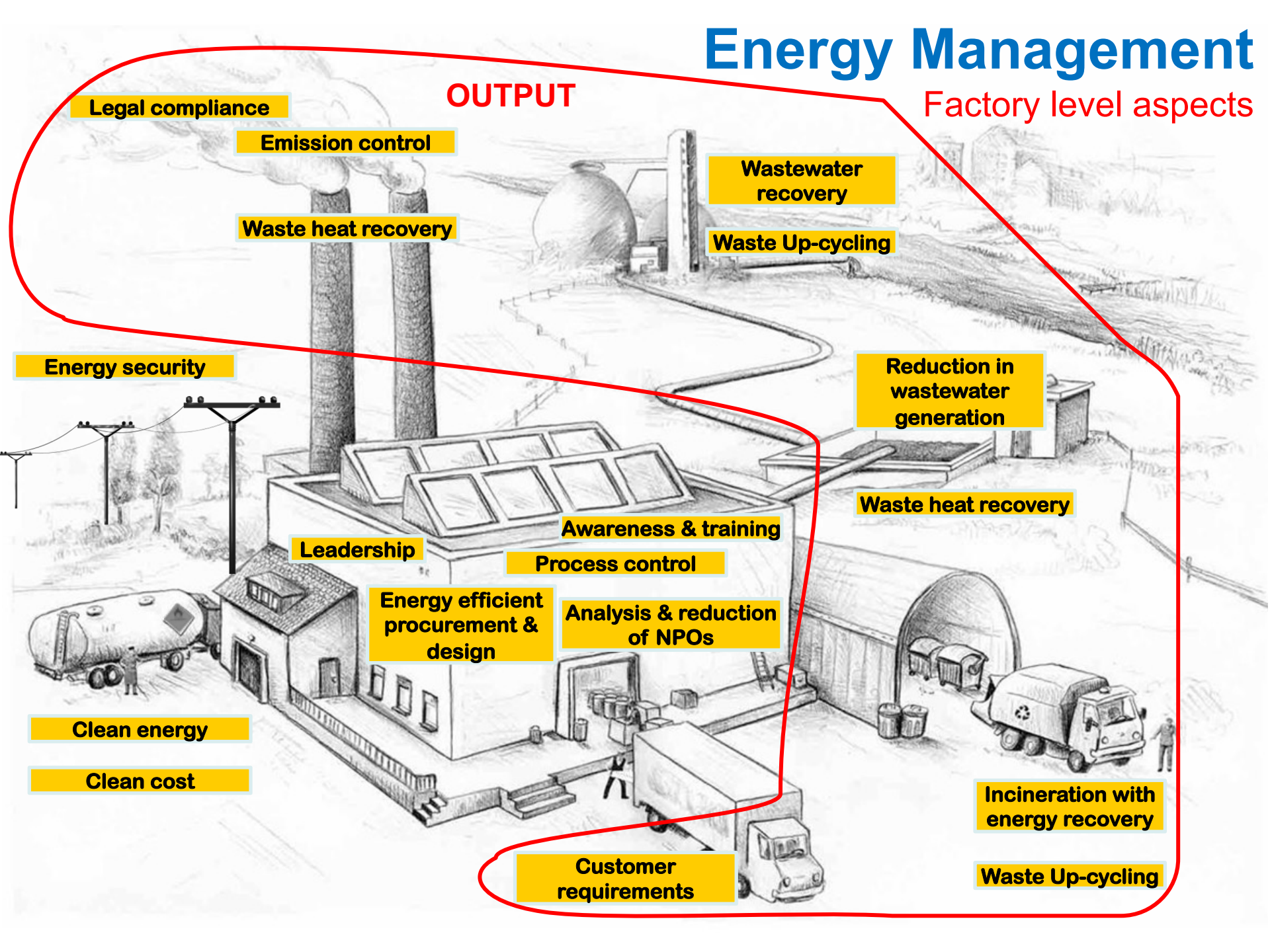
Energy Management

Factory level aspects



Energy Management

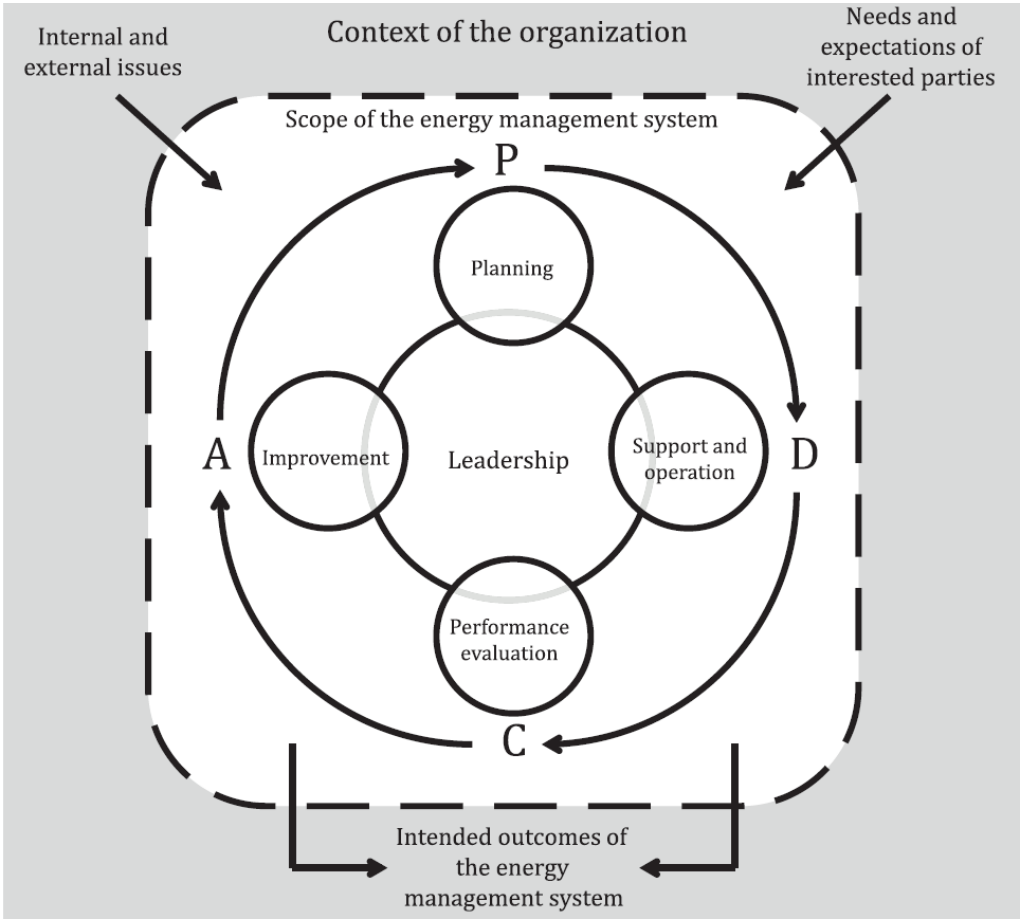
Factory level aspects







Energy Management Framework

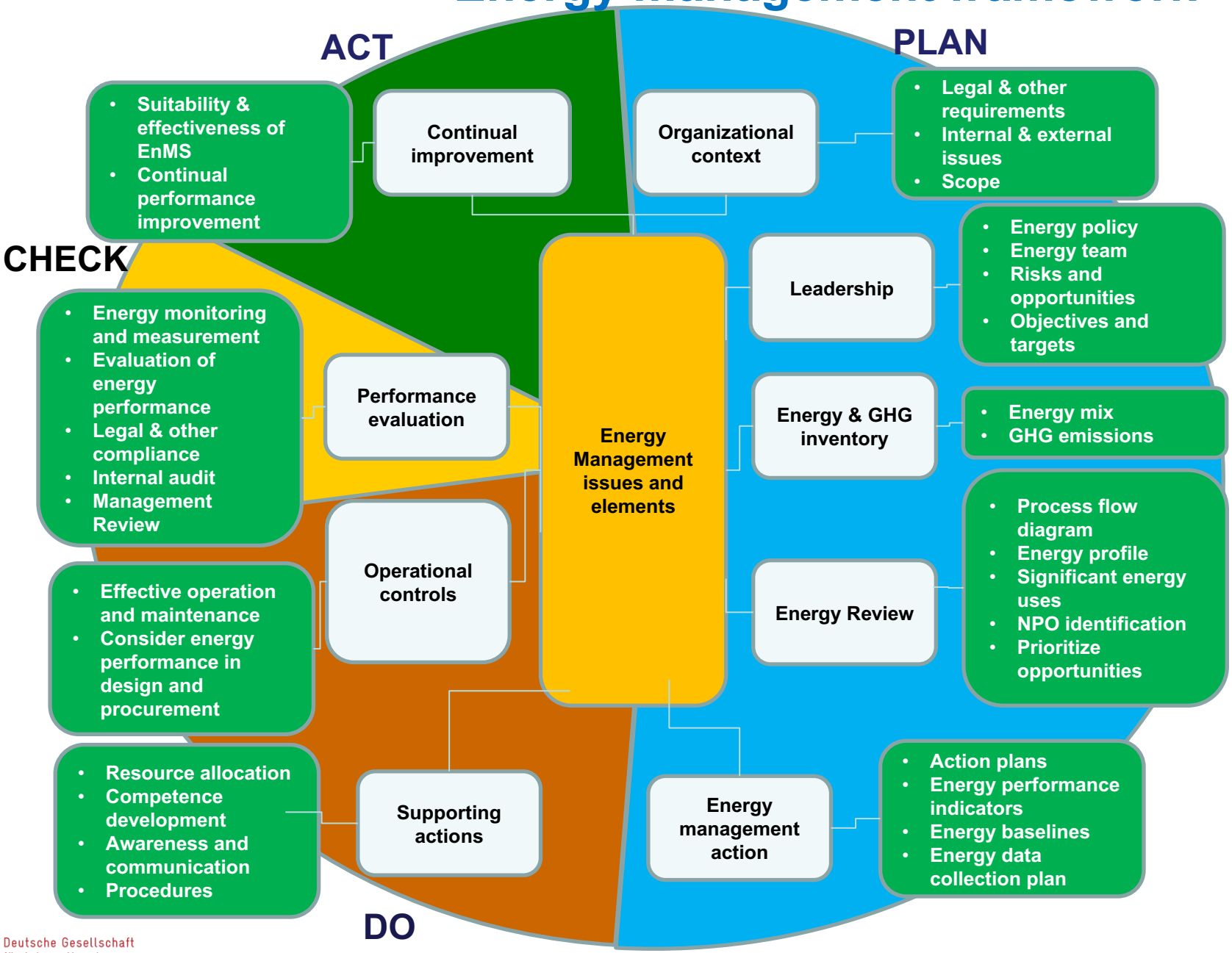


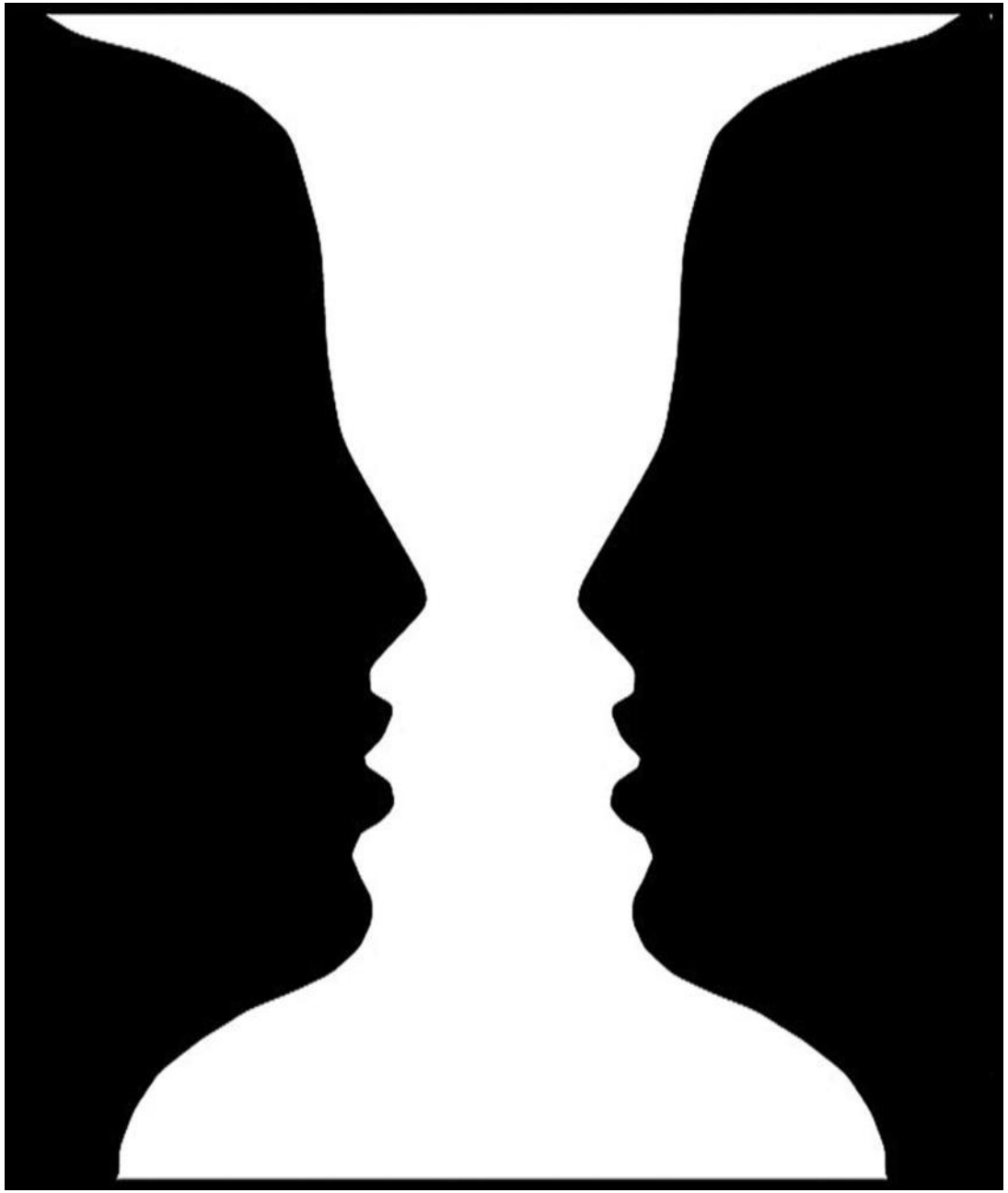
Source: ISO 50001:2018, Figure-1: Plan-Do-Check-Act Cycle

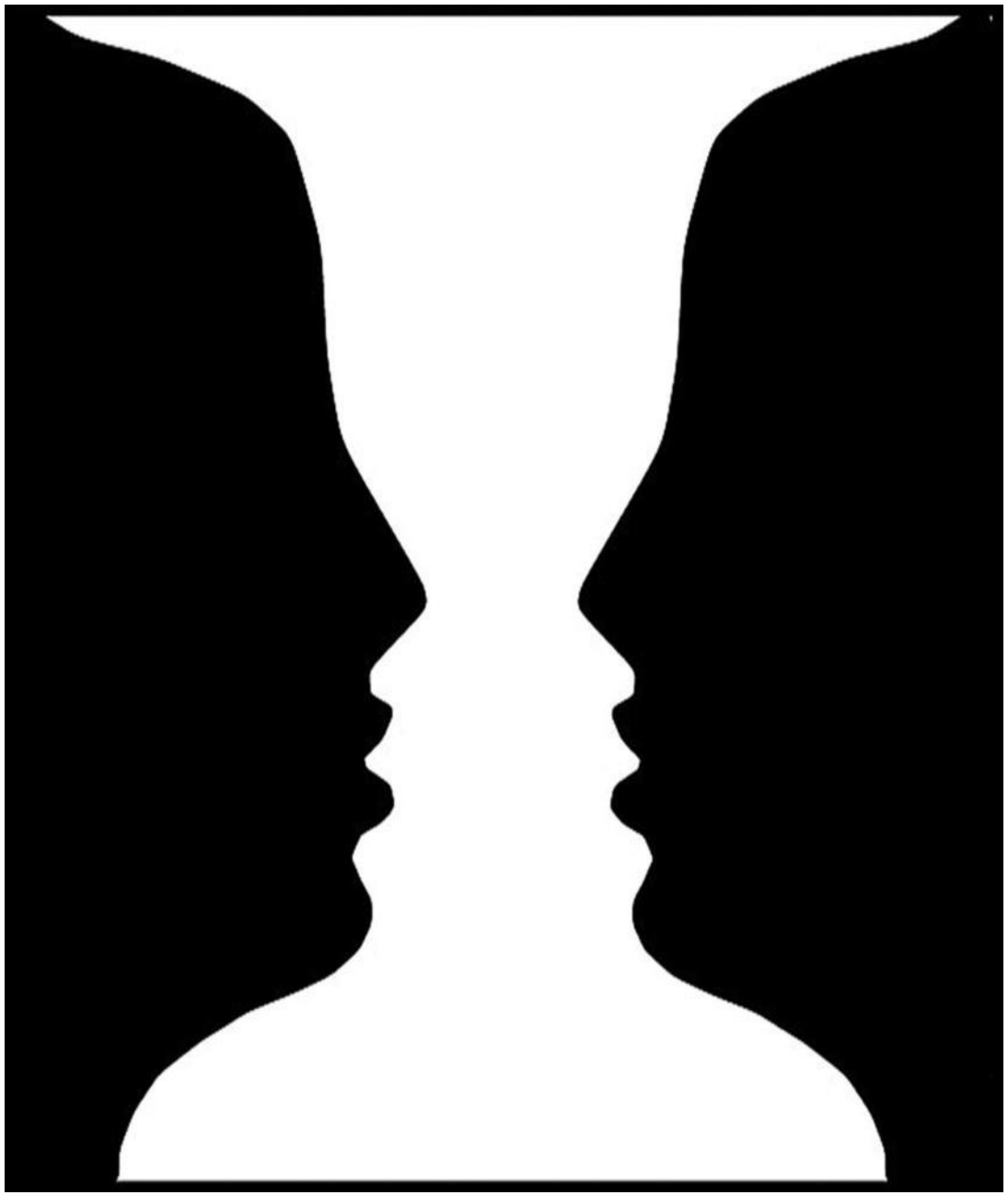
Energy management framework











Looking at NPOs

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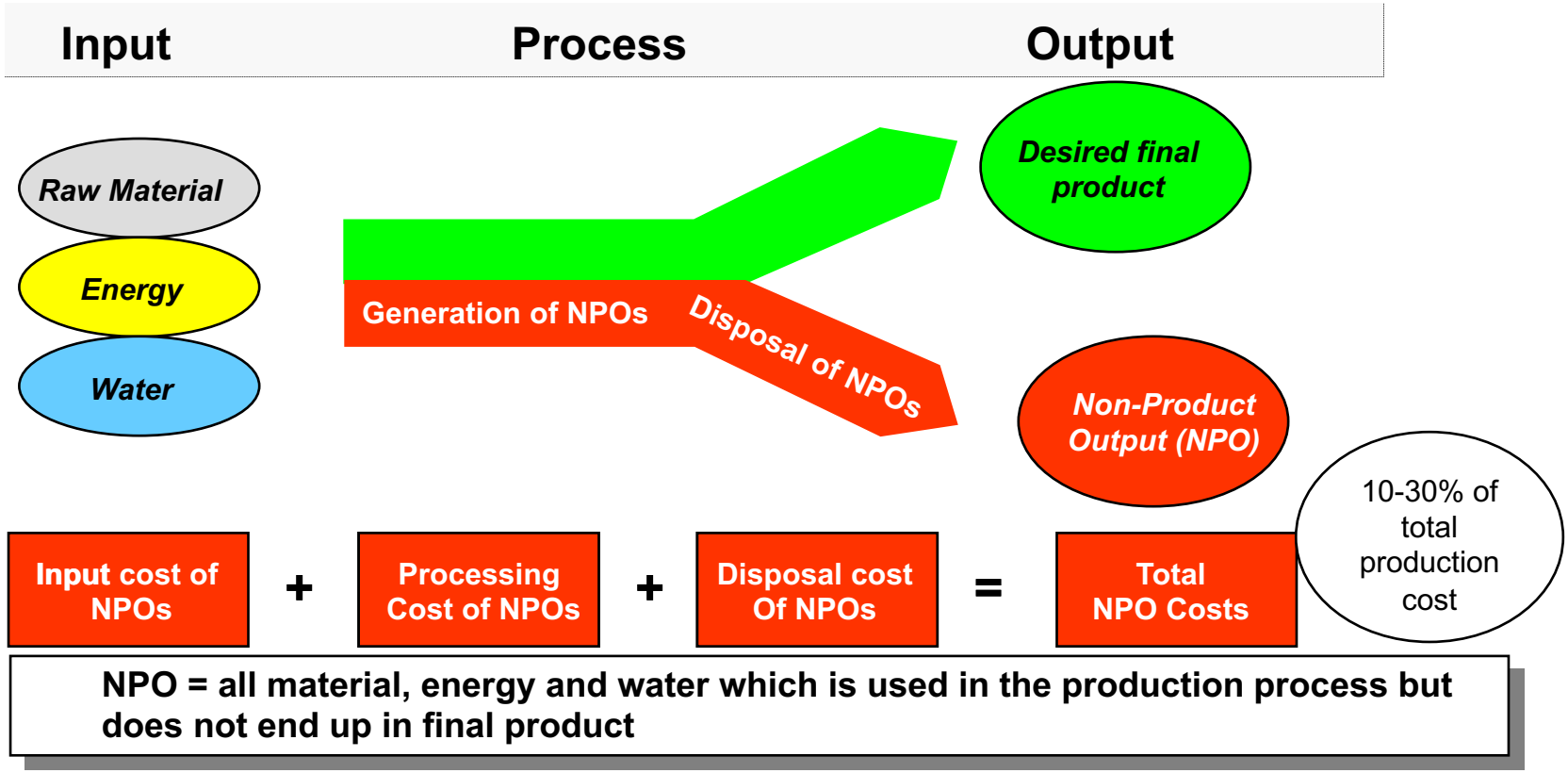
Change your point of view





Starting points…

Non-product Outputs (NPOs) – the starting point

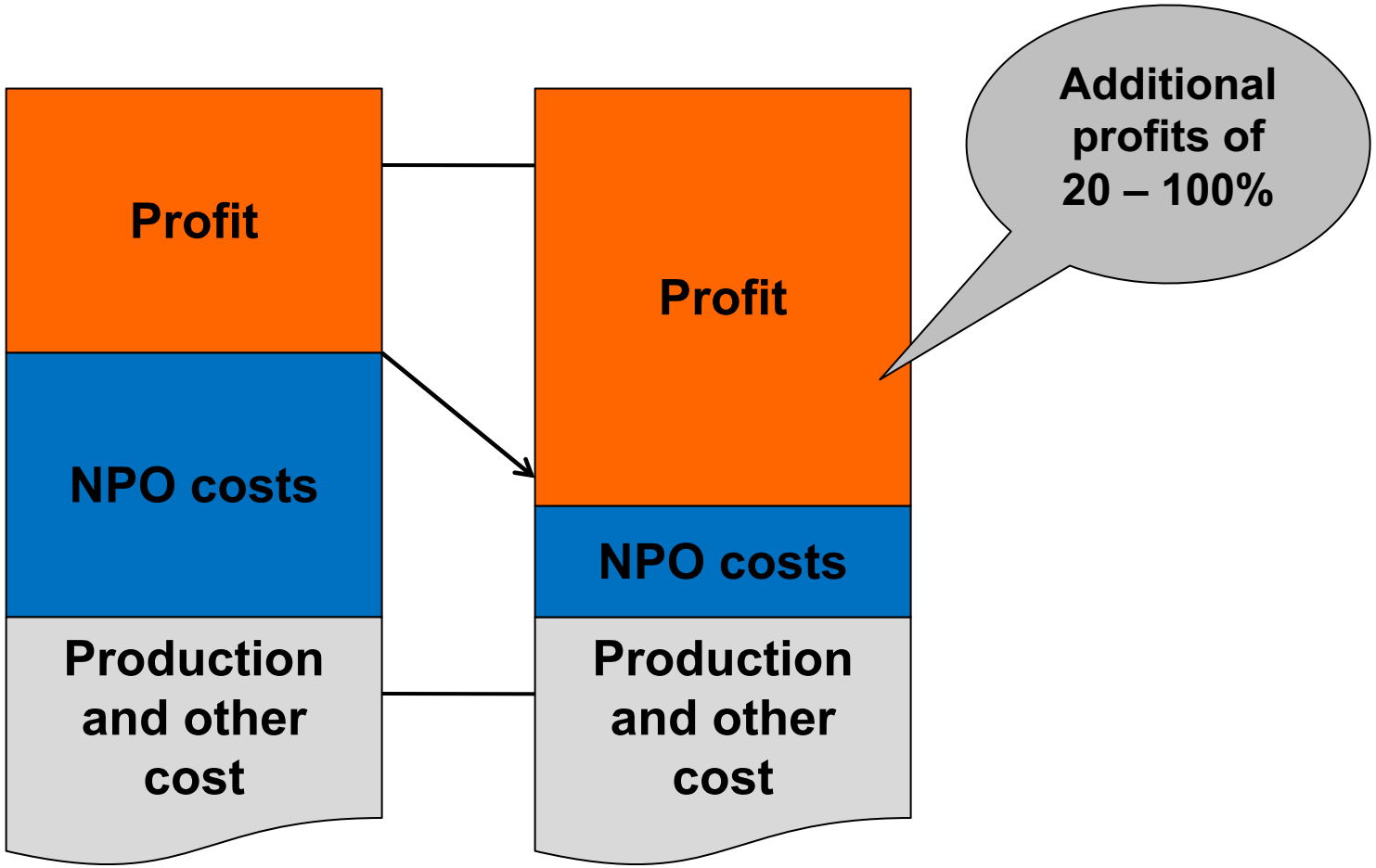


Source: PREMAnet e.V





Economic benefit of addressing NPOs



Source: Wuppertal Institute, Germany





Questions?